CITY OF EVERETT, MASSACHUSETTS

CORPORAL ARTHUR NELSON PLAY LOT RENOVATION PROJECT

(FULLER STREET PARK)

CITY PROJECT NO.: DPW-26-58

Delivery Method: M.G.L. c. 30 § 39M

OWNER:

City of Everett, Massachusetts
484 Broadway, Room 14
Everett, MA 02149

ARCHITECT:

NESRA Engineering
111 Washington Street, Unit 201A
Plainville, MA 02760

January 14, 2026

TABLE OF CONTENTS

Number of Pages

TITLE SHEET FOR PROJECT MANUAL 1
TABLE OF CONTENTS.....4

BIDDING REQUIREMENTS

INVITATION TO BID AND INSTRUCTIONS TO BIDDERS (CHAPTER 30) 5
BID FORM 15

CONTRACTING REQUIREMENTS

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR 23
FORM OF GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION.....89
MINIMUM PREVAILING WAGE RATES 33
SUPPLEMENTARY CONDITIONS TO THE CONTRACT FOR CONSTRUCTION 4

TECHNICAL SPECIFICATIONS

(CONTINUED ON NEXT PAGE)

TECHNICAL SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS	SECTION NUMBER
SUMMARY OF WORK	01 10 00
ALTERNATES	01 23 00
CONDUCT OF THE WORK	01 31 13
PROJECT MEETINGS	01 31 19
SUBMITTAL PROCEDURES	01 33 00
QUALITY CONTROL	01 45 00
TEMPORARY FACILITIES	01 52 00
TEMPORARY PEST CONTROL	01 57 16
FINAL CLEANING	01 74 23
PROTECTING INSTALLED CONSTRUCTION	01 76 00
PROJECT CLOSEOUT	01 77 00
WARRANTIES	01 78 36
RECORD DOCUMENTS	01 78 39

DIVISION 2 – EXISTING CONDITIONS	SECTION NUMBER
SITE REQUIREMENTS	02 20 00
SITE PREPARATION	02 21 00

DIVISION 3 – CONCRETE	SECTION NUMBER
CONCRETE FORMING AND ACCESSORIES	03 10 00
CONCRETE REINFORCING	03 20 00
CAST-IN-PLACE CONCRETE	03 30 00

DIVISION 9 – FINISHES	SECTION NUMBER
STAINING AND TRANSPARENT FINISHING	09 93 13

DIVISION 10 – SPECIALTIES	SECTION NUMBER
GROUND-SET FLAGPOLES WITH SOLAR LIGHTING	10 75 16

DIVISION 11 - EQUIPMENT	SECTION NUMBER
ATHLETIC EQUIPMENT	11 68 33

DIVISION 26 – ELECTRICAL	SECTION NUMBER
ELECTRICAL (SEE DRAWINGS)	NONE

DIVISION 31 – EARTHWORK	SECTION NUMBER
SITE CLEARING	31 10 10
EARTH MOVING	31 20 00
EROSION AND SEDIMENT CONTROL	31 25 00

DIVISION 32 – EXTERIOR IMPROVEMENTS	SECTION NUMBER
ASPHALT PAVING	32 12 16
CURBS AND GUTTERS	32 16 00
CHAIN LINK FENCES AND GATES	32 31 13
SITE TRASH AND LITTER RECEPTACLES	32 33 23
SITE SEATING	32 33 43.13
SITE TABLES	32 33 43.53
PLANTING	32 90 00
TOPSOIL PLANTING AND GRADING	32 91 19.13
SEEDING	32 92 19

DIVISION 33 – UTILITIES	SECTION NUMBER
WATER UTILITY DISTRIBUTION PIPING	33 11 00
DISINFECTING OF WATER DISTRIBUTION	33 13 00
STORM UTILITY SUBDRAINAGE PIPING	33 41 00

APPENDIX A – ADDITIONAL INFORMATION

PLAYGROUND EQUIPMENT, SPECIFICATIONS, INSTALL INSTRUCTIONS	NONE
SPLASH PAD EQUIPMENT, SPECIFICATIONS, INSTALL INSTRUCTIONS	NONE
MIRAFI 140N	NONE
NOMAFLEX JOINT FILLER	NONE
COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS (LINK ONLY)	NONE

CITY OF EVERETT, MASSACHUSETTS
CORPORAL ARTHUR NELSON PLAY LOT
RENOVATION PROJECT

CITY PROJECT NO.: DPW-26-58

INVITATION TO BID AND INSTRUCTIONS TO BIDDERS

GENERAL CONTRACTOR SERVICES

I. SUMMARY OF WORK AND PROJECT SCHEDULE

The Corporal Arthur Nelson Play Lot Renovation Project (referred to as Fuller Street Park within this document) is located in Everett, MA. The work includes furnishing all labor, materials, and equipment to demolish and remove the existing playground and site features, implement and maintain erosion and sediment controls, obtain required permits, and complete all necessary site preparation, grading, and drainage/utility work for the proposed improvements. New construction includes a bituminous concrete half-court basketball court, a new splash pad with associated equipment and utilities, and new playground equipment (including swings) with required PIP safety surfacing. Additional improvements include new ADA-accessible concrete walkways, site perimeter modular block wall, fencing and gates, and all related appurtenances, including site furnishings (tables, benches, bike racks), a shade shelter, a new flagpole and park signage, and new landscaping and plantings.

Estimated construction cost is $800,000. All work to be performed in accordance with the Bid Documents as herein defined.

On-Site Construction Start:	April 1, 2026
Substantial Completion:	August 1, 2026
Final Completion:	August 15, 2026

II. INVITATION FOR BIDS

The City of Everett, Massachusetts (the "City") hereby requests bids from General Contractors interested in bidding for the Work described herein pursuant to the requirements of M.G.L. c. 30, § 39M and all other applicable provisions of the Massachusetts General Laws. If it be in the best interest of the City to do so, the City reserves the right to reject any and all Bids, to waive any informalities or minor deviations, to cancel the project and Bid Documents at any time prior to award, and/or to advertise for new Bids if funds are not available for the Project.

These instructions provide Bidders with information intended to enable them to prepare and submit Bids for consideration and evaluation by the City. These instructions cover all work as documented in the attached bid documents, as modified by addenda, if any (collectively, the "Bid Documents"). Bids shall be submitted in compliance with and shall be governed by the Agreement between Owner and Contractor, the General Conditions and Supplementary Conditions, if any.

III. BIDDING REQUIREMENTS

(A) **Bid Form.** Bids shall be submitted on the appropriate Bid Form attached hereto. All entries on the Bid Form shall be made by typewriter or in ink. No modifications should be made to the Bid Forms. Sums shall be expressed in both words and figures in the space indicated on the Bid form. Where there is a discrepancy between the sum expressed in words and the sum expressed in figures, the amount expressed in words shall control. Total lump sum price will be basis of award regardless of any mathematical errors by bidders. Bids shall be signed by the person having legal authority to bind the Bidder to the terms and conditions of the Bid, and the person so signing shall give the person's own name, business address and title. **Bids not properly signed will be rejected as non-responsive**.

(B) **Bid Deposit.** Each bid must be secured by an accompanying deposit of five percent (5%) of the total amount of the Bid. Deposits shall be in the form of a bid bond, or a certified check, treasurer's or cashier's check issued by a responsible bank or trust company, payable to the City of Everett. No cash will be accepted. Bid deposits of all Bidders, except those of the three lowest responsible and eligible Bidders, will be returned within five (5) business following the Bid opening. Except as provided in the "BONDS AND INSURANCE CERTIFICATES" and "FOREIGN CORPORATION" sections appearing below, the Bid Deposits of the three lowest responsible and eligible bidders will be returned upon the execution of the Contract or, if no award is made, upon the expiration of the time prescribed for making an award.

(C) **Submission of Bids.** Bids shall be enclosed in a **sealed envelope** with the following plainly marked on the outside:

Bid for: **Everett City Hall**
Kiara M. Freeman, Chief Procurement Officer

Project Number: DPW-26-58
Project Name: Corporal Arthur Nelson Play Lot Renovation Project
Bidder's Name
Business Address
Phone Number

Bids must be received at Everett City Hall – Purchasing Department, 484 Broadway, Room 14 Everett, MA 02149 on or before the bid due date and time. Timely delivery of a Bid to the location designated shall be the full and sole responsibility of Bidder.

(D) **Form of Agreement.** Any contract awarded by the City pursuant to this solicitation shall be governed by the Contract Documents including, but not limited to, the Agreement between Owner and Contractor, the General Conditions, and Supplementary Conditions, if any. A bidder may not, in its Bid, take exception to the form of Agreement Between Owner and Contractor or otherwise condition its bid on changes to the form of Agreement Between Owner and Contractor. The bidder to whom a contract is awarded will be required to enter into the City form of Agreement Between Owner and Contractor within five (5) business days of presentation of the contract by the City.

(E) **Prevailing Wage.** Minimum Wage Rates as determined by the Commissioner of the Department of Workforce Development under the provisions of Massachusetts General Law, Chapter 149, §§ 26-27, inclusive, apply to this project. It is the responsibility of each Bidder, before opening of Bids, to request if necessary any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this Contract. The Minimum Wage Rates to be used for this Contract are shown on the schedule provided in the Bid Documents.

IV. BID SCHEDULE

- Bid Documents available to Bidders: January 14, 2026 at 10:00AM via Purchasing - Everett, MA - Official Website.
- Pre-Bid Conference: A pre-bid meeting will be held at 10:30AM, on January 22, 2026. Attendees should meet at the intersection of Fuller and Lynn Street, Everett, MA, 02149.
- Question/Clarification Period closes: January 29, 2026 at 4:00PM
- Bid Due Date and Time: **February 5, 2026 at 2:00 PM** at the office of:
  Kiara M. Freeman, Chief Procurement Officer,
  Everett City Hall, Purchasing Department,
  484 Broadway, Room 14
  Everett Ma, 02149

Timely submission of Bids shall be the sole responsibility of the Bidder.

V. BIDDER'S REPRESENTATIONS

By submitting its Bid in response to this solicitation, each Bidder makes the following representations:

a) The Bidder has read and understands the Bid Documents and the Bid is made in accordance therewith. The Bidder has visited the site where the Work is to be performed and is familiar with the local conditions under which the Work will be performed. Failure to so examine the Bid Documents and site will not relieve any Bidder from any obligation under the Bid as submitted.

b) The information contained in the Bid is true and complete to the best knowledge of the Bidder.

c) The Bid has been prepared in good faith and the Bidder is duly authorized to submit the Bid on behalf of the Bidder.

d) In preparation and development of the Bid, the Bidder has not, directly or indirectly, solicited or received any advice, assistance, or information concerning the Project from any representative of the City, its agents, or consultants that was not issued in writing by the City to all Bidders.

e) The Bidder has filed with the Secretary of State all certificates and annual reports required by Chapter 156D, § 16.22 (domestic and foreign corporation), § 15.03 (foreign corporations), § 109 (Massachusetts business corporation), or Chapter 180, § 26A (non-profit corporation) as applicable, of the Massachusetts General Laws.

VI. WRITTEN QUESTIONS

Bidders shall promptly notify the City in writing of any ambiguity, inconsistency or error that they may discover upon examination of the Bid Documents, the site, and local conditions.

Bidders requiring clarification or interpretation of the Bid Documents shall make a written request to the design consultant and a copy to the City by email or by fax as follows:

Arhcitect:
Nesra Engineering
Hip Aguilera
111 Washington St. STE 201A
Plainville, MA 02762
Email: HA@NesraEng.com

COPY:
City of Everett
Kiara M. Freeman, Chief Procurement Officer
484 Broadway, Room 14
Everett, MA 02149
Kiara.Freeman@ci.everett,ma.us

Requests for interpretation of the Bid Documents by phone will not be accepted. Any responses to written questions may be issued as an addendum to the Bidding Documents and posted at City of Everett website. Any Bidder that contacts directly or indirectly any member or employee of the City, or the City's consultants, in connection with the selection process or the contract contemplated herein, other than by participation in the pre-bid conference, submission of a written question or request for clarification or interpretation as prescribed in this section, may be subject to disqualification.

The City will not be responsible for, and a Bidder shall not rely upon or use, any information, explanation, or interpretation of this Invitation to Bid/Instructions to Bidders rendered in any fashion except written responses by the City posted at the City of Everett's website.

It is the sole responsibility of Bidders to ascertain the existence of any and all Addenda. Only written Addenda issued as described in these Instructions to Bidders shall be effective to modify the Bid Documents. All registered plan holders will be electronically notified when addenda are issued. Hard copies of the addenda may not be forwarded to the registered plan holders. In preparing its bid, each Bidder must acknowledge that it has reviewed all addenda.

VII. MODIFICATION AND WITHDRAWAL OF BIDS

After Bid opening, a Bidder may not change any provision of the Bid in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the Bidder will be allowed to correct them. If a mistake and the intended Bid are clearly evident on the face of the Bid proposal, the mistake will be corrected to reflect the indeed correct Bid, and the Bidder will be notified in writing - the Bidder may not withdraw the Bid in such circumstances. A Bidder may withdraw a Bid if a mistake is clearly evident on the face of the Bid document, but the intended correct Bid is not similarly evident.

A Bid may be withdrawn prior to the time designated for receipt of Bids upon written request made to the City. Withdrawal of Bids must be confirmed over the Bidder's signature by written notice post-marked or sent by facsimile on or before the date and time set for receipt of Bids. Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids.

VIII. EVALUATION PROCESS

The City will evaluate all Bids in accordance with the provisions of the Bid Documents and the criteria described below. The City may consider in its evaluation all information contained in the Bid and any other information obtained or received by the City. Any Bid from a Bidder that is determined to be nonresponsive or not in conformance with the requirements of the Bid Documents may be rejected. Bids that are deemed, in the judgment of the City, to contain unrealistic prices or substantially deviate from the City's estimate of cost to complete all of the

Work, or any portion thereof, will be considered as not responsive to the Invitation to Bid and may be rejected at the sole discretion of the Authority.

The City will award the contract in accordance with the "CONTRACT AWARD" section below. Before award, the City may conduct interviews with selected Bidders. The purpose of the interviews will be to clarify and assure understanding of the contents of the Bid, as well as the requirements of the Bid Documents, and discuss any other matters relevant to such Bid as the City may determine appropriate. No statements made or actions taken by any representative of the City during such discussions shall be binding on the City. If requested by the City, the key personnel identified in the Bid shall participate in the discussions or be available for an interview with City representatives.

IX. BASIS OF AWARD

The criteria listed below are the criteria that will be applied to evaluate the Bids.

A. Price
Award will be to the lowest eligible and responsible Bidder with selected alternates provided that all required documents listed below are attached and satisfactory. The Citymay consider in its evaluation the reasonableness of the prices proposed by the Bidder.

B. Required Documents to be Submitted with Bid

1. Bid Form

2. Bid Deposit of 5% of the total bid amount (bid bond, certified check, or treasurer's or cashier's check payable to the City of Everett).

3. A proposed construction schedule showing all work included in the Bid. The proposed construction schedule must include key milestones substantial and final completion.

X. CONTRACT AWARD

(A) The City will open Bids on the Bid Due Date immediately following the deadline, and a register will be maintained of those firms submitting timely Bids. Bids shall be publically open and read.

(B) The City will award the Contract to the lowest responsible and eligible bidder within thirty (30) days after the opening of Bids, subject to the reservations contained herein and the

exceptions set forth in Massachusetts General Laws Chapter 30 and 149, whichever is applicable. The selected Bidders will be notified in writing.

(C) If a selected Bidder fails or refuses to execute the Agreement between Owner and Contractor in the form included in the Bid Documents, as modified by addenda, if any, and furnish the other documents required in connection with execution of the contract, within ten (10) business days after the presentation of the Agreement between Owner and Contractor, as applicable, by the City, the City may award the Contract to another Bidder.

(D) THE CITY RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS if it determines that such action is in the best interest of the CITY. Any Bid which is incomplete, conditional or obscure may be considered invalid and the CITY may reject such Bid. In addition, the CITY may reject any Bid which is not prepared and submitted in accordance with all requirements of these Bid Documents and the attached forms or which contains alterations, contingencies or additions not called for or errors or irregularities of any kind; PROVIDED, HOWEVER, that the CITY reserves the right to waive any and all informalities or minor irregularities contained in the Bid. If these Bid Documents, the Bid Forms, or any other document or applicable law requires submission of certain information or other items as a part of or to accompany Bids and any Bidder neglects to furnish such information or other items with its Bid, the CITY may reject the Bid of such Bidder as incomplete; PROVIDED, HOWEVER, that the CITY reserves the right to deem any such omission as an informality for which such Bid will not be rejected, and to subsequently receive such information or other items prior to award of the contract.

(E) More than one Bid from the same Bidder, whether or not the same or different names appear on the signature page, will not be considered. Reasonable grounds for believing that any bidder is so interested in more than one Bid for the work contemplated may cause rejection of all Bids made by that Bidder directly or indirectly.

(F) Any and all Bids potentially affected by collusion will be rejected if there is reason for believing that collusion exists between the Bidders. The decisions of the CITY will be final. Bidders whose Bids have been rejected because of evidence of collusion will not be considered in future bids for the same work and may be disqualified from bidding on future work. The City shall reject any Bid that does not include the signed Non-Collusion and Attestation Forms provided in the Bid Documents.

(G) As used herein, the term “lowest responsive and responsible bidder” shall mean the Bidder (1) whose Bid is the lowest of those Bidders possessing the skill, ability and integrity necessary for the faithful performance of the work described in the Bid documents; (2) who shall certify that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course

with the first certified payroll report for each employee; and (4) who obtains within ten (10) days of the notification of contract award the security by bond required under section 29 of chapter 149 from a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the City; provided further, that if there is more than one (1) surety company providing such bond, the surety companies shall be jointly and severally liable. The City may consider the reasonableness of the prices proposed for the scope of the work involved in its evaluation of the Bids.

(H) The City reserves the right to amend these Bid Documents at any time. Any amendments to these Bid Documents shall be issued by means of written addenda. All addenda so issued shall become part of these Bid Documents.

(I) The City reserves the right to withdraw this Invitation to Bid at any time in its sole discretion before award of a contract.

(J) The City assumes no responsibility for the costs incurred by the Bidders in the preparation of a Bid or any related activities. The Bid Documents and this Invitation to Bid/Instructions to Bidders have been prepared solely to solicit Bids, and are not contract offers. <u>The only document that may be binding on the City is the Agreement between Owner and Contractor, and all documents incorporated therein by reference, only when duly executed by the City and the contractor to whom the contract is awarded.</u>

XI. ADDITIONAL PROVISION

(A) Council Approval. In all cases, the award of the contract shall be subject to the approval of the members of the Everett City Council in a public meeting.

(B) Estimated Quantities. Unless otherwise stated, quantities shown in the Bid Documents represent the estimated quantities of labor and materials that might be expected to be encountered during the contract period. In the event of a discrepancy between the estimated quantities shown in the Specifications and those shown in the Price Sheets, quantities shown in the Price Sheets shall control. The City does not expressly or by implication agree that the actual amount of work will correspond therewith. These estimated quantities will be used solely for the comparison of Bids. The City reserves the right to increase, decrease, or delete the amount of any or all items of work after Bids have been received. Such increase, decrease or deletion in the quantity for any item shall not be regarded as cause for an increase or decrease in the unit prices. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased, decreased, or deleted quantities or from unbalanced allocation among the Contract items or overhead expenses on the part of the Bidder and subsequent loss of expected reimbursement therefore or from any other cause.

(C) Bonds and Insurance Certificates. Should the successful bidder fail to perform its agreement to furnish the required bonds and insurance certificates required herein, the Bid Deposit shall become and be the property of the City as liquidated damages; provided that, the amount of the Bid Deposit which becomes the property of the City shall not, in any event, exceed the difference between its bid price and the Bid Price of the next lowest responsible and eligible Bidder.

(D) Foreign Corporations. If the successful bidder is a foreign corporation as defined at G.L. c. 156D, § 1.40, and if successful bidder fails to perform its agreement to furnish the required certificate of the state secretary, the Bid Deposit shall become and be the property of the City as liquidated damages; PROVIDED THAT, the amount of the Bid Deposit which becomes the property of the City shall not, in any event, exceed the difference between its Bid Price and the Bid Price of the next lowest responsible and eligible Bidder.

(E) Sales and Use Taxes. Bidders are advised that City is exempt from sales and use taxes and shall submit its Bid Prices without taxes. An Exemption Certificate may be obtained by the successful Bidder from the City upon request.

(F) Health and Safety. This Contract is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations" (Chapter 454 CMR 10.00 et seq.). Bidders shall be familiar with the requirements of these regulations.

(G) Monthly Price Adjustments for Certain Items. Monthly price adjustments will be made for qualifying work orders using diesel fuel, gasoline, asphalt, concrete, and steel in accordance with the Bid Documents.

(H) Permits and Approvals. The successful Bidder will be solely responsible for obtaining all necessary construction permits, licenses, and approvals required in connection with the Project and/or under the Bid Documents, including without limitation as set forth in Contract between Owner and Contractor and the General Conditions. All bidders shall be responsible for investigating in detail the permitting requirements of the work and shall be responsible for making such examination thereof as may be necessary to satisfy themselves in regard to the character of the permitting required, and shall Bid in sole reliance upon their own investigation.

(I) Bid Information. The City's receipt or discussion of any information (including information contained in the proposal and any ideas or other material communicated or exhibited by the Bidder or on its behalf) shall not impose any obligation whatsoever on the City or entitle the Bidder to any compensation therefor, except to the extent specifically provided in such written agreement as may be entered into between the City and the Bidder. Any such information given to the City before, with, or after submission of the proposal, either orally or in writing, except as noted below, is not given in confidence, and may be used, or disclosed to others, for any purpose at any time without obligation or compensation

and without liability of any kind whatsoever. Any statement which is inconsistent with the terms of this paragraph, whether made as part of or in connection with any information received from the Bidder or made at any other time in any fashion, shall be void and of no effect.

CITY OF EVERETT, MASSACHUSETTS

Project Number: DPW-26-58

CORPORAL ARTHUR NELSON PLAY LOT RENOVATION PROJECT (FULLER STREET PARK)

GENERAL CONTRACTOR SERVICES

BID FORM

Firm Name: _____

(A) The Undersigned, as Bidder, proposes to furnish to the City of Everett, Massachusetts (the "Owner" or the "City") all labor, materials, equipment, supervision, tools and services required for the _____ Project at _____, in accordance with the accompanying plans and specifications prepared by NESRA Engineering. and entitled Corporal Arthur Nelson Play Lot Renovation Project, dated 12/12/2025, for the fixed contract price specified below, subject to additions and deductions according to the terms of the Contract.

(B) This Bid includes addenda numbered _____

(C) The Proposed Fixed Contract Price is _____ dollars*

($_____)*

** Bond Price is to be included in the "The Proposed Fixed Contract Price" line (C) and includes lump sum with allowance price (E).*

(D) ALTERNATES (REFER TO SECTION 01 23 00 ALTERNATES FOR DETAILS)

For Alternate No.1 - Deduct $_____

For Alternate No.2 - Deduct $_____

For Alternate No.3 - Deduct $_____

For Alternate No.4 - Deduct $_____

(E) ALLOWANCES

The Bidder agrees that the Lump Sum Base Bid includes the following allowances, which will be incorporated into the Contract. All allowance work shall include complete in-place labor, materials, and workmanship, and shall conform strictly to the Drawings and Specifications. Any unused allowance funds shall be credited to the Owner.

1. **Allowance No. 1: New Park Granite Monument Sign (Details To Be Provided By The City Of Everett During Construction Process).**

   Item: **$20,000 (Twenty Thousand Dollars)**

(F) UNIT PRICES

Unit Prices for potential Change Orders as specified in the General Conditions and Section _____(UNIT PRICES). Prices shall include materials, labor, overhead, profit, insurance and bonding.

Description of Work	Unit	Amount to ADD	Amount to DEDUCT

(G) **Contract Execution.** The undersigned agrees that, if selected as general contractor, general contractor will within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the City, execute a contract in accordance with the terms of this Bid and furnish a performance bond and also a labor and materials payment bond, each of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the City and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

(H) **Withdrawal of Bids.** As provided in the Instructions to Bidders, the Bidder hereby agrees that he will not withdraw this Bid within thirty (30) consecutive calendar days after the actual date of the opening of Bids. Should the Bidder fail to fulfill any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages the amount of the bid security which shall become the Owner's property. If a bid bond was given, it is agreed that the amount thereof shall be paid as liquidated damages to the Owner by the Surety.

(I) **Certification Regarding Labor Harmony.** The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A.

(J) **Certification Regarding Contract Requirements.** Contractor certifies that he has carefully examined the site of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and he has carefully read and examined the drawings, specifications, and other Contract Documents therein referred to and knows and understands the terms and provisions thereof.

(K) **Information Regarding Subsurface Conditions.** Contractor understands that information, if any, relative to subsurface and other conditions, natural phenomena, existing

pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures.

(L) **Certification Regarding Quantities.** Contractor certifies that he understands that the quantities of work tabulated in this Bid or indicated on the Drawings or in the Specifications or other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Architect.

(M) **Certification Regarding Labor:** The undersigned hereby certifies under penalties of perjury that: (i) that all employees to be employed in the work included in this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration; and (ii) any employee found on worksite subject to this bid without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration shall be subject to immediate removal.

(N) **Certification Regarding Financial Position/Business Organization:** The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

(O) **Certification Regarding Tax Compliance:** The undersigned further certifies under penalty of perjury that the said undersigned has complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support pursuant to the provisions of M.G.L. c. 62C, §49A(b).

(P) **Certification of Compliance of Secretary of State Requirements:** The undersigned further certifies under penalty of perjury that the Bidder has filed with the Secretary of State for the Commonwealth of Massachusetts all certificates and annual reports required by Chapter 156B, Section 109 (business corporation), by Chapter 181, Section 4 (foreign corporation), or Chapter 180, Section 26A (non-profit corporation) of the Massachusetts General Laws.

(Q) **Certification Regarding Non-Collusion:** The undersigned further certifies under penalty of perjury that this bid has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural

person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

(R) **Certification Regarding Prevailing Wage Compliance:** The undersigned further certifies under penalty of perjury that the said undersigned shall comply with the provisions of sections 26 and 27D of chapter one hundred and forty-nine of the General Laws governing the payment of prevailing wages.

_____ Date: _____
Name of Contractor

_____
Signature

_____
Name & Title of Person Signing Bid

_____
Business Address

_____
Telephone/Fax/Email

_____
Facsimile

Attach: Bid Security (five percent of Contract Sum)
Proposed Construction Schedule

CITY OF EVERETT, MASSACHUSETTS

AGREEMENT BETWEEN OWNER AND CONTRACTOR

This **AGREEMENT** (the "Agreement") is made and entered into as of the ___ day of ____, 20__ by and between the Owner and the Contractor in connection with the Project, all as defined below, pursuant to the applicable provisions of Massachusetts General Laws, Chapter 30, § 39M.

Owner:	**City of Everett, Massachusetts** **484 Broadway, Room 14** **Everett, MA 02149**
Contractor:	_____ _____ _____
Project:	_____ **(City Project No. _____)**
Site:	_____
Architect:	_____
Architect's Representative:	_____
Owner's Representative:	_____
Owner's Representative Contact Person:	_____
Contractor's Project Team:	**Project Executive: _____** **Project Manager: _____** **Project Superintendent: _____**

In consideration of the mutual agreements and covenants of the Owner and the Contractor (collectively, the "Parties") set forth herein, the Parties hereby agree as follows:

ARTICLE 1

DEFINITIONS & EXHIBITS

1.1 Definitions. Capitalized terms not defined in this Agreement shall have the meanings defined elsewhere in this Agreement or in the General Conditions of the Contract for Construction or in other provisions of the Contract Documents. In the event of conflict in the definitions of capitalized terms, the definitions set forth in this Agreement shall take precedence followed by definitions in the General Conditions.

1.2 Exhibits. The following is a list of the documents which, when completed or provided, shall become exhibits to this Agreement, each of which is incorporated into this Agreement by reference and shall be deemed a part hereof:

Exhibit	Description
A	List of Specifications
B	List of Drawings
C	List of Addenda
D	Equal Employment Opportunity Requirements
E	Affirmative Action Requirements
F	Form of Project Workforce Monthly Report
G	Certificates of Insurance
H	Certificate of Vote of Authorization
I	Performance and Payment Bonds
J	Insurance Requirements

1.3 Applicable Statutory Provisions. This Project is subject to certain statutory provisions. The applicable statutory provisions are enumerated in the General Conditions and in the Special Conditions of the Contract of the Specifications and shall be deemed incorporated in the Contract Documents in their entirety to the extent such statutory provisions apply to this Project. Any other provisions required by statute to be included herein but not set forth in the Contract Documents shall be deemed to be so included. In case of a conflict between the provisions of the Contract Documents and the provisions of any applicable statute, the statutory provisions shall govern.

ARTICLE 2

THE WORK

2.1 Scope of the Work. The Work of the Project includes all labor, materials, equipment, tools, supplies, supervision, coordination, administration, and all other items or services required to fully complete the Project as described in the Contract Documents or as may be reasonably inferable therefrom. The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others. The Contractor shall ensure that the Work is completed within the Contract Time at a cost no greater than the Contract Sum, as further provided in Article 4 and elsewhere in the Contract Documents.

2.2 Contract Documents. The Contract Documents consist of this Agreement and the Exhibits hereto, the General Conditions of the Contract for Construction, the Supplementary General Conditions, if any, Drawings, Specifications, Change Orders, other written amendments to this Agreement duly executed by the Owner and the Contractor, Construction Change Directives, Performance Bond, Labor and Material Payment Bond, and all other documents set forth or incorporated by reference herein or elsewhere in the Contract Documents. The Contract Documents are all as fully a part of this Agreement as if attached to this Agreement and repeated herein and together constitute the "Agreement" or the "Contract." The Contract represents the entire and integrated agreement between the parties hereto and supersede prior negotiations, representations or agreements, either written or oral.

2.3 Representations. In addition to other representations set forth in the Contract Documents, the Contractor represents that it is a duly-licensed and registered business entity which is experienced and skilled in construction of projects of the type, magnitude, and complexity described in the Contract Documents and that it is familiar with the special problems, regulations, and requirements of construction of the type required hereunder. The Contractor further represents that it is fully cognizant of all aspects of the overall development of the Site as described by the Owner and of the relationship of the Project to such overall development, and that it will furnish, at a cost not to exceed the Contract Sum, a complete and fully operable Project as indicated by or reasonably inferable from the Contract Documents.

ARTICLE 3

CONTRACT TIME

3.1 The Contractor shall commence performance upon the issuance of a Notice to Proceed by the Owner for a portion, or all, of the Work. The period of time from the date of the initial Notice to Proceed to the Final Completion Date, together with any valid extensions thereof approved by the Owner in accordance with the Contract Documents, shall constitute the Contract Time. The Contractor shall achieve Substantial Completion of the entire Work on or before _____. Final Completion of the entire Work shall be achieved fourteen (14) calendar days after the date of Substantial Completion.

3.2 The Contractor shall proceed to carry out the Work in a timely, diligent and continuous manner in accordance with the requirements of the Project Schedule and all other Contract Documents and in accordance with the directions of the Owner so as to ensure (i) Substantial Completion of the Work, or any specified portion thereof, on or before the Substantial Completion Date, and (ii) Final Completion of the Work, or any specified portion thereof, on or before the Final Completion Date, as such dates may be extended as provided in the Contract Documents.

3.3 It is understood and agreed that the time of commencement and the dates of Substantial Completion and Final Completion of the Work are material conditions of this Agreement, and that TIME IS OF THE ESSENCE of this Agreement.

ARTICLE 4

CONTRACT SUM

4.1 Contract Sum. The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract in accordance with the requirements of the Contract Documents. The Contract Sum is hereby established as _____ Dollars ($_____), subject to additions and deductions as provided in the Contract Documents.

4.2 Alternates. The Contract Sum is based on, and inclusive of, the following alternates:

No.	Description	Price
X	(Insert alternate description here)	$

4.3 Unit Prices. Unit prices, if any, applicable to this Contract are as follows:

No.	Description	Unit	Price
X	(Insert alternate description here)	per _____	$

4.4 Pricing of Alternates and Unit Prices. The Alternate Prices and Unit Prices specified shall include all services, labor, materials, supplies, equipment, transportation, taxes, insurance, bonds, permits and all other expenses, including overhead, superintendence and profit required to complete the alternate or unit price Work. Unless otherwise specified, the Alternate Prices and Unit Prices listed in this Article 4 shall be applicable to both increases and decreases in the Contract Sum on an equal basis.

4.5 Variation in Estimated Quantities. The quantities contained in the Agreement are set forth as a basis for the comparison of bids only and may not necessarily reflect the actual quantity of Work required to be performed. The City reserves the right to increase, decrease or eliminate the quantity of any particular item of Work. Where the actual quantity of an item varies

by more than 25 percent above or below the estimated quantity stated in the Agreement, an equitable adjustment in the Contract Price for that pay item shall be negotiated upon demand of either party regardless of the cause of the variation in quantity. No allowances will be made for loss of anticipated overhead costs or profits suffered or claimed by the Contractor resulting directly or indirectly from such increased, decreased or eliminated quantities or from unbalanced allocation among the contract items from any other cause. It is the intention of this provision to preserve the bid basis while limiting the Contractor's risk exposure to 25% of each bid quantity. In the case of an overrun, the Contractor will be compensated at the Contract Unit Price for a quantity up to 125% of the Contract quantity. The adjusted unit price shall only be applied to that quantity above 125% of the contract quantity. Neither party shall be required to demonstrate any change in the cost to perform the work based solely on the overrun. The original Contract unit bid price shall have no bearing on determining the adjusted unit price for an overrun. The adjusted unit price shall be based on the estimated cost of performing the added work over 125% of the bid quantity. To assist the Engineer in the determination of an equitable adjustment for an overrun, the Contractor shall prepare a submission in the following manner and accept as full payment for work or materials an amount for an equitable adjustment in the Contract Price equal to the following: (1) The actual cost or a reasonable cost estimate for direct labor, material (less value of salvage, if any) and use of equipment, plus 10 percent of this total for overhead; (2) Plus actual cost or a reasonable cost estimate of Worker's Compensation and Liability Insurance, Health, Welfare and Pension Benefits, Social Security deductions and Employment Security Benefits; (3) Plus 10 percent of the total of (1) and (2) for profit and other unallocated costs; (4) Plus the estimated proportionate cost of surety bonds. No allowance shall be made for general superintendence and the use of small tools and manual equipment.

4.6 Insurance. The Owner and Contractor shall purchase and maintain insurance and bonds in accordance with the requirements of the Contract Documents. The Contractor shall carry insurance coverages with limits no less than those identified on **Exhibit J**, attached hereto.

ARTICLE 5

PAYMENTS

5.1 Based upon Applications for Payment submitted to the Engineer by the Contractor in accordance with Section 10.2 of the General Conditions and Certificates for Payment issued by the Engineer in accordance with Section 10.3 of the General Conditions, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

5.2 Prior to Substantial Completion, progress payments will be made in amounts equal to the percentage indicated below but, in each case, less than the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract Documents.

(1) 95% of Work competed (with the balance being retainage)

(2) 95% percent of the cost of materials and equipment not incorporated in the Work but which satisfies the requirements of the General Conditions (with the balance being retainage)

5.3 Upon satisfaction of the Substantial Completion procedures set forth in Section 10.7 of the General Conditions, Owner shall pay an amount sufficient to increase total payments to Contractor to 99% of Work completed, less such amounts as Engineer may determine or Owner may withhold in accordance with the Contract Documents.

5.4 Upon Final Completion and Acceptance of the Work and satisfaction of the procedures set forth in Section 10.8 of the General Conditions, the Owner shall pay the remainder of the Contract Sum as recommended by Engineer as provided in the General Conditions.

ARTICLE 6

OTHER PROVISIONS

6.1 No Personal Liability. No member, officer, director, principal, joint venturer, beneficiary, trustee, representative, consultant, volunteer participant, employee, agent or representative of the Owner or the Contractor shall be personally liable to the other party under any term or provision of this Contract for any payment obligations or otherwise, or because of any breach hereof, each party agreeing to look solely to the assets of the other party for the satisfaction of any liability hereunder.

6.2 Consequential Damages. In no event shall the Owner be liable to the Contractor except for payment for Work performed pursuant to and in accordance with the Contract Documents, nor shall the Owner ever be liable to the Contractor for indirect or consequential damages of any name or nature.

6.3 Termination or Suspension. This Agreement may be terminated or suspended as provided in Articles 16 and 17, respectively, of the General Conditions and as provided elsewhere in the Contract Documents.

6.4 Certification Relating to Tax Compliance. Pursuant to M.G.L. c. 62C, § 49A, the individual signing this Contract on behalf of the Contractor hereby certifies, under the penalties of perjury, that to the best of his or her knowledge and belief the Contractor has complied with any and all applicable state and federal tax laws.

6.5 Certification Relating to Debarment. The individual signing this Contract on behalf of the Contractor further certifies under penalties of perjury that the Contractor is not presently debarred from doing public construction work in the Commonwealth under the provisions of M.G.L. c. 29, § 29F, or any other applicable debarment provisions of any other

chapter of the General Laws or any rule or regulation promulgated thereunder and is not presently debarred from doing public construction work by any agency of the United States.

6.6 Certification Relating to Health and Safety (M.G.L. c. 30, § 39S). The individual signing this Contract on behalf of the Contractor further certifies: (1) Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and the Contractor shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the Work subject to this Contract have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement under seal in multiple counterparts, each of which shall be deemed to be an original hereof and collectively comprising a fully executed instrument, as of the date and year first above written.

CONTRACTOR

_____ _____
Name Date Signed
Title

CITY OF EVERETT:

_____ _____
Director Name Date Signed
Managing Department

_____ _____
Erik Swanson, P.E. Date Signed
City Engineer

_____ _____
Kiara M. Freeman Date Signed
Chief Procurement Officer

_____ _____
Eric Demas Date Signed
Chief Financial Officer/City Auditor

Approved as to Form:

_____	_____
Colleen Mejia, Esq. City Solicitor	Date Signed
_____	_____
Mayor	Date Signed

Exhibits:

Exhibit A: List of Specifications
Exhibit B: List of Drawings
Exhibit C: List of Addenda
Exhibit D: Equal Employment Opportunity Requirements
Exhibit E: Affirmative Action Requirements
Exhibit F: Form of Project Workforce Monthly Report
Exhibit G: Certificates of Insurance
Exhibit H: Certificate of Vote of Authorization
Exhibit I: Performance and Payment Bonds
Exhibit J: Insurance Requirements

EXHIBIT A

LIST OF SPECIFICATIONS

EXHIBIT B

LIST OF DRAWINGS

EXHIBIT C

LIST OF ADDENDA

EXHIBIT D

EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENTS

1. Definitions. For purpose of this contract, the term "minority" refers to Asian–Americans, Blacks, Spanish Surnamed Americans, North American Indians, and Cape Verdeans. The term "Commission" refers to the Massachusetts Commission Against Discrimination.

2. Obligations. During the performance of this contract, the Contractor and each of its subcontractors, and suppliers (hereinafter collectively referred to as the "Contractor") for themselves, their assignees, and successors in interest, agree as follows:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age, handicap or sex. The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising; recruitment layoff; termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship. The Contractor shall post hereafter in conspicuous places on the project site, available for employees and applicants for employment, notices to be provided by the Commission setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (M.G.L. Chapter 151B).

In connection with the performance of work under this contract, the Contractor, shall undertake, in good faith, affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age or sex, and to eliminate and remedy any effects of such discrimination in the past. Such affirmative action shall entail positive and aggressive measures to ensure equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, and in-service or apprenticeship training programs. This affirmative action shall include all action required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, age or sex. A purpose of this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this construction project undertaken by the Owner.

As part of its obligation under the foregoing section, the Contractor shall use its best efforts to maintain on this project a not less than 15.3% ratio of minority employee person hours to total person hours, and a not less than 6.9% ratio of women employee person hours to total person hours.

3. Compliance with Requirements. To the extent applicable, the Contractor shall comply with the provisions of Executive Order No. 526, which is herein incorporated by reference and made a part of this contract.

4. Solicitations for Trade Contractors or Subcontractors, and for the Procurement of Materials and Equipment. In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential trade contractor or subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this contract relative to equal employment opportunity, non-discrimination and affirmative action.

5. Compliance-Information, Reports and Sanctions. The Contractor will provide all information and reports required by the Owner, and the Contractor will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the Owner to affect the employment of personnel. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Owner and shall set forth what efforts it has made to obtain the information. Without limiting the foregoing, the Contractor shall require all trade contractors and subcontractors to submit to the Contractor a Project Workforce Monthly Report, in the form attached to the Agreement between Owner and Contractor as **Exhibit F**. The Contractor shall submit the Project Workforce Monthly Reports to the Owner on a monthly basis, together with a summary report prepared by the Contractor, in a form satisfactory to the Owner, aggregating the information provided in the trade contractors' and subcontractors' Project Workforce Monthly Reports with the Contractor's own workforce information and showing the monthly and total Project-to-date ratios of minority and women workforce hours.

Whenever the Owner believes the Contractor or any trade contractor or subcontractor may not be operating in compliance with the terms of this Section, the Owner, or its designated agent, may conduct an appropriate investigation, and may confer with the parties, to determine if the Contractor is operating in compliance with the terms of this Section. If the Owner finds the Contractor or any trade contractor or subcontractor not in compliance, it shall make a preliminary report on non-compliance, and notify the Contractor in writing of such steps as will in the judgment of the Owner bring the Contractor into compliance.

6. Severability. The provisions of this Exhibit are severable, and if any of these provisions shall be held unconstitutional or unenforceable by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

7. Equal Employment Opportunity for Persons with Disabilities. In connection with the performance of work under this contract, the Contractor, trade contractors, subcontractors and suppliers of goods and services shall not discriminate against persons with disabilities. Furthermore, the Contractor, trade contractors, subcontractors and suppliers of goods and services must give written notice of their commitments under this Exhibit to any labor union, association or brotherhood with which they have a collective bargaining contract or other agreement.

EXHIBIT E

AFFIRMATIVE ACTION REQUIREMENTS

During the performance of this contract, the Contractor and each of its subcontractors and suppliers (hereinafter collectively referred to as the "Contractor") for themselves, their assignees, and successors in interest, agree as follows.

1. Percentage Participation. On this contract, the Contractor shall use best efforts to enter into contracts and subcontracts including contracts with suppliers, distributors and manufacturers who are women/minority business enterprises. The Contractor shall use best efforts to enter into contracts worth a combined total 10.4% of the Contract Sum with W/MBE firms.

2. Definitions.

   a. Women/minority business enterprise ("W/MBE") means any business organization certified by SDO as an MBE or WBE. To be certified as a W/MBE, the minority or women must demonstrate at least 51% ownership and control, according to SDO rules and regulations.

   b. Joint Ventures -

      (1) A joint venture between a certified W/MBE and non-minority or non-WBE shall be certified by SDO as a W/MBE if the certified W/MBE has at least 51% control over the management and receipt of profits of the project bid upon.

      (2) A joint venture between a certified W/MBE subcontractor and a non-W/MBE subcontractor, in which the W/MBE does not exercise more than 51% control over management and profits, shall be entitled to a credit as a W/MBE for the proportion of the joint venture's contract equal to the W/MBE participation in the joint venture.

      (3) Whenever a general bid is filed by a joint venture with a certified W/MBE participant in the joint venture that does not exercise more than 51% control over management and profits, that joint venture shall be entitled to credit as a W/MBE for the portion of the joint venture's price equal to the W/MBE participation in the joint venture.

      (4) Whenever a joint venture with a certified W/MBE participant files a general bid or sub-bid, and requests a credit as a W/MBE, the bid must be accompanied by the pre-bid joint venture agreement for that project. SDO certified joint ventures should submit a copy of SDO certification.

c. Material Supplier - A vendor certified by SDO as a W/MBE engaged in sales to the construction industry from an established place of business or source of supply, which either:

(1) Manufactures goods from raw materials or substantially alters them before resale, entitling the Contractor to W/MBE credit for the full amount of the purchase order; or

(2) Maintains a storage facility for materials utilized in the work, entitling the Contractor to W/MBE credit for 10% of the purchase order.

d. Amount of Participation - The actual dollar amount which will be paid to W/MBE for work performed on this contract, in accordance with Section 2(b) and 2(c).

e. Contractor - Any successful general bidder to whom the Owner makes the contract award.

f. SDO - The Massachusetts Supplier Diversity Office (SDO).

g. Owner - The City of Everett, Massachusetts.

3. Determination of W/MBE Status.

a. Any Contractor subcontractor, sub–subcontractor or material supplier may apply to SDO for W/MBE status. Applications must be made on the W/MBE application form prepared by SDO. The applicant may request a form from SDO.

b. SDO is responsible for preparing, publishing, and updating a list of certified Women and Minority Owned businesses. The list is published in the Central Register established by G.L. Chapter 9, Section 20A and is available from SDO. Bidders shall rely on the list that is most current at the time the work is advertised and shall use it as a reference source to assist in meeting the requirements of these conditions**.**

Submission of an application to SDO does not constitute certification.

4. Compliance with Requirements. To the extent applicable, the Contractor shall comply with the provisions of Executive Order No. 524, which is herein incorporated by reference and made a part of this contract.

EXHIBIT F

FORM OF PROJECT WORKFORCE MONTHLY REPORT

CORPORAL ARTHUR NELSON PLAY LOT
RENOVATION PROJECT
EVERETT, MASSACHUSETTS
CITY PROJECT # DPW-26-58

CITY OF EVERETT, MASSACHUSETTS

PROJECT WORKFORCE MONTHLY REPORT

City Project No._____ Project Name:_____ Project Location:_____

Name of Contractor Filing Report_____

Month Ending:_____ **Minority Participation Goal: 15.3%** **Women Participation Goal: 6.9%**

	Current Month					Project To Date				
Job Category	**Total Monthly Workforce Hours**	**Total Monthly Workforce Hours**		**Monthly % of Workforce Hours**		**Total Workforce Hours**	**Total Workforce Hours To Date**		**% of Workforce Hours To Date**	
		Minority	**Women**	**Minority**	**Women**		**Minority**	**Women**	**Minority**	**Women**

EXHIBIT G

CERTIFICATES OF INSURANCE

EXHIBIT H

CERTIFICATE OF VOTE OF AUTHORIZATION

AT A DULY AUTHORIZED MEETING OF THE BOARD OF DIRECTORS OF THE [NAME OF CORPORATION] held on [DATE], at which a quorum of the Directors were present or waived notice, it was voted that [NAME AND TITLE] of this company be and hereby is authorized to execute contracts and bonds in the name and behalf of said company, and affix its Corporate Seal thereto, and such execution of any contract or bond of obligation in this company's name on its behalf of such [OFFICER] under seal of the company shall be valid and binding upon this company.

A TRUE COPY,

ATTEST: _____

Place of Business:
_____
_____

I hereby certify that I am the [TITLE] of the [NAME OF CORPORATION] and that [NAME OF OFFICER] is the duly elected [TITLE] of said company, and the above vote has not been amended or rescinded effect as of the date of this contract.

Signature: _____
Name/Title: _____
Date: _____

(Corporate Seal)

COMMONWEALTH OF MASSACHUSETTS, SS. _____, 20__

Then personally appeared the above named _____ and acknowledged the foregoing instrument to be his/her free act and deed before me.

NOTARY PUBLIC _____
My commission expires: _____

EXHIBIT I

PERFORMANCE AND PAYMENT BONDS

EXHIBIT J

STANDARD INSURANCE LIMIT REQUIREMENTS

The following minimum insurance limits shall apply to the Contract and be provided by the Contractor. The Contractor shall refer to the Contract Documents for all other insurance requirements relating to this Contract.

Coverage	Estimated Construction Cost	General Contractor
General Liability[1]	**-**	$1,000,000 per Occurrence/ $2,000,000 Aggregate
Auto[2]	**-**	$1,000,000 each accident
Worker's Compensation	**-**	Statutory
Employers Liability	**under $1m**	$500,000 Each Accident $500,000 Disease - Each Employee $500,000 Disease - Policy Limit
Employers Liability	**$1m and over**	$1,000,000 Each Accident $1,000,000 Disease - Each Employee $1,000,000 Disease - Policy Limit
Excess/Umbrella	**under $1m**	$2,000,000 Per Occurrence $2,000,000 Aggregate or Higher

[1] Must evidence per location aggregate or per project aggregate.

[2] Combined single limit

Coverage	Estimated Construction Cost	General Contractor
Excess/Umbrella	**between $1m and $5m**	$5,000,000 Per Occurrence $5,000,000 Aggregate or Higher
Excess/Umbrella	**under $10m**	$10,000,000 Per Occurrence $10,000,000 Aggregate or Higher
Excess/Umbrella	**$10m and over**	$20,000,000 Per Occurrence $20,000,000 Aggregate or Higher
Contractor's Pollution Liability	**-**	$5,000,000 per occurrence and $5,000,000 Annual Aggregate or higher.
Drone/UAV Aircraft Liability[3]	**-**	No less than $2,000,000

[3] Required only if the work of the vendor includes operation, or arranging for the operation, of unmanned aerial systems (i.e., drones) services.

CITY OF EVERETT, MASSACHUSETTS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

to the

AGREEMENT BETWEEN OWNER AND CONTRACTOR PURSUANT TO M.G.L. CHAPTER 30, § 39M

Dated as of: _____

by and between

CITY OF EVERETT, MASSACHUSETTS
AS OWNER

and

[NAME]
AS CONTRACTOR

City Project #DPW-26-58

TABLE OF CONTENTS

CITY OF EVERETT, MASSACHUSETTS ..... ERROR! BOOKMARK NOT DEFINED.
ARTICLE 1 DEFINITIONS; CONTRACT DOCUMENTS 1
1.1 DEFINITIONS 1
1.2 INTERPRETATION OF CONTRACT DOCUMENTS 4
1.3 OWNERSHIP AND USE OF DOCUMENTS 8
1.4 OTHER REPRESENTATIONS 8
ARTICLE 2 ADMINISTRATION OF THE CONTRACT 8
2.1 OWNER'S REPRESENTATIVE 8
2.2 DESIGNER'S SITE VISITS 9
2.3 DESIGNER'S SUPPLEMENTAL INSTRUCTIONS 10
2.4 DESIGNER'S INTERPRETATIONS 10
2.5 SUBMITTALS 10
2.6 REPLACEMENT DESIGNER 11
ARTICLE 3 CONTRACTOR'S RESPONSIBILITIES 11
3.1 DUTY TO REVIEW CONTRACT DOCUMENTS AND SITE CONDITIONS 11
3.2 SUPERVISION AND CONSTRUCTION PROCEDURES 12
3.3 LABOR AND MATERIALS 14
3.4 PHASES OF THE WORK—CONSTRUCTION PHASE 17
3.5 PERMITS AND FEES; COMPLIANCE WITH LAW 18
3.6 UTILITIES 19
3.7 DOCUMENTS AND SAMPLES AT THE SITE 19
3.8 SUBMITTALS 21
3.9 SITE ACCESS 22
3.10 CUTTING AND PATCHING 23
3.11 INTENTIONALLY OMITTED 23
3.12 WASTE DISPOSAL AND CLEANING 23
3.13 PROJECT COMMUNICATIONS 24
3.14 ROYALTIES AND INTELLECTUAL PROPERTY 25

3.15 FINANCIAL CONDITION 25
3.16 PREVAILING WAGE; RECORDKEEPING; PERSONNEL 25
3.17 EEO/AA AND M/WBE REQUIREMENTS 26
3.18 LINES AND GRADES; SURVEY 26
ARTICLE 4 OWNER 26
4.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER 26
4.2 CONFIDENTIAL INFORMATION 27
4.3 TAX EXEMPTION 27
ARTICLE 5 INDEMNIFICATION 28
5.1 CONTRACTOR'S INDEMNITY 28
ARTICLE 6 SUBCONTRACTORS 31
6.1 SUBCONTRACTS 31
ARTICLE 7 OTHER WORK 32
7.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS 32
7.2 MUTUAL RESPONSIBILITY 33
ARTICLE 8 INSPECTION AND TESTING 33
8.1 INSPECTION AND TESTING 33
8.2 SPECIAL TESTING 34
ARTICLE 9 CONTRACT TIME 35
9.1 DEFINITIONS 35
9.2 PROGRESS AND COMPLETION 35
9.3 EXTENSION OF THE CONTRACT TIME AS A RESULT OF DELAY EVENT 36
ARTICLE 10 PAYMENTS AND COMPLETION 41
10.1 SCHEDULE OF VALUES 41
10.2 APPLICATIONS FOR PAYMENT 41
10.3 CERTIFICATES FOR PAYMENT 43
10.4 PROGRESS PAYMENTS TO THE CONTRACTOR 43
10.5 PAYMENT NOT ACCEPTANCE 46
10.6 PAYMENTS WITHHELD 46

10.7 SUBSTANTIAL COMPLETION 47
10.8 FINAL COMPLETION AND FINAL PAYMENT 49
10.9 STORAGE OF MATERIALS OFF-SITE 52
ARTICLE 11 SAFETY AND PROTECTION 53
11.1 SAFETY PRECAUTIONS AND PROGRAMS 53
11.2 SAFETY OF PERSONS AND PROPERTY 54
11.3 EMERGENCIES 57
ARTICLE 12 BONDS AND INSURANCE 57
12.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND 57
12.2 CONTRACTOR'S LIABILITY INSURANCE 58
12.3 PROPERTY INSURANCE 60
12.4 PROFESSIONAL LIABILITY INSURANCE 62
ARTICLE 13 CHANGES IN THE WORK 62
13.1 CHANGE ORDERS 62
13.2 CONSTRUCTION CHANGE DIRECTIVES 65
13.3 DIFFERING SUBSURFACE OR LATENT PHYSICAL CONDITIONS 65
13.4 CLAIMS FOR ADDITIONAL COST OR DAMAGES 66
13.5 PENALTIES FOR FALSE CLAIMS 66
13.6 MINOR CHANGES IN THE WORK 66
ARTICLE 14 CORRECTION OF WORK 67
14.1 UNCOVERING OF WORK 67
14.2 CORRECTION OF WORK 67
14.3 ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK 68
ARTICLE 15 PARTIAL USE OR OCCUPANCY 69
15.1 OWNER'S RIGHT TO USE AND OCCUPY 69
15.2 PARTIAL USE NOT ACCEPTANCE 69
15.3 NO CLAIM FOR DELAY 70
ARTICLE 16 TERMINATION OF THE CONTRACT 70
16.1 TERMINATION BY THE CONTRACTOR 70

16.2 TERMINATION BY THE OWNER 70
ARTICLE 17 OWNER'S RIGHT TO STOP THE WORK AND TO CARRY OUT THE WORK 72
17.1 OWNER'S RIGHT TO STOP THE WORK 72
17.2 OWNER'S RIGHT TO CARRY OUT THE WORK 73
ARTICLE 18 POST-COMPLETION WARRANTY AND CORRECTIVE WORK 73
18.1 CONTRACTOR'S WARRANTIES 73
ARTICLE 19 DISPUTE RESOLUTION 75
19.1 GOVERNING LAW; VENUE 75
19.2 CLAIMS AND DISPUTES 75
ARTICLE 20 MISCELLANEOUS PROVISIONS 76
20.1 NOTICE 76
20.2 CONTRACT DOCUMENTS 77
20.3 RIGHTS AND REMEDIES 77
20.4 DECISIONS AND INTERPRETATIONS 78
20.5 ANTI-BOYCOTT COVENANT 78
20.6 RIGHT OF AUDIT 78
20.7 RECORD KEEPING AND REPORTING 78
20.8 FINANCIAL RECORDS OF CONTRACTOR 80
20.9 FALSE ENTRY 83

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 1 DEFINITIONS; CONTRACT DOCUMENTS

1.1 DEFINITIONS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof. The order of the terms defined below is alphabetical, and is not intended to indicate any priority.

1.1.1 Affiliated Entities - Any entity related to or affiliated with the Contractor or any Subcontractor or with respect to which the Contractor or any Subcontractor has direct or indirect ownership or control, including without limitation, any entity owned in whole or in part by the Contractor or any Subcontractor, as applicable; any holder of any issued and outstanding shares of, or the holder of any interest in, the Contractor or any Subcontractor, as applicable; any entity in which any officer, director, partner, shareholder, member, or manager (or member of the family of any of the foregoing persons) has a direct or indirect interest, which interest includes, but is not limited to, that of a partner, shareholder, officer, director, member, manager, or agent.

1.1.2 Agreement – The fixed-price Agreement between Owner and Contractor.

1.1.3 Applicable Laws - As defined in Subsection 1.2.1.

1.1.4 "Approve", "approved" or "approval" means written approval by a duly authorized representative.

1.1.5 Engineer - The Engineer designated in the Agreement or its authorized representatives.

1.1.6 Engineer's Supplemental Instructions - A written document issued by the Engineer for clarification which may order a minor change in the Work and which does not require an adjustment in the Contract Sum and/or an extension of the Contract Time. The Engineer's Supplemental Instructions shall be issued on AIA Document G710 or other form issued by or acceptable to the Owner.

1.1.7 Change Order - A written order prepared by the Engineer, issued by the Owner to the Contractor and signed by the Owner, the Contractor and the Engineer authorizing an addition to, deletion from or revision in the Work and any adjustment in the Contract Sum and/or Contract Time that may be required in accordance with the terms of the Contract. Change Orders shall be issued on AIA Document G701/2000 or other form issued by or acceptable to the Owner.

1.1.8 Construction Change Directive - A written order prepared by the Engineer, issued by the Owner to the Contractor, and signed by the Owner and the Engineer authorizing the Contractor to proceed with a change in the Work. Construction Change Directives shall be issued on AIA Document G714 or any other form issued by or acceptable to the Owner. A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith and shall be considered a Change Order.

1.1.9 Construction Period - The period of the Contract Time which commences upon the issuance of the initial Notice to Proceed with Construction and concludes on the Final Completion Date.

1.1.10 Contract - As defined in the Agreement.

1.1.11 Contract Documents - As defined in the Agreement.

1.1.12 Contract Sum - As defined in the Agreement, subject to amendment in accordance with the provisions of the Contract.

1.1.13 Contract Time - As defined in the Agreement, subject to amendment in accordance with the provisions of the Contract.

1.1.14 Contractor - The entity with which the Owner has executed the Agreement. Wherever the term "Contractor" appears in the Contract Documents, it means the Contractor and Subcontractors who are obligated to perform all, or a part of, the Work described by the Contract Documents.

1.1.15 Critical Path - The sequential Critical Path Activities shown on the Project Schedule from the date of commencement of the Work through Final Completion.

1.1.16 Critical Path Activity - Any activity identified on the Project Schedule which, if delayed or prolonged, would cause the Construction Period to extend beyond the Contract Time.

1.1.17 Day - As used in the Contract Documents, the term shall mean calendar day. The terms "working day" and "business day" shall mean any calendar day except Saturdays, Sundays, and legal holidays at the place where the Project is located.

1.1.18 Delay Event - As defined in Subsection 9.4.1 of these General Conditions.

1.1.19 Drawings - The graphic and pictorial depictions of the Work prepared by the Engineer, wherever located and whenever issued, showing the design, location, scope and dimensions of the Work, or parts thereof, generally including plans, elevations, sections, details, schedules and diagrams and any narrative notes thereon.

1.1.20 Excusable Delay - Any act, omission, event or condition which delays performance of the Work, for which the Contractor is entitled, under applicable provisions of the Contract Documents, to an extension of the Contract Time.

1.1.21 Final Completion - As defined in Subsection 10.8.5 of these General Conditions.

1.1.22 Final Completion Date - The date set forth in the Agreement on or prior to which Final Completion is required to be achieved.

1.1.23 Notice to Proceed (NTP) – A written communication issued by the Owner to the Contractor authorizing it to proceed with a specified portion of the Work.

1.1.24 Owner's Representative - A project manager retained by the Owner to represent it in connection with the Project. The Owner's Representative is designated in the Agreement.

1.1.25 Product Data - Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and any other information furnished by the Contractor to illustrate a material, product, assembly, or system for a portion of the Work. Product data are not Contract Documents.

1.1.26 Project Schedule - As defined in Section 9.2 of these General Conditions.

1.1.27 "Provide" or "Provided" - where used in the Contract Documents, such words shall be construed to mean "furnish(ed)" and "install(ed)" and/or "connect(ed)", unless specifically stated otherwise.

1.1.28 Request for Information (RFI) - A written and logged request issued by the Contractor, or any Subcontractor through the Contractor, to the Engineer, with a copy sent to the Owner's Representative, requesting information about some aspect of the Contract Documents.

1.1.29 Samples - Physical examples that illustrate materials, products, equipment or workmanship and which, when approved in accordance with the Contract Documents, establish standards by which the Work will be inspected and judged. Samples are not Contract Documents.

1.1.30 Schedule of Values – A schedule, prepared and maintained by Contractor for lump sum portions of the Work, allocating portions of the Contract Sum to various portions of the Work as required by Section 10.1 of these General Conditions.

1.1.31 Shop Drawings - All drawings, prints, diagrams, illustrations, brochures, schedules and other data prepared by the Contractor, a Subcontractor, or a Supplier

to illustrate how specific portions of the Work shall be fabricated and/or installed. Shop Drawings are not Contract Documents.

1.1.32 "Shown" or "shown on Drawings" - Where used in the Contract Documents, such words shall be construed to mean "noted", "indicated", "scheduled", "detailed", or any other diagrammatic or written reference made in any of the Contract Documents.

1.1.33 Site - The area or areas indicated within the contract limit lines on the Drawings or otherwise defined in the Contract Documents, together with such additional areas or locations adjacent thereto in which construction operations or Work required under the Contract may be performed.

1.1.34 Specifications - Written narrative descriptions, prepared by the Engineer, of requirements for materials, equipment, systems, standards and workmanship for the Work, and requirements for the performance of construction services.

1.1.35 State University – the State University campus on which the Project is located.

1.1.36 Subcontractor - An entity having a contract with the Contractor or with any other Subcontractor, regardless of tier, for the performance of a part of the Work required under the Contract Documents.

1.1.37 Substantial Completion - As defined in Subsection 9.1.3 of these General Conditions.

1.1.38 Substantial Completion Date - The date set forth in the Agreement on or prior to which Substantial Completion is required to be achieved.

1.1.39 Supplier - Any entity having a contract with the Contractor, any Subcontractor or other supplier regardless of tier, who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the Site.

1.1.40 Work – As defined in the Agreement.

1.2 INTERPRETATION OF CONTRACT DOCUMENTS

1.2.1 This Contract is subject to all applicable laws, regulations, codes, ordinances, rules, and orders of the United States of America, the Commonwealth of Massachusetts, and other governmental or public agencies and authorities with jurisdiction over the Project, and to all contracts and other agreements between the Owner and any such governmental or public agencies and authorities, referred to or incorporated in the Contract Documents (the "Applicable Laws").

1.2.2 The Contractor shall inform itself of all Applicable Laws in any manner affecting the Work, or the materials used or employed in the Work, or in any way affecting the conduct of the Work, and of all orders and decrees of bodies or tribunals having any jurisdiction or over the Work. The Contractor shall comply, and shall cause all persons and Subcontractors employed in the performance of the Work to comply, with all Applicable Laws.

1.2.3 Where any requirements contained in the Contract Documents do not conform to or are inconsistent with such Applicable Laws to which the Contract is subject or by which it is governed, such Applicable Laws shall have precedence over any matters set forth herein and the Contractor agrees to comply fully therewith. The Owner makes no representation as to and assigns no responsibility for the correctness or completeness of such statutory matters referred to or set forth in the Contract Documents.

1.2.4 The Contractor represents that it has examined and understands all of the Contract Documents and has visited the Site, examined and familiarized itself with the local conditions under which the Work is to be performed, including any work in progress under previously awarded contracts, verified to its satisfaction the nature and quantity of the Work involved, and correlated its observations with the requirements of the Contract Documents, and, by execution of the Agreement, the Contractor acknowledges its satisfaction with the same.

1.2.5 The intent of the Contract Documents is to describe the Work that, once constructed by the Contractor, will result in a functionally complete facility. It is intended that the Contractor shall furnish all Work necessary for the proper execution and completion of the Project in accordance therewith, including all Work incidental to or reasonably inferable from the Contract Documents as being necessary to produce the intended results, unless it is specifically indicated in the Contract Documents that such work is to be performed by others, and to complete the Project in a satisfactory manner, ready for use, occupancy, and operation by the Owner. The Contractor recognizes, and agrees to perform the Work consistent with the extra degree of care and skill required in an occupied academic campus setting with respect to safety, protection of pedestrians, cleanliness of the Site, health and the protection of existing utilities, adjacent streets and property. In agreeing to the Contract Time and the Contract Sum, the Contractor has considered and included those circumstances.

1.2.6 Unless the Contract Documents specifically provide otherwise or the context clearly requires a different meaning, the terms “directed,” “required,” “permitted,” “ordered,” “designated,” “prescribed,” and words of like import shall imply the direction, requirement, permission, order, designation, or prescription of the Owner’s Representative or the Engineer, subject in each case to the final determination of the Owner; and “approved,” “acceptable,” “satisfactory,” and words of like import shall mean approved by, or acceptable or satisfactory to the Owner’s Representative or the Engineer, subject in each case to the final determination of the Owner; and “necessary,” “reasonable,” “proper,” “correct,” and words of like import shall mean necessary, reasonable, proper or correct in the judgment of the Owner’s Representative or the Engineer, subject in each case to the final determination of the Owner.

1.2.7 In case of discrepancies or conflicts among the Contract Documents or within any of the Contract Documents, the Contract Documents shall be interpreted on the basis of the following priorities:

(a) First, written amendments, including Change Orders, to the Agreement – those of a later date shall take precedence over those of an earlier date;

(b) Second, the Agreement Between Owner and Contractor;

(c) Third, Supplementary General Conditions, if any;

(d) Fourth, General Conditions;

(e) Fifth, Specifications; and

(f) Sixth, Drawings.

Among Drawings, large scale details shall control over small scale details, and indicated dimensions shall control over Drawings not dimensioned. In the event of a conflict or ambiguity within or between the Specifications or Drawings as to the quantity or quality of work or materials, the higher quality or greater quantity shall be furnished unless otherwise directed in writing by the Owner or the Engineer.

1.2.8 Any information contained in the Specifications that has been omitted from the Drawings or vice versa shall be construed as though contained in both. In the event of any duplication, conflict, inconsistency, error, omission, or discrepancy among or within the Drawings and the Specifications (or among or within other portions of the Contract Documents so far as the same pertain to the Drawings or the Specifications), the matter shall promptly be brought to the attention of the Engineer for instructions. If, having identified any duplication, conflict, inconsistency or discrepancy, the Contractor proceeds with the Work without receiving instructions from the Engineer, the Contractor does so at its own risk and shall be responsible for performing any corrective Work at its own cost and without entitlement to any adjustment in the Contract Sum or the Contract Time.

1.2.9 All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Contract Documents, except where a contrary result is explicitly indicated by the Contract Documents. A typical or representative detail indicated on the Drawings shall constitute the standard for workmanship and material throughout the corresponding parts of the Work. Where necessary and where reasonably inferable from the Contract Documents, the Contractor shall adapt such representative detail for application to such corresponding parts of the Work. The details of such adaptation shall be subject to prior approval by the Engineer. Repetitive features shown in outline on the Drawings shall be in exact accordance with corresponding features completely shown.

1.2.10 Where laws, regulations, codes, standards, requirements or publications of public or private bodies are referred to in the Contract Documents, references shall be understood to be to the latest revision in effect on the date of execution of the Contract Documents, except where otherwise indicated. The Contractor warrants that all Work performed hereunder shall meet the requirements of all such laws, regulations, codes, standards, requirements and publications which are applicable to the Project. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.11 The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

(a) a duly-executed amendment to the Contract;

(b) a Change Order (pursuant to Section 13.1); or

(c) a Construction Change Directive (pursuant to Section 13.2).

The Contract Sum and the Contract Time may only be changed by a Change Order or a written amendment. In addition, the requirements of the Contract Documents may be clarified or supplemented, and minor variations and deviations in the Work may be authorized, by the Engineer's Supplemental Instructions pursuant to Section 13.6 or by the Engineer's approval of Submittals pursuant to Section 3.8.

1.2.12 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade or subcontractor. A section or division of the Specifications may cover the Work of more than one Subcontractor and the Work of one Subcontractor may be covered by more than one section or division of the Specifications. The Contractor and all Subcontractors shall refer to all of the Drawings, and to all of the Sections of the Specifications, and shall perform all Work reasonably inferable therefrom as being necessary to produce the intended results. The Owner assumes no liability to the Contractor arising out of jurisdictional issues raised or claims advanced by trade organizations, Subcontractors or other interested parties based on the arrangement or manner of subdivision of the content of the Specifications and Drawings. In the event of any claim arising out of any duplication, conflict, inconsistency or discrepancy within the Contract Documents as to the allocation of the Work among and between the Subcontractors and the Contractor's own forces, the Contractor shall be solely responsible for resolving the claim and shall be responsible for ensuring that all of the Work is completed without additional cost to the Owner and without delay, regardless of where or how it is described in the Contract Documents.

1.2.13 If any term or provision of any of the Contract Documents, or the application thereof to any party or circumstance shall, to any extent, be determined to be invalid or unenforceable, the remaining provisions of the Contract Documents, or the application of

such term or provision to parties or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of each of the Contract Documents shall be valid and shall be enforced to the fullest extent permitted by law.

1.2.14 The Contract Documents shall not be construed to create a contractual relationship of any kind between: (1) the Engineer and the Contractor; (2) the Owner and any Subcontractor or Supplier; or (3) between any other persons or entities other than the Owner and the Contractor. The Contractor understands and agrees that the obligations of the Owner's Representative and the Engineer are solely to the Owner and, by performing those obligations properly, the Owner's Representative or the Engineer may increase the burdens and expenses of the Contractor, its Subcontractors, or sureties or any of them.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All Contract Documents and other related materials and copies thereof prepared or furnished to the Contractor are the property of the Owner, subject to the rights of the Engineer as provided in the Owner-Engineer Agreement. With the exception of one contract set for the Contractor, such documents shall be returned (or suitably accounted for) to the Owner, or if requested by the Owner, lawfully disposed of by the Contractor at the completion of the Work, as a condition precedent to final payment. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project shall not be construed as publication in derogation of the Engineer's common law copyright or other reserved rights.

1.4 OTHER REPRESENTATIONS

1.4.1 The Contractor shall perform the Work strictly in accordance with the Contract Documents. The Contractor accepts the relationship of trust and confidence established between it and the Owner established by the Agreement and other Contract Documents. The Contractor covenants with the Owner to furnish its best skill and judgment and to cooperate with the Owner, the Owner's Representative, the Engineer and any other consultants employed by the Owner in furthering the interests of the Owner. The Contractor agrees to furnish efficient business administration, coordination, and superintendence and to furnish at all times an adequate supply of workers and materials, and to perform the Work in the best way and in the most expeditious and economical manner consistent with the interests of the Owner and to make every effort to achieve time savings and construction efficiencies with respect to the Work.

ARTICLE 2 ADMINISTRATION OF THE CONTRACT

2.1 OWNER'S REPRESENTATIVE

2.1.1 The Owner's Representative, if one has been retained by the Owner, and the Engineer will assist the Owner in the administration of the Contract as provided in the Contract Documents. The Owner's Representative and the Engineer may act directly or through

their properly authorized agents, such agents acting within the scope of the particular duties entrusted to them. The Engineer and the Owner's Representative will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents or as may be specified in writing by the Owner.

2.1.2 The Engineer and the Owner's Representative will be representatives of the Owner during construction of the Work and until final payment is due and will advise and consult with the Owner as to the performance and progress of the Work. The Owner may communicate with the Contractor directly or through the Owner's Representative or the Engineer. The Owner will endeavor to furnish to the Engineer copies of any communications from the Owner to the Contractor, directly or through the Owner's Representative.

2.2 DESIGNER'S SITE VISITS

2.2.1 The Engineer will visit the Site at intervals appropriate to the stage of construction as may be required to familiarize itself generally with the progress and quality of the Work and to determine in general whether the Work is proceeding in accordance with the Contract Documents. However, the Engineer will not be required to make exhaustive or continuous on-site inspections. On the basis of its on-site observations as a design professional, it will keep the Owner's Representative and the Owner informed of the progress and quality of the Work.

2.2.2 Neither the Owner, the Owner's Representative, nor the Engineer will have control, or charge of, or be responsible for, construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and nor will any of them be responsible for the acts or omissions of the Contractor, Subcontractors or any other persons or entities performing any of the Work, or for the failure of any of them to carry out the Work in accordance with the Contract Documents.

2.2.3 All portions of the Work shall be subject to inspection and testing by the Engineer and the Owner's Representative. The Engineer will have authority to reject Work which does not conform to the Contract Documents. The Contractor shall, at its sole cost and expense, furnish the Engineer with such information and assistance (including, without limitation, labor, tools, equipment and transportation) as is required for the Engineer to make complete and detailed inspections or tests. Whenever the Engineer considers it necessary or advisable for the implementation of the intent of the Contract Documents, the Engineer will have authority to require special inspection or testing of portions of the Work in accordance with Article 8 hereof whether or not such Work be then fabricated, installed or completed. However, neither the Engineer's authority to act hereunder, nor any decision made by the Engineer in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their agents or employees, or any other person or entity performing any of the Work.

2.3 DESIGNER'S SUPPLEMENTAL INSTRUCTIONS

2.3.1 The Engineer will render, in writing, Engineer's Supplemental Instructions and other interpretations necessary for the proper execution or progress of the Work, with reasonable promptness. Either party to the Contract may request such interpretations from the Engineer by giving written notice of such request to the Engineer with a copy thereof given to the other party, or the Engineer may initiate such Engineer's Supplemental Instructions or other interpretations upon notice to the Owner's Representative. The Engineer will, as it judges necessary or desirable, issue as a part of such Engineer's Supplemental Instructions additional drawings, specifications, or instructions indicating in greater detail the construction or design of the various parts of the Work reasonably inferable from the Contract Documents, and, provided such Engineer's Supplemental Instructions are reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such Engineer's Supplemental Instructions without increase in the Contract Sum or extension of the Contract Time. Such change shall be effected by written order issued by the Engineer and delivered to the Contractor. If the Engineer determines that implementation of the requested changes would result in a material change to the Contract that may cause an adjustment in the Contract Time or Contract Sum, the Engineer may make a recommendation to the Owner, which may authorize further investigation of such change. Upon such authorization, and based upon any information furnished by the Owner's Representative, the Engineer shall review and advise the Owner and the Owner's Representative concerning the additional cost and time that might result from such change. With the Owner's approval, the Engineer shall request the Contractor to incorporate those estimates into a Change Order or other appropriate documentation for the Owner's execution or negotiation with the Contractor.

2.4 DESIGNER'S INTERPRETATIONS

2.4.1 Interpretations and decisions of the Engineer shall be consistent with the intent of, and reasonably inferable from, the Contract Documents and shall be in written or graphic form. In the capacity of interpreter, the Engineer shall endeavor to secure faithful performance by both the Owner and the Contractor, shall not show partiality to either, and shall not be liable for the result of any interpretation or decision rendered in good faith in such capacity.

2.5 SUBMITTALS

2.5.1 The Engineer will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples but only for the purpose of checking for conformance with the design concept and with the information in the Contract Documents. The Engineer shall communicate all such approvals or other actions to the Contractor with copy to the Owner's Representative. Review of such submittals is not conducted for the purpose of substantiating instructions for installation or performance of equipment or systems designed by the Contractor, all of which remain the responsibility of the Contractor. The Engineer's review shall not constitute approval of safety precautions or of

construction means, methods, techniques, sequences, or procedures. The Engineer's approval of a specific item shall not constitute approval of an assembly of which the item is a component. The Engineer shall not be required to review partial submittals nor submittals for which necessary correlated submissions have not been received.

2.6 REPLACEMENT DESIGNER

2.6.1 In case of the termination of the employment of the Engineer, the Owner shall appoint a designer whose status under the Contract Documents shall be that of the former designer**.** The Contractor shall cooperate with the replacement designer in connection with the completion of the Work. Replacement of the Engineer shall not entitle the Contractor to any adjustment in the Contract Sum or the Contract Time.

ARTICLE 3 CONTRACTOR'S RESPONSIBILITIES

3.1 DUTY TO REVIEW CONTRACT DOCUMENTS AND SITE CONDITIONS

3.1.1 Before starting the Work, and continuously during the progress thereof, the Contractor shall carefully examine the Site, take field measurements, and carefully study and compare the Contract Documents with each other and with conditions at the Site, including work completed or in progress under other contracts, and with such other information, documents, plans and criteria as may be available in connection with the Project and shall immediately communicate to the Engineer and the Owner, in writing, all errors, inconsistencies and omissions it discovers. If the Contractor proceeds with the Work without such notice to the Engineer and the Owner, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents and other conditions the Contractor could have discovered the same, the Contractor shall perform all necessary corrective work and bear all costs and expenses arising therefrom and shall have no claim for increases in the Contract Sum or extensions of the Contract Time for extra work made necessary thereby.

3.1.2 The Contractor shall give the Engineer timely written notice of any additional Drawings, Specifications, clarifications or instructions required to define the Work in greater detail or otherwise required to permit the proper progress of the Work. The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings or instructions from the Engineer. If the Contractor proceeds with such Work without obtaining further drawings or instruction, the Contractor shall correct, at its own expense, Work incorrectly done.

3.1.3 Without limitation, the Contractor shall review the Contract Documents for clarity, consistency, constructability, maintainability, operability and coordination among trades, and time requirements for procurement, installation and construction, and sequence of construction, including recommendations designed to minimize adverse effects of labor or material shortages.

3.1.4 If the Contractor recognizes or discovers that any portion of the Drawings and Specifications is at variance with Applicable Laws, the Contractor shall immediately notify the Owner and the Engineer in writing and shall not proceed with such Work without specific written direction by the Owner. If the Contractor performs any Work knowing or having reason to know that said Work is contrary to Applicable Laws and without so notifying the Owner and the Engineer, the Contractor shall assume full responsibility therefor and shall bear all costs of correction thereof, and any other costs including any loss, cost or damage sustained by the Owner attributable thereto.

3.1.5 The Contractor shall at all times provide the Engineer, its representatives and consultants, the Owner's Representative, and the Owner, and its agents, employees, representatives, other contractors, and consultants with access to the Site and the Work wherever it is in preparation and progress. The Contractor shall provide safe and proper facilities for such access and for observation, testing, and inspection of the Work.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES

3.2.1 The Contractor shall supervise, coordinate, and direct the Work competently and efficiently, using its best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents. The Contractor shall not be relieved from its obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Engineer or the Owner's Representative in their administration of the Contract, or by inspections, tests or approvals required or performed under Article 8 hereof by persons other than the Contractor.

3.2.2 The Contractor's Project Team shall consist of, as a minimum, a qualified Project Executive, Project Manager, Project Superintendent, and other necessary assistants and technical and administrative personnel. The Project Superintendent shall be licensed by the Commonwealth of Massachusetts. No change shall be made in the composition of the Project Team without the Owner's prior written approval. The removal or replacement without the Owner's consent of any of the identified members of the Contractor's Project Team shall constitute a material breach of the Contract. The Owner may require replacement of any member of the Contractor's Project Team upon notice to the Contractor with or without cause.

3.2.3 Both the Project Manager and the Project Superintendent shall have full authority to act on behalf of the Contractor. The Project Manager or Project Superintendent and necessary assistants shall be in attendance at the Site at all times during the progress of the Work until Final Completion. The Project Manager and the Project Superintendent shall represent the Contractor and notices or other communications given to the Project Manager or the Project Superintendent shall be as binding as if given to the Contractor directly.

3.2.4 During the course of construction, the Engineer or the Owner's Representative shall schedule, convene and conduct Project meetings for the purpose of

conducting an orderly review of the progress of the Work, as often as the Engineer or the Owner deems necessary, but at least once each week, in accordance with a schedule established by the Engineer. Such meetings shall be held at the Site and shall be attended by representatives of the Owner, the Contractor and the Engineer. Representatives of Subcontractors shall attend such meetings as necessary when Subcontractors are performing significant work on the Project or when a Subcontractor's presence is requested by the Owner or the Engineer. The Contractor's representative(s) at each meeting shall be the Project Manager and the Project Superintendent. The Engineer shall take minutes of each meeting in form, substance, and detail acceptable to the Owner.

3.2.5 The Contractor shall furnish sufficient forces, plant, and equipment as may be necessary to insure the progress of the Work in accordance with the Project Schedule (as defined below). If the Contractor falls behind the Project Schedule, the Contractor shall promptly submit a proposal demonstrating the manner in which the rate of progress may be increased and shall take such steps as may be necessary to meet the Project Schedule at no additional cost to the Owner. It shall be the responsibility of the Contractor to maintain its schedule so as not to delay the progress of the Work or the scheduled work of other contractors.

3.2.6 The Contractor shall be solely responsible for properly laying out the Work, and for all lines, elevations and measurements for all of the Work. It shall verify the figures shown on the Drawings before laying out the Work and will be responsible for any errors or inaccuracies resulting from its failure to do so.

3.2.7 Where the Contract Documents refer to particular construction means, methods, techniques, sequences or procedures or indicate or imply that such are to be used in the Work, such mention is intended only to indicate that the operations of the Contractor shall be such as to produce at least the quality of Work implied by the operations described, but the actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the responsibility of the Contractor, who shall notify the Owner's Representative and the Engineer in writing of the actual means, methods, techniques, sequences or procedures which will be employed on the Work, if these differ from those mentioned in the Contract Documents. All loss, damage or liability, or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences or procedures shall be borne by the Contractor, notwithstanding that such construction means, methods, techniques, sequences or procedures are referred to, indicated, or implied by the Contract Documents, unless the Contractor has given timely notice to the Owner's Representative and the Engineer in writing that such means, methods, techniques, sequences or procedures are not safe or suitable, and the Contractor has then been instructed in writing to proceed at the Owner's risk.

3.2.8 If any portion of the Work is suspended by the Contractor for any reason at any time, prior notice shall be given to the Owner's Representative of such suspension and of the resumption of such Work.

3.2.9 If the Contractor observes or determines that any Work previously performed under the Contract or any work performed by the Owner or by a separate contractor is not in accordance with the Contract Documents or is otherwise unsatisfactory, the Contractor shall promptly notify the Owner's Representative and the Engineer in writing describing the situation in full detail.

3.3 LABOR AND MATERIALS

3.3.1 The Contractor shall provide competent, suitably qualified personnel to perform all Work as required by the Contract Documents. Unless otherwise specified in the Contract Documents, the Contractor shall furnish at its expense and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other utilities, services, facilities and incidentals necessary for the proper furnishing, performance, testing and completion of the Work.

3.3.2 All materials and equipment shall be of first quality and new and of recent manufacture, except as otherwise expressly provided in the Contract Documents. If required by the Engineer, or the Owner's Representative, the Contractor shall furnish written information or other satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment, and stating the original sources of supply of materials and products manufactured or produced at locations other than the Site of the Work. In order to permit time for required inspections, testing and approvals, such information shall be furnished at least thirty days (or as otherwise directed by the Engineer or the Owner's Representative) in advance of the incorporation of any such materials or products in the Work. The Contractor shall make no claim for extra cost or extension of the Contract Time arising directly or indirectly out of its failure to timely select materials or products to permit a reasonable time for completion of inspections, testing or approvals, or because of the Contractor's purchase of materials or products in advance of approval.

3.3.3 Reference in the Contract Documents to any product, material, equipment, method or process by proprietary name, manufacturer, vendor, supplier, make or catalog number shall be interpreted as establishing a standard of quality.

3.3.4 Except in the case of minor changes in the Work authorized by the Engineer in accordance with the provisions of the Contract Documents, the Contractor may make substitutions only in conformance with the provisions of Section 00.73.73 of the Specifications (M.G.L. c. 30, § 39M(b)).

3.3.5 The Contractor's attention is directed to M.G.L. c. 30, § 39I which provides criminal penalties for unauthorized deviations from the Drawings and Specifications: "Contractor shall perform all Work required by the Contract in conformity with the plans and specifications contained therein or made a part thereof. No willful and substantial deviation from said plans and specifications shall be made unless authorized in writing by the Owner or by the Engineer who is duly authorized by the Owner to approve such deviations. In order to

avoid delays in the prosecution of the Work required by the Contract such deviation from the plans or specifications may be authorized by a written order of the Owner or Engineer so authorized to approve such deviation. Within thirty days thereafter, such written order shall be confirmed by a certificate of the Owner stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the Project as a whole; (3) that either the work substituted for the Work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the Owner and the Contractor and the amount in dollars of said adjustment; and (4) that the deviation is in the best interest of the Owner. Such certificate shall be signed under the penalties of perjury and shall be a permanent part of the file record of the Work contracted for. Whoever violates any provision of this section willfully and with intent to defraud shall be punished by a fine of not more than five thousand dollars or by imprisonment for not more than six months, or both."

3.3.6 The Owner will consider formal written requests made through the Engineer for the substitution of products in place of those specified only under the conditions set forth in the Contract Documents, unless otherwise expressly agreed by Owner in its sole discretion. By making requests for substitutions, the Contractor:

(a) represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified, and expressly warrants that such proposed substitute product will perform adequately the functions and achieve the results called for by the Contract Documents;

(b) represents that it will provide the same warranties and guarantees for the substitute product that it would for that specified;

(c) certifies that the cost data presented is complete and includes all related costs under the Contract but excluding costs under other contracts (but separately identifying such costs, if any, of other contracts), and excluding the Engineer's redesign costs, if any, and waives all claims for additional costs related to the substitution which subsequently become apparent;

(d) certifies that the proposed substitution will not result in any increase in the Contract Sum and represents and agrees that any cost savings will be passed through to the Owner in the form of a credit against the Contract Sum; and

(e) will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

Notwithstanding approval or acceptance of such substitution by the Owner, any additional cost, or any loss or damage to the Owner arising from the substitution of any material or any method for those originally specified, shall be borne by the Contractor, including, without limitation, the costs of modifying Contract Documents and additional fees of the Engineer, the Owner's consultants or engineers, unless such substitution was made at the written request or order of the Owner.

3.3.7 The Contractor shall at all times enforce strict discipline and good order among and between its employees and the employees of its Subcontractors and shall not employ or permit to be employed on the Work any person who is not properly skilled in the work to be performed by it or who is otherwise unfit. Whenever the Owner shall notify the Contractor in writing that any person employed on the Work is, in the opinion of the Owner or the Engineer, incompetent, disorderly or otherwise unsatisfactory, such person shall be discharged immediately and shall not again be employed on the Work except with the prior written consent of the Owner.

3.3.8 The Contractor shall furnish labor that can and will work in harmony with all other elements of labor employed or to be employed on the Project. The costs of maintaining labor harmony, including without limitation, the cost of security, public safety measures and necessary traffic management shall be paid by the Contractor and the Contractor shall have no claim for any costs of maintaining labor harmony.

3.3.9 Any employee found on site subject to M.G.L. c. 30, § 39S without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration shall be subject to immediate removal and the Contractor shall immediately remove any such employee.

3.3.10 The Contractor will not be entitled to additional compensation for Work performed outside of regular working hours, except as otherwise expressly authorized in writing by the Owner prior to the performance of such overtime or premium shift work. Additional compensation for such authorized overtime or premium shift work shall be limited to the direct cost of the premium portion of such authorized overtime. The Contractor shall comply with M.G.L. c. 149, §§ 30, 34 and 34A which provide that no laborer, workman, mechanic, foreman or inspector working within the Commonwealth in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the Work shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of extraordinary emergency.

3.3.11 All materials and equipment shall be delivered, handled, stored, installed and protected to prevent damage in accordance with the best current practice in the industry, in accordance with the manufacturers' specifications and recommendations, and in accordance with Contract Document requirements. The Contractor shall deliver materials and equipment in ample time to facilitate inspection and testing prior to installation. The term "delivery" in reference to any item specified or indicated, means the unloading and storing with proper

protection at the Site. Damaged materials or equipment may be rejected and the Contractor shall provide conforming materials or equipment at no additional cost.

3.3.12 The Contractor shall be responsible for determining that all materials furnished for the Work meet all the requirements of the Contract Documents. The Owner's Representative or the Engineer may require the Contractor to produce reasonable evidence that a material meets such requirements, such as certified reports of studies by qualified experts, or other evidence which, in the opinion of the Engineer, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents.

3.3.13 All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, conditioned and commissioned in accordance with the manufacturer's or supplier's written or printed directions and instructions unless otherwise indicated in the Contract Documents.

3.3.14 The layout of mechanical and electrical systems, equipment, fixtures, piping, duct work, conduit, specialty items, and accessories indicated on the Contract Documents is diagrammatic, and all variations in alignment, elevations, and detail required to avoid interferences and satisfy architectural, engineering and structural limitations are not necessarily shown. Prior to the commencement of the portion of the Work relating to the mechanical, electrical, plumbing, fire protection or any similar systems, the Contractor shall furnish the Owner with a coordination drawing, illustrating all systems, equipment, fixtures, conduit, pipes, valves and all related installations in CADD format. Actual layout of such Work shall be carried out without affecting the architectural, engineering and structural integrity and limitations of the Work and shall be performed in such sequence and manner as to avoid conflicts, provide clear access to all control points, including valves, strainers, control devices, and specialty items of every nature related to such systems and equipment, obtain maximum headroom, provide adequate clearances as required for operation and maintenance, and provide an orderly appearance when exposed. Exact locations of fixtures and outlets shall be obtained from the Engineer as provided in the Contract Documents before the Work is roughed in. Work incorrectly installed without such information from the Engineer shall be relocated at the Contractor's expense.

3.3.15 Every employee under these General Conditions shall lodge, board and trade where and with whom he or she elects, and neither the Contractor nor its agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person. [NTD: see GL c. 149, s. 25]

3.4 PHASES OF THE WORK—CONSTRUCTION PHASE

3.4.1 The construction phase shall commence upon the issuance by the Owner of a written Notice to Proceed with the Work.

3.4.2 The Contractor shall be responsible for ensuring that adequate quality control programs are developed, implemented and enforced by the Contractor's staff and all Subcontractors, including assigning an experienced quality manager, who may be the Project Superintendent employed by the Contractor, who shall be stationed at the Project Site and who shall be responsible for reviewing and coordinating the quality control activities of all Subcontractors and monitoring the implementation and enforcement thereof in connection with all aspects of the Work.

3.4.3 The Contractor shall be responsible for overall management, supervision, and coordination of all Subcontracts and of labor relations in connection with the Project to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work and in accordance with the requirements of the Contract Documents. The Contractor shall identify and resolve jurisdictional issues and disputes prior to bidding and award of the applicable Subcontracts, so as to cause no delay in the Work.

3.4.3.1 In consultation with the Owner's Representative and the Engineer, the Contractor shall develop and implement procedures for orderly completion of Punch-List items, check out of utilities, operational systems and equipment and initial start-up and testing. The Contractor shall prepare and deliver to the Engineer warranties, as-built drawings, maintenance manuals and the like, and generally administer closeout of the Work. In connection with the closeout of the Work, the Contractor shall take steps to ensure the performance of all warranty and guarantee obligations, resolution of all claims and other post construction requirements in accordance with the terms of the Contract Documents.

3.5 PERMITS AND FEES; COMPLIANCE WITH LAW

3.5.1 The Contractor, at its cost, shall secure and pay for all demolition permits, construction or building permits, utility inspection and connection fees, and all other permits and approvals and governmental fees or charges (including, without limitation, microfilming charges), licenses, inspections and certificates of inspection necessary for the proper execution, completion and use of the Work, including, without limiting the generality of the foregoing, permits for obstruction of or projection into, over or under public streets and sidewalks and other public ways, curb-cut permits, and notifications to and permits or approvals from the Massachusetts Department of Environmental Protection or others necessary in connection with the performance of the Work (the "Permits and Approvals"). The Contractor shall promptly deliver to the Owner's Representative and the Engineer copies of all such Permits and Approvals (and supporting applications), licenses and certificates, and satisfactory evidence that disposal of all waste material in connection with the Project is done in full compliance with Applicable Laws.

3.5.2 The Contractor shall arrange for and provide at its expense all local policemen required to be present at or adjacent to the Site for traffic control purposes.

3.5.3 The Contractor shall give all notices required by and shall otherwise comply with all Applicable Laws bearing on the performance of the Work including, without limitation, applicable environmental laws and ordinances and regulations concerning noise pollution and dust control.

3.6 UTILITIES

3.6.1 The Contractor shall be solely responsible for verifying the precise locations of utilities on the Site or serving the Project. The Drawings and Specifications endeavor to indicate all pipes, conduits, lines or other structures or equipment of public and private utility companies ("Utility Equipment") at and adjacent to the Site of which the Owner is aware. However, the Owner makes no representation or warranty that the utility equipment shown on the Drawings or referred to in the Specifications is the only utility equipment that may be encountered. Prior to commencing the Work, the Contractor shall visit the Site and to the extent possible shall confirm the existence and location of all utility equipment and shall, during the course of the Work, make diligent and continuous efforts to confirm the locations of all utility equipment at and adjacent to the Site. The Contractor shall promptly notify the Owner and Engineer in writing, prior to commencing affected portions of the Work, of any Utility Equipment that it discovers and that has not been identified on the Drawings. If and as directed by the Owner, the Contractor shall make necessary arrangements with utility companies for the protection, alteration and relocation of utility equipment necessary in connection with performance of the Work, and shall notify all municipal departments and utility companies concerned of the time and location of any work which may affect them. To the extent not covered by insurance, the Contractor shall be responsible for all costs and all claims, damages and liabilities arising directly or indirectly from any damage to Utility Equipment or any intentional or unintentional interruption of service occurring in connection with the performance of the Work and caused by the Contractor or any Subcontractor or other operations of the Contractor.

3.6.2 The Contractor shall perform the Work so as not to interfere with utility companies or municipal departments that may enter on the Site to make changes in Utility Equipment or to place new utility equipment. Except as otherwise set forth in Section 9.4 hereof, the Contractor shall have no claim for or on account of any delay which may be due to or result from such work of utility companies or municipal departments.

3.7 DOCUMENTS AND SAMPLES AT THE SITE

3.7.1 The Contractor shall maintain at the Site in a safe and secure place one record copy of: (i) all Contract Documents and other Project-related documents marked currently to record all changes made during construction; (ii) approved Shop Drawings, Product Data and Samples; (iii) copies of all building, electrical, plumbing, public safety and other codes and regulations applicable to the Work; (iv) certified payroll reports; and (v) all permits, licenses, approvals, inspection reports and certificates obtained as required by Section 3.5. These shall be available to the Engineer, the Owner's Representative, and the Owner for reference and shall be delivered to the Owner's Representative upon completion of the Work.

The Contractor shall keep all such documents in good order and shall maintain current logs of all Project-related documents, which logs shall be in form and detail satisfactory to the Owner and the Engineer.

3.7.2 The Contractor shall keep a separate and complete set of black-line prints of the Drawings and Specifications on which shall be noted neatly, accurately, completely, and promptly, as the Work progresses: (a) the progress of the Work installed by coloring in all pipe lines, ducts and apparatus as constructed or installed; and (b) all changes, deviations, revisions to the plumbing, electrical, and all other Work, wherever such Work was installed other than as shown on the Contract Documents. The Contractor shall be responsible for assuring that the progress of the Work and all changes, deviations, and revisions are delineated by the Subcontractors responsible for performing the specific Work. Failure to maintain such as-built Drawings and Specifications may result in withholding of payments to the Contractor. The Owner, the Owner's Representative, the Engineer, and their respective agents, representatives, and other consultants, shall have access to all Project documents maintained by the Contractor at all times. The Contractor shall cooperate with and assist the Engineer in connection with the Engineer's periodic reviews of the as-built Drawings and other Project documents prepared and maintained by the Contractor.

3.7.3 Upon Substantial Completion of the Work, the Engineer shall make a final review of the as-built Drawings prepared by the Contractor and if any omissions, incorrect information, or inconsistencies are found, the Drawings shall be revised by the Contractor until acceptable to the Engineer. When the final as-built Drawings are complete to the satisfaction of the Engineer, the Contractor shall furnish to the Engineer a complete set of as-built Drawings with each sheet being clearly marked "AS-BUILT DRAWING" and containing the date of the print and the Contractor's certification that the as-built Drawing accurately and completely depicts the Work as constructed. The Contractor shall deliver the as-built Drawings to the Engineer in hand-marked and electronic form in the Engineer's and the Owner's CADD format, containing a full set of CADD as-built Drawings for the Work.

3.7.4 Upon Substantial Completion of the Work, if appropriate, the Contractor shall prepare and deliver to the Engineer four (4) copies of a full and complete operating and maintenance manual for the Project. In accordance with the Specifications, the manual shall contain full information for each item of mechanical, electrical or other operating equipment, copies of warranties therefore, schematic diagrams of control systems, circuit directories for each electric and communications panel board, and charts showing the tagging of all valves. The Contractor shall obtain and include in the manual reduced scale photocopies of the relevant, revised as-built Drawings referred to in Subsection 3.7.3. Each volume of the manual shall contain all information required by the Specifications and these General Conditions, shall be clearly indexed, and shall include a directory of all Subcontractors and maintenance contractors, indicating the area of responsibility of each, and the name, telephone number, and other pertinent contact information for the responsible member of each organization. Such manuals shall be delivered to the Owner prior to, and as a condition precedent to, final payment.

3.7.5 The Contractor shall arrange for instruction in the operation and maintenance of the fire protection, plumbing, electrical and mechanical systems for State University employees. It is the intent of this Subsection 3.7.5 to require the Contractor and the applicable Subcontractors to furnish as much detailed instruction as is required by the Contract Documents to educate State University facilities personnel in the proper use of the facilities equipment. This instruction shall be provided by the manufacturer's representative for each item of equipment at no additional cost to the Owner. In some cases, this may require several visits to the Project by those responsible for the instruction. The Contractor shall, with written consent of all instructors, videotape all such training sessions, and a copy of each videotape shall be delivered to the Owner, prior to, and as a condition precedent to, final payment.

3.8 SUBMITTALS

3.8.1 The Contractor shall prepare or review, approve and submit to the Engineer, with a copy of the transmittal to the Owner's Representative, for review, sufficiently in advance and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate Contractor, all Shop Drawings, Product Data and Samples or other submittals required by the Contract Documents, all in accordance with the requirements set forth in the Specifications. Neither the Owner nor the Engineer shall be responsible for Work performed in shop or field prior to approval of any applicable Shop Drawings, Product Data or Samples.

3.8.1.1 Within thirty (30) days of receiving a Notice to Proceed with construction from the Owner, the Contractor shall submit to the Engineer and the Owner's Representative a detailed submittal schedule detailing the submittal and review process for all shop drawings, product data, samples, and other submittals. The submittal schedule shall incorporate appropriate time periods for the Engineer's review of Shop Drawings and all other submittals required by the Contract Documents. The submittal schedule shall be coordinated with the Project Schedule and shall be in form, substance, and detail acceptable to the Owner and the Engineer.

3.8.2 By preparing, approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor thereby represents that it has determined and verified all materials, design required in the implementation of the Work, dimensions, quantities, field measurements, details, relations to existing work, coordination with work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples or similar submittals and compliance with all the requirements of the Contract Documents. The accuracy and completeness of all such information is the responsibility of the Contractor. Approval by the Contractor shall be clearly indicated on each submittal, in ink or by stamp, and signed or initialed and dated by the Contractor. Submittals that have not been reviewed and approved by the Contractor in accordance with the requirements stated in this Section 3.8 and the Specifications shall be returned to the Contractor with no action taken by the Engineer. Such submissions shall be re-submitted to the Engineer with the Contractor's review and approval provided as required. Language contained in the Contractor's approval of submittals shall not be interpreted to limit in any respect or otherwise affect the Contractor's responsibilities and liabilities hereunder.

3.8.3 The Engineer shall review the Contractor's submittals in accordance with Section 2.5. If corrections are required, a full set of copies of duplicate parts or corrected submittals shall be submitted to the Engineer for approval, and this procedure shall be followed until final approval of the submittal has been given by the Engineer. All portions of the Work shall be performed strictly in accordance with the approved submittals.

3.8.4 If Shop Drawings submitted by the Contractor indicate a deviation from the Contract Documents, the Contractor shall specifically inform the Engineer and the Owner's Representative, in writing, of such deviation at the time of submission. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data or Samples or other submittals, unless the Contractor has specifically informed the Engineer and the Owner's Representative in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer's approval thereof. The Engineer's approval of a specific item shall not constitute approval of an assembly of which the item is a component.

3.8.5 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or other submittals to revisions other than those requested by the Engineer on previous submittals. Unless such written notice has been given, the Engineer's approval of a revised submittal shall not constitute approval of any changes not requested by the Engineer on the prior submittal.

3.8.6 No acceptance or approval of any Shop Drawing, Product Data or Sample, nor any indication or request marked by the Engineer on any Shop Drawing shall constitute an authorization for any increase in the Contract Sum.

3.9 SITE ACCESS

3.9.1 The right of possession of the Site and the improvements made thereon by the Contractor shall remain at all times with the Owner. The Contractor's right to entry and use thereof arises solely from the permission granted by the Owner under the Contract Documents. The Contractor shall confine its apparatus and equipment, storage of materials, and all operations at the Site to areas permitted by law, ordinances, permits, the Contract Documents, and the directions of the Owner's Representative, and shall not unreasonably encumber the Site with any materials or equipment.

3.9.2 The Contractor shall not use, occupy or obstruct, nor permit any Subcontractor or any other person performing the Work to use, occupy or obstruct, any lands or areas outside of the legal limits of the Site, unless written permission in form and substance satisfactory to the Owner has been obtained by the Contractor at the Contractor's sole cost.

3.9.3 The Contractor may, subject to the Owner's prior written consent, install a construction sign as provided in the Specifications, but shall not permit the posting of any

other sign, trademark, advertisement, or other identification symbol in or about the Site. The Owner shall have the right, without notice to the Contractor, to remove any sign, trademark, advertisement or other identification symbol installed in violation of this Subsection 3.9.3 at the Contractor's expense. The construction sign installed by the Contractor shall also identify the Subcontractors or, alternatively, the Contractor shall provide a single location, approved by the Owner in writing, for Subcontractor signage.

3.9.4 Any damage to the premises or equipment of the Owner caused by the Contractor or any Subcontractor shall be corrected by the Contractor as directed by the Owner and at the expense of the Contractor, subject to the Contractor's right to coverage under the Owner's builders risk insurance obtained with respect to the Project, but such right shall pertain only to the extent of proceeds actually received by the Owner, the Contractor being responsible for any deductible and for any of the Owner's losses not covered.

3.10 CUTTING AND PATCHING

3.10.1 The Contractor shall be responsible for all cutting and patching, as approved by the Engineer, necessary for the completion of the Work in accordance with the Contract Documents.

3.10.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by excavation, cutting, patching or otherwise altering any Work. The Contractor shall not unreasonably withhold from the Owner or any other contractor its consent to excavating, cutting, patching, or otherwise altering the Work.

3.11 INTENTIONALLY OMITTED

3.12 WASTE DISPOSAL AND CLEANING

3.12.1 All wastes, including any special or hazardous wastes, construction waste, demolition waste, and general rubbish, generated as a part of the Work, shall be properly classified by the Contractor and transported and disposed in accordance will all local, state, and federal laws and regulations that pertain to such materials. The Contractor shall retain the services of a qualified and properly licensed waste transporter. The Contractor shall make all arrangements and give and obtain all notices, communications, documentation, permits, certificates, and approvals necessary for disposal from the owner or officials in charge of such landfills, disposal or recycling facilities. The Contractor shall bear all fees and costs in connection with such classification, removal, transportation, and disposal. The Contractor shall not permit any storage of debris or waste of any name or nature on the premises.

3.12.2 Chemical waste shall be stored in corrosion resistant containers, removed from the premises, and disposed of in accordance with all Applicable Laws and any Contract Documents requirements. Disposal of chemical waste shall be performed in accordance with requirements of the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). The Contractor shall immediately notify the

Owner, the Engineer, and the appropriate governmental agency of any hazardous materials release large enough to require reporting under Applicable Laws. The Contractor shall be responsible for immediately cleaning up, in accordance with Applicable Laws, any oil or hazardous materials releases resulting from its operations on the Project. Any costs incurred by the Contractor in cleaning up any such releases and any damages incurred by the Owner arising from such release shall be borne by the Contractor.

3.12.3 The Project and the Site shall be maintained in a neat and orderly condition and kept free from accumulation of waste materials and rubbish during the entire Construction Period. All crates, cartons and other flammable waste materials or trash shall be removed from the work areas at the end of each working day. If the Project and Site are not maintained properly, after 24 hours prior written notice to the Contractor, the Owner may have any accumulations of waste materials or trash removed and charge the cost to the Contractor. Electrical closets, pipe and duct shafts, chases, furred spaces and similar spaces which are generally unfinished, shall be cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt and dust.

3.12.4 At the completion of the Work, the Contractor shall remove all its tools, construction equipment, machinery and surplus materials, and shall leave the Site in a neat and clean condition satisfactory to the Owner. Immediately prior to the Engineer's inspection for Substantial Completion of the entire Work, or any portion thereof, the Contractor shall, when directed to do so by the Owner, completely clean any and all portions of the Project to be inspected. Without limitation, concrete surfaces shall be cleaned and washed; resilient coverings shall be cleaned, waxed and buffed; ; fixtures, and equipment shall be thoroughly cleaned; stains, spots, dust, marks and smears shall be removed from all surfaces; and hardware and all metal surfaces shall be cleaned and polished. All damaged, broken and scratched surfaces shall be replaced by the Contractor at the Contractor's sole expense.

3.12.5 If the Owner elects to take use or occupancy of specific areas or portions of the Work prior to the completion and acceptance of the entire Work as provided in Article 15 hereof, the Contractor shall carry out final cleaning operations as herein specified in such specific areas or portions of the Work prior to use or occupancy thereof, as directed by the Owner. The Contractor shall remove or, when appropriate, relocate, all surplus materials, equipment, supplies, construction plant, and facilities as required in order to permit the occupancy and utilization of such specific areas or portions of the Work.

3.13 PROJECT COMMUNICATIONS

3.13.1 Copies of all communications from the Contractor to the Engineer or the Owner's Representative shall be provided simultaneously to the other and, if required by the Contract Documents, also to the Owner.

3.13.2 The Contractor shall forward to the Engineer any communications which the Contractor transmits to the Owner relating to any matter within the purview of the Engineer pursuant to the provisions of the Contract Documents.

3.14 ROYALTIES AND INTELLECTUAL PROPERTY

3.14.1 The Contractor shall pay all royalties and license fees, shall defend all suits or claims for alleged infringement of any intellectual property rights, and shall indemnify and save the Owner, the Owner's Representative, the Engineer, and the State University harmless from loss on account thereof, except that the Contractor shall not be responsible for such loss when a particular design, process, or the product of a particular manufacturer or manufacturers is specified, unless the Contractor has reason to believe that the design, process, or product specified is an infringement of intellectual property rights, in which event the Contractor shall be responsible for such loss unless it promptly gives such information to the Owner.

3.15 FINANCIAL CONDITION

3.15.1 The Contractor warrants and represents that its financial condition is sound and that the Contractor is capable of performing the Work and obtaining any bonds now or hereafter required pursuant to the Contract Documents. Upon request by the Owner, the Contractor shall make available to the Owner, within fourteen (14) days, such audited and unaudited financial statements of the Contractor as the Owner may reasonably request or as may be required by Applicable Law. The Contractor shall promptly advise the Owner of any occurrence, event, fact, or other matter that has had, will have, or might reasonably be predicted to have a material adverse effect upon the financial condition of the Contractor.

3.16 PREVAILING WAGE; RECORDKEEPING; PERSONNEL

3.16.1 The Contractor shall comply with the Massachusetts Prevailing Wage Law, M.G.L. c. 149, § 26-27H. The Prevailing Wage Law requires that a true and accurate record be kept of all persons employed on the a project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Owner at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its Subcontractors to, submit weekly copies of their weekly payroll records to the Owner. In addition, the Contractor and each Subcontractor shall furnish to the Executive Department of Labor within fifteen days after completion of its portion of the Work a signed statement in the form required by the Owner.

3.16.2 The Contractor shall comply with, and shall cause its Subcontractors to comply with M.G.L. c. 149, § 148 which requires the weekly or biweekly payment of employees within six days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

3.17 EEO/AA AND M/WBE REQUIREMENTS

3.17.1 The Contractor shall comply at all times in all respects with all government laws, regulations and ordinances affecting or regulating employment of persons in connection with the Work, and with the equal employment opportunity and affirmative action requirements set forth in **Exhibit D** and **Exhibit E** to the Agreement.

3.17.2 The Contractor shall submit a construction employment plan to the Owner pursuant to which the Contractor will specify its plan for meeting and monitoring the Owner's employment requirements. The plan shall comply with the provisions set forth in **Exhibit D** and **Exhibit E**. The Contractor shall provide the Owner with such reports concerning its compliance with the construction employment plan as the Owner shall require.

3.18 LINES AND GRADES; SURVEY

3.18.1 The Contractor agrees that the Work shall be constructed within the contract limit lines established in the Contract Documents and other information made available to the Contractor.

3.18.2 The Contractor shall engage a land surveyor registered in the Commonwealth of Massachusetts to establish, and the Contractor shall be responsible for the accuracy of, base lines for the Work.

3.18.3 The Contractor shall establish and plainly mark such points, lines and grades as are necessary to assure that location, orientation and elevations established for each structure or element of the Work are in accordance with the lines and elevations shown on the Drawings.

3.18.4 After the perimeter foundation walls are in place, the Contractor shall verify that lines and grades meet the requirements of the Drawings and Specifications. Such verification shall be provided by a registered land surveyor or professional engineer who shall record actual as-built lines and grades on the as-built Drawings.

3.18.5 During the progress of the Work the registered land surveyor or professional engineer shall record actual as-built lines and grades on the as-built Drawings. The Contractor shall, from time to time, furnish to the Owner surveys certified by a registered land surveyor, in such form as may be required by the Owner, of the location of all improvements and utilities on the Site.

ARTICLE 4 OWNER

4.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER

4.1.1 If available, the Owner shall furnish to the Contractor surveys describing the physical characteristics, legal limitations for the Site, and a legal description of the Site.

4.1.2 The Owner may furnish the Contractor with certain reports, plans, studies, tests, information and other documentation relating to utilities and subsurface and other conditions affecting or relating to the performance of the Work (the "Site Conditions Documents"). The Contractor represents that it has thoroughly studied and is familiar with the Site Conditions Documents which it has received. In the case of Site Condition Documents to be supplied by the Owner after execution of the Agreement, the Contractor shall study and become familiar with such documents. The Contractor shall advise the Owner in writing of any errors, omissions, inconsistencies discovered by the Contractor in its review of the Site Condition Documents. The Contractor represents further that it has examined the Site and local conditions and as they are developed will carefully study and compare the Contract Documents with each other and with conditions at the Site, and with the Site Conditions Documents. Unless otherwise specifically stated, the Owner does not assume any responsibility for the accuracy or completeness of the Site Condition Documents. Such information and data is furnished to the Contractor for its informational value, but the Owner does not hold out such information or data to the Contractor as being complete nor as an accurate or approximate indication of surface, subsurface or other conditions. No claim for extra cost or any extension of the Contract Time resulting from reliance by the Contractor on the Site Conditions Documents shall be allowed except as expressly provided in the Contract Documents.

4.1.3 Information or services required of the Owner under the Contract Documents and requested in writing by the Contractor shall be furnished by the Owner, if available, with reasonable promptness so as to endeavor to avoid delay in the orderly progress of the Work.

4.1.4 The Contractor will be furnished, free of charge, four (4) copies of the Contract Documents.

4.1.5 The Owner may, but shall not be required to, forward instructions to the Contractor through the Owner's Representative. If communicated directly to the Contractor by the Owner, the Owner will endeavor to provide copies of such communications to the Owner's Representative and the Engineer.

4.2 CONFIDENTIAL INFORMATION

4.2.1 The Contractor shall not disclose, at any time during or after the Work, either directly or indirectly, any confidential records, knowledge or information which the Contractor may acquire about the Project or the Owner, except as may be required by law or by order of a court of competent jurisdiction. The Contractor shall treat all information relating to the Project and all information supplied to the Contractor by the Owner, the Owner's Representative, or the Engineer as confidential and proprietary information of the Owner and shall not permit its release to third parties or make any public use of such information without the Owner's prior express written authorization. The Contractor shall require all Subcontractors to comply with this provision.

4.3 TAX EXEMPTION

4.3.1 The Owner, as an authority of the Commonwealth of Massachusetts, is exempt from certain taxes. The Owner's taxpayer exemption number is 042-379-317. The Contractor hereby acknowledges that the Contract Sum has been established based upon the understanding that the Owner is exempt from certain taxes. It is therefore required that the Contractor and Subcontractors purchasing materials and supplies to be used in construction of the Project (including rental charges for construction vehicles, equipment and machinery rented specifically for use on the site of the Project or while being used exclusively for the transportation of materials for the Project) ("Construction Materials") apprise vendors of the tax-exempt status of the Owner, so that certain taxes will not be imposed upon the purchase of Construction Materials. At the time of purchase of Construction Materials, the purchaser shall provide the vendor with copies of certificates or other documentation necessary to permit the sale of such Construction Materials to be exempt from sales, use and other applicable taxes imposed by any state or federal taxing authority. If such taxes are paid on any Construction Material used in the construction of the Project, the Contractor shall be responsible for reimbursing the Owner, whether the purchases were made by the Contractor, a Subcontractor or Supplier, the full amount of such taxes and the Owner shall have the right to recover any such amounts not promptly reimbursed by reducing any payment due the Contractor under the Contract by such amount. Taxes not applicable to the Owner include, but may not be limited to: (a) Sales and Use Tax imposed by the Commonwealth under M.G.L. c. 64H and c. 64I on Construction Materials; and (b) Federal Excise Taxes as applied to articles which are taxable under Chapter 32 of the Internal Revenue Code of 1986, as amended.

ARTICLE 5 INDEMNIFICATION

5.1 CONTRACTOR'S INDEMNITY

5.1.1 The Contractor shall indemnify, defend with counsel acceptable to the Owner, keep and save harmless the Commonwealth, the State University, and the Owner, including their respective board members, trustees, directors, officers, contractors, consultants, agents, employees, and other representatives, in both their respective individual and official capacities, against all liabilities, suits, claims, damages, losses, expenses, penalties, fines, fees including, but not limited, to attorneys' fees, expert witness fees and other legal expenses (including fees and expenses in connection with any alternative dispute resolution process) and other costs and liabilities caused by, arising out of, resulting from, or incidental to, the following, each to the full extent allowed by the laws of the Commonwealth of Massachusetts and not beyond any extent that would render these provisions void or unenforceable:

(a) breach or default under or failure to perform or comply with the terms of the Contract by the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible;

(b) negligent acts or omissions of the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible;

(c) infringement of any patent or trademark, or violation of any copyright, right of privacy or any similar right protected by any law affecting intellectual property arising out of or relating to the use of methods, processes or information, or products or other materials or property, in connection with performance of the Work by the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible, or otherwise relating to the Work;

(d) violation of any Applicable Law in connection with performance of the Work by the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible;

(e) violation of or noncompliance with the conditions of any Permits and Approvals by the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible;

(f) failure of the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible to pay any federal, state or local taxes based upon gross receipts, income, purchases, rentals or sales, the use of any property, unemployment insurance or any other social security or social benefit taxes applicable to employees of the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible, or any other taxes imposed in connection with the Contract or the Work;

(g) personal injury, sickness, emotional distress, disease or death directly or indirectly caused by, arising out of, resulting from, or incidental to the performance of the Contract or otherwise relating to the Work or any act or omission of the Contractor, any Subcontractor or Supplier, or any other party for whose acts or omissions the Contractor is or becomes liable;

(h) loss or damage to any property of the Contractor, and loss or damage to any property of Subcontractor, Supplier, or other parties for whom the Contractor is or becomes responsible;

(i) claims by Subcontractors, Suppliers, or others against the Contractor or the Owner on account of amounts due or claimed to be due to such Subcontractor, Supplier, or others in connection with the performance of the Work;

(j) loss or damage to property owned by the Owner or any third parties located on or about the Site, in whole or in part arising out of, resulting from, or incidental to the performance of the Work or any acts or omissions of the Contractor, any Subcontractor, Supplier, or any other party for whom the Contractor is or becomes responsible;

(k) neglect or failure to construct the Work within the contract work lines, or by reason of any encroachment by any element or portion of the Work, or any part or projection thereof, on adjoining land if such encroachment shall result from the Contractor's failure to construct the Work within said contract work lines;

(l) release or threatened release of any hazardous material which: (i) was brought onto the Site by the Contractor, or any Subcontractor, Supplier, or any other party for whom the Contractor is or becomes responsible; or (ii) was negligently removed from, handled on, or disposed of on the Site by the Contractor, any Subcontractor, Supplier, or any other party for whom the Contractor is or becomes responsible, regardless of the source or origin of such hazardous material or the method of deposit of such hazardous material on the Site or, in the case of the removal of any hazardous material from the site, on the Site to which such hazardous material was removed;

(m) claims or assertions by any separate contractor of disruption, delay or loss caused by interference by the Contractor (or its Subcontractors or others for whom the Contractor is or becomes responsible) with or hindrance of the progress or completion of work being performed by separate contractor, or failure of the Contractor or any Subcontractor, Supplier, or any other party for whom the Contractor is or becomes responsible, to cooperate reasonably with such separate contractor; and

(n) failure of the Contractor, any Subcontractor or Supplier, or others for whom the Contractor is or becomes responsible to comply with their obligations to not use undocumented workers to perform any part of the Work.

Such agreement and obligation of the Contractor shall not be construed to negate, abridge, or otherwise reduce any right or remedy which would otherwise exist as to any party or person described in this Section 5.1.

5.1.2 Provisions of this Section 5.1 shall be for the benefit of each party indemnified hereunder with the same force and effect as if each individual were in privity of contract with the Contractor, and each party so indemnified shall have the right to bring a direct action against the Contractor to enforce this indemnity. Each party so indemnified is hereby made a third party beneficiary of the Contract with respect to the provisions of this Section 5.1.

5.1.3 In connection with any and all claims against the Owner, the Owner's Representative or the Engineer or their consultants or separate contractors, or any of their Subcontractors, agents or employees, by any employee of the Contractor, any Subcontractor or Supplier, or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the Contractor's indemnification obligation under this Section 5.1

shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts or other employee benefit acts.

5.1.4 In the event that a claim, demand or action is asserted against a party indemnified under this Section 5.1 with respect to which the Contractor is obligated to indemnify such party in accordance with this Section, such party shall give timely notice to the Contractor of such claim and may request that the Contractor undertake the defense of such claim with counsel reasonably satisfactory to such indemnified party and without cost to such indemnified party, or the indemnified party may undertake the defense of such claim, with counsel satisfactory to the Contractor, in which case the Contractor shall cooperate and assist in the defense and resolution of such claim, and shall be responsible for all costs of defense, judgments, settlements and other liabilities as provided in this Section 5.1. Failure of the indemnified party to notify the Contractor as provided in the preceding sentence shall not waive, release or otherwise affect the indemnification obligations of the Contractor hereunder, except to the extent that the Contractor establishes that such failure to give notice has prejudiced the Contractor in the defense of such claim.

5.1.5 The indemnification obligations of the Contractor under the Contract shall survive the termination or expiration of the Contract and completion of the Work.

5.1.6 The obligations of the Contractor under this Article 5 shall not extend to the liability of the Engineer, his agents or employees, arising out of the performance of the Engineer's obligations under the Contract Documents.

ARTICLE 6 SUBCONTRACTORS

6.1 SUBCONTRACTS

6.1.1 All Subcontractors shall look solely to the Contractor for payment for their Work performed in accordance with the Contract Documents except as expressly otherwise permitted by law. The Contractor shall furnish the Owner with executed copies of all Subcontracts promptly upon execution thereof.

6.1.2 Contractor shall make payments to Subcontractors in accordance with M.G.L. c. 30, § 39F. For the purposes of this Contract, the word "forthwith" appearing in paragraph (1)(a) of M.G.L. c. 30, § 39F shall be deemed to mean "within five (5) business days".

6.1.3 The Contractor hereby conditionally assigns to the Owner all Subcontracts now or hereafter executed by the Contractor in connection with the Work and in accordance with the requirements of the Contract Documents.

(a) Such assignment shall become an effective and present assignment only upon a termination by the Owner of the Contract in accordance with the provisions of the Contract Documents and only as to those Subcontracts which the Owner explicitly accepts and assumes in writing. The Owner shall have the sole option to determine which Subcontracts the Owner shall accept as aforesaid.

(b) This Subsection 6.1.3 shall serve as the instrument of assignment at such time as the assignment provided for above becomes effective. The Contractor agrees, however, at the Owner's request, to execute whatever instruments the Owner requests to confirm such assignment.

6.1.4 The Contractor shall maintain and distribute to the Owner, the Owner's Representative, and the Engineer a Project Directory listing the names, addresses, email addresses, and telephone numbers of the principal members of the staff of each Subcontractor in addition to any other information requested by the Owner or the Engineer regarding Subcontractors. The Contractor shall update such Project Directory periodically during the Project. The principal contact for each Subcontractor and his/her home telephone number shall be indicated in the Project Directory so that such person may be reached in emergency situations.

ARTICLE 7 OTHER WORK

7.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

7.1.1 In addition to the Work required to be performed under the Contract, the Owner may perform other work related to the Project at the Site with its own forces, have other work performed by utility suppliers, or award separate contracts for such work or other work on the Site under these or other conditions of the contract. If the fact that such other work is to be performed is not noted in the Contract Documents, notice thereof will be given to the Contractor prior to commencement of such other work.

7.1.2 If, after commencement of the Work, the plans of the Contractor and any such separate contractors performing work in connection with the Project, or other contractors, are inconsistent with respect to methods, scheduling, progress or otherwise, the Contractor shall promptly take all steps necessary to coordinate its Work with that of other contractors. The Contractor shall have no claims against the Owner or such separate contractors performing work in connection with the Project or other contractors for any delays arising from joint use of any work area or staging area, or from joint use of access. All coordination undertaken by the Contractor shall be acceptable to Owner in all respects.

7.2 MUTUAL RESPONSIBILITY

7.2.1 The Contractor shall provide the Owner, utility suppliers and other separate contractors proper and safe access to the Site and a reasonable opportunity for the delivery and storage of materials and equipment and the execution of their work, and for reasonable access to, and use of, the Contractor's hoisting facilities, if provided, and temporary electric, water and sanitary facilities. Disputes arising with respect to delivery or storage of materials or equipment, or otherwise relating to coordination of the Work under the Contract with the work of utility suppliers or separate contractors shall initially be submitted to the Engineer. Recognizing the constraints imposed upon the Contractor by the requirements of this Section, the Owner agrees to give the Contractor as much advance notice as is practicable of the particular needs of separate contractors and utility suppliers for access to the Site and joint use of the Site and site facilities so as to minimize the impacts upon the Contractor's scheduling and operations. The Contractor shall cooperate with the Owner, utility suppliers and separate contractors, and require and enforce the cooperation of its Subcontractors in such manner as to permit the expeditious, efficient connection of utilities and to facilitate completion of the Project as a whole and completion of specific parts of the Project for early use or occupancy by the Owner in accordance with the Project Schedule.

7.2.2 If any portion of the Contractor's Work depends, for proper execution or results, upon other work of the Owner or any such utility supplier or other separate contractors, the Contractor shall, prior to proceeding with that portion of the Work, inspect and promptly report to the Engineer and the Owner, in writing, any delays, discrepancies or defects in such other work discoverable as a result of prudent examination, testing and observation by the Contractor that render such other work unavailable or unsuitable to receive Contractor's Work. Failure of the Contractor to so report shall constitute an acknowledgment that such other work is fit and proper to receive the Contractor's Work, except as to defects not so discoverable.

ARTICLE 8 INSPECTION AND TESTING

8.1 INSPECTION AND TESTING

8.1.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of, or conditions imposed by, any government entity having jurisdiction over the Project require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Owner's Representative (with a copy to the Engineer), the Owner's testing agents or consultants, and if applicable, government entities requiring such inspection, testing or approval, timely notice (at least five (5) full business days) prior to the commencement of Work or operations requiring such inspection, testing or approval so the Engineer, such government entities and agents or consultants may perform or observe such inspection, testing or approval. The Contractor shall perform and bear all costs of such inspections, tests and approvals, unless otherwise provided in the Contract Documents. Except in the event of an unforeseen emergency, Work or operations requiring such inspection, testing or approval shall not be performed at times other than during the normal working day without the prior approval of the

Owner. The Contractor will provide all required assistance (including, without limitation, labor, tools, equipment and transportation) as the Engineer or such government entities or agents or consultants may request in connection with such inspection, testing or approval. The Contractor shall make all necessary arrangements at its expense to permit the Engineer to make factory, shop or other inspections of materials or products ordered for the Work and in the process of manufacture, fabrication or extraction or in storage at locations other than the Site of the Work. Where certain testing and inspection requirements are required by the Contract Documents to be performed at the expense of the Owner, the Owner will retain the services of testing laboratories, agencies or consultants, to perform such tests or inspections and render such services as may be required to verify that the Work fulfills the requirements and intent of the Contract Documents. Such services will be performed in a manner consistent with the requirements of the Owner and the various agencies having jurisdiction over the Work and in accordance with sound standards of professional architectural and engineering practice applicable thereto. The Contractor and Subcontractors shall place their personnel at the Engineer's disposal for field checking during any inspection period. When layouts of the site work are to be made, the Contractor shall notify the Owner's Representative and the Engineer in sufficient time so that they may be present.

8.1.2 The Contractor shall make no claim for delay or extra costs or extension of the Contract Time arising directly or indirectly out of reasonably required inspection or testing or out of the Contractor's failure to give timely notice so as to permit performance or observance of inspections, testing or approvals. Inspections and testing of the Work shall not relieve the Contractor of any obligations under the Contract Documents. Without limiting any other provisions hereof, defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such Work and materials have been previously inspected by the Engineer and accepted or estimated for payment or paid for.

8.2 SPECIAL TESTING

8.2.1 If the Owner or the Engineer determines that any portion of the Work requires special inspection, testing, or approval beyond that required in the Contract Documents, the Owner's Representative, upon written authorization from the Owner, or the Owner, will instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as provided in Section 8.1 hereof. If such special inspection or testing reveals a failure of the Work to comply strictly with the requirements of the Contract Documents, the Contractor shall correct such Work and bear all costs of such inspection, testing and corrections, including compensation for the additional services of the Engineer and other consultant made necessary by such failure; otherwise the Owner shall bear the costs of such inspection or testing, and an appropriate Change Order shall be issued. In no event shall the Contractor be entitled to any claim for delay or extra cost or extension of the Contract Time as a result of any such inspection, testing or corrections.

ARTICLE 9 CONTRACT TIME

9.1 DEFINITIONS

9.1.1 The Contract Time is the period of time stated in the Agreement to achieve Final Completion of the Work, as may be adjusted in accordance with the Contract.

9.1.2 The date of commencement of the Work is date of the issuance of a Notice to Proceed by the Owner for a portion, or all, of the Work.

9.1.3 The Date of Substantial Completion of the Work, or a designated portion thereof, is the date certified by the Engineer when the requirements of the Contract Documents have been satisfied. Substantial Completion of the Work shall not be deemed to be achieved until either (1) the Work required by the Contract has been completed except for Work having a contract price of less than one per cent of the then adjusted total Contract Sum, or (2) substantially all of the Work has been completed and opened to public use except for minor incomplete or unsatisfactory Work items that do not materially impair the usefulness of the Work required by the Contract

For purposes of this Article 9, Substantial Completion refers to Substantial Completion of the entire Project. In the event of any question or dispute as to the date of Substantial Completion, such question or dispute shall be determined by the Engineer in its sole discretion, and neither the Engineer nor the Owner shall have any liability to the Contractor arising out of such determination made by the Engineer in good faith.

9.2 PROGRESS AND COMPLETION

9.2.1 Upon execution by the Owner of the Agreement and issuance of a written Notice to Proceed by the Owner, the Contractor agrees to proceed with the Work, or portion thereof covered by a Notice to Proceed with Construction, promptly, continuously, and diligently. The Contractor agrees to adhere to the Project Schedule, to achieve all interim completion milestones, if any, and to achieve Substantial Completion of the Work on or before the Substantial Completion Date set forth in the Agreement. It is agreed that TIME IS OF THE ESSENCE of the Contract Documents.

9.2.2 Recognizing that, from time to time during the progress of the Work, the Owner may find it necessary to establish the current status of performance under the Contract Documents, the Contractor shall, at the request of the Owner, promptly provide statements, documents or certificates to the Owner regarding the status of the Work, compliance of the Work with the Contract Documents, compliance by the Contractor or any Subcontractor with the Contract Documents, and such other matters within the scope of the Contractor's performance under the Contract Documents as the Owner may require.

9.2.3 The Contractor shall submit a detailed written report on the status of the Work compared to the current Project Schedule for the Owner's review with each Application

for Payment. Each such report shall reflect all items required by the Contract Documents. If the Contractor fails to complete any activity by its latest scheduled completion date, the Contractor shall, within seven (7) days of such failure, submit a written statement showing how the Contractor intends to correct such failure and return to the current Project Schedule. The Contractor shall update the Project Schedule weekly to reflect changed logic, adjusted and modified sequences of Work, and other identifiable changes, including, without limitation, specific strategies for continuing to meet the Substantial Completion Date. With its monthly report on the status of the Work, the Contractor shall submit a written certification by the Contractor's Project Manager that the Project Schedule submitted with the report is the actual schedule being utilized for execution of the Work and that the Work is progressing in accordance therewith.

9.2.4 If, at any time, the Owner determines that the progress of the Work is delayed or has not reached the level of completion required by the current Project Schedule, the Owner shall have the right to direct the Contractor to take all measures necessary to recover any lost time and return the Work to the level of progress required by the current Project Schedule ("Recovery Measures"). In such event, within five (5) business days of receiving the Owner's direction to take Recovery Measures, the Contractor shall notify the Owner in writing of the steps which the Contractor proposes to take to remedy the situation, shall furnish Owner with an updated Project Schedule reflecting such Recovery Measures, and shall implement such steps promptly. Such Recovery Measures shall continue until the progress of the Work is returned to the stage of completion required by the current Project Schedule. If the Contractor disputes the Owner's direction to the Contractor to take Recovery Measures, the Contractor shall, nonetheless, promptly and diligently perform the Recovery Measures and shall have no right whatsoever to fail or refuse to take Recovery Measures once so directed by the Owner. If, and to the extent the delays giving rise to a direction from the Owner to the Contractor to take Recovery Measures are not Excusable Delays, the Contractor shall not be entitled to an extension of the Contract Time or an adjustment of the Contract Sum in connection with undertaking Recovery Measures. If and to the extent that any delay giving rise to a direction from the Owner to implement Recovery Measures is an Excusable Delay, the Contractor shall be entitled to assert a claim in accordance with the Contract.

9.3 EXTENSION OF THE CONTRACT TIME AS A RESULT OF DELAY EVENT

The provisions of this Section 9.4 govern, and constitute the Contractor's sole remedy, if a Delay Event is encountered by the Contractor in the course of performance of the Work. Any claim for an extension of the Contract Time associated with a Change in the Work shall be governed by, and subject to, the provisions of Article 13. If the Contractor is entitled, subject to the provisions of this Section 9.4, to an extension of the Contract Time by reason of a Delay Event, then an extension of the Contract Time may be granted for the period of the necessary delay caused to Critical Path Activities, determined in accordance with, and subject to, this Section 9.4, and other applicable provisions of the Contract Documents. A Change Order effecting such extension will be furnished to the Contractor within a reasonable period after such determination. No extension of the Contract

Time shall be granted to the Contractor under the Contract (except as expressly authorized in connection with a Change in the Work) unless the requirements of this Section 9.4 shall have been satisfied.

9.3.1 Types Of Delay Events

"Delay Event" shall be limited to any of the following acts, omissions, events or conditions which delays completion of the Work or prevents performance of the Contractor's obligations under the Contract and which could not be prevented by the Contractor even though the Contractor were to take all appropriate care to avoid or diminish the adverse consequences of the Delay Event:

(a) Unavoidable casualty;

(b) Act of war, civil disorder, riot or similar occurrence;

(c) Order, legislation, judgment or other official action, of any governmental body, agency or official having jurisdiction over the Project;

(d) Any act or omission of the Owner or the Engineer, such as a temporary stoppage or suspension of Work, not resulting from, or caused, in whole or in part, by any act or omission of the Contractor, any Subcontractor or any other person or entity for whom the Contractor is responsible;

(e) Any work of utility companies or municipal departments that may enter the Site to make changes in utility equipment or to place new utility equipment, to the extent such delay does not result, in whole or in part, from the act or omission of the Contractor, any Subcontractor or any other person or entity for whom the Contractor is responsible;

(f) Unusually severe weather preventing the Contractor from engaging, on a particular day, at least 75% of the labor force and equipment that was scheduled for engagement on Critical Path Activities on that particular day for at least 50% of that day; and

(g) Strikes or work shutdowns caused by labor disputes and lockouts (other than lockouts caused by the Contractor, Subcontractors or Sub-Subcontractors unrelated to the Contractor's forces or the forces of any Subcontractor).

The financial difficulties of the Contractor (or any Subcontractor, supplier or other party for whom the Contractor is responsible) or the consequences thereof, shall not constitute a Delay Event.

9.3.2 NOTICE AND PROCEDURES AS TO DELAY EVENTS

9.3.2.1 Initial Notice. The Contractor shall provide the Owner with an initial written notice of any occurrence, event or condition which the Contractor claims (or may intend to claim) constitutes a Delay Event. Such initial written notice shall be submitted to the Owner within five (5) business days of the commencement of such occurrence, event or condition, and shall:

(h) State in detail the factual circumstances which form the basis of the delay, and the current and anticipated future effects on the Contractor's performance and Project Schedule; and

(i) State the date of commencement of the delay and the duration or expected duration of the delay with respect to each affected portion of the Work.

The submission of such initial written notice within the time period provided above shall be a condition precedent to any extension of the Contract Time. Neither the Owner's Representative and nor the Engineer nor any other agent, consultant or employee of either shall have authority to modify or waive, expressly or by implication, such condition precedent or the corresponding condition precedents set forth in Subsection 9.4.2. and any action, inaction or statement by any of them to such effect shall not be binding upon the Owner.

9.3.2.2 Second Notice. Following submission of the initial written notice, not later than fifteen (15) business days of the commencement of any occurrence, event or condition which the Contractor claims (or intends to claim) constitutes a Delay Event, the Contractor shall submit to the Owner's Representative written notice of such occurrence, event or condition. This written notice shall (i) state whether an extension of the Contract Time is claimed and the Contractor's alleged contractual entitlement thereto; (ii) state in detail the factual circumstances which form the basis of the delay; (iii) identify Work activities alleged to have been delayed; (iv) state the calendar dates on which the Work activities were delayed and are anticipated to be further delayed; (v) state the number of calendar days by which the Contractor is requesting the Contract Time to be extended; (vi) fully and completely state the analysis justifying the request, including a schedule impact (fragnet) analysis worksheet prepared in a time-scale to graphically illustrate the effect of the alleged delay on affected activities; (vii) state the date of commencement and duration or expected duration of the delay and its effect on the various portions of the Work; and (viii) state any other information reasonably requested by Owner.

9.3.2.2.1 The Contractor shall provide such detailed supporting documentation, including, where appropriate, an updated Project Schedule indicating all of the activities affected by the circumstances which form the basis for the claim. The submission of such written notice within the time period provided above shall be a condition precedent to any extension of the Contract Time.

9.3.2.2.2 Because the possible necessity for an extension of the Contract Time might materially alter the scheduling, plans and other actions of the Owner and because, with sufficient opportunity, the Owner might (if it knew of the Contractor's claim)

attempt to mitigate the effect of a delay for which an extension of the Contract Time was to be claimed, and only oral notice might cause disputes as to the existence or substance of such claim, and because delayed notice might seriously hinder or prevent the Owner's investigation of the pertinent facts, the giving of written notice within the time periods stated above in Subsections 9.4.2.1, and 9.4.2.2 shall be of the essence of the Contractor's obligations, and failure of the Contractor to comply with these requirements shall be deemed a conclusive, full and final waiver of any claim for extension of the Contract Time.

9.3.2.2.3 It shall in all cases be presumed that no extension or further extension of the Contract Time is appropriate unless the Contractor shall affirmatively demonstrate the Contractor's entitlement to such extension under all applicable terms and conditions of the Contract Documents. To this end, the Contractor shall maintain adequate records supporting any claim for an extension of the Contract Time, and in the absence of such records, the foregoing presumption shall be conclusive.

9.3.3 Limitations On Delay Computation

9.3.3.1 Whenever the Contractor claims an extension of the Contract Time as a result of a Delay Event, only the unavoidable delay caused to completion of the Work as a whole shall be considered in measuring or evaluating the extent of the delay. If, for example, extra work can be (or could have been) performed along with the regular Work called for by the Contract Documents so as to reduce or eliminate a delay in the progress of the Work or some portion thereof, without causing necessary delay to such regular work, no claim for extension of the Contract Time shall be granted. An extension of the Contract Time may be granted only for Delay Events affecting Critical Path Activities. In any event, even though a Delay Event meets all of the above conditions, an extension may be granted only to the extent that the effect of such cause cannot be (or could not have been) avoided or mitigated by the exercise of all reasonable precautions, efforts and measures (including planning, scheduling and rescheduling, resequencing Work activities, and reallocating and redeploying work forces), whether before or after the occurrence of the cause of delay. If a concurrent delay occurs (*i.e.*, either a single delay resulting from two or more causes where at least one delay is the responsibility of the Contractor, or multiple delays, where at least one delay is the responsibility of the Contractor), no extension of the Contract Time shall be granted to the Contractor during the period of any such concurrent delay for which the Contractor is responsible.

9.3.4 Sole Remedy

9.3.4.1 Except as expressly provided in the Contract Documents, the Contractor assumes the financial risk of all delays of any kind or duration, whether or not within the contemplation of the parties and whether foreseeable or unforeseeable. The Contractor shall have no right to rescind or terminate the Contract except as expressly provided herein, and the Contractor shall have no cause of action under any theory of quasi-contract or *quantum meruit* by reason of any such delay. The Contractor agrees that extensions of the Contract Time, as provided herein, shall be the Contractor's sole and exclusive remedy against the Owner in the

event the Work is delayed, except to the extent otherwise provided in Subsections 9.4.4.2 and 9.4.4.3 below.

9.3.4.2 Adjustment of the Contract Sum as a Result of Certain Delays

If, and to the extent that, the Contractor establishes that all of the following have occurred:

(j) The Contractor is entitled to an extension of the Contract Time pursuant to this Section 9.4,

(k) The Contractor suffered Compensable Losses (as defined below) as a result of the delay, and

(l) The Contractor could not have avoided or mitigated such Compensable Losses despite having taken all reasonable precautions, efforts and measures to avoid or reduce the amount thereof, including, without limitation, mitigating delays by resequencing Work activities, and reallocating and redeploying work forces of the Contractor, Subcontractors and Sub-Subcontractors to the maximum extent practicable.

In such event the Owner may adjust the Contract Sum by an amount equal to the Contractor's Compensable Losses directly attributable to the Delay Event giving rise to the extension of the Contract Time. A Change Order effecting the adjustment to the Contract Sum will be furnished to the Contractor within a reasonable period after such determination.

"Compensable Losses" include only the reasonable verified amounts of necessary direct costs of: (i) idle time of equipment; (ii) idle time of workers; and (iii) moving of equipment and extended field office overhead expenses. No mark-up of Compensable Losses will be allowed for home office overhead or profit. For purposes of the Contract, "extended field office overhead" expenses shall mean those indirect costs incurred at the Site (sometimes also referred to as general conditions costs or job site overhead costs): (i) which cannot reasonably be allocated to any specific work item within the Work, and (ii) which increase or decrease as a function of the duration of the Contract Time. Examples of extended field office overhead items include: project manager, superintendent, temporary utilities and temporary facilities, clerical staff, office equipment and supplies and project trucks and automobiles. The Contractor shall provide to the Owner all documentation and information reasonably requested by the Owner to substantiate the sum of Compensable Losses.

9.3.4.3 The following clauses (a) and (b) of this Subsection 9.4.4.3 are included herein pursuant to requirements of M.G.L. c. 30, § 39O. In the event that a suspension, delay, interruption or failure to act of the Owner increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the Contractor for payment for an increase in the cost of its performance as provisions (a) and (b) give the Contractor against

the Owner, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the Contractor or the Subcontractor may have against each other.

(a) The Owner may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the Owner; provided, however, that if there is a suspension, delay or interruption for fifteen (15) days or more or due to a failure of the Owner to act within the time specified in the Contract, the Owner shall make an adjustment in the Contract Sum equal to the actual increase in the cost of the Work but shall not include any profit to the Contractor with respect to such increase; and provided further, that the Owner shall not make any adjustment in the Contract Sum under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which the Contract provides for an equitable adjustment of the Contract Sum under any other contract provisions.

(b) The Contractor must submit the amount of a claim under provision (a) hereof to the Owner in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of submission of the Application for Payment seeking final payment under the Contract and, except for costs due to a suspension order, the Owner shall not approve any costs in the claim incurred more than twenty (20) days before the Contractor notified the Owner in writing of the act or failure to act involved in the claim.

ARTICLE 10 PAYMENTS AND COMPLETION

10.1 SCHEDULE OF VALUES

10.1.1 Prior to the first Application for Payment, and as a condition precedent to the making of any payments to the Contractor, the Contractor shall submit to the Owner's Representative and Engineer, for approval by the Owner, a preliminary Schedule of Values allocating the Contract Sum among the various portions of the Work, prepared in such form and detail and supported by such data to substantiate its accuracy as the Owner may require. Such Schedule of Values shall be based upon, and consistent with, the Project Schedule. The Schedule shall be reviewed and revised from time to time to reflect changes in the Work, or if found by the Owner's Representative or Engineer to be inaccurate. Once approved by the Owner and so long as the Schedule of Values remains up to date and accurate, the approved Schedule of Values shall be used as a basis for the Contractor's Applications for Payment.

10.2 APPLICATIONS FOR PAYMENT

10.2.1 The Contractor shall submit to the Owner's Representative and the Engineer for review, no later than the first day of each month, a draft of the Application for Payment which the Contractor intends to submit that month. Such draft Applications shall not be considered the Application for Payment for purposes of Subsection 10.2.2.

10.2.2 The Contractor shall submit to the Owner's Representative and the Engineer an itemized Application for Payment for Work completed as of the end of the preceding month, based upon the approved Schedule of Values and supported by such data substantiating the Contractor's right to payment as the Owner may require, including invoices with check vouchers attached, payrolls, receipted bills, requisitions from Subcontractors and Suppliers, and reflecting the retainage set forth in the Contract. The format of such Applications for Payment shall be AIA Documents No. G702 and G703 (Contractor's Application for Payment) or such other form as may be required by the Owner. The Contractor shall submit its Applications for Payment no later than the fifth (5^{th}) calendar day of each month for each payment period constituting the preceding calendar month. The Application for Payment shall show the total cost of the Work performed and materials furnished by the Contractor and each Subcontractor to date, based on a percentage of the work completed.

10.2.3 Unless otherwise provided in the Contract Documents, such Application for Payment may include materials or equipment not incorporated in the Work but delivered and suitably stored at the Site and, if approved in advance in writing by the Owner, in its sole discretion, payment may be requested for materials or equipment suitably stored at some other location agreed upon in writing, all in accordance with Section 10.9, below. Payments for materials or equipment stored on or off the Site shall be conditioned upon submission by the Contractor of bills of sale, invoices or such other documents, information or procedures as may be required by the Owner to establish the Owner's title to such materials or equipment free and clear of all liens, claims, security interests or encumbrances (collectively referred to in the Contract Documents as "liens"), or otherwise to protect the Owner's interests, and if off-site storage is involved, compliance in full with the requirements of Section 10.9, below.

10.2.4 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner automatically without further action by the parties, free and clear of all liens or other encumbrances and upon the first to occur of: (i) incorporation in the construction, or (ii) the receipt of payment by the Contractor. Transfer of title to the Owner shall not relieve the Contractor of any of its duties or obligations under the Contract Documents or of any responsibility or liability for the safe delivery and safeguarding, custody, or warehousing of the materials or equipment, nor shall it constitute any waiver of the Owner's right to absolute fulfillment by the Contractor of all of the terms of the Contract, nor shall it commence any warranty or guarantee period prior to Substantial Completion. The Contractor warrants that no Work, materials or equipment covered by an Application for Payment shall have been acquired by the Contractor, or by any other person performing Work at the Site or furnishing materials or equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or any other secured party or otherwise imposed by the Contractor or any other person or entity.

10.2.5 At the request of the Owner, each Application for Payment shall be accompanied by an affidavit or certificate from each Subcontractor stating that it has been paid all amounts due it on the basis of the previous periodic payment(s) to the Contractor, or stating the amount not so paid and the reason for any discrepancy. In the event of any such discrepancy,

the Contractor shall furnish its own written explanation to the Owner through the Owner's Representative. If requested by the Owner, the Contractor shall furnish a statement accounting for the disbursement of funds received under prior Applications for Payment.

10.2.6 Each Application for Payment shall include a monthly status report on the progress of the Work, including those items more particularly set forth in the Contract, in these General Conditions, and in the Specifications. The Contractor acknowledges that such status report is of significant importance to the Owner in determining whether the Contractor is entitled to payment pursuant to such Application for Payment, and failure to deliver such status report, in form, substance, or detail satisfactory to the Owner, shall be deemed to be just cause for withholding payment to the Contractor. Any waiver by the Owner of the requirement of submission of such status report (or any portion thereof) with respect to any Application for Payment shall not be deemed to be a waiver of the Owner's right to require the full and complete status report with respect to any future Application for Payment. Each status report shall include the items specified in the Agreement, in these General Conditions, and in the Specifications and any other reports or items requested by the Owner's Representative or the Owner. All status reports shall be in form and substance satisfactory to the Owner.

10.3 CERTIFICATES FOR PAYMENT

10.3.1 Within five (5) days after receipt of the Contractor's Application for Payment, the Engineer will either issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Engineer determines is properly due, or notify the Owner and Contractor in writing its reasons for withholding a Certificate for Payment, or any portion thereof, as provided in Subsection 10.6.1.

10.3.2 The issuance of a Certificate for Payment will constitute a representation by the Engineer to the Owner, based on the Engineer's observations, that the Work has progressed to the point indicated, that to the best of the Engineer's knowledge, information and belief the quality of the Work indicated therein is in accordance with the Contract Documents (subject to evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in the Certificate), that the submission includes all necessary prevailing wage submittals and that the Contractor is entitled to payment in the amount certified. The Engineer shall not certify the final payment until an inspection for Final Completion has been performed and the Owner has acted affirmatively on the Engineer's recommendation that the Project be accepted.

10.4 PROGRESS PAYMENTS TO THE CONTRACTOR

10.4.1 [Reserved]

10.4.2 Within twenty-five (25) days after receipt of a Certificate for Payment issued by the Engineer, the Owner shall make payment of amounts properly due to the Contractor, subject to the terms and conditions of the Contract Documents.

10.4.3 Upon receipt of payment from the Owner, the Contractor shall promptly pay each Subcontractor out of the amount paid to the Contractor on account of such Subcontractor's work, the amount to which the Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its lower tier Subcontractors in similar manner.

10.4.4 Neither the Owner nor the Owner's Representative nor the Engineer shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as set forth in this Section 10.4.

10.4.5 Pursuant to M.G.L. c. 30, § 39F, the Contractor shall make payments to Subcontractors in accordance with the following provisions:

(a) Forthwith after the Contractor receives payment on account of an Application for Payment, the Contractor shall pay to each Subcontractor the amount paid to the Contractor for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the Contractor.

(b) Not later than the sixty-fifth (65^{th}) day after each Subcontractor substantially completes its Work in accordance with the plans and specifications, the entire balance due under the subcontract, less amounts retained by the Owner as the estimated cost of completing the incomplete and unsatisfactory items of Work, shall be due the Subcontractor; and the Owner shall pay that amount to the Contractor. The Contractor shall forthwith pay to the Subcontractor the full amount received from the Owner less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the Contractor.

(c) Each payment made by the Owner to the Contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a Subcontractor shall be made to the Contractor for the account of that Subcontractor; and the Owner shall take reasonable steps to compel the Contractor to make each such payment to each such Subcontractor. If the Owner has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the Contractor or which is to be included in a payment to the Contractor for payment to the Subcontractor as provided in subparagraphs (a) and (b), the Owner shall act upon the demand as provided in this Subparagraph 10.4.5.

(d) If, within seventy (70) days after the Subcontractor has substantially completed the subcontract work, the Subcontractor has not received from the Contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the Contractor, less any amount retained by the Owner as the estimated cost of completing the incomplete and unsatisfactory items of work, the Subcontractor may demand direct payment of that balance from the Owner. The demand shall be by a sworn statement delivered to or sent by certified mail to the Owner, and a copy shall be delivered to or sent by certified mail to the Contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the Subcontractor has substantially completed the subcontract work. Within ten days after the Subcontractor has delivered or so mailed the demand to the Owner and delivered or so mailed a copy to the Contractor, the Contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the Owner, and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contains a detailed breakdown of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the Contractor and of the amount due for each claim made by the Contractor against the Subcontractor.

(e) Within fifteen (15) days after receipt of the demand by the Owner, but in no event prior to the seventieth day after substantial completion of the subcontract work, the Owner shall make direct payment to the Subcontractor of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the Contractor, less any amount (i) retained by the Owner as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the Contractor in the sworn reply; provided that the Owner shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The Owner shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The Owner shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the Contractor and the Subcontractor in a bank in Massachusetts selected by the Owner or agreed upon by the Contractor and the Subcontractor and shall notify the Contractor and the Subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the Contractor and the Subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall

be made out of amounts payable to the Contractor at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the Contractor and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the Owner to the Contractor to the extent of such payment.

(h) The Owner shall deduct from payments to the Contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the Contractor.

10.5 PAYMENT NOT ACCEPTANCE

10.5.1 No Certificate for Payment, nor any progress payment made by the Owner, nor any partial or full use or occupancy of the Work or the Project by the Owner, shall constitute an acceptance of the Work, or any portion thereof, that is not in accordance with the Contract Documents.

10.6 PAYMENTS WITHHELD

10.6.1 The Engineer may decline to certify payment, and may withhold its Certificate for Payment, in whole or in part, to the extent necessary to protect the Owner, if in the Engineer's opinion the Engineer is unable to make representations to the Owner as provided in Subsection 10.3.2. In such case, the Engineer will notify the Owner and the Contractor as provided in Subsection 10.3.1. The Engineer will issue a Certificate for Payment for the amount for which it is able to make all of the representations to the Owner set forth in Subsection 10.3.2. The Engineer may also decline to issue a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, it may nullify or amend the whole or any part of any Certificate for Payment previously issued, or, notwithstanding that the Engineer has issued a Certificate for Payment, the Owner (in addition to and without limitation of any other rights and remedies of the Owner under the Contract Documents) may withhold payment of any amounts claimed to be due by the Contractor and certified for payment by the Engineer, in each case to such extent as may be necessary in order to provide for retention covering the fair value of any possible claims the Owner may have against the Contractor, which amounts may include, but shall not be limited to, the fair value of costs or losses arising from:

(a) defective Work not remedied,

(b) third party claims filed or reasonable evidence indicating probable filing of such claims,

(c) failure of the Contractor to make payments properly due to Subcontractors or Suppliers,

(d) reasonable evidence that the Work cannot be completed in accordance with the Contract Documents for the unpaid balance of the Contract Sum,

(e) reasonable evidence of any previous overpayment or improperly issued payment upon an Application for Payment,

(f) improper prior allocation of the Owner's contingency,

(g) damage to the Owner or another contractor,

(h) reasonable evidence that the Work is not progressing in accordance with the Project Schedule or will not be completed within the Contract Time,

(i) failure to carry out the Work in accordance with the Contract Documents or other default by the Contractor under, or failure of the Contractor to comply with any provisions of, the Contract Documents,

(j) claims for damages for delay (including accrued liquidated or actual damages, if any), or

(k) any lien, attachment or other encumbrance not discharged as required by the Contract Documents.

If and when the grounds set forth above are removed without cost to the Owner, payment may be requested and shall be made for amounts withheld because of such grounds, less any cost or damage incurred by the Owner as a result thereof.

10.7 SUBSTANTIAL COMPLETION

10.7.1 When the Contractor considers that the Work, or a portion thereof designated in the Contract Documents for separate completion, is substantially complete as defined in Subsection 9.1.3, the Contractor shall prepare and submit to the Owner's Representative for delivery to the Engineer and to the Owner all documents, records, permits and licenses required by the Contract Documents in a form satisfactory to the Engineer and the Owner, and a monetized punch list of items to be completed or corrected. Failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

10.7.2 [Reserved] .

10.7.3 Warranties and guarantees required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof, unless otherwise provided in the Certificate of Substantial Completion.

10.7.4 Subject to the procedures set forth in this Section 10.7, within 21 days after presentation of Contractor's certification, Engineer on behalf of Owner shall present to Contractor either a written declaration that the Work has been Substantially Completed or an itemized list of incomplete or unsatisfactory work items required by the Contract sufficient to demonstrate that the Work has not been Substantially Completed. Engineer's declaration shall be made in accordance with the following procedures:

1. Promptly after Contractor's notification, Owner, Contractor and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing within 10 days of the Contractor's presentation of the certification required under Paragraph 10.7.1, giving reasons therefor.

2. If Engineer considers the Work substantially complete, Engineer will, within 10 days of the Contractor's presentation of the certification required under 10.7.1, deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed and corrected before final payment. Owner shall have 7 days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 21 days after presentation of Contractor's certification under Paragraph 10.7.1, notify Contractor in writing, stating the reasons therefor and providing an itemized list of incomplete or unsatisfactory Work items required by the Contract. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 21 days, execute and deliver to Owner and contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as the Engineer believes justified after consideration of any objection from Owner

10.7.5 At the time of Engineer's delivery of the tentative certificate of Substantial Completion to Owner, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment..Engineer shall be entitled to withhold certification

of Substantial Completion if Contractor has not brought all substantially completed Work to functioning condition to the satisfaction of Owner.

10.7.6 Within 15 days after the effective date of the declaration of Substantial Completion. Owner shall send to Contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond its control, Contractor shall complete all work items within 45 days after the receipt of such list or before the then Contract Completion Date, whichever is later. If Contractor fails to complete such work within such time, Owner may, subsequent to 7 days' written notice to Contractor by certified mail, return receipt requested, terminate the Contract and complete the incomplete or unsatisfactory work items and charge the cost of same to Contractor.

10.7.7 Within 65 days after the effective date of the declaration of Substantial Completion, Owner shall prepare and forthwith send to Contractor for acceptance a Substantial Completion estimate for the quantity and price of the Work done and all but one percent retainage on that Work, including the quantity, price, and all but one percent retainage for the undisputed part of each Work item and extra Work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory Work items and less the total periodic payments made to date for the Work. Owner shall also deduct from the Substantial Completion estimate an amount equal to the sum of all demands for direct payment filed by Subcontractors and not yet paid to Subcontractors or deposited in joint accounts pursuant to G.L. c. 30, § 39F. [NTD: the foregoing per GL c. 30, s 39G]

10.8 FINAL COMPLETION AND FINAL PAYMENT

10.8.1 At such time as the Contractor has fully performed the Work, including all obligations set forth in the Contract Documents and all Work listed on the Certificate of Substantial Completion, the Contractor shall give notice to the Engineer and the Owner. The Contractor shall also provide a certificate to the Owner regarding completion of the Work in accordance with the Contract Documents, compliance by the Contractor with the Contract Documents, and such other matters within the scope of the Contractor's performance under the Contract Documents as the Owner may require. Such certificate shall be in form and substance acceptable to the Owner.

10.8.2 Upon receipt of written notice that the Work is ready for final inspection and acceptance, the Engineer and the Owner's Representative will promptly make such inspection. The Engineer shall, within 30 days of its and the Owner's Representative's receipt of the Contractor's written notice, notify Contractor in writing of all particulars in which the inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies. If Engineer and Owner's Representative agree that the Work is complete, the Contractor shall receive a copy of the Engineer's certificate of final inspection within 30 days of the Engineer's and

Owner's Representative's receipt of the written notice provided by Contractor under this section 10.8 .

10.8.3 The Engineer's Certificate of Final Completion will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in this Section 10.8, and elsewhere in the Contract Documents, have been fulfilled in accordance with the requirements of the Contract Documents.

10.8.4 Notwithstanding anything to the contrary in this Section 10.8 contained, if the Owner elects to take use or occupancy of the Project in stages, final inspection may be performed, at the request of the Contractor or the Owner, in stages (i.e., in respect of the portion of the Work to be occupied by the Owner and such systems, (e.g., mechanical, sanitary, etc.), as are necessary for the Owner's use or occupancy of such portion of the Project). The provisions of this Section 10.8 shall apply to any staged final inspection, except that in no event shall Final Completion be deemed to have occurred until final inspection has occurred with respect to the entire Work.

10.8.5 Final Completion shall mean the completion of all of the Work in accordance with all of the terms and conditions of the Contract Documents and acceptance thereof after final inspection in accordance with Subsections 10.8.1 through 10.8.4. The date of issuance of the Owner's written notice of acceptance shall be designated as the date of Final Completion. Upon Final Completion, the Owner may take over the Site for permanent use and occupancy. A final Application for Payment may be made at any time after the date of Final Completion.

10.8.6 Prior to, and as a condition precedent to, Final Completion, all of the following matters shall have been resolved and documents and items shall have been received and approved in writing by the Owner:

(a) final documents of similar nature to those required by the Contract Documents in connection with any Application for Payment hereunder; and

(b) all final permits, approvals, (including, without limitation, the approval of the Owner's insurance company, if required) certificates and affidavits (including, without limitation, certificates in respect of plumbing, electrical systems and life safety systems, required by governmental authorities) and authorizations for use and occupancy of the Project required by any authority having jurisdiction, including an unconditioned permanent and full Certificate of Occupancy and any other necessary occupancy and use permits (unless such Certificate is not issued solely for reasons as to which the Contractor has no responsibility or over which it has no control); and

(c) full record "as built" Drawings in the Owner's CADD software approved by the Engineer; records and related data including all field notes and daily

reports of all the Work, all in accordance with the requirements of the Contract Documents; and

(d) satisfactory proof that all claims arising out of the Work have been released or bonded; and

(e) acknowledgment of prior payments (to the extent permitted by law) from all Subcontractors and the Contractor; and

(f) the Engineer's certificate certifying that the Work is complete; and

(g) a written statement from the Engineer that all practical orientation and operating instructions for all materials, systems, and equipment have been satisfactorily completed, and that all required training of Owner's personnel has been completed; and

(h) a satisfactory report by the Contractor which is approved by the Engineer that all mechanical systems have been and are properly balanced; and

(i) a certificate of insurance for product liability and completed operations insurance coverage for the three year period following Final Completion; and

(j) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or its property might in any way be responsible, have been paid or otherwise satisfied; and

(k) consent of surety, if required, to final payment; and

(l) if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts and releases arising out of the Contract, to the extent and in such form as may be designated by the Owner; and

(m) delivery of all spare parts required to be submitted pursuant to the Contract Documents; and

(n) delivery of all Contract Documents and other related materials, with the exception of one record contract set, by the Contractor to the Owner or certification by the Contractor that all such documents were lawfully disposed; and

(o) a general release of the Owner from the Contractor and each Subcontractor.

If the final documentation submitted by the Contractor is determined not to be complete by the Owner or if the Owner deems the Work incomplete in any respect, the Contractor shall promptly complete any such Work and shall promptly resubmit the final documentation.

10.8.7 Within 30 days after receipt by Owner of notice from Contractor that the entire Work is complete, Owner shall prepare and forthwith send to Contractor for acceptance a final estimate for the quantity and price of the Work done and all retainage on the Work less all payments made to date, unless Owner's inspection shows that Work items required by the Contract remain incomplete or unsatisfactory, or that documentation required by the Contract has not been completed. [NTD: per GL c. 30, s. 39G].

10.8.8 After Final Completion and receipt by the Owner of a proper final Application for Payment, the Engineer and Owner's Representative shall review the application following the procedures set forth in this Article 10 for progress payments. Thirty days after the presentation to Owner of the Final Application for Payment (as signed by the Engineer) and accompanying documentation as required in this Article 10, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to the amounts withheld

pursuant to Subsection 10.6.1,

the aggregate of all previous payments made by the Owner, and any liquidated and actual damages, will become due and will be paid by Owner to Contractor.

If at any time the aggregate of previous payments made by the Owner exceeds the amount due the Contractor, the Construction Manger shall reimburse the difference to the Owner.

10.8.9 The acceptance of final payment shall constitute a release and waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final payment.

10.9 STORAGE OF MATERIALS OFF-SITE

10.9.1 The Contractor and its Subcontractors shall obtain prior written approval from the Owner, for permission to store at off-site locations materials or equipment to be incorporated in the Work, for which progress payments will be requested. No out-of-state storage will be permitted by the Owner. Any and all charges for storage, including insurance, shall be borne solely by the Contractor. Before approval, the Owner may require, without limitation, (i) evidence that the location is properly secure, (ii) proper proof of insurance and proof of satisfactory contractual arrangements for transportation to the Site, (iii) proof that Owner will obtain clear title to the materials, and (iv) a certificate from the Contractor stating:

(a) The name of the Contractor and/or Subcontractor leasing or owning the storage area;

(b) The location of such storage space, including the storage area; i.e., the entire premises or certain areas of a warehouse giving the number of floors or portions thereof, and a certification that the Contractor has visited such

location, verified the storage of such material or equipment therein or thereon, and payment of all current storage charges;

(c) The date on which the material or equipment is first stored; and

(d) A description, including quantities and the value of the material or equipment stored.

10.9.2 The Contractor shall furnish to the Owner, not less often than once per month, a current inventory of all materials or equipment being stored at any off-site location.

10.9.3 The Contractor and its Subcontractors shall mark each sealed carton or other item with the name of the Project and the Owner, and all materials or equipment stored off-site shall be segregated to the extent required by the Owner, the Owner's Representative, or the Engineer.

10.9.4 Payment for materials or equipment stored off-site shall be at the sole discretion of the Owner. Title to materials or equipment stored off-site shall be transferred at the time at which the Owner pays for them.

ARTICLE 11 SAFETY AND PROTECTION

11.1 SAFETY PRECAUTIONS AND PROGRAMS

11.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work, including, but not limited to, compliance by the Contractor and all Subcontractors with all safety precautions and programs and other legal requirements of the Occupational Safety and Health Act, other Applicable Laws, the Contract Documents, and any insurance carrier providing insurance coverage for the Owner or the Contractor in connection with the Project. Without limiting the generality of the foregoing, the Contractor shall, promptly after execution of the Agreement, prepare a written safety program which shall be submitted to the Owner's Representative and the Owner and issued to all Subcontractors and all forces employed on the Work. Such program shall include weekly safety meetings with representatives of all Subcontractors working on the Site, and the Contractor shall prepare, circulate and maintain on file at the Site minutes of all safety meetings. The Contractor shall ensure that all forces employed on the Work are free of drugs and alcohol and are provided with all necessary personal protective equipment. The Contractor's written safety program shall identify, by trade, tasks for which specific safety planning and precautions are necessary and the steps necessary to implement such precautions. The Contractor shall plan hazardous sequences in advance, shall institute procedures for reporting any injuries and providing for emergency medical care and shall report to the Owner's Representative when such sequences are to commence and when completed.

11.1.2 The Contractor shall designate a responsible member of its organization at the Site whose duty shall be the prevention of accidents. This person shall be the Contractor's Project Superintendent unless otherwise designated by the Contractor in writing to the Owner's Representative.

11.2 SAFETY OF PERSONS AND PROPERTY

11.2.1 The Contractor shall take all necessary precautions for the safety of, and shall provide all protection necessary to prevent damage, injury or loss to:

(a) all employees on the Work and all other persons or other entities who may be affected thereby;

(b) all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site; and

(c) other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, improvements and utilities not designated for removal, relocation or replacement in the course of construction.

Without limitation, the Contractor shall provide security watch service at all such times as are necessary to protect the interests of the Contractor and the Owner and to provide for the safety and security of the general public, employees and agents of the Owner, the Owner's Representative and the Engineer, and other persons who may be affected by the Work, and to exclude unauthorized persons from the Site.

11.2.2 The Contractor shall give all notices and comply with all Applicable Laws bearing on the safety of persons or property or their protection from damage, injury or loss.

11.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including fencing and posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities and other improvements as more particularly set forth in the Specifications.

11.2.4 The Contractor shall satisfactorily conduct its work at all highway crossings and along all highways, street and other ways in accordance with the permission and requirements of the proper authorities. Vehicular traffic shall be routed over temporary detours during construction when required to maintain proper flow of traffic. The Contractor shall plan and conduct its operations in such a manner that the continuous flow of traffic is uninterrupted and with a minimum of inconvenience to the general public. The Contractor shall prepare a plan for construction and traffic management acceptable to the Owner and the municipal authorities. The Contractor shall arrange for and provide all policemen required by the town or

city in which the Project is located to be present at or adjacent to the Site for traffic control purposes. The cost of all policemen so required shall be borne by the Contractor and included in the Contract Sum.

11.2.5 The Contractor shall assume all responsibility for the protection of property of adjacent owners so far as affected by its operations. The Contractor shall provide temporary protection at all openings in the outside fences or walls to prevent unauthorized persons from obtaining access during the night and at other non-working hours. The Contractor acknowledges that there may be Construction projects being undertaken on adjacent properties and will coordinate the Work with such other projects as required.

11.2.6 Blasting operations, if any, shall be specifically approved in advance in writing by the Engineer, shall be conducted by experienced personnel and in strict accordance with the rules and regulations of the Massachusetts Department of Public Safety governing the keeping, storage, use, manufacture, sale, handling, transportation or other disposition of explosives, and such other rules and regulations as may be promulgated from time to time by authorities having jurisdiction, and shall not be commenced until the Contractor provides written evidence to the Owner that XCU coverage is in force and effect as required by Subsection 12.2.3 hereof. When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

11.2.7 The Contractor shall promptly remedy all damage or loss (excluding damage or loss insured under the property insurance carried by the Owner, if any, as provided in the insurance requirements contained in the Contract Documents, but including losses within the deductibles of such insurance) to any property referred to in Subsection 11.2.1 caused in whole or in part by the Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under this Article 11, except to the extent that the damage or loss is attributable to the acts or omissions of the Owner, the Owner's Representative or the Engineer. The foregoing obligations of the Contractor are in addition to its obligations under Article 5.

11.2.8 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

11.2.9 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment, and shall comply with all recommendations regarding fire protection made by the representatives of the insurance company or companies carrying insurance on the Work or by the local fire chief or fire marshal. The Site shall be kept orderly and clean, and all combustible rubbish shall be removed from the Site daily.

11.2.10 The Contractor shall at all times protect excavations, trenches, structures, materials, equipment and fixtures from damage from rain water and other weather, ground water, back-up or leakage of sewers, drains and other piping, and from water of any other origin

and shall remove promptly any accumulation of water at the Project Site. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end. The Contractor shall remove snow and ice which might create a hazard on or about the Site or result in damage or delay.

11.2.11 The Contractor shall take all necessary precautions to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner forming part of the Work, or located within those areas of the Project to which the Contractor has access. The Contractor shall have full responsibility for the security of such property of the Owner and shall reimburse the Owner for any such loss, damage or injury resulting from vandalism, theft, burglary, pilferage, unexplained disappearance or any other cause, to the extent that the same is not covered by the Owner's insurance.

11.2.12 In the event the Contractor discovers any active utility line which had not yet been disclosed in any survey, it shall cease all work in the immediate area which may affect such line and shall promptly notify the Owner, Owner's Representative, and the affected utility company. The Contractor shall not restart work without notice from and approval of the Owner's Representative.

11.2.13 The Contractor shall at all times provide and maintain adequate protection against weather so as to preserve the Work, materials, equipment, apparatus, and fixtures free from injury or damage.

11.2.14 The Contractor shall protect all finished surfaces of the Work, including the jambs and soffits of all openings used as passageways or through which materials are handled, against any possible damage resulting from the conduct of Work by the Contractor or by any separate Contractors.

11.2.15 In the event of temporary suspension of Work and during inclement weather, or whenever further directed by the Owner or Engineer, Work and materials shall be adequately protected against damage. The Contractor shall take special precautions to prevent damage to materials and work installed in cold or freezing weather, by providing adequate temporary heat and suitable enclosures or covering. The ground surfaces under footings and under pipe lines, and all concrete and masonry work, shall be protected against frost and freezing. The minimum measures to be taken shall be in accordance with the requirements for winter conditions as set forth in the current edition of ACI-318-83 "Building Code Requirements for Reinforced Concrete" published by the American Concrete Institute.

11.2.16 The Contractor shall provide ventilation of enclosed areas during construction as required to permit proper curing and drying out, and to prevent excessive humidity, moisture and condensation. Ventilation shall be by natural or artificial means as required by the conditions involved.

11.2.17 The Contractor shall control the safe handling and storage of all explosives, welding materials, acetylene and oxygen tanks, and other equipment required for

blasting operations, welding and cutting work at the Site. All welding materials and equipment shall be removed promptly from the premises and upon completion of the welding and cutting work. No welding torch or other open flames will be used within any building or temporary structure without a fire watch with an appropriate fire extinguisher or within one hour of quitting time.

11.2.18 The Work shall be performed in such a manner as to prevent fire, and during any Work involving a fire hazard the Contractor shall take all necessary precautions against fires starting and spreading on the Site, within buildings and temporary structures. The Contractor shall provide and maintain sand buckets, suitable fire extinguishers and hoses where and as required to provide adequate means of extinguishing fires. Fire prevention requirements may be directed by the Owner's insurance agents and the local Fire Department. Permanent standpipes shall be made available during construction. Gasoline and other flammable liquids shall not be stored within buildings or temporary structures; shall be stored in and dispensed from U.L. listed safety containers in conformance with N.B.F.U. recommendations and the requirements of all authorities having jurisdiction. The Contractor shall make arrangements for periodic inspection by town/city fire protection authorities and insurance underwriters' inspectors, cooperate with them and promptly carry out their recommendations.

11.3 EMERGENCIES

11.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at its discretion, to prevent threatened damage, injury or loss and shall as promptly as conditions permit notify insurance carriers and the Owner's Representative of the nature of the emergency and circumstances related thereto. Immediately thereafter, the Contractor shall prepare a written report setting forth in detail the action taken and describing in detail all circumstances and conditions which are related to such action. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 13 for Changes in the Work.

ARTICLE 12 BONDS AND INSURANCE

12.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

12.1.1 The Contractor shall furnish a performance bond and a labor and materials payment bond, each for the full amount of the Contract Sum. The performance bond and the labor and materials payment bond shall be in the unmodified form of the AIA A312-2010 performance and payment bonds. The Owner reserves the right to specify any alternative form for the performance or payment bond. Each bond shall name the Owner as obligee and each shall be issued by a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and whose name appears on the United States Treasury Department Circular 570. The bond premiums shall be included in the Contract Sum and shall be paid by the Contractor. If the Agreement provides for the imposition of liquidated or actual

damages in the event that the Contractor fails to complete the Work within the Contract Time, then the obligations assumed by the surety under the performance bond shall include the payment of such liquidated or actual damages. These bonds shall remain in effect for the entire Guarantee Period, as defined in Subsection 14.2.2. All bonds shall be executed in the required number of counterparts and shall be submitted to the Owner for insertion into the Contract Documents prior to the execution of the Agreement.

12.2 CONTRACTOR'S LIABILITY INSURANCE

12.2.1 The Contractor shall purchase and maintain such insurance as will protect it and the other parties specified or referred to in Subsection 12.2.10 below from claims referred to below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

12.2.2 The Contractor shall purchase and maintain during the life of the Agreement:

(a) Insurance sufficient to discharge its obligations under all applicable workers' compensation laws of the Commonwealth of Massachusetts and the United States.

(b) Employer's liability insurance with minimum limit per accident or disease of $1,000,000.

(c) Statutory disability and other employee benefit insurance.

12.2.3 The Contractor shall purchase and maintain commercial general liability insurance, which coverage shall be in a form no less broad than ISO CG 00 01 12 07 or its equivalent and covering the full scope of this contract with limits not less than $1,000,000 per occurrence and $5,000,000 aggregate for personal or bodily injuries and for property damage. A per occurrence limit of not less than $5,000,000 is acceptable. All policies issued shall include permission for partial or total use and occupancy of the premises by the Owner within the scope of the Contract. Such insurance shall include at least the following:

(a) Commercial general liability insurance, including all products, premises-operations, completed operations for at least three (3) years following acceptance and final payment, independent contractors, additional interests of employees, sudden and accidental pollution and contamination, and incidental medical malpractice, and including notice of occurrence and knowledge of occurrence endorsements satisfactory to the Owner.

(b) Blanket contractual liability insurance covering all liabilities assumed under the Contract Documents, including, but not limited to, the Contractor's obligations under Article 5 of the General Conditions.

(c) Coverage for the so-called "XCU" hazards (explosion, collapse of buildings, blasting, undermining, and damage to underground property). Before any blasting is done, the Contractor shall provide to the Owner written evidence that blasting damage is included in the Contractor's insurance coverage.

12.2.4 The Contractor shall purchase and maintain automobile liability insurance, which coverage shall be in a form no less broad than ISO CA 00 01 03 10 or its equivalent and covering all owned, non-owned and hired vehicles with a limit of not less than $1,000,000 per accident for bodily injury, including death and property damage.

12.2.5 The Contractor shall also purchase and maintain umbrella form excess liability insurance in the limits specified below and containing coverage no less restrictive than that required under Subsections 12.2.2, 12.2.3, and 12.2.4 above. The required primary insurance shall be listed as underlying coverage in the first layer of the umbrella policy. Nothing contained herein shall be interpreted to restrict or prohibit the Contractor from carrying, or requiring any of its Subcontractors to carry, insurance in addition to that required hereby. The Contractor's umbrella excess policies shall contain a minimum total occurrence and aggregate limit of $10,000,000.

12.2.6 The Owner shall have the right to require that the coverages and limits of liability set forth in Subsections 12.2.2, 12.2.3, 12.2.4, and 12.2.5 be expanded or raised if required by law or any lender of the Owner, or if in the Owner's judgment economic conditions or other factors so warrant. If additional costs are incurred because of raised limits, the additional cost shall be added to the Contract Sum. The Owner shall also have the right to reduce the coverages and limits of liability set forth in Subsections 12.2.2, 12.2.3, 12.2.4, and 12.2.5 if in the Owner's judgment the degree of risk associated with any portion of the Work warrants reduced coverage and limits of liability.

12.2.7 Insurance coverages similar to those required of the Contractor shall be provided by or on behalf of all Subcontractors to cover their operations performed under the Contract Documents. The Contractor shall be held responsible for compliance with and enforcement of the insurance requirements and for any modifications of these insurance requirements as they apply to Subcontractors. The Contractor shall not permit any Subcontractor to commence work until such Subcontractor has furnished evidence that insurance has been procured and certificates of insurance have been obtained by the Contractor providing that, in the event of non-renewal or cancellation of Subcontractor's policies, thirty (30) days advance written notice will be given to the Contractor by registered mail. Copies of such certificates and, upon Owner's written request, copies of the insurance policies shall be delivered to the Owner, who shall be designated as a certificate holder.

12.2.8 Prior to the commencement of the Work, the Contractor shall cause its insurance company or companies to provide insurance certificates, which shall be attached as **Exhibit G** to the Agreement, and, upon Owner's written request, copies of insurance policies acceptable to the Owner and the other additional insureds specified in Subsection 12.2.10 below

evidencing the above coverages to be furnished the Owner and the other additional insureds specified in Subsection 12.2.10 below by the Contractor's insurance company. Such certificates and all insurance policies required by this Article 12 shall contain provisions requiring at least 30 days' prior written notice to the Owner and to other certificate holders of any cancellations or non-renewals of the policies. Certificates shall indicate effective dates and dates of expiration of policies. An additional certificate evidencing continuation of all insurance coverages required to remain in force after final payment shall be submitted with the application for final payment, and neither final payment nor any remaining retainage under this Contract shall be due until such certificate has been submitted to the Owner.

12.2.9 The Owner is to be furnished originals or certified copies of the policy or policies including all endorsements required to provide stated coverage within 10 days after commencement of Work under this Contract.

12.2.10 All insurance policies provided pursuant to Article 12 shall be written by companies licensed to do business in the Commonwealth of Massachusetts and having an A.M. Best rating of A-, VIII or better, or otherwise acceptable to Owner, in its reasonable discretion, and shall be in form satisfactory to the Owner. All such policies shall name as additional insureds, under endorsements no less broad than CG 20/10 (11-85) or both CG 2026 (7/04 version) and CG 2037 (7/04 version), the Owner, affiliates and participants of the Owner, the State University, the Commonwealth of Massachusetts, and any other parties as the Owner may identify by notice to the Contractor from time to time. All such policies shall contain provisions or endorsements necessary to assure coverage of claims by one additional insured against another additional insured. All required insurance policies are to be endorsed to state that the Contractor's policies shall be primary to all other insurance available to the Owner, which insurance shall be excess of all other valid and collectible insurance policies. The Contractor shall bear all costs of any amounts deductible, retained or self-insured under the policies required to be maintained by the Contractor.

12.2.11 The purchase of insurance to satisfy the above requirements, or the furnishing of certificates evidencing same, shall not be a satisfaction of the Contractor's liability under this Contract or in any way modify the Contractor's indemnification of the Owner.

12.2.12 Certificates and policies of insurance shall be filed with the Owner.

12.3 PROPERTY INSURANCE

12.3.1 The Contractor shall purchase and maintain property insurance insuring against the perils of fire and extended coverage and including "all risk" builders' risk insurance for physical loss or damage to the Work, including all labor, materials, supplies, machinery, equipment, fixtures, temporary structures and all other work of whatever nature, used or to be used in or incidental to the construction, fabrication, erection or completion and testing of the Work, until Final Completion. Limits shall be 100% of the replacement value of the Work. Such insurance shall protect the interests of the Owner, the Contractor and all Subcontractors performing work at the Site, and the proceeds in case of loss may be held by the Contractor and

applied by it in the manner hereafter set forth. The Contractor shall have power to adjust and settle any loss with the insurers, using due diligence to protect the interests of the Owner, Contractor and Subcontractors, subject to the rights of the Owner. The Contractor's property insurance will not cover any tools, equipment, materials, supplies, temporary structures or other property owned or rented by the Contractor or Subcontractors which is not to be incorporated in the Work. The Contractor and Subcontractors assume these excluded risks, and waive all rights they may have against the Owner for damage to such items, and, further, any policy of insurance covering the Contractor's own tools, equipment, facilities and other property against loss by physical damage shall include an endorsement providing that the underwriters waive their rights of subrogation against the Owner. In accordance with Article 12, the Contractor will furnish the Owner with a certificate of such insurance coverage, which shall be attached as **Exhibit G** to the Agreement. The Contractor will furnish the Owner with originals or certified copies of the policy including endorsements within 10 days after commencement of Work under this Contract. In accordance with Article 12, the Owner shall be listed as an additional named insured on such property insurance policy.

12.3.2 The Contractor, as trustee for the parties in interest, shall receive the proceeds of any insurance upon the occurrence of an insured loss, and shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or in accordance with an award or finding of a court of competent jurisdiction. If after such loss no other agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.

12.3.3 The Contractor shall be completely responsible for the proper care and protection of the Work. The Contractor shall be responsible for all losses within the deductible specified above, and the Contractor shall promptly, and in any event so as not to delay the progress of the Work, replace or reimburse the Owner for any property to the extent loss or damage to such property is within the deductible.

12.3.4 If there is a casualty resulting in a loss of more than 20% of the Contract Sum, as determined by the Owner, then the Owner may elect to terminate the Contract upon seven (7) days' notice to the Contractor and the Engineer, and the Contractor shall be entitled to payment for all Work executed in accordance with the Contract Documents prior to said termination. Contractor shall have no claim for payment for loss of profit on that portion of the Work not executed.

12.3.5 The Owner and the Contractor waive all rights against (i) each other and the Subcontractors, consultants, agents and employees each of the other, and (ii) the Engineer, the Owner's Representative, and separate contractors, if any, and their Subcontractors, sub-Subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Section 12.3 or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the Contractor. The foregoing waiver afforded the Engineer, its agents and employees shall not extend to the liability imposed by Subsection 5.1.4. The Owner or the Contractor, as appropriate, shall require of the Engineer, separate contractors, and Subcontractors by written

agreements, similar waivers each in favor of all other parties enumerated in this Subsection 12.3.5.

12.4 PROFESSIONAL LIABILITY INSURANCE

12.4.1 If the Work performed by the Contractor or any Subcontractor requires design and/or other professional services, the Contractor shall purchase and maintain, and shall cause any such Subcontractor to purchase and maintain, professional liability insurance for claims arising out of the negligent performance of such professional services. Professional liability coverage shall be written for minimum limits of $2,000,000 per claim and annual aggregate with a deductible no greater than $100,000. Professional liability coverage may be provided on a "claims made" basis if it includes a retroactive date that is no later than the effective date of this Agreement, and such insurance coverage shall be maintained for a period at least six (6) years after the earlier of: (1) the date of official acceptance of the completed Project by the Owner; (2) the date of the opening of the Project to public use; (3) the date of acceptance by the Contractor of final payment under this Agreement; or (4) the date of final completion of the Project and the taking of possession of the Project for use and occupancy by the Owner. Throughout the term of this Agreement and the entire six (6) year period, the Contractor and any such Subcontractor shall provide renewal certificates of professional liability insurance to the Owner as evidence that this coverage is being maintained. Alternatively, the six (6) year maintenance period for this coverage may be satisfied by providing an extended reporting period endorsement.

ARTICLE 13 CHANGES IN THE WORK

13.1 CHANGE ORDERS

13.1.1 The Contract Sum and the Contract Time may be changed only by duly executed Change Order. A Change Order signed by the Contractor indicates its agreement therewith, including the adjustment, if any, in the Contract Sum or the Contract Time.

13.1.2 The Owner, without invalidating the Contract, may order Changes in the Work consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly, if necessary. All such Changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

13.1.3 With respect to Change Orders, upon the request of the Owner or the Engineer, the Contractor shall submit to the Engineer, as soon as reasonably possible but in any event within twenty (20) days of the Contractor's receipt of a request therefor, an accurate written statement setting forth in detail, with a suitable breakdown for each trade and work classification, and including a breakdown of the items set forth in Subsection 13.1.8 below, the net increase in the cost of the Contractor's performance and payment bond premiums attributable to such changes, and any allowable markup for overhead and profit. The Contractor

shall state in such proposal any change to the Contract Time required for the completion of the Work if the Change Order is approved. The Contractor shall promptly revise and resubmit such proposal if the Engineer determines that the proposal is not in compliance with the requirements of this Article, or that it contains errors or ambiguities. Once it has been reviewed and approved by the Engineer, the Change Order shall be submitted to the Owner and the Contractor for Execution.

13.1.4 The amount by which the Contract Sum shall be adjusted as a result of a Change Order shall be determined in one or more of the following ways, as the Owner in its sole discretion shall determine:

(a) by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

(b) by unit prices stated in the Contract Documents or subsequently agreed upon;

(c) by cost to be determined in a manner agreed upon by the parties; or

(d) by the method provided in Subsection 13.1.5.

13.1.5 If the amount by which the Contract Sum shall be adjusted as a result of a Change in the Work is not agreed upon using one of the methods set forth in Subsection 13.1.4 above, the Contractor, provided it receives a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be estimated by the Engineer on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change (as set forth in Subsection 13.1.8), and including, in the case of an increase in the Contract Sum, an amount equal to the allowable markup for overhead and profit as provided in the Contract. Such estimate shall be presented by the Engineer to the Owner for approval. In such case, and also in the case of changes with respect to which the cost or credit is determined under one of the methods set forth in Subsection 13.1.4 above, the Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. The Contractor shall review all quotations from Subcontractors and shall assure that pricing is fair and equitable before forwarding such proposed pricing to the Owner. Pending final determination of cost to the Owner, payments on account, if any, shall be made on the Engineer's Certificate for Payment. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net decrease in the cost of the Work plus the Contractor's allowable markups, as may be permitted by the Agreement, as confirmed by the Engineer. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead, superintendence and profit, to the extent permitted hereunder, shall be figured on the basis of the net increase, if any, with respect to that change.

13.1.6 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted.

13.1.7 Proposals as provided for in Subsection 13.1.4(a), above, shall be accompanied by a detailed breakdown of estimated costs of labor, materials, equipment and insurance, including a similar breakdown of costs for subcontracted Work. Such proposals shall be subject to the Engineer's review and acceptance by the Owner which will be based upon the Contractor's satisfactory demonstration that all costs and charges included therein are fair and reasonable, consistent with current price indexes for labor, materials and equipment, and do not in any way reflect exorbitant or non-applicable charges. Proposals shall be based on the approved Schedule of Values where applicable. The Contractor shall cooperate fully with the Owner's Representative and the Engineer to whatever extent necessary in providing adequate substantiation of cost and in conducting negotiations pertaining thereto.

13.1.8 Costs of material and labor for Changes in the Work shall be limited to the following:

(a) The net cost to the Contractor of all necessary materials, including transportation to the Site.

(b) Cost of all necessary labor, in accordance with established wage rates, as evidenced by payroll records.

(c) Premium the Contractor has to pay for liability and other insurance and bonds directly required by reason of performance of such Change in the Work.

(d) Payments required to labor organizations under existing labor agreements, and directly required by reason of performance of such Change in the Work.

(e) State taxes for unemployment insurance and Federal taxes for Social Security required to be paid and directly required by reason of such Change in the Work.

(f) Taxes, if any, required to be paid on materials incorporated in such Work (subject, however, to the provisions of Section 4.2).

(g) Gas, oil, coal, electric current and other forms of energy used, where directly required by reason of such Change in the Work.

13.1.9 The Contractor shall not subcontract any Work under a Change Order unless work under the basic Contract of a similar type was previously subcontracted, or unless

the Owner specifically approves and accepts such subcontracting in advance and in writing; and Subcontractors will not be allowed to further subcontract any Work under a Change Order without the prior written approval and acceptance of the Owner, unless Work under the basic Contract of a similar type was previously subcontracted by them. No mark-up shall be allowed on bond premiums of the Contractor or any of the Subcontractors.

13.2 CONSTRUCTION CHANGE DIRECTIVES

13.2.1 The Owner may order the Contractor to proceed with changes in the Work consisting of additions, deletions or other revisions prior to incorporation thereof in the Contract by issuance of a Change Order or in the event of the Owner and the Contractor to agree on an appropriate Change Order. All such changes shall be authorized by Construction Change Directives issued by the Owner through the Engineer.

13.2.2 The Construction Change Directive shall include a description of the work involved and the basis for revision, if any, in the Contract Sum or Contract Time or both.

13.2.3 Within the time period specified in Subsection 13.1.3, the Contractor shall submit to the Engineer and the Owner final costs for work required by the Construction Change Directive in accordance with Subsections 13.1.6 through 13.1.8, and request for change, if any, in the Contract Sum or Contract Time or both, for review by the Engineer and inclusion in a subsequent Change Order.

13.3 DIFFERING SUBSURFACE OR LATENT PHYSICAL CONDITIONS

13.3.1 Pursuant to Section 39N of Chapter 30 of the Massachusetts General Laws, changes in the Work based on concealed subsurface or latent conditions shall be in accordance with the following:

If, during the progress of the Work, the Contractor or the Owner discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the plans or indicated in the Contract Documents, either the Contractor or the Owner may request an equitable adjustment in the contract price of the Contract applying to the work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from the Contractor, or upon its own initiative, the Owner shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the Contract Documents from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, the Owner shall make an equitable adjustment in the contract price and the Contract Documents shall be modified in writing accordingly.

13.4 CLAIMS FOR ADDITIONAL COST OR DAMAGES

13.4.1 If the Contractor wishes to make a claim for an increase in the Contract Sum by reason of any work required to be performed or materials furnished by it or by reason of any event, circumstance, occurrence, direction or interpretation, or if it wishes to make a claim for damages by reason of any act or omission of the Owner or the Engineer, including, without limitation, any order by the Owner to stop the Work pursuant to Section 17.1 where the Contractor was not at fault, the Contractor shall give the Owner written notice thereof within seven (7) days after the occurrence of the event giving rise to such claim, otherwise it shall be waived. Such notice shall be given by the Contractor before proceeding to execute the work involved, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Section 11.3. A written report by the Contractor setting forth the facts and reasons for proceeding under Section 11.3 shall be submitted by it in support of its claim for relief under Section 11.3. No such claim for an increase in the Contract Sum or any other matter described above shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment, if any, to the Contract Sum or the Contract Time, it shall be determined by the Engineer, subject to the provisions of Article 19.

13.4.2 The Contractor understands that no director, member, trustee, officer, principal, employee, agent or other representative of the Owner, the Owner's Representative or the Engineer has authority to waive compliance with the notice provisions of this Section 13.4.

13.4.3 The Contractor shall maintain a current listing of unresolved claims under this Section 13.4 and under Section 9.4.

13.5 PENALTIES FOR FALSE CLAIMS

13.5.1 The attention of the Contractor and all Subcontractors is directed to M.G.L. c. 266, § 67B, which provides criminal penalties for false claims by the Contractor or any Subcontractor under this Contract: "Whoever makes or presents to any employee, department, agency or public instrumentality of the commonwealth, or of any political subdivision thereof, any claim upon or against any department, agency, or public instrumentality of the commonwealth, or any political subdivision thereof, knowing such claim to be false, fictitious, or fraudulent, shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than five years, or in the house of correction for not more than two and one-half years, or both."

13.6 MINOR CHANGES IN THE WORK

13.6.1 The Engineer will have authority to order minor Changes in the Work not involving an adjustment in the Contract Sum or an adjustment of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written Engineer's Supplemental Instructions, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such Engineer's Supplemental Instructions promptly.

ARTICLE 14 CORRECTION OF WORK

14.1 UNCOVERING OF WORK

14.1.1 If any portion of the Work should be covered contrary to the request of the Engineer or the Owner's Representative or contrary to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Engineer, the Owner's Representative, or the Owner, be uncovered for observation by the Engineer and replaced at the Contractor's expense.

14.1.2 If any other portion of the Work has been covered which the Engineer has not specifically requested to observe prior to being covered, the Engineer through the Owner's Representative, may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate contractor as provided in Article 7, in which event the Owner shall be responsible for the payment of such costs.

14.2 CORRECTION OF WORK

14.2.1 The Contractor shall promptly correct all Work rejected by the Engineer or the Owner as defective or as failing to conform to the Contract Documents, whether observed before or after Substantial Completion or Final Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Engineer's additional services made necessary thereby.

14.2.2 Without limiting any other rights which the Owner has hereunder or pursuant to law, if, within one (1) year after the date of Substantial Completion of the Work or portion thereof designated by the Owner or within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable guarantee or warranty required by or referred to in the Contract Documents (the "Guarantee Period"), any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct such defective work promptly after receipt of a written notice from the Owner to do so and shall reimburse the Owner for any expenses it shall have incurred in inspecting or testing such portion of the Work. The obligations provided in this Section 14.2 shall survive termination of the Contract and the making of final payment hereunder and may be extended pursuant to the provisions of Subsection 18.1.4.

14.2.3 The Contractor shall remove from the Site all portions of the Work which are defective or nonconforming and which have not been corrected under Article 18 or Subsections 14.2.1 and 14.2.2, unless removal is specifically waived in writing by the Owner.

14.2.4 If the Contractor fails to correct defective or nonconforming Work as provided in Article 18 or Subsections 14.2.1 and 14.2.2, the Owner may correct it in accordance with Section 17.2.

14.2.5 If the Contractor does not proceed with the correction of such defective or nonconforming work within a reasonable period of time (fixed by the Owner's Representative or the Engineer in writing) after receipt of a written notice from the Owner's Representative or the Engineer to correct such Work, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Owner may upon ten (10) additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Engineer's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

14.2.6 The Contractor shall bear the cost of making good all work of the Owner or separate contractors destroyed or damaged by such correction or removal.

14.2.7 Nothing contained in this Section 14.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Article 18 hereof, or under law. The establishment of the Guarantee Period of one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any guarantee or warranty required by or referred to in the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which its obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligations other than specifically to correct the Work.

14.3 ACCEPTANCE OF DEFECTIVE OR NONCONFORMING WORK

14.3.1 If the Owner prefers to accept defective or nonconforming Work, it may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 15 PARTIAL USE OR OCCUPANCY

15.1 OWNER'S RIGHT TO USE AND OCCUPY

15.1.1 The Owner shall have the right to use and occupy spaces, areas, systems and other portions of the Work prior to completion and acceptance of all the Work or of other portions of the Work, provided that in the opinion of the Engineer such use or occupancy shall not interfere with the Contractor's operations nor delay it in completing the entire Work. If the Owner desires to exercise its right of partial occupancy and use under this Section 15.1, the Owner shall give, through the Owner's Representative, reasonable notice thereof to the Engineer and the Contractor. If the Engineer determines that the proposed use or occupancy would not interfere with the Contractor's operations or delay it in completing the entire Work, the Contractor shall cooperate with the Owner in providing basic services and facilities reasonably required for the proposed use or the health, safety and comfort of the users or occupants and other parties lawfully present on or entering or leaving the Site such as water, lighting, power, fire protection, and telephone services for the space or spaces to be occupied. If the equipment required to furnish such services is not entirely completed at the time the Owner desires to use or occupy the aforesaid space or spaces, the Contractor shall make every reasonable effort to complete the same as soon as possible so that the necessary equipment can be put into operation and use. Mutually acceptable arrangements shall be made between the Owner and the Contractor with regard to procedures, terms, and conditions governing the operation and maintenance of such services and facilities as may be utilized for the benefit of the Owner. The Owner will assume proportionate and reasonable responsibility for operation of systems, equipment and/or utilities required to provide such services, in part or in total, including proportionate and reasonable expenses of operation incidental thereto, and mutually acceptable arrangements shall be made as to guarantees and warranties affecting designated portions or elements of the Work associated therewith.

15.2 PARTIAL USE NOT ACCEPTANCE

15.2.1 The Owner's use or occupancy of such designated areas or portions of the Work prior to completion and acceptance of all or portions of the Work pursuant to Section 15.1 shall not constitute acceptance of systems, materials, or elements of the Work which are not in accordance with the requirements of the Contract Documents, nor relieve the Contractor from its obligation to complete the Work, or its responsibility for loss or damage due to or arising out of defects in, or malfunctioning of, systems, materials, equipment, or elements of the Work, nor from other unfulfilled obligations or responsibilities of the Contractor under the Contract. If, however, damage results to such designated areas or portions of the Work, in whole or in part, from any act of the Owner, then the Owner will assume its proportionate responsibility for such damage, to the extent that such damage is not covered by insurance provided in accordance with the terms of the Contract Documents.

15.3 NO CLAIM FOR DELAY

15.3.1 The Contractor shall make no claim for any adjustment to the Contract Sum or the Contract Time or for damages of any kind arising directly or indirectly out of the exercise by the Owner of the rights reserved under this Article 15.

ARTICLE 16 TERMINATION OF THE CONTRACT

16.1 TERMINATION BY THE CONTRACTOR

16.1.1 If the Owner has failed to make a progress payment properly due and payable to the Contractor, then the Contractor, if not in default hereunder, may give the Owner written notice of its intention to terminate the Contract and if, after thirty (30) days after the Owner's receipt of such notice, the default of the Owner shall not have been cured or action by the Owner to effect such cure shall not have been commenced within such thirty (30) day period and diligently pursued, as the case may be, then the Contractor may terminate the Contract and recover from the Owner payment for all Work executed in accordance with the Contract Documents based on the percentage of the Work properly completed as determined by the Engineer.

16.2 TERMINATION BY THE OWNER

16.2.1 If any one (1) or more of the following events set forth in clauses (i) through (xiii) hereof shall occur:

(i) a petition is filed by the Contractor, or against the Contractor with its consent, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors; or

(ii) such a petition is filed against the Contractor without its consent; or

(iii) the Contractor becomes insolvent or is generally not paying its debts as they become due; or

(iv) the Contractor consents to the appointment of a receiver, trustee, liquidator, custodian or the like of the Contractor or of all or any substantial portion of its assets; or

(v) a receiver, trustee, liquidator, custodian or the like is appointed with respect to the Contractor or takes possession of all or any substantial portion of its assets; or

(vi) the Contractor makes an assignment for the benefit of creditors; or

(vii) there has been a material adverse change in the financial condition of the Contractor; or

(viii) the Contractor's bonding or surety company shall refuse to issue a labor or material payment or performance bond or other similar guarantee of performance with respect to the Project; or

(ix) due to the fault of the Contractor (and not due to causes beyond the Contractor's reasonable control): (a) the Work is unreasonably delayed or discontinued, or (b) the execution of the Work ceases for more than three (3) days, or (c) the Work is delayed so that, in the Owner's judgment, the Work cannot be completed on or prior to the expiration of the Contract Time;

(x) the Contractor defaults in its obligation to perform the Work in a skilled and expeditious manner or refuses or fails to supply sufficient labor, materials, equipment and facilities to assure the proper progress of the Work; or

(xi) the Contractor fails to make prompt payment to any Subcontractor(s);

(xii) the Contractor fails to comply with Applicable Laws; or

(xiii) the Contractor otherwise violates or fails to comply with any material provision of the Contract Documents;

then, in any such event, the Owner may, without prejudice to any other right or remedy, and after giving the Contractor seven (7) days written notice, terminate the Contract and the employment of the Contractor and hold the Contractor and its sureties liable in damages for breach of the Contract Documents, or may direct the Contractor to discontinue the Work or any designated portion thereof and take possession of the Site or any portion thereof and possession and use of any and all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work or any portion thereof by whatever method it may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is fully completed. The Owner shall not be liable for any depreciation, loss or damage to such materials, equipment or tools during such use thereof, nor thereafter prior to removal thereof by the Contractor after completion of the Work. The Owner may, at its option, require the Contractor's surety or sureties to complete the Work in accordance with the Contract Documents. If the Owner elects to terminate this Contract pursuant to the provisions of this Section and it is subsequently determined that none of the foregoing events have occurred, then such termination, at Owner's election, may be deemed a termination pursuant to Subsection 16.2.3.

16.2.2 When the Work is fully completed by the Owner, if the costs incurred by the Owner in finishing the Work, including the cost of any additional services of the Engineer or others, when added to the payments made to the Contractor prior to termination, exceed the Contract Sum, the Contractor or its sureties shall pay the amount of such excess to the Owner, together with interest thereon from the date incurred by the Owner until paid by the Contractor at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston. If the sum of such costs and payments is less than the Contract Sum,

the Contractor shall be paid for any costs, as certified by the Engineer on the basis of its determination of "cost" under Subsection 13.1.8, incurred by the Contractor but not paid for prior to the termination, to the extent that such payment does not cause the total of payments to the Contractor when added to the cost of finishing the Work to exceed the Contract Sum. In case of such termination of the Contract pursuant to this Article 16, the Owner may, at its election, assume and become liable for obligations, commitments and unsettled claims that the Contractor has previously undertaken or incurred in good faith in connection with the Work. Without limiting the generality of the foregoing, the Owner shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of such assumption or assignment by the Owner, no such Subcontractor shall have any claim against the Owner or such third party for Work performed by such Subcontractor or other matters arising prior to termination of the Contract except as expressly provided by law, and the Owner or such third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after such assumption. Should the Owner so elect, the Contractor shall execute and deliver all such documents and take all such steps, including the legal assignment of its contractual rights, as the Owner may require, for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the Owner for expenses and damages suffered by the Owner as a result of any default, acts or omissions of the Contractor.

16.2.3 Upon fifteen (15) days' written notice, the Owner shall have the right to terminate the Contract at any time and for any reason whether or not any of the events specified in Subsection 16.2.1 shall have occurred, and the Owner shall incur no liability to the Contractor or any other person by reason of such termination. In the event of such termination, the Owner shall pay to the Contractor a sum equivalent to the unpaid Contract Sum attributable to the percentage of Work completed, as determined by the Engineer, pursuant to the Contract Documents and accepted by the Owner.

16.2.4 In the event of a termination of the Contract pursuant to this Article 16, the Owner and the Contractor shall forthwith return to the other all papers, materials and other properties of the other held by each for the purposes of execution and performance of the Contract Documents. In addition, each party will assist the other party in an orderly termination of this Contract.

ARTICLE 17 OWNER'S RIGHT TO STOP THE WORK AND TO CARRY OUT THE WORK

17.1 OWNER'S RIGHT TO STOP THE WORK

17.1.1 If, in the sole judgment of the Owner, the Contractor fails to commence to correct and diligently pursue the correction of defective work as required by Section 14.2 or

fails to carry out the Work in accordance with the Contract Documents, the Owner may, by a written order through the Owner's Representative, and without prejudice to any other remedy the Owner may have, order the Contractor to stop the Work or any portion thereof, and the Contractor shall not thereafter incur any further cost or expense therefor without the Owner's prior written approval, until the cause for such order has been eliminated. Notwithstanding the foregoing, the right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

17.2 OWNER'S RIGHT TO CARRY OUT THE WORK

17.2.1 If the Contractor fails to perform the Work diligently and in a timely manner or defaults or neglects to carry out the Work in accordance with the Contract Documents or otherwise fails to perform its obligations under the Contract Documents, the Owner may, without prejudice to any other remedy it may have, make good such deficiencies, provided, however, that the Owner shall not take any action to perform the Work or to make good such deficiencies, except in the event of an emergency, unless the Contractor shall have failed, within seven (7) business days after receipt of written notice from the Owner of such failure, default or neglect, to commence corrective action and thereafter to promptly and diligently pursue the corrective action to completion. If the Owner undertakes to make good such deficiencies, the Owner may take possession of the Site or any portion thereof and possession and use of any and all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor in order to make good such deficiencies by whatever method it may deem expedient. The Owner shall not be liable for any depreciation, loss or damage to such materials, equipment or tools during such use thereof. Further, if the Owner undertakes to make good such deficiencies, an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation additional services of the Engineer and others made necessary by such default, neglect or failure, and the Contract Sum shall be likewise reduced. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, then, as provided in Subsection 16.2.2, the Contractor shall, within thirty (30) days of receipt of an invoice therefor, pay to the Owner the difference with interest thereon. Further, if the Contractor fails, within such seven (7) business day notice period, to commence corrective action and thereafter to promptly and diligently pursue correction of such deficiencies, or fails to carry out the Work in a timely manner in accordance with the Contract Documents, or if the Engineer advises the Owner that the Project cannot reasonably be completed by the Contractor within the Contract Time, then, at the request of the Owner, the Contractor's surety shall promptly complete the Work in accordance with the terms of the Contract Documents.

ARTICLE 18 POST-COMPLETION WARRANTY AND CORRECTIVE WORK

18.1 CONTRACTOR'S WARRANTIES

18.1.1 In addition to the Contractor's obligations under Subsection 14.2.2 hereof, the Contractor guarantees and warrants to the Owner and the Engineer that all materials and equipment furnished under the Contract Documents will be new and of recent manufacture unless otherwise expressly required or permitted by the Contract Documents, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents in all respects. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective or as failing to conform to the Contract Documents.

18.1.2 It is specifically agreed that the Contractor's warranties of materials, equipment and labor under this Article 18 and all other warranties, guarantees, responsibilities and liabilities of the Contractor under the Contract Documents or otherwise provided under law, shall apply to products and equipment, if any, furnished by the Owner as referred to in the Specifications and to the installation thereof by the Contractor or its Subcontractors under this Contract as fully as if such products and equipment had been purchased directly by the Contractor for incorporation in the Work. The Contractor acknowledges that it has received and approved all information and specifications for such Owner-furnished products and equipment sufficient so as to permit the Contractor to make this agreement. Such specifications for Owner-furnished products and equipment shall be considered a part of the Contract Documents, and such Owner-furnished products and equipment, upon delivery to and acceptance by the Contractor, shall become part of the Work. The Owner shall assign to the Contractor all warranties of any materials or equipment furnished by the Owner and installed by the Contractor or its Subcontractors under the Contract. The Owner and the Contractor agree to cooperate as necessary to facilitate any claims under such warranties.

18.1.3 The Contractor shall obtain and preserve for the benefit of the Owner manufacturer's warranties on materials, fixtures and equipment incorporated into the Work, and the Contractor shall prepare and execute a written guarantee and warranty applicable to all phases of the Work in accordance with the provisions of this Article and all other applicable provisions of the Contract Documents pertaining to warranties and guarantees, and shall also secure and pass through to the Owner written guarantees and warranties prepared in a similar manner from each Subcontractor engaged in the performance of the Work and, prior to Substantial Completion, shall deliver complete sets of all such guarantees and warranties to the Engineer for review and approval in accordance with Subsection 3.7.4.

18.1.4 In the event that any work is performed to correct, repair or remedy any portion of the Work pursuant to any warranty or guarantee provided under the Contract Documents or otherwise available to the Owner, all such work, and all materials, equipment, supplies, appliances, fixtures and specialty devices requiring replacement during any guarantee period specified in the Contract Documents, shall be subject to a supplementary guarantee and warranty extending the guarantee or warranty period to cover all such work and all such items for the full guarantee or warranty period specified, beginning as of the date of acceptance of each such replacement item or element of work.

18.1.5 The warranty and guarantee provisions of this Article 18 shall be in addition to and not in limitation of any other warranties, guarantees, or remedies allowed by law or the Contract Documents.

18.1.6 No additional charge shall be made by the Contractor or by any Subcontractor for attending meetings at the Site to diagnose problems or to instruct the Owner's personnel in the proper operation or maintenance of the Work, or for making initial or seasonal adjustments (not including normal maintenance) of mechanical systems or other movable work during the applicable guarantee or warranty period (as it may be extended with respect to certain items pursuant to Subsection 18.1.4). The Contractor shall provide such service promptly upon notice from the Owner. In case of emergency, service shall be provided as necessary to avoid loss or damage or to maintain normal use of the premises. The Contractor shall furnish to the Engineer and to the Owner a list of names and telephone numbers, with a back-up name and telephone number, covering each area of potential emergency.

ARTICLE 19 DISPUTE RESOLUTION

19.1 GOVERNING LAW; VENUE

19.1.1 The Contract and all modifications, amendments, or alterations thereto, if any, shall be governed by the laws of the Commonwealth of Massachusetts. The Contractor, all Subcontractors, and other persons performing any part of the Work agree that each of them shall be subject to the jurisdiction of the courts of the Commonwealth of Massachusetts or the federal courts for the District of Massachusetts with respect to any actions or suits at law or in equity arising out of or related to the bidding, award or performance of the Contract, subject to the dispute resolution provisions set forth herein.

19.2 CLAIMS AND DISPUTES

19.2.1 All claims, disputes or other matters in controversy between the Contractor and the Owner relating to the execution and progress of the Work or the interpretation of the Contract Documents, and any claims, disputes, and other matters in question relating to whether the Contractor's performance of the Work complies with the Contract Documents, which cannot be resolved by agreement between them, shall be referred to the Engineer in writing for initial determination, with a copy to the other party. The Engineer shall afford both parties a reasonable opportunity to present written evidence in support of their respective positions. The Engineer shall render its decision in writing to each of the parties within a reasonable time and in no event later than thirty (30) days after the receipt of submissions from the parties.

19.2.2 No such claim, dispute or other matter in question shall constitute grounds for the Contractor to delay progress of the Work, and the Contractor shall carry on the Work and maintain its progress during consideration of any such claim, dispute or other matter by the Engineer. The decision of the Engineer with respect to any and all such claims, disputes

or other matters in question shall be final and conclusive, provided that any party having complied with the provisions of Subsection 19.2.3, below, may file an action in a court of competent jurisdiction challenging the decision of the Engineer or otherwise seeking final resolution of the claim, dispute or other matter in question.

19.2.3 The decision of the Engineer on any such claim, dispute or other matter in question shall be final and binding upon the Owner and the Contractor, unless the Owner or the Contractor gives written notice to the other and to the Engineer of its objection to such decision within ten (10) days after receipt by such aggrieved party of the Engineer's decision and commences an action challenging the Engineer's decision in a court of competent jurisdiction within the time permitted by law. If either party fails to give notice of objection to the Engineer's decision within such ten (10) day period, it shall be conclusively deemed to have waived its right to object to such decision. If the Engineer renders a decision after court proceedings have been commenced, such decision may be entered as evidence but will not supersede any such proceedings unless the decision is acceptable to all parties concerned. Nothing contained in this Article 19 shall limit the Owner's right to damages for delays by the Contractor or any other rights or remedies of the Owner under the Contract Documents or otherwise available under Applicable Law.

19.2.4 Prior to commencing litigation as to any claim, dispute or other matter in controversy, the parties shall discuss the possibility of resolution of such claim, dispute or controversy through non-binding mediation or other alternative dispute resolution methods. If the parties agree to mediation, the fees and expenses of the mediator shall be borne equally by the parties unless otherwise agreed.

19.2.5 Pursuant to M.G.L. c. 30, § 39J, notwithstanding any contrary provision of this Contract, no decision by the Owner or by the Engineer on a dispute, whether of fact or of law, arising under the Contract shall be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, or arbitrarily, is unsupported by substantial evidence, or is based upon error of law.

ARTICLE 20 MISCELLANEOUS PROVISIONS

20.1 NOTICE

20.1.1 Whenever written notice is required or permitted pursuant to the Contract Documents, the same shall be deemed to have been properly given if in writing and delivered by hand in person or by registered or certified mail, postage prepaid, or express overnight courier service, return receipt requested; and, in the case of notices to the Owner, to the address set forth at the beginning of the Agreement and, in the case of notices to the Owner's Representative or the Engineer, to the address set forth at the beginning of the Agreement, marked to the attention of the Owner's Representative or Engineer, as the case may be, and, in the case of notices to the Contractor, to the Contractor's Project Executive or Project Manager, addressed to such person at the Contractor's mailing address set forth at the beginning of the

Agreement or the Contractor's field office at the Site. Any of the persons or addresses specified above for notice purposes may be changed by notice given in the manner provided herein from the party concerned to each of the other parties. Written notice shall be deemed to be given on the day received, if delivered by hand in person; on the next business day after mailing if sent by express overnight courier service; and three (3) business days after mailing if sent by registered or certified mail.

20.2 CONTRACT DOCUMENTS

20.2.1 The Contract Documents form the comprise the entire Contract between the Owner and the Contractor, and supersede all prior negotiations, representations and agreements, whether written or oral. Subject to the provisions of Article 6, the Contractor may not assign its rights or obligations under all or any portion of the Contract Documents nor shall the Contractor assign any moneys due or to become due under the Contract Documents without the written consent of the Owner, which consent may be withheld or granted in its sole discretion. Any such assignment without the written consent of the Owner shall be void and the assignee in such case shall acquire no rights in the Contract or to receive any moneys. Nothing contained in the Contract Documents shall be construed to modify or affect in any way the rights and obligations of the Owner and the Engineer under any contract or agreement between the Owner and the Engineer.

20.2.2 The Contract shall be governed by the laws of the Commonwealth of Massachusetts. The Contractor, all Subcontractors, and other persons performing any part of the Work agree that each of them shall be subject to the jurisdiction of the courts of Suffolk County in the Commonwealth of Massachusetts or the federal courts for the District of Massachusetts with respect to any actions or suits at law or in equity arising out of or related to the bidding, award or performance of the Contract, and that any such actions or suits commenced by any of such parties shall be commenced in the courts or appropriate administrative tribunals of Suffolk County in the Commonwealth of Massachusetts or the federal courts for the District of Massachusetts and not otherwise.

20.3 RIGHTS AND REMEDIES

20.3.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

20.3.2 No action or failure to act by the Owner, Owner's Representative, Engineer, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

20.3.3 No consent, express or implied, by the Owner, the Owner's Representative, or the Engineer to any breach of any covenant, condition or duty of the

Contractor, or waiver, express or implied, by any of same, shall be construed as a consent to or waiver of any other breach of the same or any other covenant, condition or duty.

20.4 DECISIONS AND INTERPRETATIONS

20.4.1 Pursuant to M.G.L. c. 39, § 39P, in every case in which this Contract requires the Owner, any official, the Owner's Representative, or the Engineer to make a decision on interpretation of the Specifications, approval of equipment, material or any other approval, or progress of the Work, the decision shall be made promptly and, in any event, no later than thirty (30) days after the written submission for decision containing all information necessary in the judgment of the Engineer to render such decision; but if such decision requires extended investigation and study, the Owner, the official, the Owner's Representative, or the Engineer shall, within thirty (30) days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made.

20.5 ANTI-BOYCOTT COVENANT

20.5.1 The Contractor warrants, represents and agrees that during the time the Contract is in effect, neither it nor any affiliated company, as hereafter defined, shall participate in or cooperate with an international boycott, as defined in Section 999(b)(3) and (4) of the Internal Revenue Code of 1954, as amended, or shall engage in conduct declared to be unlawful by M.G.L. c. 151E, § 2. If there shall be a breach in the warranty, representation, and agreement contained in this Subsection, then without limiting such other rights as it may have, the Owner shall be entitled to rescind the Agreement. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Contractor or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interest of the Contractor, or which directly or indirectly owns at least 51% of the ownership interests of the Contractor. This provision is included in the Agreement pursuant to Commonwealth of Massachusetts Executive Order No. 130.

20.6 RIGHT OF AUDIT

20.6.1 Without limiting any of the Owner's other rights under the Contract Documents, the Governor of the Commonwealth of Massachusetts or his or her designee, the Secretary of Administration and Finance of the Commonwealth of Massachusetts, and the State Auditor or his or her designee shall have the right at reasonable times and upon reasonable notice to examine the books, records and other compilations of data of the Contractor and all Subcontractors which pertain to the performance of the provisions and requirements of the Contract. This provision is included in the Contract pursuant to Commonwealth of Massachusetts Executive Order No. 195.

20.7 RECORD KEEPING AND REPORTING

20.7.1 The Contractor shall maintain at the Site or at such other location as shall be approved by the Owner, on a current basis, during the term of the Agreement and shall retain for a period of six (6) years after the date of Final Payment, records of all Subcontracts, material orders, Shop Drawings, Samples, and other Project-related documents and revisions thereto which arise out of the Contract, the Contract Documents or the Work, including, but not limited to, the following:

(a) A detailed daily log of all events occurring on the Site or connected with progress of the Project. Such log shall include a listing of the Contractor staffing, manpower by Subcontractors, relevant weather information and names and purpose of all visitors to the Site. Copies of such daily logs shall be distributed weekly to the Owner's Representative;

(b) Copies of the Project Schedule as more specifically set forth in Article 9 of these General Conditions, and Schedules of Values as more specifically set forth in Article 10 of these General Conditions, and all updates thereto to reflect current conditions;

(c) A set of as-built Drawings and Specifications which records all changes made during construction and actual as-built conditions in accordance with the requirements of the Contract Documents; and

(d) Correspondence, meeting notes and minutes, clarifications and interpretations of the Contract Documents issued by the Engineer, progress reports, all other Project related documents.

20.7.2 The Contractor shall furnish to the Owner on a weekly basis, a Progress Report for the preceding week, in form and substance acceptable to the Owner, containing, without limitation, the following information:

(a) Project Schedule, updated against baseline;

(b) List and status of outstanding issues, claims or disputes, or information required from the Owner;

(c) Safety record report.

(d) Certified payroll reports; and

(e) Suggestions for solutions to outstanding issues and schedule delays.

20.7.3 The Contractor shall provide a system of Project monitoring and reporting. The Contractor shall assist the Owner in developing and implementing a Change Order control system. Such reports and other information shall be included in the weekly progress reports to be submitted to the Owner in accordance with the Contract Documents, and the provisions of Subsection 20.7.2 hereof.

20.7.4 The Contractor shall establish and implement procedures for preparing and/or reviewing and processing Requests for Information and/or clarifications and interpretations of the Contract Documents, Shop Drawings, Samples and other submittals, requests for Construction Change Directives, requests for Change Orders, proposals for substitutions, Payment Applications, as-built Drawings and maintenance of logs.

20.7.5 The Contractor shall check all materials, equipment and labor entering into the Work and shall keep such full and detailed accounts as may be necessary for proper accounting and financial management under the Contract, utilizing such procedures as shall be satisfactory to the Owner. The Owner shall, upon request, be afforded copies of, and access to, all of the Contractor's records, books, correspondence, subcontracts, instructions, drawings, estimates, budgets, receipts, invoices, vouchers, memoranda, breakdowns, accounting data, bid proposals, cost control information and any other documents relating to the Work, in a form acceptable to the Owner.

20.7.6 Without limitation of the foregoing, the Owner shall have the right, at any time and from time to time, upon notice to the Contractor, to monitor and audit the Contractor's books and records in connection with any aspect of the Agreement or the Contract Documents at the Contractor's offices at the Contractor's sole cost and expense. The Contractor shall facilitate any such audit by making necessary facilities available to the Owner and its representatives. Further provisions concerning the Contractor's records and the Owner's right to audit such records are set forth in the General Conditions.

20.7.7 If any inspection of the Contractor's books, records or other documents reveals an overcharge with respect to the Contract Sum, the Contractor shall pay the Owner or, at the Owner's election, the Owner may reimburse itself by taking as a credit against future payments due the Contractor, an amount equal to the overcharge plus the administrative and auditing expenses incurred by the Owner in determining the existence and amount of the overcharge. Nothing contained in this provision is intended as a limitation of any other rights or remedies which may be available to the Owner, be they civil or criminal.

20.8 FINANCIAL RECORDS OF CONTRACTOR

20.8.1 The provisions of this Section 20.8 are included in this Contract pursuant to Massachusetts General Laws Chapter 30, § 39R:

(a) The Contractor shall make, and keep for at least six (6) years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor, and

(b) until the expiration of six years after final payment, the Office of Inspector General, and the Commissioner of Capital Asset Management and Maintenance shall have the right to examine any books, documents, papers or records of the Contractor or of its Subcontractor that directly pertain to, and involve transactions relating to, the Contractor or its Subcontractors, and

(c) the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the Owner, including in its description the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(d) the Contractor has filed a statement of management on internal accounting controls as set forth in Subsection 20.8.2 below prior to the execution of the Contract, and

(e) the Contractor has filed prior to the execution of the Contract and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in Subsection 20.8.4.

20.8.2 Every Contractor awarded a contract shall file with the Owner a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

(a) transactions are executed in accordance with management's general and specific authorization;

(b) transactions are recorded as necessary

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. to maintain accountability for assets;

(c) access to assets is permitted only in accordance with management's general or specific authorization; and

(d) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

20.8.3 Every Contractor awarded a contract shall also file with the Owner a statement prepared and signed by an independent certified public accountant, stating that s/he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(a) whether the representations of management in response to this Section and Subsection 20.8.1 above are consistent with the result of management's evaluation of the system of internal accounting controls and

(b) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial condition.

20.8.4 Every Contractor awarded a contract by the Commonwealth or by any political subdivision thereof shall annually file with Commissioner of Capital Asset Management and Maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the Owner upon request.

20.8.5 Records and statements required to be made, kept or filed under the provisions of M.G.L. c. 30, § 39R shall not be public records as defined in M.G.L. c. 4, § 7, and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of Subsection 20.8.1(b).

20.8.6 As used in this Section 20.8, the following terms have the meanings set forth below:

(a) "Contract" means any contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven [now sections 38A½ through 38O] and any contract awarded or executed pursuant to section thirty-nine M of chapter thirty, or sections forty-four A through H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(b) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

(c) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(d) "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of

expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(e) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which s/he has made and sets forth his/her opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.

(f) "Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

20.9 FALSE ENTRY

20.9.1 The attention of the Contractor is called to M.G.L. c. 266, § 67C, which provides:

Any person who knowingly and willfully, directly or indirectly makes, or knowingly and willfully causes to be made, a false entry or omission of a true entry in any books, record or account subject to the provisions of section thirty-nine R of chapter thirty shall be punished by a fine of not more than five thousand dollars, or by imprisonment in the state prison for not more than five years, or in the house of correction for not more than two years, or both.

END OF DOCUMENT

4852-9014-4057.1

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS
Prevailing Wage Rates

MAURA HEALY
Governor
KIM DRISCOLL
Lt. Governor

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority:	Everett - Department of Public Works	**City/Town:**	EVERETT
Contract Number:	26-58		
Description of Work:	New construction includes bituminous concrete half-court basketball court, anew splash pad with associated equipment and utilities, and new playground equipment, including ADA compliance.		
Job Location:	79 Lynn Street, Everett, MA 02149		

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F “rental of equipment” contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	$42.05	$15.41	$21.78	$0.00	$0.00	$79.24
	6/1/2026	$43.05	$15.41	$21.78	$0.00	$0.00	$80.24
	8/1/2026	$43.05	$15.91	$21.78	$0.00	$0.00	$80.74
	12/1/2026	$43.05	$15.91	$23.52	$0.00	$0.00	$82.48
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	$41.12	$15.41	$21.78	$0.00	$0.00	$78.31
	6/1/2026	$43.12	$15.41	$21.78	$0.00	$0.00	$80.31
	8/1/2026	$43.12	$15.91	$21.78	$0.00	$0.00	$80.81
	12/1/2026	$43.12	$15.91	$23.52	$0.00	$0.00	$82.55
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	$42.24	$15.41	$21.78	$0.00	$0.00	$79.43
	6/1/2026	$43.24	$15.41	$21.78	$0.00	$0.00	$80.43
	8/1/2026	$43.24	$15.91	$21.78	$0.00	$0.00	$80.93
	12/1/2026	$43.24	$15.91	$23.52	$0.00	$0.00	$82.67
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"	1/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
AIR TRACK OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$49.35	$10.15	$9.50	$9.65	$0.00	$78.65
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$52.40	$10.15	$9.50	$9.65	$0.00	$81.70
	6/1/2027	$54.00	$10.15	$9.50	$9.65	$0.00	$83.30
	12/1/2027	$55.60	$10.15	$9.50	$9.65	$0.00	$84.90
	6/1/2028	$57.28	$10.15	$9.50	$9.65	$0.00	$86.58
	12/1/2028	$58.95	$10.15	$9.50	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$49.45	$10.15	$9.50	$9.65	$0.00	$78.75
	6/1/2026	$51.00	$10.15	$9.50	$9.65	$0.00	$80.30
	12/1/2026	$52.50	$10.15	$9.50	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	12/1/2025	$44.80	$14.50	$4.30	$6.75	$0.00	$70.35
ASPHALT RAKER LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
ASPHALT RAKER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BACKHOE/FRONT-END LOADER	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
LABORERS	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
LABORERS - ZONE 1	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER	12/1/2025	$49.35	$10.15	$9.50	$9.65	$0.00	$78.65
LABORERS	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
LABORERS - ZONE 1	12/1/2026	$52.40	$10.15	$9.50	$9.65	$0.00	$81.70
	6/1/2027	$54.00	$10.15	$9.50	$9.65	$0.00	$83.30
	12/1/2027	$55.60	$10.15	$9.50	$9.65	$0.00	$84.90
	6/1/2028	$57.28	$10.15	$9.50	$9.65	$0.00	$86.58
	12/1/2028	$58.95	$10.15	$9.50	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY)	12/1/2025	$49.45	$10.15	$9.50	$9.65	$0.00	$78.75
LABORERS	6/1/2026	$51.00	$10.15	$9.50	$9.65	$0.00	$80.30
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	$52.50	$10.15	$9.50	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
BOILER MAKER	1/1/2024	$48.12	$7.07	$14.60	$6.00	$0.00	$75.79
BOILERMAKERS LOCAL 29							
BOILERMAKERS LOCAL 29							

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
2	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
3	70.00	$33.68	$7.07	$10.03	$4.20	$0.00	$54.98
4	75.00	$36.09	$7.07	$10.74	$4.50	$0.00	$58.40
5	80.00	$38.50	$7.07	$11.45	$4.80	$0.00	$61.82
6	85.00	$40.90	$7.07	$12.18	$5.10	$0.00	$65.25

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
7	90.00	$43.31	$7.07	$12.88	$5.40	$0.00	$68.66
8	95.00	$45.71	$7.07	$13.62	$5.70	$0.00	$72.10

Apprentice to Journeyworker Ratio: 1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (BOSTON)	8/1/2025	$67.95	$11.49	$15.57	$8.02	$0.00	$103.03
	2/1/2026	$69.30	$11.49	$15.57	$8.02	$0.00	$104.38
	8/1/2026	$71.50	$11.49	$15.57	$8.02	$0.00	$106.58
	2/1/2027	$72.90	$11.49	$15.57	$8.02	$0.00	$107.98

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.98	$11.49	$15.57	$8.02	$0.00	$69.06
2	60.00	$40.77	$11.49	$15.57	$8.02	$0.00	$75.85
3	70.00	$47.57	$11.49	$15.57	$8.02	$0.00	$82.65
4	80.00	$54.36	$11.49	$15.57	$8.02	$0.00	$89.44
5	90.00	$61.16	$11.49	$15.57	$8.02	$0.00	$96.24

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.65	$11.49	$15.57	$8.02	$0.00	$69.73
2	60.00	$41.58	$11.49	$15.57	$8.02	$0.00	$76.66
3	70.00	$48.51	$11.49	$15.57	$8.02	$0.00	$83.59
4	80.00	$55.44	$11.49	$15.57	$8.02	$0.00	$90.52
5	90.00	$62.37	$11.49	$15.57	$8.02	$0.00	$97.45

Apprentice to Journeyworker Ratio: 1:5

BULLDOZER/GRADER/SCRAPER OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN LABORERS LABORERS - FOUNDATION AND MARINE	12/1/2025	$49.85	$10.15	$9.50	$9.80	$0.00	$79.30
	6/1/2026	$51.40	$10.15	$9.50	$9.80	$0.00	$80.85
	12/1/2026	$52.90	$10.15	$9.50	$9.80	$0.00	$82.35

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
LABORERS - FOUNDATION AND MARINE	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING TOP MAN	12/1/2025	$49.03	$10.15	$9.50	$9.80	$0.00	$78.48
LABORERS	6/1/2026	$50.58	$10.15	$9.50	$9.80	$0.00	$80.03
LABORERS - FOUNDATION AND MARINE	12/1/2026	$52.08	$10.15	$9.50	$9.80	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"							
CARBIDE CORE DRILL OPERATOR	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
LABORERS	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
LABORERS - ZONE 1	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
CARPENTER	9/1/2025	$61.44	$10.33	$11.47	$8.50	$0.00	$91.74
CARPENTERS	3/1/2026	$62.94	$10.33	$11.47	$8.50	$0.00	$93.24
CARPENTERS -ZONE 1 (Metro Boston)	9/1/2026	$64.44	$10.33	$11.47	$8.50	$0.00	$94.74
	3/1/2027	$65.94	$10.33	$11.47	$8.50	$0.00	$96.24

Apprentice: CARPENTER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$27.65	$10.33	$0.00	$1.73	$0.00	$39.71
2	45.00	$27.65	$10.33	$0.00	$1.73	$0.00	$39.71
3	55.00	$33.79	$10.33	$0.00	$3.40	$0.00	$47.52
4	55.00	$33.79	$10.33	$0.00	$3.40	$0.00	$47.52
5	70.00	$43.01	$10.33	$11.41	$5.10	$0.00	$69.85
6	70.00	$43.01	$10.33	$11.41	$5.10	$0.00	$69.85
7	80.00	$49.15	$10.33	$11.44	$6.80	$0.00	$77.72
8	80.00	$49.15	$10.33	$11.44	$6.80	$0.00	$77.72

Apprentice: CARPENTER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$28.32	$10.33	$0.00	$1.73	$0.00	$40.38
2	45.00	$28.32	$10.33	$0.00	$1.73	$0.00	$40.38
3	55.00	$34.62	$10.33	$0.00	$3.40	$0.00	$48.35
4	55.00	$34.62	$10.33	$0.00	$3.40	$0.00	$48.35
5	70.00	$44.06	$10.33	$11.41	$5.10	$0.00	$70.90
6	70.00	$44.06	$10.33	$11.41	$5.10	$0.00	$70.90
7	80.00	$50.35	$10.33	$11.44	$6.80	$0.00	$78.92

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/1/2025	$32.91	$7.10	$4.47	$2.20	$0.00	$46.68
CARPENTERS	10/1/2026	$34.21	$7.10	$4.47	$2.20	$0.00	$47.98
CARPENTERS -ZONE 2 (Wood Frame)							

All Aspects of New Wood Frame Work

Apprentice: CARPENTER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
8	80.00	$50.35	$10.33	$11.44	$6.80	$0.00	$78.92

Apprentice to Journeyworker Ratio: 1:5

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$16.46	$7.02	$0.00	$0.00	$0.00	$23.48
2	50.00	$16.46	$7.02	$0.00	$0.00	$0.00	$23.48
3	55.00	$18.10	$7.02	$0.00	$2.00	$0.00	$27.12
4	55.00	$18.10	$7.02	$0.00	$2.20	$0.00	$27.32
5	70.00	$23.04	$7.02	$4.47	$2.20	$0.00	$36.73
6	70.00	$23.04	$7.02	$4.47	$2.20	$0.00	$36.73
7	80.00	$26.33	$7.02	$4.47	$2.20	$0.00	$40.02
8	80.00	$26.33	$7.02	$4.47	$2.20	$0.00	$40.02

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$17.11	$7.10	$0.00	$0.00	$0.00	$24.21
2	50.00	$17.11	$7.10	$0.00	$0.00	$0.00	$24.21
3	55.00	$18.82	$7.10	$0.00	$2.20	$0.00	$28.12
4	55.00	$18.82	$7.10	$0.00	$2.20	$0.00	$28.12
5	70.00	$23.95	$7.10	$4.47	$2.20	$0.00	$37.72
6	70.00	$23.95	$7.10	$4.47	$2.20	$0.00	$37.72
7	80.00	$27.37	$7.10	$4.47	$2.20	$0.00	$41.14
8	80.00	$27.37	$7.10	$4.47	$2.20	$0.00	$41.14

Apprentice to Journeyworker Ratio: 1:5

CEMENT MASONRY/PLASTERING	7/1/2024	$49.19	$13.35	$16.43	$7.78	$1.80	$88.55
BRICKLAYERS LOCAL 3							
BRICKLAYERS LOCAL 3 (BOSTON)							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: CEMENT MASONRY/PLASTERING

Effective Date: 7/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.60	$13.35	$16.43	$0.00	$0.00	$54.38
2	60.00	$29.51	$13.35	$16.43	$2.78	$1.80	$63.87
3	65.00	$31.97	$13.35	$16.43	$3.78	$1.80	$67.33
4	70.00	$34.43	$13.35	$16.43	$4.78	$1.80	$70.79
5	75.00	$36.89	$13.35	$16.43	$5.78	$1.80	$74.25
6	80.00	$39.35	$13.35	$16.43	$6.78	$1.80	$77.71
7	90.00	$44.27	$13.35	$16.43	$7.78	$1.80	$83.63

Apprentice to Journeyworker Ratio: 1:3

CHAIN SAW OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$60.48	$16.05	$13.25	$3.25	$0.00	$93.03
	6/1/2026	$61.81	$16.05	$13.25	$3.25	$0.00	$94.36
	12/1/2026	$63.29	$16.05	$13.25	$3.25	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$37.97	$16.05	$13.25	$3.25	$0.00	$70.52
	6/1/2026	$38.83	$16.05	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$39.78	$16.05	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DELEADER (BRIDGE) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

DEMO: ADZEMAN	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
LABORERS	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
LABORERS - ZONE 1	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
LABORERS	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
LABORERS - ZONE 1	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BURNERS	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
LABORERS	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
LABORERS - ZONE 1	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: CONCRETE CUTTER/SAWYER	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
LABORERS	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
LABORERS - ZONE 1	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
LABORERS	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
LABORERS - ZONE 1	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER LABORERS LABORERS - ZONE 1	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$78.11	$10.08	$11.62	$10.04	$0.00	$109.85
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate							
DIVER TENDER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate							
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$83.69	$10.08	$11.62	$12.67	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"							
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"							
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888 DRAWBRIDGE - SEIU LOCAL 888	7/1/2020	$26.77	$6.67	$3.93	$0.00	$0.16	$37.53
ELECTRICIAN ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: ELECTRICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
2	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
3	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
4	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
5	50.00	$33.09	$13.00	$13.37	$4.36	$0.00	$63.82
6	55.00	$36.39	$13.00	$13.47	$4.80	$0.00	$67.66
7	60.00	$39.70	$13.00	$13.57	$5.23	$0.00	$71.50
8	65.00	$43.01	$13.00	$13.67	$5.67	$0.00	$75.35
9	70.00	$46.32	$13.00	$13.77	$6.10	$0.00	$79.19
10	75.00	$49.63	$13.00	$13.87	$6.54	$0.00	$83.04

Apprentice: ELECTRICIAN

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$26.74	$13.00	$0.80	$0.00	$0.00	$40.54
2	40.00	$26.74	$13.00	$0.80	$0.00	$0.00	$40.54
3	45.00	$30.09	$13.00	$13.53	$4.05	$0.00	$60.67
4	45.00	$30.09	$13.00	$13.53	$4.05	$0.00	$60.67
5	50.00	$33.43	$13.00	$13.63	$4.50	$0.00	$64.56
6	55.00	$36.77	$13.00	$13.73	$4.95	$0.00	$68.45
7	60.00	$40.12	$13.00	$13.83	$5.40	$0.00	$72.35
8	65.00	$43.46	$13.00	$13.93	$5.85	$0.00	$76.24
9	70.00	$46.80	$13.00	$14.03	$6.30	$0.00	$80.13
10	75.00	$50.15	$13.00	$14.13	$6.75	$0.00	$84.03

Apprentice Notes

:

Apprentice to Journeyworker Ratio: 2:3

ELEVATOR CONSTRUCTOR	1/1/2026	$77.26	$16.38	$11.06	$10.70	$0.00	$115.40
ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	$80.55	$16.48	$11.16	$11.00	$0.00	$119.19
ELEVATOR CONSTRUCTORS LOCAL 4							

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$38.63	$0.00	$0.00	$0.00	$0.00	$38.63
2	55.00	$42.49	$16.38	$11.06	$10.70	$0.00	$80.63

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
3	65.00	$50.22	$16.38	$11.06	$10.70	$0.00	$88.36
4	70.00	$54.08	$16.38	$11.06	$10.70	$0.00	$92.22
5	80.00	$61.81	$16.38	$11.06	$10.70	$0.00	$99.95

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2027

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$40.28	$0.00	$0.00	$0.00	$0.00	$40.28
2	55.00	$44.30	$16.48	$11.16	$11.00	$0.00	$82.94
3	65.00	$52.36	$16.48	$11.16	$11.00	$0.00	$91.00
4	70.00	$56.39	$16.48	$11.16	$11.00	$0.00	$95.03
5	80.00	$64.44	$16.48	$11.16	$11.00	$0.00	$103.08

Apprentice to Journeyworker Ratio: 1:1

ELEVATOR CONSTRUCTOR HELPER	1/1/2026	$54.08	$16.38	$11.06	$10.07	$0.00	$91.59
ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	$56.39	$16.48	$11.16	$11.00	$0.00	$95.03
ELEVATOR CONSTRUCTORS LOCAL 4							
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"							
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
LABORERS	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	11/1/2025	$53.56	$16.05	$13.25	$3.25	$0.00	$86.11
OPERATING ENGINEERS LOCAL 4	5/1/2026	$55.00	$16.05	$13.25	$3.25	$0.00	$87.55
OPERATING ENGINEERS LOCAL 4	11/1/2026	$56.29	$16.05	$13.25	$3.25	$0.00	$88.84
	5/1/2027	$57.72	$16.05	$13.25	$3.25	$0.00	$90.27
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	11/1/2025	$55.17	$16.05	$13.25	$3.25	$0.00	$87.72
OPERATING ENGINEERS LOCAL 4	5/1/2026	$56.62	$16.05	$13.25	$3.25	$0.00	$89.17
OPERATING ENGINEERS LOCAL 4	11/1/2026	$57.92	$16.05	$13.25	$3.25	$0.00	$90.47
	5/1/2027	$59.37	$16.05	$13.25	$3.25	$0.00	$91.92
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY	11/1/2025	$26.03	$16.05	$13.25	$3.25	$0.00	$58.58
OPERATING ENGINEERS LOCAL 4	5/1/2026	$26.88	$16.05	$13.25	$3.25	$0.00	$59.43
OPERATING ENGINEERS LOCAL 4	11/1/2026	$27.64	$16.05	$13.25	$3.25	$0.00	$60.19
	5/1/2027	$28.49	$16.05	$13.25	$3.25	$0.00	$61.04
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
FIRE ALARM INSTALLER	9/1/2025	$66.17	$13.00	$14.37	$9.00	$0.00	$102.54
ELECTRICIANS LOCAL 103	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
ELECTRICIANS LOCAL 103	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
/ COMMISSIONING	3/1/2026	$53.49	$13.00	$14.23	$7.20	$0.00	$87.92
ELECTRICIANS LOCAL 103	9/1/2026	$55.02	$13.00	$14.28	$7.20	$0.00	$89.50
ELECTRICIANS LOCAL 103	3/1/2027	$55.98	$13.00	$14.31	$7.20	$0.00	$90.49
	9/1/2027	$57.50	$13.00	$14.36	$7.20	$0.00	$92.06
	3/1/2028	$58.46	$13.00	$14.38	$7.20	$0.00	$93.04
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN (ASST. ENGINEER)	12/1/2025	$47.69	$16.05	$13.25	$3.25	$0.00	$80.24
OPERATING ENGINEERS LOCAL 4	6/1/2026	$48.75	$16.05	$13.25	$3.25	$0.00	$81.30
OPERATING ENGINEERS LOCAL 4	12/1/2026	$49.93	$16.05	$13.25	$3.25	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	12/1/2025	$28.09	$10.15	$9.50	$9.65	$0.00	$57.39
LABORERS	6/1/2026	$29.21	$10.15	$9.50	$9.65	$0.00	$58.51
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	$29.21	$10.15	$9.50	$9.65	$0.00	$58.51
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FLOORCOVERER	9/1/2025	$57.74	$10.33	$11.47	$8.80	$0.00	$88.34
FLOORCOVERERS LOCAL 2168	3/1/2026	$59.24	$10.33	$11.47	$8.80	$0.00	$89.84
FLOORCOVERERS LOCAL 2168 ZONE I	9/1/2026	$60.74	$10.33	$11.47	$8.80	$0.00	$91.34
	3/1/2027	$62.24	$10.33	$11.47	$8.80	$0.00	$92.84

Apprentice: FLOORCOVERER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.98	$10.33	$0.00	$1.76	$0.00	$38.07
2	45.00	$25.98	$10.33	$0.00	$1.76	$0.00	$38.07
3	55.00	$31.76	$10.33	$0.00	$3.52	$0.00	$45.61
4	55.00	$31.76	$10.33	$0.00	$3.52	$0.00	$45.61
5	70.00	$40.42	$10.33	$11.47	$5.28	$0.00	$67.50
6	70.00	$40.42	$10.33	$11.47	$5.28	$0.00	$67.50
7	80.00	$46.19	$10.33	$11.47	$7.04	$0.00	$75.03
8	80.00	$46.19	$10.33	$11.47	$7.04	$0.00	$75.03

Apprentice: FLOORCOVERER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: FLOORCOVERER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$26.66	$10.33	$0.00	$1.76	$0.00	$38.75
2	45.00	$26.66	$10.33	$0.00	$1.76	$0.00	$38.75
3	55.00	$32.58	$10.33	$0.00	$3.52	$0.00	$46.43
4	55.00	$32.58	$10.33	$0.00	$3.52	$0.00	$46.43
5	70.00	$41.47	$10.33	$11.47	$5.28	$0.00	$68.55
6	70.00	$41.47	$10.33	$11.47	$5.28	$0.00	$68.55
7	80.00	$47.39	$10.33	$11.47	$7.04	$0.00	$76.23
8	80.00	$47.39	$10.33	$11.47	$7.04	$0.00	$76.23

Apprentice Notes

Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

FORK LIFT/CHERRY PICKER	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GENERATOR/LIGHTING PLANT/HEATERS	12/1/2025	$37.97	$16.05	$13.25	$3.25	$0.00	$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	$38.83	$16.05	$13.25	$3.25	$0.00	$71.38
OPERATING ENGINEERS LOCAL 4	12/1/2026	$39.78	$16.05	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	1/1/2026	$54.85	$10.35	$12.00	$12.60	$0.00	$89.80
GLAZIERS LOCAL 35							
GLAZIERS LOCAL 35 (ZONE 1)							

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.43	$10.35	$0.00	$0.00	$0.00	$37.78
2	55.00	$30.17	$10.35	$0.00	$6.88	$0.00	$47.40
3	60.00	$32.91	$10.35	$0.00	$7.50	$0.00	$50.76
4	65.00	$35.65	$10.35	$0.00	$8.13	$0.00	$54.13
5	70.00	$38.40	$10.35	$11.95	$8.75	$0.00	$69.45
6	75.00	$41.14	$10.35	$11.95	$9.38	$0.00	$72.82
7	80.00	$43.88	$10.35	$11.95	$10.00	$0.00	$76.18
8	90.00	$49.37	$10.35	$11.95	$11.25	$0.00	$82.92

Apprentice to Journeyworker Ratio: 1:1

HOISTING ENGINEER/CRANES/GRADALLS	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.88	$0.00	$0.00	$0.00	$0.00	$32.88
2	60.00	$35.87	$16.05	$13.25	$3.25	$0.00	$68.42
3	65.00	$38.86	$16.05	$13.25	$3.25	$0.00	$71.41
4	70.00	$41.85	$16.05	$13.25	$3.25	$0.00	$74.40
5	75.00	$44.84	$16.05	$13.25	$3.25	$0.00	$77.39
6	80.00	$47.82	$16.05	$13.25	$3.25	$0.00	$80.37
7	85.00	$50.81	$16.05	$13.25	$3.25	$0.00	$83.36
8	90.00	$53.80	$16.05	$13.25	$3.25	$0.00	$86.35

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$33.32	$0.00	$0.00	$0.00	$0.00	$33.32
2	60.00	$36.35	$16.05	$13.25	$3.25	$0.00	$68.90
3	65.00	$39.38	$16.05	$13.25	$3.25	$0.00	$71.93
4	70.00	$42.41	$16.50	$13.25	$3.25	$0.00	$75.41
5	75.00	$45.44	$16.50	$13.25	$3.25	$0.00	$78.44
6	80.00	$48.46	$16.50	$13.25	$3.25	$0.00	$81.46
7	85.00	$51.49	$16.50	$13.25	$3.25	$0.00	$84.49
8	90.00	$54.52	$16.50	$13.25	$3.25	$0.00	$87.52

Apprentice to Journeyworker Ratio: 1:6

HVAC (DUCTWORK)	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS)	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
ELECTRICIANS LOCAL 103	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
ELECTRICIANS LOCAL 103	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR)	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							

For apprentice rates see "Apprentice- SHEET METAL WORKER"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING -WATER) PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	9/1/2025	$69.08	$13.45	$13.75	$9.30	$0.00	$105.58
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HVAC MECHANIC PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	9/1/2025	$69.08	$13.45	$13.75	$9.30	$0.00	$105.58
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS LABORERS LABORERS - ZONE 1	12/1/2025	$49.35	$10.15	$9.50	$9.65	$0.00	$78.65
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$52.40	$10.15	$9.50	$9.65	$0.00	$81.70
	6/1/2027	$54.00	$10.15	$9.50	$9.65	$0.00	$83.30
	12/1/2027	$55.60	$10.15	$9.50	$9.65	$0.00	$84.90
	6/1/2028	$57.28	$10.15	$9.50	$9.65	$0.00	$86.58
	12/1/2028	$58.95	$10.15	$9.50	$9.65	$0.00	$88.25
For apprentice rates see "Apprentice- LABORER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$49.45	$10.15	$9.50	$9.65	$0.00	$78.75
	6/1/2026	$51.00	$10.15	$9.50	$9.65	$0.00	$80.30
	12/1/2026	$52.50	$10.15	$9.50	$9.65	$0.00	$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	9/1/2025	$60.34	$14.75	$9.52	$10.09	$0.00	$94.70
	9/1/2026	$63.76	$14.75	$9.52	$10.09	$0.00	$98.12

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$30.17	$14.75	$9.27	$5.05	$0.00	$59.24
2	60.00	$36.20	$14.75	$9.32	$6.05	$0.00	$66.32
3	70.00	$42.24	$14.75	$9.37	$7.06	$0.00	$73.42
4	80.00	$48.27	$14.75	$9.42	$8.07	$0.00	$80.51

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$31.88	$14.75	$9.27	$5.05	$0.00	$60.95
2	60.00	$38.26	$14.75	$9.32	$6.05	$0.00	$68.38
3	70.00	$44.63	$14.75	$9.37	$7.06	$0.00	$75.81
4	80.00	$51.01	$14.75	$9.42	$8.07	$0.00	$83.25

Apprentice to Journeyworker Ratio: 1:4

IRONWORKER/WELDER	9/16/2025	$57.87	$9.05	$12.75	$14.50	$0.00	$94.17

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
IRONWORKERS LOCAL 7 IRONWORKERS LOCAL 7 (BOSTON AREA)							

Apprentice: IRONWORKER/WELDER

Effective Date: 9/16/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$34.72	$9.05	$12.75	$4.50	$0.00	$61.02
2	75.00	$43.40	$9.05	$12.75	$4.50	$0.00	$69.70
3	85.00	$49.19	$9.05	$12.75	$4.50	$0.00	$75.49
4	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
5	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
6	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Apprentice to Journeyworker Ratio: 1:4

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75

For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS LABORERS - ZONE 1	12/1/2025	$48.60	$10.15	$9.50	$9.65	$0.00	$77.90
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$51.65	$10.15	$9.50	$9.65	$0.00	$80.95
	6/1/2027	$53.25	$10.15	$9.50	$9.65	$0.00	$82.55
	12/1/2027	$54.85	$10.15	$9.50	$9.65	$0.00	$84.15
	6/1/2028	$56.53	$10.15	$9.50	$9.65	$0.00	$85.83
	12/1/2028	$58.20	$10.15	$9.50	$9.65	$0.00	$87.50

Apprentice: LABORER

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$29.16	$10.15	$9.50	$9.65	$0.00	$58.46
2	70.00	$34.02	$10.15	$9.50	$9.65	$0.00	$63.32
3	80.00	$38.88	$10.15	$9.50	$9.65	$0.00	$68.18
4	90.00	$43.74	$10.15	$9.50	$9.65	$0.00	$73.04

Apprentice: LABORER

Effective Date: 6/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$30.09	$10.15	$9.50	$9.65	$0.00	$59.39

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: LABORER							
Effective Date: 6/1/2026							
Step / Percent		**Apprentice Base Wage**					
2 / 70.00		$35.11	$10.15	$9.50	$9.65	$0.00	$64.41
3 / 80.00		$40.12	$10.15	$9.50	$9.65	$0.00	$69.42
4 / 90.00		$45.14	$10.15	$9.50	$9.65	$0.00	$74.44
Apprentice to Journeyworker Ratio: 1:5							
LABORER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.70	$10.15	$9.50	$9.65	$0.00	$78.00
	6/1/2026	$50.25	$10.15	$9.50	$9.65	$0.00	$79.55
	12/1/2026	$51.75	$10.15	$9.50	$9.65	$0.00	$81.05
Apprentice: LABORER (HEAVY & HIGHWAY)							
Effective Date: 12/1/2025							
Step / Percent		**Apprentice Base Wage**					
1 / 60.00		$29.22	$10.15	$9.50	$9.65	$0.00	$58.52
2 / 70.00		$34.09	$10.15	$9.50	$9.65	$0.00	$63.39
3 / 80.00		$38.96	$10.15	$9.50	$9.65	$0.00	$68.26
4 / 90.00		$43.83	$10.15	$9.50	$9.65	$0.00	$73.13
Apprentice: LABORER (HEAVY & HIGHWAY)							
Effective Date: 6/1/2026							
Step / Percent		**Apprentice Base Wage**					
1 / 60.00		$30.15	$10.15	$9.50	$9.65	$0.00	$59.45
2 / 70.00		$35.18	$10.15	$9.50	$9.65	$0.00	$64.48
3 / 80.00		$40.20	$10.15	$9.50	$9.65	$0.00	$69.50
4 / 90.00		$45.23	$10.15	$9.50	$9.65	$0.00	$74.53
Apprentice to Journeyworker Ratio: 1:5							
LABORER: CARPENTER TENDER LABORERS LABORERS - ZONE 1	12/1/2025	$48.60	$10.15	$9.50	$9.65	$0.00	$77.90
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$51.65	$10.15	$9.50	$9.65	$0.00	$80.95
	6/1/2027	$53.25	$10.15	$9.50	$9.65	$0.00	$82.55
	12/1/2027	$54.85	$10.15	$9.50	$9.65	$0.00	$84.15
	6/1/2028	$56.53	$10.15	$9.50	$9.65	$0.00	$85.83
	12/1/2028	$58.20	$10.15	$9.50	$9.65	$0.00	$87.50
For apprentice rates see "Apprentice- LABORER"							
LABORER: CEMENT FINISHER TENDER LABORERS LABORERS - ZONE 1	12/1/2025	$48.60	$10.15	$9.50	$9.65	$0.00	$77.90
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$51.65	$10.15	$9.50	$9.65	$0.00	$80.95
	6/1/2027	$53.25	$10.15	$9.50	$9.65	$0.00	$82.55

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2027	$54.85	$10.15	$9.50	$9.65	$0.00	$84.15
	6/1/2028	$56.53	$10.15	$9.50	$9.65	$0.00	$85.83
	12/1/2028	$58.20	$10.15	$9.50	$9.65	$0.00	$87.50
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS LABORERS - ZONE 1	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
LABORER: MULTI-TRADE TENDER LABORERS LABORERS - ZONE 1	12/1/2025	$48.60	$10.15	$9.50	$9.65	$0.00	$77.90
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$51.65	$10.15	$9.50	$9.65	$0.00	$80.95
	6/1/2027	$53.25	$10.15	$9.50	$9.65	$0.00	$82.55
	12/1/2027	$54.85	$10.15	$9.50	$9.65	$0.00	$84.15
	6/1/2028	$56.53	$10.15	$9.50	$9.65	$0.00	$85.83
	12/1/2028	$58.20	$10.15	$9.50	$9.65	$0.00	$87.50
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER LABORERS LABORERS - ZONE 1	12/1/2025	$48.60	$10.15	$9.50	$9.65	$0.00	$77.90
	6/1/2026	$50.15	$10.15	$9.50	$9.65	$0.00	$79.45
	12/1/2026	$51.65	$10.15	$9.50	$9.65	$0.00	$80.95
	6/1/2027	$53.25	$10.15	$9.50	$9.65	$0.00	$82.55
	12/1/2027	$54.85	$10.15	$9.50	$9.65	$0.00	$84.15
	6/1/2028	$56.53	$10.15	$9.50	$9.65	$0.00	$85.83
	12/1/2028	$58.20	$10.15	$9.50	$9.65	$0.00	$87.50
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
LASER BEAM OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
MARBLE & TILE FINISHERS BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$52.08	$11.49	$15.57	$6.05	$0.00	$85.19
	2/1/2026	$53.16	$11.49	$15.57	$6.05	$0.00	$86.27
	8/1/2026	$54.92	$11.49	$15.57	$6.05	$0.00	$88.03
	2/1/2027	$56.04	$11.49	$15.57	$6.05	$0.00	$89.15

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.04	$11.49	$15.57	$6.05	$0.00	$59.15
2	60.00	$31.25	$11.49	$15.57	$6.05	$0.00	$64.36
3	70.00	$36.46	$11.49	$15.57	$6.05	$0.00	$69.57
4	80.00	$41.66	$11.49	$15.57	$6.05	$0.00	$74.77
5	90.00	$46.87	$11.49	$15.57	$6.05	$0.00	$79.98

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.58	$11.49	$15.57	$6.05	$0.00	$59.69
2	60.00	$31.90	$11.49	$15.57	$6.05	$0.00	$65.01
3	70.00	$37.21	$11.49	$15.57	$6.05	$0.00	$70.32
4	80.00	$42.53	$11.49	$15.57	$6.05	$0.00	$75.64
5	90.00	$47.84	$11.49	$15.57	$6.05	$0.00	$80.95

Apprentice to Journeyworker Ratio: 1:5

MARBLE MASONS,TILELAYERS & TERRAZZO MECH BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$67.97	$11.49	$15.57	$7.99	$0.00	$103.02
	2/1/2026	$69.32	$11.49	$15.57	$7.99	$0.00	$104.37
	8/1/2026	$71.52	$11.49	$15.57	$7.99	$0.00	$106.57
	2/1/2027	$72.92	$11.49	$15.57	$7.99	$0.00	$107.97

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.99	$11.49	$15.57	$7.99	$0.00	$69.04
2	60.00	$40.78	$11.49	$15.57	$7.99	$0.00	$75.83
3	70.00	$47.58	$11.49	$15.57	$7.99	$0.00	$82.63
4	80.00	$54.38	$11.49	$15.57	$7.99	$0.00	$89.43
5	90.00	$61.17	$11.49	$15.57	$7.99	$0.00	$96.22

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.66	$11.49	$15.57	$7.99	$0.00	$69.71
2	60.00	$41.59	$11.49	$15.57	$7.99	$0.00	$76.64
3	70.00	$48.52	$11.49	$15.57	$7.99	$0.00	$83.57
4	80.00	$55.46	$11.49	$15.57	$7.99	$0.00	$90.51
5	90.00	$62.39	$11.49	$15.57	$7.99	$0.00	$97.44

Apprentice to Journeyworker Ratio: 1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
MECHANICS MAINTENANCE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
MILLWRIGHT (Zone 1) MILLWRIGHTS LOCAL 1121 MILLWRIGHTS LOCAL 1121 - Zone 1	1/5/2026	$52.97	$10.08	$11.47	$10.25	$0.00	$84.77

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/5/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$29.13	$10.08	$0.00	$5.64	$0.00	$44.85
2	65.00	$34.43	$10.08	$0.00	$6.66	$0.00	$51.17
3	75.00	$39.73	$10.08	$11.47	$7.69	$0.00	$68.97
4	85.00	$45.02	$10.08	$11.47	$8.71	$0.00	$75.28

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice Notes

Step 1&2 Appr. indentured after 1/6/2020 receive no pension,

Apprentice to Journeyworker Ratio: 1:4

MORTAR MIXER LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$25.68	$16.05	$13.25	$3.25	$0.00	$58.23
	6/1/2026	$26.27	$16.05	$13.25	$3.25	$0.00	$58.82
	12/1/2026	$26.94	$16.05	$13.25	$3.25	$0.00	$59.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$31.65	$16.05	$13.25	$3.25	$0.00	$64.20
	6/1/2026	$32.37	$16.05	$13.25	$3.25	$0.00	$64.92
	12/1/2026	$33.17	$16.05	$13.25	$3.25	$0.00	$65.72
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	1/1/2026	$56.25	$10.35	$12.00	$12.60	$0.00	$91.20

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used.
PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$28.13	$10.35	$0.00	$0.00	$0.00	$38.48
2	55.00	$30.94	$10.35	$0.00	$6.93	$0.00	$48.22
3	60.00	$33.75	$10.35	$0.00	$7.56	$0.00	$51.66
4	65.00	$36.56	$10.35	$0.00	$8.19	$0.00	$55.10
5	70.00	$39.38	$10.35	$12.00	$8.92	$0.00	$70.65
6	75.00	$42.19	$10.35	$12.00	$9.45	$0.00	$73.99
7	80.00	$45.00	$10.35	$12.00	$10.08	$0.00	$77.43
8	90.00	$50.63	$10.35	$12.00	$11.34	$0.00	$84.32

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	1/1/2026	$54.31	$10.35	$12.00	$12.60	$0.00	$89.26

PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.16	$10.35	$0.00	$0.00	$0.00	$37.51
2	55.00	$29.87	$10.35	$0.00	$6.93	$0.00	$47.15
3	60.00	$32.59	$10.35	$0.00	$7.56	$0.00	$50.50
4	65.00	$35.30	$10.35	$0.00	$8.19	$0.00	$53.84
5	70.00	$38.02	$10.35	$12.00	$8.82	$0.00	$69.19
6	75.00	$40.73	$10.35	$12.00	$9.45	$0.00	$72.53
7	80.00	$43.45	$10.35	$12.00	$10.08	$0.00	$75.88
8	90.00	$48.88	$10.35	$12.00	$11.34	$0.00	$82.57

Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, NEW) *	1/1/2026	$54.85	$10.35	$12.00	$12.60	$0.00	$89.80

* If 30% or more of surfaces to be painted are new construction,
NEW paint rate shall be used.
PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.43	$10.35	$0.00	$0.00	$0.00	$37.78
2	55.00	$30.17	$10.35	$0.00	$6.93	$0.00	$47.45
3	60.00	$32.91	$10.35	$0.00	$7.56	$0.00	$50.82
4	65.00	$35.65	$10.35	$0.00	$8.19	$0.00	$54.19
5	70.00	$38.40	$10.35	$12.00	$8.82	$0.00	$69.57
6	75.00	$41.14	$10.35	$12.00	$9.45	$0.00	$72.94
7	80.00	$43.88	$10.35	$12.00	$10.08	$0.00	$76.31
8	90.00	$49.37	$10.35	$12.00	$11.34	$0.00	$83.06

Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 1	1/1/2026	$52.91	$10.35	$12.00	$12.60	$0.00	$87.86

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.46	$10.35	$0.00	$0.00	$0.00	$36.81
2	55.00	$29.10	$10.35	$0.00	$6.93	$0.00	$46.38
3	60.00	$31.75	$10.35	$0.00	$7.56	$0.00	$49.66
4	65.00	$34.39	$10.35	$0.00	$8.19	$0.00	$52.93
5	70.00	$37.04	$10.35	$12.00	$8.82	$0.00	$68.21
6	75.00	$39.68	$10.35	$12.00	$9.45	$0.00	$71.48
7	80.00	$42.33	$10.35	$12.00	$10.08	$0.00	$74.76
8	90.00	$47.62	$10.35	$12.00	$11.34	$0.00	$81.31

Apprentice to Journeyworker Ratio: 1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	12/1/2025	$48.70	$10.15	$9.50	$9.65	$0.00	$78.00
LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	$50.25	$10.15	$9.50	$9.65	$0.00	$79.55
	12/1/2026	$51.75	$10.15	$9.50	$9.65	$0.00	$81.05
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
PANEL & PICKUP TRUCKS DRIVER	12/1/2025	$41.88	$15.41	$21.78	$0.00	$0.00	$79.07
TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	6/1/2026	$42.88	$15.41	$21.78	$0.00	$0.00	$80.07
	8/1/2026	$42.88	$15.91	$21.78	$0.00	$0.00	$80.57
	12/1/2026	$42.88	$15.91	$23.52	$0.00	$0.00	$82.31
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
For apprentice rates see "Apprentice- PILE DRIVER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PILE DRIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16

Apprentice: PILE DRIVER

Effective Date: 8/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.11	$10.08	$0.00	$2.53	$0.00	$37.72
2	55.00	$30.68	$10.08	$0.00	$5.07	$0.00	$45.83
3	70.00	$39.05	$10.08	$11.62	$7.60	$0.00	$68.35
4	80.00	$44.63	$10.08	$11.62	$10.14	$0.00	$76.47

Apprentice to Journeyworker Ratio: 1:5

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	9/1/2025	$69.08	$13.45	$13.75	$9.30	$0.00	$105.58

Apprentice: PIPEFITTER & STEAMFITTER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$27.63	$13.45	$13.75	$9.30	$0.00	$64.13
2	45.00	$31.09	$13.45	$13.75	$9.30	$0.00	$67.59
3	60.00	$41.45	$13.45	$13.75	$9.30	$0.00	$77.95
4	70.00	$48.36	$13.45	$13.75	$9.30	$0.00	$84.86
5	80.00	$55.26	$13.45	$13.75	$9.30	$0.00	$91.76

Apprentice to Journeyworker Ratio: 1:3

PIPELAYER LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12 PLUMBERS & GASFITTERS LOCAL 12	9/1/2025	$71.74	$14.32	$12.61	$8.00	$0.00	$106.67
	3/2/2026	$73.89	$14.32	$12.61	$8.00	$0.00	$108.82
	8/31/2026	$76.04	$14.32	$12.61	$8.00	$0.00	$110.97
	3/1/2027	$78.19	$14.32	$12.61	$8.00	$0.00	$113.12

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	8/30/2027	$80.34	$14.32	$12.61	$8.00	$0.00	$115.27
	2/28/2028	$82.54	$14.32	$12.61	$8.00	$0.00	$117.47
	9/4/2028	$84.74	$14.32	$12.61	$8.00	$0.00	$119.67
	3/5/2029	$86.94	$14.32	$12.61	$8.00	$0.00	$121.87
	9/3/2029	$89.14	$14.32	$12.61	$8.00	$0.00	$124.07
	3/4/2030	$91.09	$14.32	$12.61	$8.00	$0.00	$126.02

Apprentice: PLUMBERS & GASFITTERS

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	$25.11	$14.32	$4.61	$2.80	$0.00	$46.84
2	40.00	$28.70	$14.32	$5.22	$3.20	$0.00	$51.44
3	55.00	$39.46	$14.32	$7.07	$4.40	$0.00	$65.25
4	65.00	$46.63	$14.32	$8.30	$5.20	$0.00	$74.45
5	75.00	$53.81	$14.32	$9.53	$6.00	$0.00	$83.66

Apprentice: PLUMBERS & GASFITTERS

Effective Date: 3/2/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	$25.86	$14.32	$4.61	$2.80	$0.00	$47.59
2	40.00	$29.56	$14.32	$5.22	$3.20	$0.00	$52.30
3	55.00	$40.64	$14.32	$7.07	$4.40	$0.00	$66.43
4	65.00	$48.03	$14.32	$8.30	$5.20	$0.00	$75.85
5	75.00	$55.42	$14.32	$9.53	$6.00	$0.00	$85.27

Apprentice to Journeyworker Ratio: 1:2

PNEUMATIC CONTROLS (TEMP.) PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	9/1/2025	$69.08	$13.45	$13.75	$9.30	$0.00	$105.58
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
PNEUMATIC DRILL/TOOL OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWDERMAN & BLASTER	12/1/2025	$49.60	$10.15	$9.50	$9.65	$0.00	$78.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS LABORERS - ZONE 1	6/1/2026	$51.15	$10.15	$9.50	$9.65	$0.00	$80.45
	12/1/2026	$52.65	$10.15	$9.50	$9.65	$0.00	$81.95
	6/1/2027	$54.25	$10.15	$9.50	$9.65	$0.00	$83.55
	12/1/2027	$55.85	$10.15	$9.50	$9.65	$0.00	$85.15
	6/1/2028	$57.53	$10.15	$9.50	$9.65	$0.00	$86.83
	12/1/2028	$59.20	$10.15	$9.50	$9.65	$0.00	$88.50
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	$49.70	$10.15	$9.50	$9.65	$0.00	$79.00
	6/1/2026	$51.25	$10.15	$9.50	$9.65	$0.00	$80.55
	12/1/2026	$52.75	$10.15	$9.50	$9.65	$0.00	$82.05
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWER SHOVEL/DERRICK/TRENCHING MACHINE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83
	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$37.97	$16.05	$13.25	$3.25	$0.00	$70.52
	6/1/2026	$38.83	$16.05	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$39.78	$16.05	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
READY MIX CONCRETE DRIVERS after 4/30/12 (Drivers Hired After 4/30/2012) TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate	8/1/2022	$30.40	$11.91	$15.25	$0.00	$0.00	$57.56
READY-MIX CONCRETE DRIVER TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate	8/1/2022	$34.41	$11.91	$15.25	$0.00	$0.00	$61.57
RECLAIMERS OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS LABORERS - ZONE 1	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	8/1/2025	$53.53	$13.28	$12.67	$9.03	$0.00	$88.51
ROOFERS LOCAL 33	2/1/2026	$54.78	$13.28	$12.67	$9.03	$0.00	$89.76
ROOFERS LOCAL 33							

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.77	$13.28	$6.52	$9.03	$0.00	$55.60
2	60.00	$32.12	$13.28	$12.67	$9.03	$0.00	$67.10
3	65.00	$34.79	$13.28	$12.67	$9.03	$0.00	$69.77
4	75.00	$40.15	$13.28	$12.67	$9.03	$0.00	$75.13
5	85.00	$45.50	$13.28	$12.67	$9.03	$0.00	$80.48

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.39	$13.28	$6.52	$9.03	$0.00	$56.22
2	60.00	$32.87	$13.28	$12.67	$9.03	$0.00	$67.85
3	65.00	$35.61	$13.28	$12.67	$9.03	$0.00	$70.59
4	75.00	$41.09	$13.28	$12.67	$9.03	$0.00	$76.07
5	85.00	$46.56	$13.28	$12.67	$9.03	$0.00	$81.54

Apprentice Notes

** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Apprentice to Journeyworker Ratio: 1:5

ROOFER SLATE / TILE / PRECAST CONCRETE	8/1/2025	$53.78	$13.28	$12.67	$9.03	$0.00	$88.76
ROOFERS LOCAL 33	2/1/2026	$55.03	$13.28	$12.67	$9.03	$0.00	$90.01
ROOFERS LOCAL 33							

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
SHEETMETAL WORKERS LOCAL 17	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
SHEETMETAL WORKERS LOCAL 17 - A							

Apprentice: SHEETMETAL WORKER

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: SHEETMETAL WORKER

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
2	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
3	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
4	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
5	52.00	$31.71	$14.91	$11.74	$1.50	$1.74	$61.60
6	52.00	$31.71	$14.91	$11.74	$1.75	$1.75	$61.86
7	60.00	$36.59	$14.91	$12.90	$2.00	$1.93	$68.33
8	65.00	$39.64	$14.91	$13.63	$2.25	$2.04	$72.47
9	75.00	$45.74	$14.91	$15.09	$2.75	$2.28	$80.77
10	85.00	$51.83	$14.91	$16.55	$2.75	$2.49	$88.53

Apprentice: SHEETMETAL WORKER

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
2	42.00	$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
3	47.00	$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
4	47.00	$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
5	52.00	$32.72	$14.91	$11.66	$1.50	$1.74	$62.53
6	52.00	$32.72	$14.91	$11.66	$1.75	$1.75	$62.79
7	60.00	$37.76	$14.91	$12.84	$2.00	$1.93	$69.44
8	65.00	$40.90	$14.91	$13.58	$2.25	$2.04	$73.68
9	75.00	$47.20	$14.91	$15.06	$2.75	$2.28	$82.20
10	85.00	$53.49	$14.91	$16.53	$2.75	$2.49	$90.17

Apprentice to Journeyworker Ratio: 1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	$42.63	$15.41	$21.78	$0.00	$0.00	$79.82
	6/1/2026	$43.63	$15.41	$21.78	$0.00	$0.00	$80.82
	8/1/2026	$43.63	$15.91	$21.78	$0.00	$0.00	$81.32
	12/1/2026	$43.63	$15.91	$23.52	$0.00	$0.00	$83.06
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	1/1/2026	$72.05	$13.45	$7.45	$18.25	$0.00	$111.20

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: SPRINKLER FITTER

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	$25.22	$13.45	$13.84	$0.00	$0.00	$52.51
2	40.00	$28.82	$13.45	$14.75	$0.00	$0.00	$57.02
3	45.00	$32.42	$13.45	$15.67	$0.00	$0.00	$61.54
4	50.00	$36.03	$13.45	$16.57	$0.00	$0.00	$66.05
5	55.00	$39.63	$13.45	$17.49	$0.00	$0.00	$70.57
6	60.00	$43.23	$13.45	$18.40	$0.00	$0.00	$75.08
7	65.00	$46.83	$13.45	$19.32	$0.00	$0.00	$79.60
8	70.00	$50.44	$13.45	$20.22	$0.00	$0.00	$84.11
9	75.00	$54.04	$13.45	$21.15	$0.00	$0.00	$88.64
10	80.00	$57.64	$13.45	$22.05	$0.00	$0.00	$93.14

Apprentice Notes

Apprentice entered prior 9/30/10:

Apprentice to Journeyworker Ratio: 1:3

STEAM BOILER OPERATOR	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
TELECOMMUNICATION TECHNICIAN	3/1/2026	$53.49	$13.00	$14.23	$7.20	$0.00	$87.92
ELECTRICIANS LOCAL 103	9/1/2026	$55.02	$13.00	$14.28	$7.20	$0.00	$89.50
ELECTRICIANS LOCAL 103	3/1/2027	$55.98	$13.00	$14.31	$7.20	$0.00	$90.49
	9/1/2027	$57.50	$13.00	$14.36	$7.20	$0.00	$92.06
	3/1/2028	$58.46	$13.00	$14.38	$7.20	$0.00	$93.04

For apprentice rates and ratios see "Apprentice- ELECTRICIAN"

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
2	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
3	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13
4	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
5	55.00	$29.12	$13.00	$13.25	$3.84	$0.00	$59.21
6	60.00	$31.76	$13.00	$13.33	$4.19	$0.00	$62.28
7	65.00	$34.41	$13.00	$13.41	$4.54	$0.00	$65.36
8	70.00	$37.06	$13.00	$13.49	$4.89	$0.00	$68.44
9	75.00	$39.71	$13.00	$13.57	$5.24	$0.00	$71.52
10	80.00	$42.35	$13.00	$13.65	$5.58	$0.00	$74.58

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$24.07	$13.00	$0.72	$0.00	$0.00	$37.79
2	45.00	$24.07	$13.00	$0.72	$0.00	$0.00	$37.79
3	50.00	$26.75	$13.00	$13.43	$3.60	$0.00	$56.78
4	50.00	$26.75	$13.00	$13.43	$3.60	$0.00	$56.78
5	55.00	$29.42	$13.00	$13.51	$3.96	$0.00	$59.89
6	60.00	$32.09	$13.00	$13.59	$4.32	$0.00	$63.00
7	65.00	$34.77	$13.00	$13.67	$4.68	$0.00	$66.12
8	70.00	$37.44	$13.00	$13.75	$5.04	$0.00	$69.23
9	75.00	$40.12	$13.00	$13.83	$5.40	$0.00	$72.35
10	80.00	$42.79	$13.00	$13.91	$5.76	$0.00	$75.46

Apprentice to Journeyworker Ratio: 1:1

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$66.89	$11.49	$15.57	$8.02	$0.00	$101.97
	2/1/2026	$68.24	$11.49	$15.57	$8.02	$0.00	$103.32
	8/1/2026	$70.44	$11.49	$15.57	$8.02	$0.00	$105.52
	2/1/2027	$71.84	$11.49	$15.57	$8.02	$0.00	$106.92

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.45	$11.49	$15.57	$8.02	$0.00	$68.53
2	60.00	$40.13	$11.49	$15.57	$8.02	$0.00	$75.21
3	70.00	$46.82	$11.49	$15.57	$8.02	$0.00	$81.90
4	80.00	$53.51	$11.49	$15.57	$8.02	$0.00	$88.59
5	90.00	$60.20	$11.49	$15.57	$8.02	$0.00	$95.28

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.12	$11.49	$15.57	$8.02	$0.00	$69.20
2	60.00	$40.94	$11.49	$15.57	$8.02	$0.00	$76.02
3	70.00	$47.77	$11.49	$15.57	$8.02	$0.00	$82.85
4	80.00	$54.59	$11.49	$15.57	$8.02	$0.00	$89.67
5	90.00	$61.42	$11.49	$15.57	$8.02	$0.00	$96.50

Apprentice to Journeyworker Ratio: 1:5

TEST BORING DRILLER	12/1/2025	$52.70	$10.15	$9.50	$9.80	$0.00	$82.15
LABORERS	6/1/2026	$54.25	$10.15	$9.50	$9.80	$0.00	$83.70
LABORERS - FOUNDATION AND MARINE	12/1/2026	$55.75	$10.15	$9.50	$9.80	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER	12/1/2025	$48.82	$10.15	$9.50	$9.80	$0.00	$78.27
LABORERS	6/1/2026	$50.37	$10.15	$9.50	$9.80	$0.00	$79.82
LABORERS - FOUNDATION AND MARINE	12/1/2026	$51.87	$10.15	$9.50	$9.80	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15
LABORERS	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
LABORERS - FOUNDATION AND MARINE	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS	12/1/2025	$58.62	$16.05	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$59.90	$16.05	$13.25	$3.25	$0.00	$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	$61.34	$16.05	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT	12/1/2025	$42.92	$15.41	$21.78	$0.00	$0.00	$80.11
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	$43.92	$15.41	$21.78	$0.00	$0.00	$81.11
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	$43.92	$15.91	$21.78	$0.00	$0.00	$81.61
	12/1/2026	$43.92	$15.91	$23.52	$0.00	$0.00	$83.35
TUNNEL WORK - COMPRESSED AIR	12/1/2025	$60.93	$10.15	$9.50	$10.25	$0.00	$90.83
LABORERS	6/1/2026	$62.48	$10.15	$9.50	$10.25	$0.00	$92.38
LABORERS (COMPRESSED AIR)	12/1/2026	$63.98	$10.15	$9.50	$10.25	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	12/1/2025	$62.93	$10.15	$9.50	$10.25	$0.00	$92.83
LABORERS	6/1/2026	$64.48	$10.15	$9.50	$10.25	$0.00	$94.38
LABORERS (COMPRESSED AIR)	12/1/2026	$65.98	$10.15	$9.50	$10.25	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR	12/1/2025	$53.00	$10.15	$9.50	$10.25	$0.00	$82.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS	6/1/2026	$54.55	$10.15	$9.50	$10.25	$0.00	$84.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	$56.05	$10.15	$9.50	$10.25	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/1/2025	$55.00	$10.15	$9.50	$10.25	$0.00	$84.90
LABORERS	6/1/2026	$56.55	$10.15	$9.50	$10.25	$0.00	$86.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	$58.05	$10.15	$9.50	$10.25	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
WAGON DRILL OPERATOR	12/1/2025	$48.85	$10.15	$9.50	$9.65	$0.00	$78.15
LABORERS	6/1/2026	$50.40	$10.15	$9.50	$9.65	$0.00	$79.70
LABORERS - ZONE 1	12/1/2026	$51.90	$10.15	$9.50	$9.65	$0.00	$81.20
	6/1/2027	$53.50	$10.15	$9.50	$9.65	$0.00	$82.80
	12/1/2027	$55.10	$10.15	$9.50	$9.65	$0.00	$84.40
	6/1/2028	$56.78	$10.15	$9.50	$9.65	$0.00	$86.08
	12/1/2028	$58.45	$10.15	$9.50	$9.65	$0.00	$87.75
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/1/2025	$48.95	$10.15	$9.50	$9.65	$0.00	$78.25
LABORERS	6/1/2026	$50.50	$10.15	$9.50	$9.65	$0.00	$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	$52.00	$10.15	$9.50	$9.65	$0.00	$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WASTE WATER PUMP OPERATOR	12/1/2025	$59.28	$16.05	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.58	$16.05	$13.25	$3.25	$0.00	$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	$62.03	$16.05	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
WATER METER INSTALLER	9/1/2025	$71.74	$14.32	$12.61	$8.00	$0.00	$106.67
PLUMBERS & GASFITTERS LOCAL 12	3/2/2026	$73.89	$14.32	$12.61	$8.00	$0.00	$108.82
PLUMBERS & GASFITTERS LOCAL 12	8/31/2026	$76.04	$14.32	$12.61	$8.00	$0.00	$110.97
	3/1/2027	$78.19	$14.32	$12.61	$8.00	$0.00	$113.12
	8/30/2027	$80.34	$14.32	$12.61	$8.00	$0.00	$115.27
	2/2/2028	$82.54	$14.32	$12.61	$8.00	$0.00	$117.47
	9/4/2028	$84.74	$14.32	$12.61	$8.00	$0.00	$119.67
	3/5/2029	$86.94	$14.32	$12.61	$8.00	$0.00	$121.87
	9/3/2029	$89.14	$14.32	$12.61	$8.00	$0.00	$124.07
	3/4/2030	$91.09	$14.32	$12.61	$8.00	$0.00	$126.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

Additional Apprentice Information

All apprentices must be registered with the Division of Apprenticeship Training(DAS) in accordance with M.G.L.c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L.c. 149, §§ 26-27D.

Apprentice ratios are established by DAS pursuant to M.G.L.c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements(CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate.

Parties having questions regarding what ratio to use should contact DAS.

SECTION 00 72 13

SUPPLEMENTAL GENERAL CONDITIONS

1.01 *GENERAL*

A. The following supplements modify, change, delete from and add to the General Conditions Standard form of Agreement Between Owner and Contractor. Where any Subsection of the Agreement is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplemental General Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.02 INSURANCE REQUIREMENTS

A. The insurance provisions of the General Conditions are amended by adding the following requirements:

1. The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified below and in such form as shall protect him performing work covered by this Contract and the City of Everett and its employees, officials, agents, and owner's representative from all claims and liability for errors and omissions in the Contract Documents, damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Contractor covenants and agrees to hold the City and its employees, agents and officials harmless from loss or damage due to claims for personal injury and/or property damage arising from, or in connection with operations under this Contract. **Except as otherwise stated, the amounts of such insurance shall be for each policy, not less than:**

   a. For liability for bodily injury, including accidental death, $1,000,000 for any one person and $1,000,000 on account of one occurrence and $3,000,000 Aggregate Limit.

   b. For liability for property damage $1,000,000 on account of any one occurrence and $3,000,000 Aggregate Limit. Extra-territorial clause shall be included.

   c. Umbrella Liability, $2,000,000 Per Occurrence and $2,000,000 Aggregate Limit.

   d. Worker's Compensation insurance as required by the General Laws of the Commonwealth of Massachusetts.

   e. Bodily Injury Premise-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (a) above.

f. Property Damage Premises-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (b) above.

g. Bodily Injury Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor, while such vehicles are being operated in connection with the prosecution of the work under this Contract, in the amounts required in (a) above.

h. Property Damage Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor, while such vehicles are being operated in connection with prosecution of the work under this Contract, in the amounts required in (b) above.

i. Contractual Liability Insurance covering the liability assumed by the Contractor in the amounts required under (a) and (b) above.

j. City's Protective Insurance secured by the Contractor on behalf of City of Taunton and Taunton Public Schools which will directly protect the City of Everett and/or its employees, agents, officers, owner's representative, including the Engineer, from liability for bodily injuries, including accident death, in the amounts required in (a) above, and for property damage in the amounts required in (b) above.

2. All policies shall be so written that the City will be notified of cancellation or restrictive amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. A certificate from the Contractor's Insurance Carrier showing at least the coverage and limits of liability specified above and expiration date shall be filed with the City before operations are begun. Such certificates shall not merely name the type of policy provided but shall specifically refer to this Contract and shall state that such insurance is required by this Contract. The Contractor shall make no claims against the City of Everett or its officers for any injury to any of his officers or employees or for damage to his/her trucks or equipment arising out of work contemplated by the Contractor.

3. The Contractor shall provide insurance under the Contract shall submit accurate and bona fide Certificates of Insurance issued by a responsible agent of the insurance company. This insurance must cover the Contractor's obligations, including protection against errors or omissions in the Contract Documents.

   a. Certificate Content and Coverage:

      i. City of Everett shall be named as an additional insured party under the Contractor's insurance. Certificate of Insurance shall explicitly list the insurance coverage provided, including all riders, policy limits, and any specific endorsements required by the Contract Documents.

ii. Premises Operations.

iii. Owners and Contractors Protective.

iv. Broad Form Comprehensive General Liability Endorsement or equivalent to include Broad Form Contractual, Personal Injury, Broad Form Property Damage.

v. Cross Liability.

vi. Professional Liability:

1. The Certificate shall cover errors and omissions related to Professional Liability from claims arising due to inaccuracies or errors in the Contract Documents.

b. Every Certificate must be accompanied by a notarized statement from the issuing insurance agent, affirming that the required insurance is in effect as specified in the Contract Documents and that there are no deviations or exclusions affecting the coverage of inaccuracies within the Contract Documents.

c. The insurance agent issuing the Certificate of Insurance shall be responsible and liable for its accuracy and validity.

d. The Contractor and all parties involved in issuing the Certificate shall certify, through sworn and notarized statements, that the insurance coverage provided meets the Contract's requirements, including any liabilities resulting from errors and omissions in the Contract Documents.

e. Prohibited Disclaimers:

i. Certificates of Insurance must not include any disclaimers such as: *"This Certificate is issued as a matter of information only and confers no rights upon the certificate holder. It does not amend, extend, or alter the coverage provided by the policies listed below."* Such disclaimers will not be accepted.

ii. Any attempt to disclaim the enforceability of the Certificate of Insurance shall render the certificate invalid for purposes of this Contract.

f. Reliance of Certificates: The Owner, Engineer, and any other parties receiving the Certificates of Insurance are entitled to fully rely on the validity and enforceability of the insurance. They shall have the right to claim the benefits and protection provided by the insurance as it applies to them.

g. The coverage must remain effective throughout the duration of the project and cannot be revoked without prior written consent from the Owner with at least thirty (30) days' notice prior to the cancellation of coverage.

h. The Contractor shall indemnify and save harmless the City, and all of its officers, agents, and employees from all suits, actions or claims of any character.

1.03 EQUAL EMPLOYMENT OPPORTUNITY

A. The Contractor shall abide by the Commonwealth of Massachusetts' Modified Supplemental Equal Employment Opportunity Anti-Discrimination and the Special Provisions of Participation by Minority and Women Business Enterprises, as well as with all other applicable Federal, State and Local equal employment opportunity, minority/women's business enterprise laws, rules, regulations and policies (if applicable to this Project).

END OF SECTION

SECTION 01 10 00

SUMMARY OF WORK

PART 1 – GENERAL

1.1 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 *SITE WORK SCOPE*

A. Project Description: The project site:

a. The Corporal Arthur Nelson Play Lot, known as Fuller St. Park, is located in Everett Massachusetts and is located at the corner of Fuller Street and Lynn Street.

b. Work includes but is not limited to:

1. The Contractor is responsible for obtaining the necessary permitting for this project, at no additional cost to to the Owner.
2. The Contractor shall comply with all General Notes indicated on Sheet C-2 of the Drawings.

B. In addition, the Work under the Contract includes:

1. The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.

2. Providing and restoring, where appropriate, all temporary facilities.

3. All other work indicated on the contract plans and/or specifications.

4. Winterization: Contractor to perform winterization, spring opening, and an additional winterization for the referenced project. Contractor to perform work in the presence of the City Representatives and conduct training of City employees at the same time.

5. Train owner's representatives in maintenance and operations of lighting, irrigation, winterization, etc.

6. Landscape Areas: Landscape to include cleanup along the perimeter of the facility. Work to be performed at no additional cost to the Owner.

1.3 *CONSTRUCTION DRAWINGS, PERMITS, AND FEES*

A. The Contractor, at its cost, shall schedule, secure and obtain all permits, approvals, licenses, and inspections necessary for the proper execution of the work under all sections of this project prior to installation, including but not limited to the following:

B. The Contractor shall coordinate all of its work with the appropriate City of Everett's Departments and Agencies as required by the Contract Documents and comply with local, state, and federal regulations.

1.4 *TIME OF COMPLETION*

A. Per front end specifications.

1.5 *LIQUIDATED DAMAGES*

A. Per front end specifications.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *SCOPE*

A. This Section lists the Alternate(s) which appear in the Contract Documents. Consult the individual Sections for requirements to all alternatives.

B. Bid price for each Alternate shall include overhead, profit, and all other expenses incidental to the Work under each Alternate.

C. The Contractor and Subcontractors shall be responsible for examining the scope of each Alternate generally defined herein and for recognizing modifications to the Work caused by the Alternates and including the cost thereof in the bid price. **The Contractor shall review all alternates and shall submit any requests for clarification (RFIs) prior to the Bid Questions/Clarifications deadline. Pricing for each alternate shall include all items specified in the Contract Documents, including all related and incidental work, labor, materials, equipment, supervision, mobilization, taxes, fees, overhead, profit, and any other costs necessary to a complete and fully functional installation for that alternate.**

1.03 *DEDUCT ALTERNATE NO. 1*

A. Color mix shall be comprised of 66% color / 33% Black Mix (instead of 100% Solid Colors) with up to 3 colors. Contractor to provide credit amount if selected.

1.04 *DEDUCT ALTERNATE NO. 2*

A. Eliminate Acrylic Surfacing from Basketball Court and provide striping on asphalt pavement. Contractor to proivde credit amount if selected.

1.05 *DEDUCT ALTERNATE NO. 3*

A. Eliminate acrylic surfacing from splash pad. Contractor to provide credit amount if selected.

1.06 *DEDUCT ALTERNATE NO. 4*

A. Provide bituminous concrete walkways in lieu of concrete walkways. Contractor to

provide credit amount. See drawings for details.

END OF SECTION

SECTION 01 31 13

CONDUCT OF THE WORK

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *PROJECT MANAGEMENT*

A. The work must be completed in a continuous uninterrupted operation except when noted. The Contractor must use sufficient personnel and adequate equipment to complete all the necessary work requirements within a minimum period and within the specified amount of time.

B. Unless specifically authorized by the Owner, in writing, the work must be conducted between the hours of 7:00 a.m. and 5:00 p.m. on Monday through Friday. No work is to be done on holidays, Saturdays, or Sundays other than for emergencies or as approved by the Owner.

C. The Contractor is responsible for the security of partially completed work until the Owner accepts the project.

D. Only materials and/or equipment intended and necessary for immediate use shall be brought onto the sites. At the end of each workday and at the completion of each phase of work, equipment and leftover or unused materials shall be removed from the sites.

E. The Contractor is responsible for the security of the site.

1.03 *SHUTDOWN OF SERVICES*

A. The Contractor's attention is especially called to the fact that the continuous operation of services for the Owner is mandatory. The work cannot result in the shutdown of any major utilities in adjacent City/Town facilities without the Owner’s consent in writing. If the Owner will not allow this shutdown but wants instead a temporary means of supplying said services, the Contractor shall supply all labor, materials or whatever may be required to supply said temporary services at no extra cost to the Owner and in accordance with the state and local regulations on health and safety.

1.04 *COORDINATION*

A. The Contractor shall submit at the pre-construction conference for approval to the Owner a detailed operational schedule showing the sequence of operations prior to

commencement of any work at the sites. The Owner must approve any changes to this operational plan, upon written notice, should the project fall behind the approved schedule through no fault of the city.

B. The Contractor shall submit at the pre-construction conference for approval to the Owner a detailed schedule of values for the various components of the project. The schedule of values shall be accurate and balanced. It will be used to determine credits and costs of individual items in the event of contract changes. Should the Engineer or owner request that the Schedule of Values be more detailed for specific items, the Contractor shall provide.

C. The Contractor must retain on the Work sites during its progress a competent full time representative, satisfactory to the Owner. This representative shall not be changed, except with the consent of the Owner. The representative shall be in full charge of the work and all instructions given to this person by the Engineer shall be binding.

D. Any overtime needed to maintain the operational schedule shall be provided by the contractor at no additional cost to the City/Town.

E. The Contractor must supply to the Owner the home and mobile telephone numbers of responsible persons who may be contacted during non-work hours for emergencies on the Project.

1.05 *CONSTRUCTION MATERIAL AND EQUIPMENT*

A. Furnish construction material and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the Contract Time. If at any time such construction material or equipment appear to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforementioned, the Engineer may order the Contractor to increase the efficiency, change the character, or increase the equipment and the Contractor shall conform to such order at no additional cost to the Owner. Failure of the Engineer to give such an order shall in no way relieve the Contractor of his obligation to secure the quality of the work and rate of progress required.

1.06 *OTHER OR ADJACENT LAND*

A. All adjacent areas, including the nearby streets and driveways may be accessed and/or occupied during construction. The Contractor shall take all necessary precautions to ensure the public safety and convenience of the occupants during construction. Use of any on-site structures by the Contractor, proximate to the site work as a construction office, shall not be used unless the Owner gives express written consent.

B. Work area shall be restricted to the areas shown on the Drawings and/or specified herein.

C. There shall be no storage of materials, tools, and/or equipment within any of the occupied buildings. The Owner, in writing, must authorize any storage within City/Town facilities.

D. Additional work may be completed by another contractor on Owner's property adjacent to the project sites during construction. The Contractor shall make reasonable efforts to avoid conflicts and delays of either project and coordinate as required with other contractors working at the project site. Delays resulting from failure to properly coordinate with other contractors will not be grounds for a claim for extra time or compensation.

1.07 *OPEN EXCAVATIONS*

A. Adequately safeguard all open excavations by providing temporary barricades, caution signs, lights, and other means to prevent accidents to persons and damage to property. The length or size of excavation will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, the Engineer may require special construction procedures such as limiting the length of the open trench and requiring that the trench shall not remain open overnight.

B. Take precautions to prevent injury to the public due to open trenches. Provide adequate light at all open excavations, excavated material, equipment, or other obstacles, which could be dangerous to the public at night.

1.08 *CARE AND PROTECTION OF PROPERTY*

A. The Contractor is responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, restore such property to a condition similar or equal to that existing before the damage was done, or fix the damage in another manner acceptable to the Engineer.

1.09 *PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES*

A. Upon execution of the contract and mobilization of the site, the Contractor is in full care and control of the site and assumes all liability for loss.

B. Assume full responsibility for the protection of all structures, and utilities, public or private, including poles, signs, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electrical and telephone cables, whether or not they are shown on the

Drawings. Carefully support and protect all such structures and utilities from injury of any kind. Immediately repair any damage resulting from the construction operations.

C. The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities, including existing water services, drain lines and sewers. Maintain services and pay costs or charges resulting from damage thereto.

D. The Contractor shall notify Massachusetts Dig Safe and all non-participating utility companies at least 72 hours prior to start of any construction activity.

1.10 *DISPOSAL OF EXCESS MATERIAL AND CLEAN-UP*

A. During the course of work, keep the site as clean and neat as possible. No soil storage is allowed within 100 feet of wetlands, or outside the limits of work. The contractor shall dispose of all existing, concrete, fencing, rock, asphalt, wood, trash, or contractor debris or residue resulting from the construction work and at the conclusion of the work, remove and haul away any surplus materials, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction activity and leave the entire construction site in a neat and orderly condition.

B. The contractor shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in the contract documents.

C. Disposal of excess excavated material in wetlands, stream corridors and floodplains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by the contractor will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. The Contractor will be required to remove the fill and restore the area impacted at no additional cost to the Owner, and may be subject to fines by regulatory authorities.

D. Any excess loam, fill or tailings shall be removed and disposed of properly by the contractor.

1.11 *FACILITY LAYOUT AND GRADING*

A. Contractor shall employ a Massachusetts Registered Land Surveyor or Massachusetts Professional Engineer to locate proposed improvements as well as grade stakes. The Professional Land Surveyor or Engineer shall be approved by the Engineer.

B. Material Testing Lab: Contractor shall employ an independent and qualified testing agency to be approved by the Engineer and Owner.

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. This Section contains general information that applies to all work performed under the Contract and is inherently made a part of each specification section.

1.02 *PROJECT MEETINGS*

A. Preconstruction Conferences: Conduct a preconstruction conference prior to beginning work on site. Require all major subcontractors and suppliers to attend. In general, the meeting shall cover the following subjects:

1. Creation of project team directory listing contact person for each organization.
2. Issuance of Contract Documents.
3. Review of project constraints and work hours.
4. Unloading policies, storage locations, temporary office locations, and temporary facilities.
5. First aid, safety, and security procedures.
6. Cleaning, housekeeping, and waste removal.
7. Change order requirements.
8. Progress payment requirements.
9. Submittal Requirements, schedules, and procedures.
10. Record documents requirements and procedures.
11. Video report of existing conditions prior to construction.
12. Review of Schedule of Values.

B. Regular Progress Meetings: Conduct Progress Meetings to aid coordination and planning of the work and to create a forum to resolve coordination and scheduling problems and conflicts. Project meetings will be held as required at the job site but no less than once per week. Special project meetings may be called at any time by the Owner or Engineer and shall be attended by the Contractor and any required Subcontractors.

C. Chairperson and Minutes: The Engineer will chair the meetings and will prepare written meeting minutes.

D. The Contractor shall require representatives of all major subcontractors and suppliers to attend each Progress meeting as required. Representatives of Contractor, Subcontractor and suppliers who are present at Progress Meetings shall have the full authority to commit their respective organizations to decisions, commitments, and agreements made

at Progress Meetings.

E. Contractor or Contractor Representative shall be present at all scheduled and reoccurring site meetings.

F. Progress Meeting Agenda: Progress Meetings shall have at a minimum the following agenda:

1. Review and approval of minutes and record of the previous meeting.
2. Review progress of work, Progress Schedule, and status of Submittals.
3. Identify problems that impede planned progress.
4. Develop corrective measures and procedures to maintain a planned schedule.
5. Review apparent conflicts and other problems and develop corrective measures.
6. Monthly review of payment applications.
7. Pre-installation discussion regarding specific project items.
8. Other current business.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *RELATED DOCUMENTS*

A. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

1.03 *GENERAL PROCEDURES FOR SUBMITTALS*

A. **Submittal Register:** Within seven (7) days of receipt of a Notice to Proceed, the Contractor will furnish to the Engineer a complete listing of all submittals (Shop Drawings, Manufacturer's Data, Samples, etc.) required by these specifications in tabular form. This form will include columns sufficient to manage and track the submission and action for each submission. The Contractor will revise and update this form upon request of the Engineer.

B. **Schedule of Values:** Within seven (7) days of receipt of a Notice to Proceed, the Contractor will provide the Engineer with a Schedule of Values for review and approval. The Contractor will revise and update this form upon request of the Engineer.

C. **Timeliness:** The Contractor shall transmit each submittal to the Engineer sufficiently in advance of performing related Work or other applicable activities so that the installation is not delayed by processing times, including rejection and re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer in advance of the Work.

D. **Sequence:** The Contractor shall transmit each submittal in a sequence which will not result in the Engineer's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.

E. **Contractor's Review and Approval:** Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review by the Engineer. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To", "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section, or Drawing No. to which the submittal refers, purpose (first submittal, re-submittal), description, remarks, distribution record, and signature of transmitter.

F. **Engineer's Action:** The Engineer will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:

1. Final Unrestricted Release: Where marked "Approved" the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.

2. Final-But-Restricted Release: When marked "Approved As Corrected" the Work may proceed provided it complies with the Engineer' s notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend on these compliances.

3. Returned for Re-submittal: When marked "Revise and Resubmit" or "Rejected", the Work covered by the submittal (such as purchasing, fabrication, delivery, or other activity) should not proceed. The submittal should be revised, or a new submittal resubmitted without delay, in accordance with the Engineer's notations stating the reasons for returning the submittal.

G. **Processing:** All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

1.04 *OR EQUALS*

A. **Definition:** Whenever a specification section names one or more brands for a given item, and the Contractor wishes to submit, for consideration, another brand, the submission shall be considered an "or-equal" or a "material substitution". For the purposes of this Contract, the terms "or-equal" and "material substitution" shall be considered synonymous.

B. In no case may an item be furnished on the Work other than the item named or described, unless the Engineer, shall consider the item equal to the item so named or described.

C. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Engineer at the expense of the Contractor submitting the substitution.

D. The Engineer and/or the Owner may require that full size samples of both the specified and proposed products be submitted for review and evaluation. The Contractor shall bear full cost for providing, delivering, and disposal of all such samples.

E. The Contractor shall assume full responsibility for the performance of any item submitted as an "Or-Equal" and assume the costs of any changes in any Work which may be caused by such substitution.

F. Or Equal Approval Process: On the transmittal, or on a separate sheet attached to the

submission, the Contractor shall direct attention to any deviations, including minor limitations and variations, from the Contract Documents.

1. The Contractor shall submit to the Engineers for consideration of any or-equal substitution a written point-by-point comparison containing the name and full particulars of the proposed product and the product named or described in the Contract Documents.

2. Such submittal shall in no event be made later than 14 calendar days prior to the incorporation of the item into the Work. This requirement may be waived by the Engineer upon written request.

3. Upon receipt of a written request for approval of an or-equal substitution, the Engineer shall investigate whether the proposed item shall be considered equal to the item named or described in the Contract Documents. Upon conclusion of the investigation, the Engineer shall promptly advise the Contractor that the item is, or is not, considered acceptable as on Or-Equal substitution. Such written notice must have the concurrence of the Owner.

1.05 SUBMISSION *OF SHOP DRAWINGS*

A. Shop Drawings shall be complete and to scale, giving all information necessary or requested in the individual section of the specifications. They shall also show adjoining Work and details of connection thereto.

B. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.

C. The Engineer reserves the right to review and approve shop drawings only after approval of related product data and samples.

D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, the specification section relevant to the submittal, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Engineer's stamp.

E. The Contractor shall submit to the Engineer two legible, reproducible copies and three (3) black line prints of each shop drawing. Transparency and prints shall be mailed or delivered in roll form. Each individual submittal shall be accompanied by a transmittal notice. After review of the submission, the engineer will retain the two-color copies for the Engineer’s and Owner’s records. The three black line prints will be returned to the Contractor.

F. When the black line prints are returned by the Engineer with the stamp "Revise and Resubmit", “Submit Specified Items” or "Rejected", the Contractor shall correct the original drawing or prepare a new drawing and resubmit two transparencies and three (3) prints thereof to the Engineer for approval. This procedure shall be repeated until the Engineer’s approval is obtained.

G. When the prints are acceptable, the Engineer will stamp "Approved" or "Approved as Corrected", retain two (2) color copies, and return (3) copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.

H. The Contractor shall maintain one full set of approved shop drawings at the site. The Contractor shall produce a set of coordination drawings before the installation of any electrical work.

1.06 *SUBMISSION OF PRODUCT DATA*

A. The Contractor shall submit five (5) copies of Product Data to the Engineer. All such data shall be specific and identification of material or equipment submitted shall be clearly marked in ink. Data of general nature will not be accepted.

B. Each Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not impair legibility.

C. Product Data returned by the Engineer as "Rejected" shall be resubmitted in five (5) copies until the Engineers approval is obtained.

D. When the Product Data is acceptable, the Engineer will stamp them "Approved" or "Approved as Noted", retain two (2) copies, and return three (3) copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.

E. The Contractor shall maintain one full set of approved, original, Product Data at the site.

1.07 *SUBMISSION OF SAMPLES*

A. Unless otherwise specified in the individual section, the Contractor shall submit four (4) specimens of each sample required for submission.

B. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.

C. Samples which can be conveniently mailed shall be sent directly to the Engineer, accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.

D. All other samples shall be delivered at the field office of the Project Representative with sample identification tag attached and properly filled in. Transmittal notice of samples so delivered with the Contractor's stamp of approval shall be mailed to the Engineer.

E. If a sample is rejected by the Engineer, a new sample shall be resubmitted in the manner specified herein above. This procedure shall be repeated until the sample is approved by the Engineer.

F. Samples will not be returned unless return is requested at the time of submission and agreed to by the Engineer and/or Owner. The contractor is responsible for charges associated with returning the sample. The right is reserved to require submission of samples whether or not particular mention is made in the specifications, at no additional cost to the Owner.

1.08 *RESPONSIBILITIES*

A. The Contractor is responsible for construction delays caused by insufficient time for fabrication, delivery, and/or installation of materials or performance of the Work when approval of the pertinent shop drawing is withheld due to the failure of the Contractor to submit, revise, or resubmit submittals in adequate time to allow for an appropriate review (not to exceed 10 days by Owner/Engineer). The Contractor is responsible for errors and omissions in submittals regardless of the Engineer's review.

1.09 *ADDITIONAL SUBMITTALS*

A. If required to clarify intended construction methods, materials, or sequence, the Engineer may request additional submittals for any aspects of the Work not required in the specification, at no additional cost.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *SECTION INCLUDES*

A. Administrative and procedural requirements for quality-control services.

B. Quality-control services include inspection, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Engineer.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality-control requirements for individual construction activities are specified in the Section that specifies those activities. Requirements in those Sections may also cover production of standard products.

2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.

3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.03 *RESPONSIBILITIES*

A. Contractor Responsibilities: unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.

B. Retesting: The contractor is responsible for retesting where results of inspections, tests,

or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as required. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the work.

2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.

3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.

4. Provide facilities for storage and curing of test samples.

5. Deliver samples to testing laboratories.

6. Provide the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.

7. Provide security and protection of samples and test equipment at the project site.

D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling and testing of materials and construction specified in the individual Sections shall cooperate with the Owner, Engineer and Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and testing.

1. The agency shall notify the Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

3. The agency shall not perform any duties of the Contractor.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.04 *SUBMITTALS*

A. Unless the Contractor is responsible for the services, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Engineer. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test or similar service.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data: Written reports of each inspection, test, or similar services include, but are not limited to the following:

a. Date of issue.

b. Project Title and number.

c. Name, address, and telephone number of testing agency.

d. Dates and locations of samples and tests or inspections.

e. Names of individuals making the inspection or test.

f. Designation of the Work and test method.

g. Identification of product and Specification Section.

h. Complete inspection or test data.

i. Test results and an interpretation of test results.

j. Ambient conditions at the time of sample taking and testing.

k. Comment or professional opinion on whether inspected or tested Work complies with the Contract Document requirements.

l. Name and signature of laboratory inspector.

m. Recommendations on retesting.

1.05 QUALITY *ASSURANCE*

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories that are pre-qualified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualifications" and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state of Massachusetts.

1.06 *REPAIR AND PROTECTION*

A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.

B. Protect construction exposed by or for quality-control service activities and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01 52 00

TEMPORARY FACILITIES

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *GENERAL REQUIREMENTS*

A. The Contractor shall be responsible for providing and maintaining all temporary facilities until Substantial Completion. Removal of such prior to Substantial Completion must be with the concurrence of the Engineer. The Contractor bears full responsibility for providing any facility removed prior to Substantial Completion

B. Removal of all temporary facilities shall be a condition precedent to Substantial Completion unless directed otherwise by the Engineer or specifically noted in the specifications.

C. The Contractor must comply with all safety laws and regulations of the state of Massachusetts, the United States Government, and local government agencies applicable to Work under this contract. The Contractor's attention is directed to the state of Massachusetts, Department of Labor and Industries Regulations.

D. Submittals:

1. Within seven (7) days from Notice to Proceed, the Contractor will submit for approval of the Engineer a site layout plan indicating the location of all temporary facilities described within this specification.

2. Shop drawings showing proposed project signs.

3. Manufacturer’s Data for proposed field offices.

1.03 *FIELD OFFICES*

A. A field office is not required for this project.

1.04 *TEMPORARY TELEPHONES*

A. The Contractor shall provide a cell phone on site at all times with the same phone number. This shall be the number that the Engineer or Owner may contact in times of emergency.

1.05 *TEMPORARY TOILETS*

A. The Contractor shall provide and service an adequate number of toilet booths with chemical type toilets.

B. The toilets shall be maintained by the Contractor in a clean and orderly condition in compliance with all local and state health requirements.

C. Under no circumstances will the Contractor's personnel be allowed to use Owner's toilets.

D. Location of toilets shall be finalized at the pre-construction conference.

1.06 *TEMPORARY CONSTRUCTION FENCE*

A. The Contractor shall be responsible for providing and maintaining temporary construction fencing along the limits specified on contract documents. The construction fence shall meet local, state, and federal ordinances, laws, codes, or regulations or as required by the Engineer or Owner.

B. The Contractor shall not remove the temporary construction fence until the project is completed and the Owner has taken beneficial occupancy of the facility.

1.07 *TEMPORARY STRUCTURES AND MATERIAL HANDLING*

A. The Contractor shall provide such storage sheds, temporary buildings, or trailers as required for the performance of the Contract. Subcontractors shall provide their own temporary buildings and trailers. Location of such to be approved by the Engineer.

B. Materials shall be handled, stored, installed, cleaned, and protected in accordance with the best practice in the industry and, except where otherwise specified in the Contract Documents, in accordance with manufacturer's specifications and directions.

C. The Contractor must obtain the permission of the Owner for the use of any storage facilities available on site, but the Owner assumes no responsibility for articles stored.

1.08 *HOISTING FACILITIES*

A. Except as otherwise specified, the Contractor shall provide, operate, and remove material hoists, cranes, and other hoisting as required for the performance of the Work by all trades. All such hoisting service shall be without cost to the Subcontractors.

1.09 *TEMPORARY WATER*

A. The Contractor may make use of the available water supply at the site for construction purposes, provided the permission of the Owner is obtained beforehand and only as long as the water is not used wastefully. The Owner requires the use of a water meter and

backflow preventer if temporary water is needed.

B. The Contractor shall provide all necessary piping and hoses to utilize the available sources of water.

C. The Contractor shall provide an adequate supply of cool drinking water with individual drinking cups for personnel on the job.

1.10 *TEMPORARY ELECTRICITY*

A. The Contractor may make use of the electricity as available at the site, metered and paid for by the Owner, provided that the Contractor shall supply proper adapters and extension cords. Power requirements that cannot be met locally by the Owner will be the responsibility of the Contractor.

1. Where heavy duty electric equipment drawing current in excess of 15 amperes is involved, the Contractor shall provide temporary service to supply the power.

2. The temporary electric service shall include, but not be limited to labor, materials, and equipment necessary to supply temporary power of adequate capacity for the project.

3. Transformers and meters, when required by the power company, will be furnished by the power company and the contractor shall pay the costs therefore.

B. Temporary electrical Work shall be performed under the direct supervision of at least one master electrician, who will be present on the project at all times when such work is being performed.

C. All temporary work shall be provided in conformity with the National Electric Code, state and local laws, and requirements of the power company.

D. Dismantle and completely remove from the project site, temporary electrical facilities only when the permanent electrical system is operational and accepted by the Engineer.

E. Permits shall be the responsibility of the Contractor to obtain.

1.11 *WEATHER PROTECTION*

A. It is to be specifically understood that the Contractor shall do no work under any conditions deemed unsuitable by the manufacturer of various materials to be installed or the Engineer and/or Owner for the execution of the Work. This provision shall not constitute any waiver, release, or lessening of the Contractor's obligation to bring the Work to Substantial Completion within the period of time set forth in the Contract Documents.

1.12 *TEMPORARY SIGNAGE*

A. The contractor, at no additional expense to the Owner, shall install facility closed signs at all existing entrances of the site where the work is being performed. These signs shall be standard manufactured signs and shall be aesthetically pleasing. Where applicable, the adjacent building/facilities shall remain open and functioning throughout the construction period. Signs shall be provided in strict conformance with all applicable local, state, and federal requirements.

END OF SECTION

SECTION 01 57 16

TEMPORARY PEST CONTROL

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. This section specifies general pest control requirements within the project area, and areas immediately adjacent to the site. This work is to be performed prior to any demolition, site preparation and excavation throughout the Contract. The intent is to prevent the pests and rodents from dispersing from the project site or infesting the project site.

C. The Contractor shall develop and implement an Integrated Pest Control (IPC).

1.02 *SUBMITTALS*

A. Submit to the Engineer and Owner, copies of pesticide applicator certifications and licenses within seven (7) days of the start of rodent control activities.

B. Submit to the Engineer and Owner, copies of pesticide applicator certifications and licenses fourteen (14) days prior to their issuance or renewal throughout the duration of the Contract.

C. Submit to the Engineer and Owner a written description of proposed pest control procedures, indicating materials, quantities, methods, and time schedule. For all pesticides to be used, submit a copy of the pesticide manufacturer's EPA-approved pesticide label with application directions.

D. Submit to the Engineer and Owner documentation of pest control activities and results as follows:

1. Upon request, submit a report detailing the locations of sites treated, amount and type of pesticide used, number and type of traps set, inspection results and any site problems.

2. Notify the Engineer and Owner of any complaints or calls received regarding pests during weekly construction progress meetings.

1.03 *QUALIFICATIONS*

A. The Contractor shall perform this work at all times in accordance with the following minimum standards.

1. The Contractor and key personnel shall have experience and technical training in vertebrate pest management and Integrated Pest Control. Have experience with rodent control techniques, equipment, and strategies, and have knowledge of and experience with techniques to reduce non-target hazards.

2. The supervisor shall be licensed and certified by the Massachusetts Pesticide Bureau and certified in General Pest Control as well as Vertebrate Pest Control. The supervisor shall have specific training and experience in vertebrate pest management, commercial rodent control, general pest control and integrated pest control.

1.04 *COORDINATION*

A. Initiate the work on or before mobilization begins for the Contract and with adequate timing to achieve control before environmental disruptions. Provide a maintenance program until the Contract is completed and all equipment and materials are removed.

B. Perform this work in such a manner that toxicant or other control tools do not pose a hazard to persons, domestic animals, or non-target wildlife.

C. The contractor shall work closely with the City/Town representative to obtain the necessary information and guidelines to provide all the approved pest control traps and pest birth control. All selected pest control measures shall comply with local, state, and federal regulations.

1.05 *PERMITS*

A. Obtain and maintain in coordination with the Contractor appropriate permit(s) from City or State agencies for pest control activities associated with this Work.

B. Obtain and maintain in coordination with the Contractor all right of entry permits required for the performance of this Work. This includes all utilities and private properties to which entrance is required.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Furnish And use only pesticide formulations registered by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Food and Agriculture, where appropriate according to label directions and as acceptable to the Owner and Engineer.

B. Furnish and use devices and supplies to facilitate the management and effectiveness of the pest control program, where appropriate and as acceptable to the Owner and Engineer.

C. Note: All city owned properties are now using both snap traps and birth control (contra-pest) or approved equal. Contractor to coordinate with the City/Town to ensure proper pest control traps are used and adhere to City/Town standards.

PART 3 - EXECUTION

3.01 *MEETINGS*

A. Prior to commencing the Work, all pest control personnel shall attend a Site Meeting held by the Contractor, the Owner and Engineer to discuss the planned pest control methods and coordination.

3.02 *SURVEY*

A. Prior to the start of Construction, survey the proposed construction area as well as the bordering properties and record signs of rodent activity and sanitation conditions. Maintain survey records.

B. Plan the control program based on the survey and as acceptable to the Owner and Engineer.

3.03 *APPLICATION FOR RODENT CONTROL*

A. Apply rodenticide in strict accordance with EPA-approved label directions and the Rules and Regulations of the Massachusetts Department of Agriculture. Maintain records of all bait placements.

B. Where appropriate, especially for surface placements of rodent baits, use properly secured and tamper-resistant bait stations consistent with EPA regulations. Individually number and properly identify all bait stations.

C. Surface Applications:

1. Initial Surface Baiting: Rid the construction area of all detectable rodents before construction begins, or as acceptable to the Owner. Bait all observable rodent burrows. Install and secure bait stations at regular and appropriate intervals and locations, and document rodent activity (burrows, droppings, bait consumed, dead rodents). Replenish bait and shift bait stations as necessary to ensure complete control of rodent populations. Bait edge and accessible bordering areas as necessary to ensure that rodents will not be dispersed by construction activities and that rodents will not infest work areas.

2. Maintenance of Surface Baiting: Establish a maintenance baiting program prior to mobilization by the Contractor, including construction areas and accessible bordering areas, as acceptable to the Owner. Check bait placements weekly. Use

survey and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute bait and bait stations as appropriate to ensure continued control.

D. Surface Applications:

1. For underground construction/demolition, utility relocation, or utility construction, and for other situations when determined necessary by the Owner or Engineer, initiate subsurface baiting and rid underground environments of all detectable rodents before construction begins. Assign an identifying number to each manhole and catch basin where bait is placed so that locations of bait placements can be identified and rodent activity (droppings, bait consumed, dead rats) can be documented. Conduct bait applications during off-peak traffic hours unless otherwise directed by the Engineer. Access manholes according to the requirements of appropriate agencies and utility companies. Coordinate the Work with appropriate municipal agencies and utility companies.

2. Initial Subsurface Baiting: Apply appropriate baits to control rodent populations in manholes and catch basins. This will involve suspending and securing bait using noncorrosive wire (e.g., 24-gauge plastic coated). Place bait in all accessible manholes and catch basins within the construction work area. In addition, bait an appropriate set of manholes and catch basins in the blocks bordering the work area and as acceptable to the Owner. Identify all baited manholes and catch basins with a standardized paint mark on the street and a numbered tag to be attached to the suspending wire. Approximately seven days after completion of the first baiting, check all manhole and catch basin baits and record estimates on the amount of bait consumed. Replenish or increase the amount of bait applied according to the amount consumed or as acceptable to the Owner and Engineer. Repeat this process again approximately fourteen days later and until there is little or no bait consumed. Check manholes and catch basins weekly when they repeatedly have 100 percent of the bait consumed.

3. Maintenance of Subsurface Baiting: Prior to mobilization by the Contractor, establish a maintenance baiting program appropriate for the rodent infestation patterns identified during initial subsurface baiting. This program shall ensure continued control and shall be performed in a manner acceptable to the Owner and Engineer. Maintain bait in manholes and catch basins that have rodent activity and those that had activity during initial baiting. Check each bait according to rodent activity levels. This could range from weekly to approximately every three months, depending upon the recent history of bait consumption. Use utility maps and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute baiting locations as necessary to ensure adequate interception points for controlling immigrating rodents.

E. Cleanup:

1. Remove visible rodent carcasses and dispose of them daily consistent with the pesticide label directions and applicable codes, laws, and regulations.

2. Upon completion of any pest control operations at the site, remove remaining bait and dispose of it according to the pesticide label and applicable codes, laws, and regulations. Remove all wires used for subsurface baiting and any bait station or traps.

3.04 *SANITATION*

A. Prior to construction and through the duration of this Contract, identify and document harborage and food sources available to rodents on the construction site and in adjacent areas. This includes any littering or improper or insufficient use of trash receptacles in construction areas. It also includes any adjacent areas with sanitation conditions or structural deficiencies that violate City, Town, or State sanitation codes.

B. Maintain records of sanitation conditions.

3.05 *COMPLAINTS*

A. During construction, respond to pest-related complaints from the adjacent neighborhood within 12 hours when directed by the Owner or Engineer. Inspect the particular premises and adjacent areas for sanitation and structural deficiencies, as well as historic and recent pest activity. Provide sanitation and structural maintenance information to the property owner or manager. Use pesticides or traps as necessary and appropriate to resolve the complaint when there is a relationship between the pest infestation and construction activities, or when directed by the Owner or Engineer.

B. Maintain records of all complaints investigated, including location, contact person, inspection results, and actions taken. Document the relatedness of the pest infestation to construction activities.

3.06 *RECORD KEEPING*

A. Use standardized date sheets acceptable to the Owner and Engineer to maintain accurate records of data, placement, type, and amount of pesticides or other control tools applied. Similarly, maintain records of surveys, inspections, changes in pest activity, sanitation conditions and complaints. Submit data to Owner and Engineer upon request.

END OF SECTION

SECTION 01 74 23

FINAL CLEANING

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 RELATED DOCUMENTS

A. Consult the individual sections of the specifications for cleaning of Work installed under those sections.

2.01 CLEANING DURING CONSTRUCTION

A. Conduct cleaning and disposal operations to comply with local ordinances, anti-pollution laws, and the Owner.

1. Do not burn or bury rubbish and waste materials on the site.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

C. Maintain the Site free from accumulations of waste, debris, and rubbish.

D. Provide on-site containers for collection of waste materials and rubbish.

E. At the end of each day, remove and legally dispose of waste materials and rubbish from the site.

F. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted or applied surfaces.

G. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.

3.01 FINAL CLEANING

A. Prior to submitting a request to the Engineer to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces and verify that all waste

materials, rubbish, tools, equipment, machinery, and surplus materials have been removed, and that all sight-exposed surfaces are clean. Leave the Project clean and ready for occupancy.

B. Unless otherwise specified under other sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.

C. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing.

D. Employ experienced workmen or professional cleaners for final cleaning.

E. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.

F. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.

G. Remove grease, mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective specifications.

H. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces. This includes any nicks and scratches to play equipment, netting poles, and playground equipment where applicable.

I. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken not to damage such manufacturer's or Subcontractor's finish. Any damage to finishes caused by cleaning operations shall be repaired at the Contractor's expense.

J. Broom clean exposed concrete surfaces and paved surfaces. Rake clean other surfaces of grounds.

K. The Owner’s responsibility for cleaning commences at Substantial Completion and transfer of occupancy from the Contractor to the Owner.

END OF SECTION

SECTION 01 76 00

PROTECTING INSTALLED CONSTRUCTION

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 PROTECTION OF PERSONS & PROPERTIES

A. All Owner facilities may be occupied during construction. The Contractor shall take all necessary precautions to ensure the public safety and convenience of the occupants during construction. Specifically the adjacent roads/buildings/facilities that may remain in use during construction.

B. Any damage to buildings, roads, (public and private), bituminous concrete areas, fences, lawn areas, trees, shrubbery, poles, underground utilities, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner.

1. The Contractor shall be responsible for providing photo and/or video documentation to substantiate that any reported damage was not caused by them in the event of any discrepancies.

2. The documentation shall serve as evidence to demonstrate the Contractor's non-involvement in the reported damage.

C. The Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged after the installation of new work at no expense to the Owner. All repair and replacement work shall match the existing in kind and appearance.

D. See Section 5.01 regarding noise and dust control.

2.01 TEMPORARY PROTECTION

A. The Contractor shall:

1. Protect excavations, trenches, buildings, and materials at all times from rainwater, ground water, backing up, or leakage of sewers, drains, or other piping, or from water damage of any origin. Provide all pumps, piping, coverings, and other materials and equipment as required by job conditions to accomplish this requirement.

2. Protect pavement and slabs to receive work by other trades from any soiling which will prevent proper adhesion of subsequent Work. Pavement and slabs shall be left clean and free of blemishes at the time other trades begin the application of their work.

3. Protect all surfaces to receive work by other trades from any soiling which will prevent proper execution of subsequent work.

4. Protect all existing vegetation to remain that is in proximity to the site work required for completion of the construction project.

5. Protect the private property of the Owner. Any areas damaged by the Contractor shall be restored to the original condition or compensated at the Contractor's expense.

B. After the installation of the Work by any Subcontractor is completed, the Contractor shall be responsible for its protection and for repairing, replacing, or cleaning any such Work which has been damaged by other trades or by any other cause, so that all Work is in first class condition at the time of Substantial Completion.

3.01 ACCESS

A. The Contractor shall, at all times, leave an unobstructed way along walks, parking lots and roadways outside the indicated limit of work, and shall maintain barriers and lights for the protection of all persons and property in all locations where materials are stored or work is in progress.

4.01 SECURITY

A. The Contractor shall be responsible for providing all security precautions necessary to protect the Contractor's and Owner's interests.

B. Where excavation is involved, the Contractor shall be responsible for providing continuous watchmen service as necessary, to insure adequate protection of the general public.

5.01 NOISE AND DUST CONTROL

A. The Contractor shall take special measures to protect the neighbors, abutters, and general public from noise, dust, and other disturbances as needed and/or directed by the Owner throughout construction by:

1. Keeping common pedestrian and vehicular circulation areas clean and unobstructed.

2. Applying water or other dust palliatives as needed for dust mitigation.

3. Keeping all loose trash picked up and prevent it from blowing outside the limit or work.

6.01 FIRE PROTECTION

A. The Contractor shall take necessary precautions to insure against fire during construction. The Contractor shall be responsible to ensure that the area within contract limits is kept orderly and clean and that combustible rubbish and construction debris is promptly removed from the site.

B. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work.

7.01 WIND PROTECTION

A. Should high wind or severe weather warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the Work, and to the adjacent property.

8.01 WEATHER PROTECTION

A. The Contractor shall provide Weather Protection as required by Specification Section 01 52 00, Temporary Facilities, and any other specific requirements of the Contract Documents.

9.01 COORDINATION - NOTIFICATIONS

A. The Contractor shall coordinate all work activities with the Owner. It is noted that the roads and facilities adjacent to the site may be utilized during construction.

END OF SECTION

SECTION 01 77 00

PROJECT CLOSEOUT

PART I – GENERAL

1.1 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 *RELATED DOCUMENTS*

A. Consult the individual sections of the specifications for specific items required under those sections.

1.3 *PERMITS*

A. The Contractor shall coordinate the efforts of all Subcontractors and obtain any final permits that may be required.

1.4 *SUBSTANTIAL COMPLETION*

A. Prior to requesting Substantial Completion, the Contractor shall make a thorough inspection of the Work. During this inspection, the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.

B. Upon completion of the items noted on the Contractor's list, the Contractor shall notify the Engineer that the Work is Substantially Complete. The Engineer shall then conduct a similar thorough inspection. If the Engineer agrees that the Work is Substantially Complete, the Engineer will promptly make a thorough inspection and prepare a punch list, setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.

C. The Contractor shall not be relieved of the responsibility to provide Contract items left off the Engineer's punch list.

D. If the Engineer determines that the Work is not Substantially Complete, the Engineer shall inform the Contractor of those items that must be completed before the Engineer will prepare a punch list. Upon completion of those items, the Contractor shall again request the Engineer to prepare a punch list.

E. When the punch list has been prepared, the Engineer will arrange a meeting with the Contractor and Subcontractors to identify and explain all punch list items and answer

questions on work which must be done before final acceptance.

F. The Engineer may revise the punch list, from time to time, to ensure that all items of Work are properly completed.

G. The Engineer shall prepare the Certificate of Substantial Completion.

1.5 *OPERATING AND MAINTENANCE INSTRUCTIONS*

A. Consult the individual sections of the specifications for the specific requirements for those sections and for further details and descriptions of the requirements.

B. Prior to final payment and completion, the Contractor shall provide all Operating Manuals and Maintenance Instructions as required by the Contract Documents. As a minimum, operating and maintenance manuals will be provided for the equipment, splash pad components, and systems as specified.

C. Operating Instructions and Manuals

1. Subcontractors, installers, and suppliers shall furnish to the Contractor Three (3) sets of operating and maintenance instruction binders of all mechanical, electrical, and manually operated equipment furnished and installed by them. Mechanical and electrical subcontractors shall furnish instructions as specified in their respective sections.

2. The Contractor shall collect all of the above instructions, bind them into Three (3) complete binder sets, and submit them to the Engineer who will deliver them to the Owner.

3. Submission of operating and maintenance instructions shall be a condition precedent to final payment.

4. All submissions of operating and maintenance instructions, including submittals, warranties, guarantees, and as-built drawings shall also be provided electronically on Three (3) thumb drives.

    1. As-built drawings shall be provided in AutoCAD format as well as pdf.

D. Instruction of Owner's Personnel

1. Where specified in the individual sections of the specifications, the Contractor and Subcontractor shall instruct the Owner's personnel at the site, in the use and maintenance of equipment installed under the Contract.

2. Submission to the Engineer of a Certificate of Compliance to this requirement, signed by the Contractor, shall be a condition precedent to final payment.

1.6 *ATTIC STOCK*

A. Provide Attic stock materials as described in the individual specification sections. including, but not limited to, additional paint and surfacing (for repairs), etc.

1.7 *FINAL COMPLETION*

A. Partial Release of Retainage

1. If within 21 days after Substantial Completion, any of the items on the Engineer's punch list are not complete or if the Contractor has not provided the appropriate marked up As-Built Drawings, Operating Manuals, Warranties, Guarantees, or Spare Parts, the Engineer shall not approve any release of Retainage.

2. The Engineer will not prepare a Certificate for Partial Release of Retainage if the Contractor has any remaining Work.

3. Upon completion of all open items, the Release of Retainage shall be processed.

B. Full Release of Retainage

1. Upon completion of all work, and after receipt of all appropriate marked up "As Built" Drawings, Operating Manuals, Warranties, Guarantees, and Spare Parts required by the Contract Documents, the Engineer shall prepare the Certificate of Final Completion.

2. The Contractor's signature on this Certificate shall be notarized.

3. The Contractor shall provide a final Application for Payment to complement the close-out process.

1.8 *FINAL DOCUMENTATION*

A. Final Close-out documentation shall be provided both electronically and in binder format and shall include Closeout Documentation specified herein, Warranty information as specified in SECTION 01 78 36 Warranties and SECTION 01 78 39 Record Documentation on a minimum 3 (three) 20 gigabyte flash USB drives.

B. Final Documentation: Final documentation shall include a completed punch list with all items resolved, accompanied by corresponding dates of completion and authorized signatures. Submission of this documentation is a prerequisite for the authorization of final payment release.

END OF SECTION

SECTION 01 78 36

WARRANTIES AND INSURANCE COVERAGE

PART I – GENERAL

1.01 *RELATED DOCUMENTS*

A. All the Contract Documents, including General Conditions, Supplementary Conditions, and other Division I – General Requirements, apply to the work of this Section.

B. This Section contains general information that applies to all work performed under the Contract and is inherently made a part of each specification section.

1.02 *WARRANTY REQUIREMENTS*

A. Warranties Required: All materials, equipment, and work of the Project shall be covered by comprehensive written warranties. Refer to individual specification sections for additional specific warranty requirements. For work not specified to have additional specific warranty requirements or warranties longer than one year, provide a comprehensive one-year written warranty signed by the contractor and Subcontractor.

B. Warranty Limitations: Warranties required under the Contract are in addition to and not in lieu of any remedy or warranty to which the Owner is entitled under law. Warranties required under the Contract shall not be interpreted as a waiver of any of the Owner's rights.

C. Warranty Procurement: Do not purchase or subcontract for materials, equipment or work until it has been verified that parties required to provide and sign warranties are willing to do so and that warranty language, content, and form are approved by the Owner. Special warranty terms, conditions, and requirements are often specified.

D. Warranties are Irrevocable: After a specific warranty's language, content and form has been approved by the Owner and after the work covered by a specific warranty is subcontracted or purchase order given to a manufacturer, the warrantor shall not revoke or withhold the warranty for any reason including, without limitation, non-payment or incomplete payment by and party other than the Owner, except that if the work has not been installed in compliance with the warrantor's installation requirements, then the warranty may be temporarily withheld until corrections are made and the warrantor's installation requirements have been met.

E. Warranty Forms: Submit written warranty forms to Owner through Engineer for approval prior to award of subcontract, submission or purchase order, and execution of warranty. The manufacturer's standard warranty form may not comply with the requirements of the Contract Documents. Special warranty terms, conditions, and requirements are often specified and required.

F. Work Covered by Warranty: Contractor and warrantor shall remove and replace other work damaged as a result of failure of warranted materials, equipment, or work, and shall remove

and replace other work which must be removed and replaced to provide access to and replacement of materials, equipment, or work covered under warranty. Warranties shall include full payment to the Owner for work related to warranty, repair or replacement including, without limitation, painting.

G. Pro-Rated Warranties: Unless otherwise specified or approved in writing by the Owner, each warranty shall cover full cost of replacement or repair, and shall not be pro-rated on basis of useful service life or warranty period.

H. Warranty Extensions: Work repaired or replaced under warranty shall be provided with a new warranty equal to the full length of the original warranty. The new warranty shall begin on the date of Owner's acceptance and use of the replaced or repaired item.

I. Warranty Effective Starting Date: All warranties shall begin on Date of Final Acceptance of the entire project or Owner's acceptance of the work or item covered by the warranty, whichever is later, and the warranty coverage shall continue for the period specified. If no specific warranty period is specified, the warranty shall extend for one year.

J. Contractor's Responsibilities for Warranties: The Contractor shall implement and invoke all guarantees and warranties provided by subcontractors, manufacturers, material suppliers, and other parties, including warranties with longer than one-year duration. The Contractor shall make every effort to facilitate, expedite, and aid the Owner in warranty claims the Owner may have throughout the warranty periods.

K. Warranty documentation shall be included both electronically and within the Project Closeout binder as specified in SECTION 01 77 00 Project Closeout and SECTION 01 78 39 Record Documentation on **three (3)** minimum 20 gigabyte flash USB drives.

1.03 *ADDITIONAL INSURANCE COVERAGE & REQUIREMENTS*

A. Insurance requirements per front end specifications.

B. Supplemental Insurance Coverage shall be provided as follows:

1. The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified below and in such form as shall protect him/her performing work covered by this Contract and the Owner, its employees, officials, agents, and owner's representative from all claims and liability for errors and omissions in the Contract Documents, damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Contractor covenants and agrees to hold the City and its employees, agents and officials harmless from loss or damage due to claims for personal injury and/or property damage arising from, or in connection with operations under this Contract. Except as otherwise stated, the Contractor shall provide the following coverages:

2. Property Damage Premises-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in the Front-End Specifications and the

Contract.

3. City's Protective Insurance secured by the Contractor on behalf of the Owner, which will directly protect the City, Owner, and its employees, agents, officers, owner's representative, including the Engineer, from liability for bodily injuries, including accident death and property damage, in the amounts required as specified per the Front-End Specifications and the Contract.

4. All policies shall be so written that the City of Everett will be notified of cancellation or restrictive amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. A certificate from the Contractor's Insurance Carrier showing at least the coverage and limits of liability specified above and expiration date shall be filed with the City before operations are begun. Such certificates shall not merely name the type of policy provided but shall specifically refer to this Contract and shall state that such insurance is required by this Contract. The Contractor shall make no claims against the City of Everett or its officers for any injury to any of his officers or employees or for damage to his/her trucks or equipment arising out of work contemplated by the Contractor.

5. The Contractor shall provide insurance under the Contract shall submit accurate and bona fide Certificates of Insurance issued by a responsible agent of the insurance company. This insurance must cover the Contractor's obligations, including protection against errors or omissions in the Contract Documents.

    a. Certificate Content and Coverage:

        i. The Owner shall be named as an additional insured party under the Contractor's insurance. Certificate of Insurance shall explicitly list the insurance coverage provided, including all riders, policy limits, and any specific endorsements required by the Contract Documents.

        ii. Premises Operations.

        iii. Owners and Contractors Protective.

        iv. Broad Form Comprehensive General Liability Endorsement or equivalent to include Broad Form Contractual, Personal Injury, Broad Form Property Damage.

        v. Cross Liability.

        vi. Professional Liability:

            1. The Certificate shall cover errors and omissions related to Professional Liability from claims arising due to inaccuracies or errors in the Contract Documents.

    b. Every Certificate must be accompanied by a notarized statement from the issuing insurance agent, affirming that the required insurance is in effect as specified in the Contract Documents and that there are no deviations or exclusions affecting the coverage of

inaccuracies within the Contract Documents.

c. The insurance agent issuing the Certificate of Insurance shall be responsible and liable for its accuracy and validity.

d. The Contractor and all parties involved in issuing the Certificate shall certify, through sworn and notarized statements, that the insurance coverage provided meets the Contract's requirements, including any liabilities resulting from errors and omissions in the Contract Documents.

e. Prohibited Disclaimers:

   i. Certificates of Insurance must not include any disclaimers such as: *"This Certificate is issued as a matter of information only and confers no rights upon the certificate holder. It does not amend, extend, or alter the coverage provided by the policies listed below."* Such disclaimers will not be accepted.

   ii. Any attempt to disclaim the enforceability of the Certificate of Insurance shall render the certificate invalid for purposes of this Contract.

f. Reliance of Certificates: The Owner, Engineer, and any other parties receiving the Certificates of Insurance are entitled to fully rely on the validity and enforceability of the insurance. They shall have the right to claim the benefits and protection provided by the insurance as it applies to them.

g. The coverage must remain effective throughout the duration of the project and cannot be revoked without prior written consent from the Owner with at least thirty (30) days' notice prior to the cancellation of coverage.

h. The Contractor shall indemnify and save harmless the City of Everett, and all of its officers, agents, and employees from all suits, actions or claims of any character.

END OF SECTION

SECTION 01 78 39

RECORD DOCUMENTS

PART I – GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *WORK INCLUDED*

A. This section covers paper and electronic record documents, including As-Built Record Drawings for the project. As-Built Record Drawings shall include, but not limited to:

1. The Contractors construction coordination drawings for all the project disciplines. The Contractors construction coordination drawings for the project disciplines shall be submitted to the Engineer prior to Construction of the said discipline. The Contractors construction coordination drawings for the project disciplines shall include but are not limited to the following:

    a. Civil,
    b. Structural,
    c. Electrical,
    d. Mechanical,
    e. Plumbing,
    f. Landscape

2. Draft Record Documents Review

    a. Upon completion of the project construction the Contractor shall submit a complete copy of 24- by 36-inch Record Drawings to the Owner and the Engineer for review. The Owner and the Engineer shall jointly review the Record Drawings and provide comments to the Contractor. The Contractor shall modify the Record Drawings as necessary based on the comments provided by the Owner and the Engineer.

1.03 *RELATED WORK*

A. Division 2 to Division 33.

B. Entirety of the General Requirements

1.04 *RECORD DOCUMENTS*

A. Record Documents shall consist of all the Contract Drawings.

B. From the set of drawings furnished by the Owner, The Contractor shall reserve one set for record purposes. From this set, The Contractor shall detach and furnish, at no charge to all Subcontractors, the drawings of their portion of the Work for the same purpose.

C. Prior to final payment, the Contractor shall provide an "As-Built" plan of the park facilities (including, but not limited to Memorial areas, Playgrounds, Splash Pad, Basketball Court, fencing, plantings, walkways, walls, utilities including rims and inverts, etc.) stamped by a Professional Land Surveyor or Professional Engineer registered in the State of Massachusetts demonstrating compliance with all design and regulatory requirements. An electronic version of the "As-Built" plan in AutoCAD 2014 format (or newer) shall also be provided.

D. The Contractor and the above Subcontractors shall keep their marked-up record set on the site at all times and note on it in colored ink or pencil, neatly and accurately, at the end of each working day, the exact location of their work as actually installed. This shall include the location and dimensions of underground and concealed Work, and any architectural, mechanical, or electrical variations from the Contract Drawings. All changes, including those issued by Addendum, Change Order, or instructions by the Engineer shall be recorded. Marked-up record drawings shall be prepared for the entire project and include all Work, including but not limited to:

1. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) foot intervals and at all changes of direction.

2. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, cleanouts, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps, and maintenance devices.

    a. The location of these items shall be shown by offsets to structure and drawing grid lines.

    b. The tolerance for the actual location of these items on the marked-up record drawings shall be plus or minus two (2) inches.

    c. Each item shall be referenced by showing a tag number, areas served, and function on the marked-up record drawing.

F. The Engineer may periodically inspect the marked-up record drawings at the site. The proper and current maintenance of the information required on these drawings shall be a condition precedent to approval of the monthly applications for payment.

G. At Substantial Completion, the Contractor shall submit the complete set of marked up "As-Built" drawings to the Engineer. The Contractor shall check all marked up record drawings prepared by subcontractors and certify in writing on the title sheet of the drawings that they are complete and correct prior to submission to the Engineer.

H. The Engineer shall review the marked-up record drawings and verify by letter to the Owner that the Work is complete. The Contractor shall incorporate any and all changes into the "As-Built" drawings.

I. The Contractor may make a written request for copies of the completed Record Drawings. The Contractor shall reimburse the Owner directly for the cost of printing of any requested Record Drawings.

J. The Contractor shall provide a certified "As-Built" plan sealed by a Professional Licensed Surveyor showing all elevation contours and spot grades to demonstrate compliance with all Americans with Disabilities (ADA) Act requirements.

K. Submission of accurate marked up record drawings and "As-Built" drawings, and their approval by the Engineer shall be a condition precedent to final payment.

1.05 *FINAL RECORD DOCUMENTS*

A. Upon incorporation and acceptance of the Draft Record Drawings comments, the Contractor shall submit the Final Record Drawings and documentation.

1. The Contactor shall submit a total of 4 plan sets: **Two sets** of 24- by 36- inch Record Drawings to the Owner and an additional **Two sets** of 24- by 36-inch Record Drawings to the Engineer for their records.

2. The Contractor shall also submit to the Engineer **Three** minimum 20 gigabyte flash drives with the electronic Record Drawing files, including the but not limited to the Close-Out Binder Documentation, Warranty Information, Contractor Statement, etc.

3. Flash Drive shall include the Final AutoCAD DWG file documents, drawing line types, blocks, etc.

PART 2 – MATERIALS

2.01 Not Used

PART 3 – EXECUTION

3.01 Not Used

END OF SECTION

SECTION 02 20 00

SITE REQUIREMENTS

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *EXAMINATION OF SITE*

A. Prior to bidding the Contractor shall thoroughly examine the site and the Contract Documents to ensure his knowledge of conditions and requirements affecting the work. No claim for extra compensation or extension of time will be allowed for Contractor's failure to comply with this requirement nor will any condition at the site, whether or not in agreement with conditions shown or called for on the Bid and Contract Documents, be allowed as a basis for such claims, except as otherwise specifically provided for in the General Conditions.

1.03 *DISCOVERY*

A. If during the demolition, excavation, disposal, or other work, articles of unusual value, of historical or archeological significance are encountered, the ownership of such articles is retained by the Owner, and information regarding their discovery shall be immediately furnished to the Owner and Engineer. If the nature of the article is such that the work can not proceed without danger of damaging the same, work in that area shall be immediately discontinued until the Engineer and or Owner has decided the proper procedure to be followed. Any time lost thereby shall be a condition for which the time of the contractor may be extended. All costs incurred after discovery in the salvaging of such articles shall be borne by the Owner.

1.04 *COORDINATION WITH EXISTING UTILITIES*

A. The Contractor shall give all advance notice to public utility companies as required by law, and shall provide proper disposition, subject to Engineer's and or Owner's approval of all existing pipelines, conduits, sewers, drains, poles, wiring, and other utilities that in any way interfere with the work, whether or not they are specifically shown on the Drawings. He shall immediately notify the Owner and appropriate authorities when coming across any unknown utility lines and wait for a decision as to how to dispose of the same. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has been damaged he shall notify the Owner and the Utility company involved, and assure the protection, support, or moving of utilities to adjust them to the new work. The Contractor shall be responsible for all damage caused to existing, active utilities under the work of this Contract, whether or not such utilities are shown on the Drawings, including resultant damages or injuries to persons or properties.

B. Written notice shall be given by the Contractor to all public service corporations owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one (1) week in advance of the commencement of such operations, and the Contractor shall at that time file a copy of such notice with the Engineer.

C. Before the Contractor begins any work or operations which might damage any subsurface structures, he shall carefully locate all such structures and conduct his operations so as to avoid any damage to them.

D. Agents of various public service agencies, municipal and state departments may be entering on the work site to remove existing facilities, to construct or place any facilities or to make alterations to existing facilities.

E. Prior to starting work or erecting permanent construction signing, the Contractor shall notify the "DIG-SAFE" program with a minimum of 72 hours advance warning. Once located and marked, the Contractor shall maintain such marks and access to installations to permit repairs and maintenance of service if interrupted.

F. The Contractor shall perform the work in cooperation with the various agencies in a manner that causes the least interference with the operations of the aforementioned agencies and shall have no claim for due to said work of these agencies.

1.05 *WARNING*

A. Install warning fencing around all excavations and in all areas designated on the Drawings and as directed. Maintain fencing in place throughout the length of construction period as directed by the Engineer. After completion of construction, take down fencing and remove it from the site.

1.06 *LAYOUT*

A. Contractor shall maintain a level and transit on the job, and shall employ personnel for use thereof trained and registered as a Civil Engineer or as a registered Surveyor by the State of Massachusetts. The Owner shall have reasonable use of these instruments at all times.

B. Existing survey information on Drawings is for Contractor's use. Contractor shall establish benchmarks in at least two widely separated locations, and shall establish and maintain grades, lines, levels and other dimensional reference guides as required. The Contractor shall annotate project record documents to indicate all modifications of grades, utilities, etc.

C. The contractor is responsible for complying with governing ADA regulations for walkways, sidewalks, paved surfaces, and access ramps.

1.07 *PROTECTION OF PROPERTY AND THE PUBLIC*

A. Construct all fences, barricades, and protective facilities required for the protection of the public, and in accordance with local and state regulations. Furnish and install all signs, lights, reflectors, and all such protection facilities as may be required.

B. Contractor shall hold the Owner harmless from all claims arising from the use of public streets, sidewalks, and adjoining premises for construction purposes.

C. Keep all access roads and walks clear of debris, materials, construction plans, and equipment, during work operations. Repair streets, drives, curbs, sidewalks, fences, poles and the like, where disturbed by construction. Leave them in as good conditions after completion of the work as before operations started. The Contractor shall contact appropriate City officials concerning hauling of construction materials over City roads and bridges.

D. Provide ways and means to control the flow of water from every source which may cause delay or damage during the work operations.

E. The Contractor shall be responsible for the maintenance of construction barriers and traffic barriers in order to maintain traffic, over, through, or around the work included in this Contract with the maximum of safety and practicable convenience to such traffic during the life of the Contract, and whether or not work has been suspended temporarily. He shall take all precautions for preventing injuries to persons or damage to property to or about the work.

F. The work shall be carried on and barriers erected in such a manner as to provide safe passage at all times for public travel and with the least obstruction to traffic. The Contractor shall provide and maintain, at his own expense, in a safe and passable condition, such temporary by-passes as created by the barriers as may be necessary to accommodate both pedestrian and vehicular traffic.

G. The Contractor shall maintain all legally required means of egress.

H. Where the new construction or repair work coincides with the presently traveled way, the Contractor shall carry on his work so that travel will not be obstructed.

I. Whenever gale or high winds are forecasted, take proper measures to secure all loose material, equipment or other items which could blow about and be damaged or cause damage to other work. No such loose items shall be left unsecured at end of working day.

J. All signs shall conform to local By-Laws and the Manual of Uniform Traffic Control Devices.

1.08 *POLICE*

A. Whenever, in the opinion of the Owner or the Engineer, traffic is sufficiently congested, or public safety is endangered the Contractor will furnish police officers to direct traffic or to keep traffic off the area affected by construction operations. **Such officers shall be in addition to flagmen required under other provisions of the Contractor, and the cost shall be borne by the Contractor.**

B. The employment of traffic flagman or the presence of police officers shall in no way relieve the Contractor of any responsibilities or liability which is his under the terms of the Contract.

1.09 *FIRE ACCESS*

A. The Contractor shall maintain fire lanes as required by the local Fire Department throughout the course of construction.

1.10 *SPECIAL SECURITY AND CONTRACTOR'S RESPONSIBILITY FOR THE WORK*

A. The Owner shall not provide security within the storage, staging, or construction areas nor will the owner assume responsibility for acts of vandalism within these areas.

B. Until written acceptance of the physical work by the Engineer, and/or Owner, the Contractor shall assume full charge thereof and he shall take every necessary precaution against damage to the work by action of the elements, or from any cause whatsoever, arising from the actions of the Contractor or not.

C. The Contractor shall bear all losses resulting to him on account of vandalism.

D. The Contractor shall rebuild, repair, restore, and make good all damages to any portion of the work occasioned by any of the above causes before the completion and written acceptance of the physical work, and shall bear the expense thereof.

E. Should the Contractor fail to take prompt action whenever conditions make it necessary, the Owner shall make emergency repairs or cause the same to be made, with the stipulation that the costs for such repairs shall be charged against the Contractor and deducted from monies due to him.

F. In case of suspension of work from any cause whatsoever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities at his expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, and seeding furnished under this Contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

1.11 *TEMPORARY BRACING, SHORING, SHEETING, TIE DOWN*

A. Contractor shall provide all sheeting, shoring, bracing, underpinning, reinforcement, and other temporary supports as may be required to maintain the integrity of, and prevent damage to, any structure or finish to be subjected to or adjacent to cutting work. Patches to be of sufficient final strength and acceptable appearance, subject to Engineer's and/or Owner's approval.

1.12 *SITE DRAINAGE*

A. Contractor shall take over responsibilities for existing site drainage upon entering premises and maintain such drainage during the life of his Contract in a manner approved by the Engineer and/or Owner and so as not to adversely affect adjacent area.

B. Keep excavations, pits, trenches, and other construction areas free of water at all times, including backing up of drains and sewers. Provide hydraulic equipment to control surface and groundwater. Pumping equipment shall be adequate to remove all hydrostatic pressure from structures until sufficient strength has been developed by the structure to protect work from displacement or other damage.

C. Maintain ground water level where required sufficiently below excavation level at all times to maintain a stable working platform. Ground water shall be controlled so as to avoid adverse effects on established groundwater elevation of adjacent sites.

1.13 *SITE TRENCH AND EXCAVATION*

A. Open excavation adjacent to the traveled way or shoulders shall not remain through the hours of darkness, holiday or periods of shutdown, unless adequately protected and specifically authorized by the Department of Public Works/Consolidated Public Works, Engineer, and Owner.

B. If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made safe.

C. Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this section, shall be considered included in the Contract price, and no additional compensation will be allowed therefore.

D. Before starting any work for this Contract, the Contractor shall prepare and submit to the Engineer for approval, a plan which indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work and the temporary barricades, signs, cones, drums and other safety and traffic control devices to be employed during each stage and time period of the work to maintain traffic and access to abutting properties.

E. Particular care should be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. Traffic control and safety devices required only during working hour operations shall be removed at the end of each work day.

F. Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

G. All trenches with the right-of-way in pavements to remain shall be hot patched at the end of each work day as directed.

H. All existing and delivered materials not required or needed for use on the project, and not required to be removed and stocked, shall become the property of the contractor and shall be removed from the site and legally disposed of. No separate payment will be made for this work, but all costs in connection therewith shall be included in the bid price of this Contract.

1.14 *WINTER CONDITIONS*

A. Contractor shall remove snow and ice which may impair progress of work, be detrimental to workmen, or impair trucking, delivery or moving of materials at job site, or prevent adequate drainage at site or adjoining areas.

1.15 *COORDINATION*

A. The Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades, subcontractors, or material and equipment engaged upon the work. He shall be prepared to guarantee each of his subcontractors the dimensions which they may require for the fitting of their work to all surrounding work and shall perform or cause the subcontractors to perform all cutting, fitting or adjusting and patching necessary to make all parts of the work come together properly and be fit to receive or be received by that or other Contractors.

B. Before commencing any work, or any phase of the work, the Contractor shall prepare a sequence of operations for all work under this Division, and shall submit it for approval by the Engineer and/or Owner at the Pre-Construction Conference.

C. Before commencing any work, the Contractor shall consult with the Owner regarding any use of any facility, including, but not limited to, loading docks, parking areas, storage areas, etc., that may be required to prosecute the work.

D. If, in the judgment of the Engineer, continued work under the approved sequence of operations may interfere with the operations of any other construction project at any time during the progress of the work, the Engineer may direct the Contractor to accelerate, interrupt, or cease work at particular points. The Contractor will make

reasonable changes in the sequence of operations to accommodate these directions, at no additional cost to the Owner.

E. The Contractor shall give his personal supervision to the work or have a competent superintendent with the authority to act for him on the job at all times during the progress of work. The contractor shall also provide an adequate staff for the proper coordination and expedition of his work.

F. The Contractor shall lay out his own work and shall be responsible for all lines, elevations, and measurements of the grading, landscaping and other work executed by him under the Contract. He shall exercise proper precaution to verify the dimensions shown on the Drawings before laying out the work, and will be held responsible for any error resulting from his failure to exercise such precaution.

G. The Contractor's responsibility for the coordination of all work under the Contract shall be complete, and shall extend to all modifications in the work, whether or not such modifications entail a change in the Contract price. Where the Contract Documents allow an optional material or method, the Contractor shall provide all other coordination and additional work that such change necessitates, without any additional cost to the Owner.

1.16 *MEASUREMENTS*

A. Before ordering any material or doing any work, the Contractor shall verify all measurements and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the Drawings; any difference which may be found shall be submitted to the Engineer and/or Owner, in writing, for consideration before proceeding with the work.

1.17 *CONDUCT OF WORK*

A. The Contractor shall coordinate with the Owner and Engineer, work in connection with adjacent occupied buildings or areas, driveways, walks or other facilities which could prevent access thereto or interrupt, restrict or otherwise infringe upon the Owner's use thereof.

B. Damage to existing work, if caused by Contractor's operations under this Contract, shall be repaired at Contractor's expense.

C. The Contract Site shall be shown on Drawings and shall include the entire area bounded by the "Contractor's Work Area" or "Limit of Work" lines when required for performance of work under this Contract.

D. Any street or other curbs and/or sidewalks damaged as the result of work under this Contract, whether within or outside of the limits of the work, shall be repaired and/or replaced with new matching construction by the Contractor causing such damage, at his

expense, and in a manner satisfactory to the Engineer and authorities having jurisdiction over the property.

E. Where existing curbs or walks are to remain, or after any curbs or walks are constructed and trucking is required over them, they shall be suitably protected in an approved manner.

F. The Contractor shall provide continuous, lawful, safe, adequate and convenient access to the site. Access to the site shall generally be via existing roadways and paved surfaces which the Contractor shall maintain and restore to original conditions. Contractor shall construct and maintain in good usable condition temporary roads or appurtenances as required, and when no longer required, remove temporary construction and restore such areas to their original condition.

1.18 *CLEANING UP*

A. The following specific cleaning work shall be done:

1. Concrete and masonry shall be cleaned free of all foreign matter. If, in opinion of the Engineer, further cleaning of specific areas is required they shall be scrubbed with water or other cleaning agents. Acid cleaners shall not be used, except as may otherwise specifically be permitted in the trade sections.

2. Surfaces with integral finishes shall be washed with clean water, mild soap and soft rags, thoroughly rinsed, and then wiped with clean, soft white rags. Abrasive cleansers shall not be used.

3. Painted surfaces shall be cleaned free of all foreign matter, and if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags thoroughly rinsed, and wiped with clean, soft white rags.

4. Metal surfaces, hardware, equipment, and similar items shall be cleaned free of all foreign matter and if necessary shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed and wiped with clean soft, white rags. Abrasive cleaners shall not be used.

5. All advertising matter and temporary instructional material shall be removed from exposed surfaces throughout.

1.19 *PROJECT CLOSEOUT*

A. **Punch List:** When the Engineer and/or Owner inspect the work for substantial Completion, they will prepare and issue to the Contractor a “Punch List” of items to be corrected, and provided punch list document signed, before final acceptance of work and payment can be made.

END OF SECTION

SECTION 02 21 00

SITE PREPARATION

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. Examine all other Sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 *WORK INCLUDED*

A. Perform all work required to complete the work of the Sections, as indicated. Such work includes, but is not limited to, the following:

1. Clearing, grubbing, and disposing of vegetation, including bushes, brush, trees, stumps, roots, rubbish, refuse, trash and debris within the indicated limits.

2. Removal and stockpiling of existing topsoil into a segregated and protected stockpile area.

3. Protection from injury to or defacement of trees and other vegetation and objects indicated on the plans or designated by the Engineer to be preserved.

4. Removal, salvage, or other disposition of slabs and footings, existing pavements, curbs, sidewalks, walls, steps, structures, monuments, signage, and posts, fencing, stone walls, and all other site improvements which interfere with construction as indicated, or as required, by the Engineer.

1.03 *RELATED WORK UNDER OTHER SECTIONS*

A. 31 25 00 - Erosion and Sediment Control

B. Division 31 – Earthwork

C. 33 41 00 - Subdrainage Piping

1.04 *JOB CONDITIONS*

A. General: The Contractor shall visit and accept the site as he finds it, and shall inform himself of the character and the type of site items to be removed. The Contractor shall walk the site with the Engineer prior to commencing work to review the full scope of demolition and items to remain. The Owner assumes no responsibility for the actual condition or structural adequacy of any existing construction to be demolished.

B. Damage or loss to site improvements shall be at the risk of the Contractor from and after the date of Contract execution, and no such damage or loss shall relieve the Contractor from any obligation under the Contract.

C. Disposal: Dispose of cleared, grubbed, and removed material off the site. Burning of materials on the job site will not be permitted.

D. Traffic: Conduct operations and removal of debris to ensure minimum interference with the normal use of corridors, public ways and other adjacent facilities. Do not close or obstruct traffic ways, corridors, streets, walks or other used facilities without the written permission of the Owner and authorities having jurisdiction.

E. Use of Facilities: The adjacent areas, roads, driveways, including nearby Buildings/Facilities may be occupied during construction and shall remain unobstructed and in use during construction. Contractor at his/her cost shall provide all necessary site protection to ensure safe and proper use of these facilities.

F. Protection: Prevent injury to persons and damage to property. Immediately repair damaged property to its condition before being damaged.

G. Shoring and Bracing: Provide adequate shoring and bracing to prevent uncontrolled collapse or damage to existing structures or utilities.

H. Dust and Noise Control: Take effective measures to prevent windblown dust and to control noise to avoid creating a nuisance. Avoid creating ice hazards in freezing weather.

I. Utilities: Maintain all utilities except those requiring removal or relocation. Keep utilities in service and protect from damage. Do not interrupt utilities serving used areas without first obtaining permission from the utility company and the Engineer. Provide temporary services as required.

PART 2 –PRODUCTS

2.01 *CONSTRUCTION FENCING*

A. Contractor shall provide adequate fencing to allow for the safe and proper use of the adjacent facilities, where applicable, including but not limited to the roads and buidlings, and all other facilities outside the limit of work. Contractor shall secure the limit of work for safety.

B. Minimum height shall be 6 FT CLF. For busier sites, Engineer/Owner may request fencing with privacy screens. Contractor to provide upon request at no additional cost to the Owner.

C. Reference drawings for construction fencing requirements, materials and details.

2.02 *STOCKPILING COVER*

A. Reinforced polypropylene tarps, resistant to ultraviolet radiation.

B. Secured with ropes and anchors, as required and approved by the Engineer.

C. Stockpiles shall be surrounded with siltation barriers, refer to plans and Erosion Control Specification for details.

PART 3 –EXECUTION

3.01 *DEMOLITION*

A. General: Demolish completely and legally remove from site and dispose of properly all items indicated on the demolition and erosion control drawings. Proceed with demolition systematically.

B. Demolish all existing above and below grade improvements except those indicated to remain. Wherever areas of new construction are shown to go over or encompass existing constructions or improvements, the existing construction and improvement shall be completely removed in their entirety. Unless specifically indicated to remain.

C. All demolition disposals must comply with all State and Federal regulations for waste stream management, recycling and any other provisions of the law.

3.02 *CLEARING AND GRUBBING*

A. Clear materials specified herein to the limits shown and removed from the site.

B. Remove stumps and roots completely in all proposed paved or built areas and to 1.5 feet minimum below grade where lawn is to be installed; 3 feet minimum in areas designated for shrubs, 4 feet minimum for trees.

3.03 *SALVAGE*

A. Salvage indicated material or materials determined to be suitable and required for reuse, including: gates, frames or other metal castings and miscellaneous parts of inlets and manholes; hydrants in functional condition; light poles; wood and metal fences; signs; curbing; stone from stone walls and other miscellaneous site items as indicated on the

Drawings. Stockpile items to be salvaged in on-site or off-site locations, as designated by the Engineer.

B. Protect metallic coatings on salvaged items. Remove adhering concrete from salvaged items.

C. Reassembly Documentation:

1. Provide documentation suitable for future use in the re-assemble of salvaged items. Documentation shall be in the form of a drawing or set of drawings for each assembly. Clearly identify each component of each assembly on the related drawing with identifying marks matching the labels or marks on the components as stored or stockpiled. Provide additional notes on the Drawings to aid in re-assembling. Include unusual operations, sequence of assembly, and damaged or missing components.

D. Items to be Packaged and Stored Off-Site:

1. Items to be packaged and stored off-site shall be carefully packaged in a substantial manner with all related components, accessories, and fasteners, clearly tagged for reassembly. Photocopies of reassembly documents shall be included in each package of each group or related components.

2. Type or label components with identifying code to provide proper reassembly.

3. Packaging shall be suitable for material and shall be secure.

4. Dry components thoroughly; coat components susceptible to corrosion and all threaded areas with anti-corrosion coating.

3.04 *STRIPPING AND STOCKPILING TOPSOIL*

A. Prior to starting general excavation, strip all topsoil within areas to be occupied by structures, pavements, steps, playground, planting and trenches, as well as all areas to be regarded, or used for construction operations for later use in placing topsoil and finish grading. Stockpile areas for topsoil shall be as indicated on Drawings, or as directed by the Engineer. Should the topsoil be stockpiled in any area without prior approval of the Engineer, the Engineer may direct the Contractor to relocate such stockpile to another portion of the site, and the Contractor shall do so at no additional cost to the Owner.

B. Do no soil stripping without clear understanding of existing soil, planting and site conditions to be preserved.

C. Surplus topsoil and fill not required to fulfill the requirements of the Contract shall become the property of the Contractor and shall be removed and disposed.

D. Immediately after stockpiling and at the end of each working day cover the stockpile completely with a polypropylene tarp. Secure tarp.

3.05 *BACKFILL*

A. Backfill trenches and excavations resulting from work under this section in accordance with DIVISION 31 - EARTHWORK.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMWORK AND ACCESSORIES

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 *WORK INCLUDED*

A. The Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work in this section, as required in the specifications and in accordance with good construction practice. The work under this section generally includes the furnishing, erecting, and removing after use all concrete formwork and accessories as required for concrete work.

1.03 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 31 20 00 – Earth Moving
2. Section 03 20 00 – Concrete Reinforcing
3. Section 03 30 00 – Cast-in-Place Concrete

1.04 *REFERENCES*

A. Comply with applicable requirements of the following standards. Where these standards conflict with other requirements, the most restrictive requirements shall govern.

ACI INTERNATIONAL (ACI)

ACI 301	Specification for Structural Concrete for Buildings
ACI 318/318R	Building Code requirements for Structural Concrete and Commentary
ACI 347R	Guide to Formwork for Concrete

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4 (1995) Basic Hardboard

DEPARTMENT OF COMMERCE (DOC)

DOC PS 1 Construction and Industrial Plywood

MASSACHUSETTS STATE BUILDING CODE

780 CMR Massachusetts State Building Code, 9th Edition (or latest)

B. Concrete/Pre-Cast Manufacturer shall be a National Precast Concrete Association (NPCA) Member.

1.05 *SUBMITTALS*

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

A. Data: Design analysis and calculations for form design and methodology used in the design. Manufacturer's data including literature describing form materials, accessories, and form releasing agents.

B. Drawings: Drawings showing details of formwork, including joints, supports, studding and shoring, and sequence of form and shoring removal.

C. Instructions: Manufacturer's recommendation on method and rate of application of form releasing agents.

1.06 *DESIGN*

A. Formwork shall be designed in accordance with the methodology of ACI 347R for anticipated loads, lateral pressures, and stresses.

B. Forms shall be capable of producing a surface which meets the requirements of the class of finish specified in Section 03 20 00 CONCRETE REINFORCING.

C. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

1.07 QUALITY CONTROL

A. Unless otherwise specified herein, or indicated on the drawings, concrete formwork construction and materials shall conform to ACI 301, 318, and 347, and the following tolerances:

1. Variations form the plumb, level or from the grades indicated on the drawings shall not exceed ¼ inch in 10 feet of length.

2. Variation in the thickness of slabs and walls shall not exceed plus ½ inch minus ¼ inch.

3. Variation of dimensions of footings from plan shall not exceed ½ inch.

4. Misplacement of the eccentricity of the footings shall not exceed 2 inches.

5. Reduction in thickness of footings shall not exceed 5 percent of specified thickness.

B. Maximum deflection of form facing materials at concrete surfaces exposed to view shall be L/240 of span.

PART 2 - PRODUCTS

2.01 *FORM MATERIALS*

A. Forms for Class A and Class B finished surfaces shall be plywood panels conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels.

B. Forms for Class C finished surfaces shall be shiplap lumber; plywood conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II; tempered concrete form hardboard conforming to AHA A135.4; other approved concrete form material; or steel, except that steel lining on wood sheathing shall not be used.

C. Forms for Class D finished surfaces, except where concrete is placed against earth, shall be wood or steel or other approved concrete form material.

D. Form ties shall be factory-fabricated metal ties, shall be of the removable or internal disconnecting or snap-off type, and shall be of a design that will not permit form deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Except where removable tie rods are used, ties shall not leave holes in the concrete surface less than ¼ inch nor more than 1-inch-deep and not more than 1 inch in diameter. Removable tie rods shall not be more than 1-½ inches in diameter.

E. Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

PART 3 - EXECUTION

3.01 *INSTALLATION*

A. Forms shall be mortar tight, properly aligned, and adequately supported to produce concrete surfaces meeting the surface requirements specified in Section 03 20 00 CONCRETE REINFORCING. Forms shall conform to construction tolerances previously stated in this Section.

B. Where concrete surfaces are to have a Class A or Class B finish, joints in form panels shall be arranged as approved. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar.

C. Forms shall not be reused if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. Surfaces of forms to be reused shall be cleaned of mortar from previous concreting and of all other foreign material before reuse.

D. Form ties that are to be completely withdrawn shall be coated with a non-staining bond breaker.

3.02 *CHAMFERING*

A. Except as otherwise shown, external corners that will be exposed shall be chamfered, beveled, or rounded by moldings placed in the forms.

3.03 *COATING*

A. Forms for Class A and Class B finished surfaces shall be coated with a form releasing agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions.

B. Forms for Class C and D finished surfaces may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather with probable freezing temperatures, coating shall be mandatory.

C. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

3.04 *REMOVAL OF FORMS*

A. Forms shall be removed in a manner that will prevent damage to the concrete and will ensure the complete safety of the structure. Formwork for footings, walls, and other parts not supporting the weight of concrete may be removed when the concrete has attained sufficient strength to resist damage from the removal operation, but not before at least **24 hours** has elapsed since concrete placement.

B. Supporting forms and shores shall not be removed from walls until the structural units are strong enough to carry their own weight and any other construction or natural loads.

C. In no case will supporting forms or shores be removed before the concrete strength has reached 70 percent of design strengths as determined by field cured cylinders or other approved methods. This strength shall be demonstrated by job-cured test specimens, and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of forming and shoring system.

D. The job-cured test specimens for form removal purposes shall be provided in numbers as directed and shall be in addition to those required for concrete quality control. The specimens shall be removed from molds at the age of 24 hours and shall receive, insofar as possible, the same curing and protection as the structures they represent.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 WORK INCLUDED

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work in this section, as required in the specifications and in accordance with good construction practice. The work under this section generally includes the following:

A. Furnish and install reinforcing bars, tie wires and supports as required.

B. Furnish and install welded wire fabric as required.

C. Clean all areas affected by the work.

1.03 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 03 10 00 – Concrete Forming and Accessories

2. Section 03 30 00 – Cast-in-Place Concrete

1.04 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other requirements, the most restrictive requirements shall govern.

American Concrete Institute Standards (ACI) latest edition.

301 Specifications for Structural Concrete

318 Building Code Requirements for Structural Concrete.

315 Details and Detailing of Concrete Reinforcement.

315R Manual of Engineering and Placing Drawings for Reinforced Concrete Structures

American Society for Testing and Materials (ASTM)

A615 Deformed and Plain Billet Steel Bars for Concrete Reinforcement

Concrete Reinforcing Steel Institute (CRSI)

Manual of Standard Practice, Latest Edition

Placing Reinforcing Bars, Latest Edition.

B. Concrete/Pre-Cast Manufacturer shall be a National Precast Concrete Association (NPCA) Member.

1.05 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, SUBMITTAL PROCEDURES:

A. Shop Drawings:

1. Show sizes and dimensions for fabrication and placing of reinforcing steel and bar supports. Indicate bar schedules, stirrup spacing, and diagrams of bent bars.

B. Certificates:

1. Mill test certificates identifying chemical and physical analysis of each load of reinforcing steel delivered.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.

B. Handle and store materials to prevent contamination and contact with the ground.

1.07 QUALITY CONTROL

A. Reinforcing steel shall be fabricated to conform to the required shapes, dimensions and tolerances specified in the CRSI Manual.

B. Allowable Tolerances:

1. Fabrication Tolerances:

a. **Sheared Length:** Plus or minus 1 inch for bends.

b. **Stirrups, ties, and spirals:** Plus or minus ½ inch.

2. Placement Tolerances:

a. **Concrete cover to form surface:** Plus or minus ¼ inch.

b. **Minimum spacing between bars:** Minus ¼ inch.

c. **Top bars in slabs and beams:** Members 8 inches deep or less: plus or minus ¼ inch; members between 8 inches and 2 feet: plus or minus 1 inch; members 2 feet deep or greater: plus or minus 1 inch.

d. **Crosswise of members:** Spaced evenly within 2 inches.

e. **Lengthwise of members:** Plus or minus 1 inch.

f. **Maximum bar movement to avoid interference with other reinforcing steel, conduits, or embedded items:** 1 bar diameter.

PART 2 - MATERIALS

2.01 MATERIALS

A. Reinforcing Bars:

1. Deformed billet steel: ASTM A615, Grade 60.

2. Bend test: Meet 90° bend test at 60° F minimum temperature around a 10 bar diameter bend without cracking.

B. Welded Wire Fabric:

1. Size per plans, conform to ASTM A884, Epoxy Coated.

2. All welded wire fabric to be provided in flat sheets.

C. Tie Wire:

1. Annealed Steel - Federal Specification QQ-W-461, 16 gage minimum.

D. Bar Supports:

1. Conform to "Bar Support Specifications", CRSI Manual of Standard Practice, Class B - Pregalvanized cold-drawn wire.

2.02 FABRICATION

A. In accordance with the CRSI Manual of Standard Practice.

PART 3 - EXECUTION

3.01 PREPARATION

A. Remove all mud, oil, loose rust or mill scale and other foreign materials that may reduce bond prior to placing concrete. "Tight" rust or mill scale will be permissible without cleaning or brushing, provided weights and dimensions are not less than the minimum required by referenced specifications.

3.02 INSTALLATION

A. Reinforcing Bar Placement:

1. Conform to CRSI-WCRSI "Placing Reinforcing Steel".

2. Position bars in accordance with above tolerances and secure in place.

B. Welded Wire Fabric Placement:

1. Install in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

2. Fabric shall be wired or clipped together at laps at intervals not to exceed 4 feet. Fabric shall be positioned by the use of appropriate supports suitable for application.

C. Bar Supports:

1. Provide minimum number of supports as required by ACI 315.

2. Do not use pebbles, pieces of broken stone, brick, or concrete, metal pipe or wood blocks to support reinforcement. Do not use bar supports as support for runways for concrete buggies or similar loads. Do not place bars more than 2 inches beyond the last leg at the end of a run of continuous supports.

D. Concrete Cover:

1. Except as otherwise indicated on the construction drawings, provide the minimum clearance for concrete cover in accordance with ACI 318.

E. Reinforcing Adjustment:

1. Move only within allowable tolerances to avoid interference with other reinforcing steel, conduits, or embedded items. Do not move bars beyond allowable tolerance without approval of the Engineer.

2. Do not heat, bend, or cut bars without approval of the Engineer.

F. Splices:

1. Do not splice bars except at locations on the details without approval of the Engineer.

2. Minimum lap distance is as shown on the details and as specified in ACI 318. Tie splices securely with wire to prevent displacement during placing of concrete.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 *WORK INCLUDED*

A. Perform all work required to complete the work of the Section, as indicated. Such work includes, but is not limited to, the following:

1. Concrete Curbs
2. Concrete Pads
3. Concrete Walkways
4. Foundations

1.03 *RELATED WORK*

A. SECTION 31 20 00 – Earth Moving

B. SECTION 03 20 00 – Concrete Reinforcing

C. SECTION 33 41 00 – Subdrainage Piping

1.04 *REFERENCES*

A. Work shall comply with applicable requirements of the following Standards. Where these standards conflict with other requirements, the most restrictive requirement shall govern.

1. Massachusetts Highway Department Standard Specifications for Highways and Bridges (MHD Specifications)
2. American Concrete Institute (ACI)
3. American Society for Testing and Materials (ASTM)
4. Americans with Disabilities Act (ADA)

B. Concrete/Pre-Cast Manufacturer shall be a National Precast Concrete Association (NPCA) Member.

1.05 *QUALITY ASSURANCE*

A. Unless otherwise specified, work and materials for construction of the Portland Cement Concrete Paving shall conform to ACI 216R.

B. Paving work, base course etc., shall be done only after excavation of construction work which might injure them has been completed. Damage caused during construction shall be repaired before acceptance.

C. Existing paving areas shall, if damaged or removed during course of this project, be repaired or replaced under this section of the specification. Workmanship and materials for such repair and replacement, except as otherwise noted, shall match as closely as possible those employed in existing work.

D. Pavement, base, or sub-base shall not be placed on a muddy or frozen sub-grade.

E. The Owner reserves the right to retain an independent testing laboratory to perform inspection and testing of paving and associated work.

1.06 *SUBMITTALS*

A. Submit manufacturer's product data for the following:

1. Product Data

2. Concrete job mix formula.

1.07 ALTERNATE 4

A. Provide bituminous concrete walkways in lieu of concrete walkways. Contractor to provide credit amount. See drawings for details.

PART 2 - PRODUCTS

2.01 *DENSE GRADED CRUSHED STONE*

A. Dense Graded Crushed Stone shall be as specified under Section 31 20 00, Earth Moving.

B. The Contractor shall submit to the Engineer a sieve analysis by an independent recognized testing laboratory of the material he intends to utilize. No material shall be placed until approved by the Engineer in writing.

2.03 *PORTLAND CEMENT CONCRETE*

A. Portland cement concrete for pavements and slabs shall be air-entrained type with a maximum water-cement ration of 0.5 conforming to ACI 316R.

1. Minimum compressive strengths at 28 days shall be as follows:

a. Compressive strength – 4,000 psi.

2. Concrete shall be air-entrained type, conforming to ASTM C94.

a. Air content by volume shall be 6% +/- 1%, and shall be tested in accordance with ASTM C 231.

B. **Concrete slump:** Shall be no less than 2 inches nor greater than 4 inches, determined in accordance with ASTM C 143.

C. **Cement:** Shall be Portland cement, Type 1 or II, conforming to ASTM C 150.

1. Only one color of cement, all from the same manufacturer, shall be used for the work.

2. Type III cement shall be used only with the prior approval of the Engineer.

D. Fine and coarse aggregate shall conform to ASTM C 33.

E. Concrete shall contain a water reducing agent to minimize cement and water content of the concrete mix at the specified slump. Water reducing agent shall conform to ASTM C 494.

F. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixtures other than those specified shall be used in the concrete without the specific written permission of the Engineer in each case.

2.04 *CURING MATERIALS*

A. Curing shall be moist curing or by use of curing compound.

B. Curing paper shall be non-staining, fiber reinforced laminated Kraft bituminous product conforming to ASTM C 171. Four mil polyethylene sheeting may be substituted for curing paper.

C. Curing compound shall be a resin-base, white pigmented compound conforming to ASTM C 309, Type 2.

2.05 *JOINTS*

A. Joint filler strips shall conform to ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.06 *BOND BREAKER*

A. Bond breaker shall be asphalt felt conforming to ASTM D 226, Type I or 6 mil polyethylene sheeting.

PART 3 – EXECUTION

3.01 *PREPARATION OF SUBGRADE*

A. Areas to be paved will be compacted and brought to sub-grade elevations under Section 31 10 10, Site Clearing before work of this section is performed. Final fine grading, filling, and compaction of areas to receive paving, as required to form a firm, uniform, accurate, and unyielding sub-grade at required elevations and to required lines, shall be done under this Section.

B. Existing sub-grade material which will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring sub-grade to required line and grade and to replace unsuitable material removed shall be material conforming to this Section.

C. Sub-grade of areas to be paved shall be re-compacted as required to bring top 8 inches of material immediately below gravel base course to a compaction at optimum moisture of at least 95% of maximum density, as determined by ASTM D 1557. Sub-grade compaction shall extend for a distance of at least 1 foot beyond pavement edge.

D. Excavation required in pavement sub-grade shall be completed before fine grading and final compaction of sub-grade are performed. Where excavation must be performed in completed sub-grade, sub-base, base or pavement, subsequent backfill and compaction shall be performed as directed by the Engineer as specified in Section 31 20 00, Earth Moving. Completed sub-grade after filling such areas shall be uniformly and properly graded.

E. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to 2 inches deep in sub-grade shall be graded out, reshaped as required, and re-compacted before placing pavement base course.

F. Materials shall not be stored or stockpiled on sub-grade.

G. Disposal of debris and other material excavated under this Section, and material unsuitable for or in excess of requirements for completing work of this Section shall be disposed of offsite unless otherwise directed by the Engineer or Owner.

H. Prepared sub-grade will be inspected by the Engineer. Sub-grade shall be approved by the Engineer before installation of gravel base course. Disturbance to sub-grade caused by inspection procedures shall be repaired under this Section of the specification.

3.02 *DENSE GRADED CRUSHED STONE*

A. Dense graded crushed stone base course for paving and the spreading, grading, and compaction methods employed shall conform to standard requirements for usual base course of this type for first class road work, and the following: MHD Specifications Section 402, "Dense Graded Crushed Stone for Sub-Base".

B. Width of dense graded crushed stone base course shall be grater than or equal to the width of pavement surface, if continuous lateral support is provided during rolling, and shall extend at least 2 times the base thickness beyond edge of the course above, if not so supported.

C. Dense graded crushed stone material shall be applied in lifts less than or equal to 6 inches thick, compacted measure. Each lift shall be separately compacted to specified density, using a 6-ton steel wheel roller or vibratory roller equivalent to a 6-ton static roller, or an approved equivalent.

D. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade and level.

E. Rolling shall begin at sides and progress to center of crowned areas and shall begin on low side and progress towards high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheel.

F. Surface irregularities which exceed ½ inch as measured by means of a 10-foot-long straightedge, shall be replaced and properly re-compacted.

G. Base course shall be compacted at optimum moisture content to not less than 95% of maximum density as determined by ASTM D 1557.

H. Sub-grade and base course shall be kept clean and uncontaminated. Less select materials shall not be permitted to become mixed with gravel. Materials spilled outside pavement lines shall be removed and area repaired.

I. Portions of sub-grade or of construction above which become contaminated, softened, or dislodged by passing of traffic, or otherwise injured, shall be cleaned, replaced, or otherwise repaired to conform to the requirements of this Section before proceeding with next operation.

3.03 *STEEL REINFORCEMENT*

A. Before being placed in position, reinforcing for reinforced concrete shall be thoroughly cleaned of loose mill and rust scale, dirt, ice, and other foreign material which may reduce

the bond between the concrete and reinforcing. Where there is delay in placing concrete after reinforcement is in place, bars shall be re-inspected and cleaned when necessary.

B. Unless otherwise indicated on the Drawings, reinforcing shall extend within 2 inches of formwork and expansion joints. Reinforcing shall continue through control joints.

C. After forms have been coated with form release agent, but before concrete is placed, reinforcing steel shall be securely wired in the exact position called for, and shall be maintained in that position until concrete is placed and compacted. Chair bars and supports shall be provided in a number and arrangement satisfactory to the Engineer.

3.04 *PORTLAND CEMENT CONCRETE PAVING*

A. Paving mix, equipment, methods of mixing and placing, and precautions to be observed as to weather, condition of base etc., shall meet requirements of ACI 316R. Pavement shall be constructed in accordance with the Drawings.

B. The Engineer shall be notified of concrete placement sufficiently in advance of start of operation to allow his representative to complete preliminary inspection of the work, including sub-grade, forms, and reinforcing steel, if used.

C. Normal concrete placement procedures shall be followed. Concrete shall arrive at the jobsite so that no additional water will be required to produce the desired slump. When conditions develop that require additional water to produce the desired slump, permission of the Engineer must be obtained. The concrete shall be transported from the mixer to its place of deposit by a method that will prevent segregation or loss of material.

D. Work shall not be performed during rainy weather or when temperature is less than 40ºF (4.4ºC).

E. Adjacent work, etc., shall be protected from stain and damage during entire operation. Damaged and stained areas shall be replaced or repaired to equal their original conditions.

F. Existing concrete, earth, and other water-permeable material against which new concrete is to be placed shall thoroughly damp when concrete is placed. There shall be no free water on surface.

G. Concrete which has set or partially set before placing shall not be employed. Re-tempering of concrete will not be permitted.

H. Concrete shall be thoroughly spaded and tamped to secure a solid and homogeneous mass, thoroughly worked around reinforcement and into corners of forms.

I. When joining fresh concrete to concrete which has attained full set, latter shall be cleaned of foreign matter, and mortar scum and laitance shall be removed by shipping and washing. Clean, roughened base surface shall be saturated with water, but shall have no

free water or surface. A coat of 1:1 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into thoroughly dampened concrete base. New concrete shall be placed immediately, before grout has dried or set.

3.05 *JOINTS*

A. Locate and install Expansion and Control Joints in accordance with the Drawings and as specified herein.

3.06 *FINISHING*

A. Concrete flatwork surfaces shall be screeded off and finished true to line and grade, and free of hollows and bumps. Surface shall be dense, smooth, and at exact level and slope required.

B. Finished concrete surface for concrete pads shall be wood-floated and steel troweled to a smooth surface. Surface shall not deviate more than 1/8-inch in 10 feet.

C. Unless otherwise indicated, horizontal surfaces of concrete surfaces which will be exposed shall be given a light broomed finish, with direction of grooves in concrete surface perpendicular to length of concrete band, slab, or pad. After concrete has set sufficiently to prevent coarse aggregate from being torn from surface, but before it has completely set, brooms shall be drawn across it to produce a pattern of small parallel grooves. Broomed surface shall be uniform, with no smooth, unduly rough or porous spots, or other irregularities. Coarse aggregate shall not be dislodged by brooming operation.

D. Where finishing is performed before and of curing period, concrete shall not be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

3.07 *CURING*

A. It is essential that concrete be kept continuously damp from time of placement until end of specified curing period. It is equally essential that water not be added to surface during floating and troweling operations, and not earlier than 24 hours after concrete placement. Between finishing operations surface shall be protected from rapid drying by a covering of waterproofing paper. Surface shall be damp when the covering is placed over it and shall be kept damp by means of a fog spray of water, applied as often as necessary to prevent drying, but not sooner than 24 hours after placing concrete. None of the water so applied shall be troweled or floated into surface.

B. Concrete surfaces shall be cured by completely covering with curing paper or application of a curing compound.

C. Concrete cured using waterproof paper shall be completely covered with paper with seams lapped and sealed with tape. Concrete surface shall not be allowed to become

moistened between 24 and 36 hours after placing concrete. During curing period surface shall be checked frequently and sprayed with water as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.

D. If concrete is cured with a curing compound, compound shall be applied at a rate of 200 square feet per gallon, in two applications perpendicular to each other.

E. Curing period shall be seven days minimum.

3.08 *COLD WEATHER CONCRETING*

A. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40 degrees F. or is expected to fall below 40 degrees F. within 72 hours, and the concrete after placing shall be protected by covering, heat, or both.

B. Details of handling and protecting of concrete during freezing weather shall be subject to the approval or direction of the Engineer. Procedures shall be in accordance with provisions of ACI 306 R.

3.08 *HOT WEATHER CONCRETING*

A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. Every effort shall be made to minimize delays which will result in excessive mixing of the concrete after arrival on the job.

B. During periods of excessively hot weather (95 degrees F, or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 95 degrees F, when ready for placement will not be rejected.

C. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. Records shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the work so that conditions surrounding the construction of any part of the structure can be ascertained.

3.09 *PROTECTION OF CONCRETE SURFACES*

A. Concrete surface shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary ½ inch thick plywood sheets shall be used to protect the exposed surface.

END OF SECTION

SECTION 09 93 13

STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *SUMMARY*

A. Section Includes:

1. Exterior stains, transparent, and semi-transparent finishes

B. Related Sections:

1. Section 32 32 16 – Precast Concrete Retaining Walls

1.03 *REFERENCES*

A. SSPC-SP 1 - Solvent Cleaning

B. SSPC-SP 2 - Hand Tool Cleaning

C. SSPC-SP 3 - Power Tool Cleaning

D. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete

E. ASTM F1869 - Moisture Test by use of Calcium Chloride

F. ASTM D4258 - Standard Practice for Cleaning Concrete

G. ASTM D4259 - Standard Practice for Abrading Concrete

H. ASTM D4260 - Standard Practice for Etching Concrete

I. ASTM D4263 - Plastic Sheet Method for Checking Moisture in Concrete

J. ICRI #310.2 - Surface Preparation of Concrete

1.04 *SUBMITTALS*

A. Submit under provisions of Section 01 33 00, Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each paint and coating product should include:

1. Product characteristics

2. Surface preparation instructions and recommendations

3. Primer requirements and finish specification

4. Storage and handling requirements and recommendations

5. Application methods

6. Cleanup information

C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacture's color samples available.

D. Coating Maintenance Manual: upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Paint Maintenance Manual" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.05 *MOCK-UP*

A. Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of painting on the project.

1. Finish surfaces for verification of products, colors, & sheens

2. Finish area designated by Architect/Engineer

3. Provide samples that designate prime & finish coats

4. Do not proceed with remaining work until the Architect/Engineer and/or Owner approves the mock-up samples

1.06 *DELIVERY, STORAGE, AND HANDLING*

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:

1. Product name, and type (description)

2. Application & use instructions

3. Surface preparation

4. VOC content

5. Environmental handling and SDS

6. Batch date

7. Color number

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

C. Handling: Maintain a clean, dry storage area to prevent contamination or damage to the coatings.

1.07 *PROJECT CONDITIONS*

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits are recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Staining and Finishing on Walls Based On:

1. The Sherwin-Williams Company

a. Sherwin-Williams
325 New State Highway, STE 9
Raynham, MA 02767-5467
Tel: 508-821-4010

b. Product: Sherwin-Williams Anti-graffiti Clear #B97C150

c. Or Approved Equal.

2. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.

a. To obtain accpetance of unspecifed products, submit written requirests at least 5 days before the Bid Date. Substitutions: When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2.02 APPLICATIONS AND SCOPE

A. Use this article to define the scope of painting if not fully defined in a Finish Schedule or on the drawings. This article must be carefully edited to reflect the surfaces actually found on the project. In some cases, it may be enough to use the first paragraph that says, in effect, "paint everything" along with a list of items not to paint, without exhaustively defining all the different surfaces and items that must be painted.

B. If the project involves repainting some but not all existing painted surfaces, be sure to indicate the extent of the repainting.

C. The descriptions of each system can also be used to further refine the definition of what is to be painted, stained, or clear finished.

D. Surfaces to Be Coated:

1. Masonry Exterior Systems – Opaque
2. Masonry Exterior Systems- Transparent
3. Masonry Exterior Systems- Semi-Transparent
4. Masonry Exterior Floors- Opaque-Transparent
5. Wood Exterior Systems – Opaque
6. Wood Exterior Systems - Semi-Transparent
7. Wood Exterior Systems – Decks

2.03 SCHEDULE INDEX - STAIN & TRANSPARENT FINISHES

A. Masonry Exterior Systems (vertical walls)

1. Product: Sherwin-Williams Anti-graffiti Clear #B97C150

Index of Data pages

DATA PAGES AND SDS SHEETS: (To open any of the Data page Files, please click here)
Or visit: https://www.paintdocs.com/docs/app/web/page/docCategory

*Refer to the current SDS/EDS for specific VOCs. VOCs may vary by base and sheen.

ENGINEER & OWNER TO MAY EDIT THIS SCHEDULE TO SELECT PRODUCT AND FINISH DESIRED AT PRE-CONSTRUCTION MEETING

2.04 SCHEDULE

A. Masonry Exterior Systems (vertical walls)

1. Primary Product: Sherwin-Williams Anti-graffiti Clear #B97C150

2. Alternate: (Owner/Engineer must be notified prior to Alternate substitution is ordered by the Contractor if Primary product is not available).

   a. 1st Coat: RAINGUARD Anti-Graffiti Barrier: Base 1 Step System, VG-7000, or approved equal.

   b. Up to two coats may be requested by the Owner at no additional cost.

2.05 MATERIALS - GENERAL REQUIREMENTS

A Paints and Coatings - General:
1 Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions. VOCs need to be confirmed by using the products EDS sheets.

2 For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.

B Primers:
1 Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

2.06 ACCESSORIES:

A Coating Application Accessories:
1 Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer’s specifications.

PART 3 - EXECUTION

3.01 EXAMINATION

A Do not begin application of coatings until substrates have been properly examined and prepared. Notify Architect of unsatisfactory conditions before proceeding.

B If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

D Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

(Specifier Note: Verify the existence of lead based paints on the project. Buildings constructed after 1978 are less likely to contain lead based paints. If lead based paints are suspected on the project, all

removal must be done in accordance with the EPA Renovation, Repair and Painting rule and all applicable state and local regulations. State and local regulations may be more strict than those set under the federal regulations. Verify that Owner has completed a Hazardous Material Assessment Report for the project prior to issuing of Drawings. Concluding that no lead based paints were found on project site, delete paragraph regarding lead based paints.)

3.02 SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority. Removal must be done in accordance with EPA Renovation, Repair and Painting Rule and all related state and local regulations. Care should be taken to follow all state and local regulations which may be more strict than those set under the federal RRP Rule.

A Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.

B Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.

C The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

D Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised. Mildew may be removed before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry at least 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

E No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F, unless products are designed specifically for these conditions.

F Methods:

1 Wood—Exterior
Must be clean and dry. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth. Patching compounds will generally be visible through clear coatings.

2 Concrete - Bare:
New concrete must be cured (28 days min.). If the concrete feels like 120-grit sandpaper, the pores are open enough for this product to bond properly with the substrate. If the surface does not have this texture, etch the surface (unless acid staining). Rough textured concrete does not need to be etched. Do not etch painted surfaces. Prepared concrete should have a pH between 7 and 10. Not adequately degreasing, etching, or allowing the substrate to dry completely will result in poor adhesion.

3 Repair:
For the best waterproofing protection on exterior, vertical concrete and masonry, patch and repair cracks and crevices where water can enter with the appropriate Loxon sealant or patching compounds.

4 Slip Resistance:
Some surfaces such as inclined driveways, garages, steps, patios, etc., may require a slip resistant additive for safety. Add H&C SharkGrip® Slip Resistant Additive to the final coat applied following label directions. This product should not be used in place of a non-skid finish.

3.03 INSTALLATION

A Testing: Due to the wide variety of substrates, preparation methods, application methods and environments, one should test the product in an inconspicuous spot for adhesion and compatibility prior to full-scale application.

B Apply all coatings and materials with manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

C Do not apply to wet or damp surfaces.

1.Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
2.Test new concrete for moisture content.
3.Wait until wood is fully dry

D Apply coatings using methods recommended by manufacturer.

E Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

F Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

G Regardless of number of coats specified, apply as many coats as necessary for complete hide and uniform appearance.

H Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.

I Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to the application of each coat.

3.04 PROTECTION

A Protect finished coatings from damage until completion of project.

B Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION

SECTION 10 75 16

GROUND-SET FLAGPOLES WITH SOLAR LIGHTING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 DESCRIPTION

A. Work under this section includes the installation aluminum flagpole(s) as shown on drawing and specified herein, with components as needed.

B. Related Work Specified Elsewhere:

1. Section 31 20 00 – Earthwork Moving

1.03 QUALITY CONTROL

A. Obtain each flagpole as a complete unit from the same manufacturer, including fittings, accessories, bases, and anchorage devices.

B. The Contractor shall verify the flagpole height requirements limits stipulated by the City/Town ordinances prior to the purchase and installation process. If any changes in flagpole height are necessitated by these requirements, the contractor must promptly inform both the Owner and Engineer. Failure to check and adhere to the applicable ordinances shall not exempt the contractor from their responsibility to procure and install/reinstall the correct flagpole at no additional cost to the Owner.

1.04 REFERENCE STANDARDS

A. Aluminum Association (AA): Aluminum Finishes.

B. American Society for Testing and Materials (ASTM):

1. ASTM B 241 - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

2. ASTM B 597 - Standard Practice for Heat Treatment of Aluminum Alloys.

C. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM FP 1001 - Guide Specifications for Design of Metal Flagpoles.

1.05 SUBMITTALS

A. Submit under provisions in 01 33 00 – Submittal Procedues.

B. Product Data Sheets: For each type of Flagpole required, submit manufacturer's technical data and standard installation instructions and recommendations.

C. **Shop Drawings:** The contractor shall be responsible for supplying stamped shop drawings of flagpole footings, prepared by a qualified Structural Engineer. These shop drawings shall include detailed dimensions, layouts, and construction specifications, adhering to both the Manufacturer Specifications and the Submittals Section of the project specifications. The drawings should accurately depict all necessary construction details and required accessories for the flagpole footings.

1. Include details of foundation system.

D. Samples: Finish samples for each finished metal used on flagpoles, as may be required.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Keep flagpole and accessories covered and dry to prevent soiling or damage.

D. Handle with protective gloves to prevent unwanted distortion.

1.07 PROJECT CONDITIONS

A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001 for specified ground speed.

PART 2 - MATERIALS

2.01 PRODUCTS

A. Flagpole:

1. As manufactured by:

FlagandBanner.com
Arkansas Flag & Banner, Inc.

800 W 9th Street
Little Rock, Arkansas 72201
TF: 800-445-0653
PH: 501-375-7633
FX: 501-375-7638

2. Flag And Banner Model P30INDE6156A

   a. Flag to be rated for: 120MPH
   b. Flag Height: 30FT
   c. Internal Halyard
   d. Steel Cable
   e. With Revolving Truck
   f. Gold Ball Ornament
   g. Finish: Black, anodized
   h. Flag: 5x9.5 FT American Flag
   i. Provide lighting via Electrical Plan

3. Lighting:

   a. Contractor shall furnish and install powered lighting units. Lighting shall provide sufficient illumination output to operate throughout nighttime hours.

4. Or Approved Equal

5. The above listed acceptable manufacturer/supplier does not disqualify other substitute manufacturers/suppliers seeking approval. Substitute manufacturers/suppliers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to the bid date.

6. The above listed as an acceptable manufacturer/supplier does not exclude the contractor from meeting the specifications outlined.

B. Flagpole Construction:

1. Fabricate from seamless, extruded tubing complying with ASTM B 221, alloy 6063-T6, having a tensile strength not less than 30,000 psi with yield point of 25000 psi. Heat treated after fabrication to comply with ASTM B 597, temper T-6.

2. Internal Halyard, ground set, black anodized flagpole. Including ground sleeve, internal steel halyard system, ball to match flagpole base diameter, cleat, truck, and finish exposed metal surfaces to match flagpole.

PART 3 -EXECUTION

3.01 EXAMINATION

A. Do not begin installation until final grades and elevations have been established.

B. Confirm elevation with the Engineer before proceeding.

3.02 EXCAVATION & PREPARATION

A. For foundations, excavate neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.

B. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure forms, foundation tube, fiberglass sleeve, or anchor bolts in position, braced to prevent displacement during concreting.

C. Place concrete immediately after mixing. Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than 7 days or use a non-staining curing compound.

D. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks and uniform in texture and appearance. Provide positive slope for water runoff to base perimeter.

3.03 INSTALLATION

A. General: Install flagpoles where shown and according to shop drawings and manufacturer's written instructions.

B. Foundation-Tube Installation: Install flagpole in foundation tube, seated on bottom plate between steel centering wedges. Plumb flagpole and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50 mm) layer of elastomeric sealant and cover with flashing collar.

C. Note: Flagpole shall be plumbed with ¼" for every 10 feet of pole height.

END OF SECTION

SECTION 11 68 33.33

ATHLETIC EQUIPMENT

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS (PCR), which are hereby made a part of this Section of the Specifications.

1.2 RELATED WORK

A. Examine the Contract Documents for requirements that affect the work of this Section. Other specifications divisions and sections that directly relate to the work of this section include, but are not limited to:

1. DIVISION 03 – SECTION 03 30 00 – Cast-in-Place Concrete

2. DIVISION 31 – SECTION 31 20 00 – Earth Moving

3. DIVISION 32 – SECTION 32 12 16 – Asphalt Paving

1.3 WORK INCLUDED

A. Provide all equipment and materials, and do all Work necessary to furnish, assemble and install the athletic equipment, (fixed and non-fixed), as indicated on the Drawings and as specified herein.

B. All equipment and materials shall meet or exceed all local, state, and federal safety regulations, codes, etc., as well as the Massachusetts Interscholastic Athletic Association (MIAA), the National Federation of State High School Associations (NFHS) and the American Sports Builders Association (ASBA) Rules and Regulations (if applicable).

C. All equipment must be installed in full compliance with the manufacturer's requirements.

D. Equipment:

1. Athletic equipment shall include, but not limited to basketball hoops, equipment, and padding, etc.

1.4 REFERENCES

B. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. Massachusetts Interscholastic Athletic Association (MIAA).
2. National Federation of State High School Associations (NFHS)
3. National Collegiate Athletic Association (NCAA)
4. International Association of Athletics Federations (IAAF)
5. American Sports Builders Association (ASBA)
6. Manufacturers Data and Recommended Installation Requirements

1.5 SUBMITTALS

A. Manufacturers Product Data:

1. Provide manufacturers recommended installation product data prior to actual field installation work, for Engineer and Owner review.
2. Catalog Cuts, manufacturer's data, and manufacturer's installation instructions will be submitted on each item of non-fixed and fixed equipment to be provided in accordance with this Specification. Where applicable, indicate methods of allowing each item to properly drain.

B. Shop Drawings:

1. Provide shop drawings for each equipment item, including stamped foundations and footings by a licensed Structural Engineer, submitted to the Owner and Engineer for approval.
    a. This requirement shall apply to all equipment, including, but not limited to, basketball hoop, back board, protecitve backboard and hoop padding, and any other relevant items indicated or implied on the contract drawings.

1.6 QUALITY ASSURANCE

A. Manufacturers warranties shall pass to the Owner and certification made that the project materials meet all applicable grade trademark or conform to industry standards and inspection requirements.

1.7 PRODUCT DELIVERY AND STORAGE

A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Engineer and Owner as well as the manufacturer. Replacements, if necessary, shall be immediately reordered to minimize any conflict with the construction schedule.

B. Sound materials shall be stacked, if applicable so as to not incur damage, and stored above the ground and under protective coverings, or indoors, in such a manner as to insure proper drainage, ventilation, and protection.

C. Non-fixed equipment will be delivered to the site and stored local to the project site, as directed by the Owner and/or the Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURER(S) AND MATERIALS:

A. BASKETBALL HOOPS:

1. Standard Size Basketball Hoops: Basketball Hoops, Equipment, and Accessories (including safety padding) as manufactured and/or supplied by: TrueBounce, 56 Conduit Street, New Bedford, MA 02745, or approved equal. See Construction Details Sheet.

   a. Backboard Model Number: XL7042

   b. Pole Model Number: PA6610

   c. Provide 6FT of extension for safe play

   d. The Engineer shall be contacted 3 days prior to installation.

B. All listed products above may be substituted with approved equal alternatives and listed acceptable manufacturers and products do not disqualify other substitute manufacturers seeking approval. Substitute manufacturers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 7 days prior to bid date.

C. The above listed as acceptable manufacturers do not exclude the manufacturers from meeting the specifications outlined.

D. The above-listed acceptable manufacturers do not disqualify other substitute manufacturers seeking approval. Substitute manufacturers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to bid date.

E. The above listed as acceptable manufacturers do not exclude the manufacturers from meeting the specifications outlined.

PART 3 - EXECUTION

3.1 ATHLETIC EQUIPMENT

A. Establishment of subgrade will be completed under Division 31 – Earth Moving.

B. Install equipment at the locations indicated on the Drawings and in strict accordance with the manufacturer's printed instructions. All non-fixed equipment will be assembled by the Contractor.

C. Equipment footings shall be installed prior to installation of surrounding pavement base or turf base stone, and any finished paving or turf.

D. For Concrete footing requirements refer to Division 3 of this specification and Manufacturers installation instructions.

3.2 INSTALLATION OF EQUIPMENT

A. All equipment and accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be provided by the Contractor through a structural engineering based on local soil conditions and building codes. Contractor shall have a minimum of five (5) baseball/football/softball/basketball equipment installation or similar experience in the previous three (3) years.

3.3 CLEANING

A. Upon completion of the Work in any given area, remove all rubbish and debris from the Work area and leave it in clean condition.

3.4 WARRANTY

B. Warranty shall be at least one (1) year and guarantees equipment to be free from manufacturer's defects.

END OF SECTION

SECTION 31 10 10

SITE CLEARING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 SUMMARY

A. This Section includes the following:

1. Topsoil and subsoil stripping.

B. Related Sections include the following:

1. SECTION 31 20 00 – Earth Moving

1.03 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of weeds, roots, and other deleterious materials.

B. Subsoil: Friable soil containing no stone greater than two-thirds (2/3) of the loose lift thickness. The material shall be free of trash, ice, snow, tree stumps, roots, and organic materials.

1.04 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled, reused, or to remain the Owner’s property, cleared materials shall become Contractor's property and shall be properly removed from the site.

1.05 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing, if any.

B. Record drawings according to Division 1 Section "Project Closeout" Section 01 77 00.

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct pre-clearing conference at Project site prior to commencement of clearing operations.

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, parking lots, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, parking lots, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining the Owner's property (if any), will be obtained by the Owner before award of Contract.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on the Owner's premises where indicated in accordance with demolition plan, or if not indicated then where acceptable to the Owner.

D. Notify utility locator service for area where Project is located before site clearing.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to the Owner and/or Engineer.

3.02 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.

2. Do not permit vehicles, equipment, or foot traffic within fenced area.

3. Maintain fenced area free of weeds and trash.

4. Except as otherwise directed, cutting, and trimming of existing trees will not be permitted.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.

2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.

3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.

4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Engineer.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.

2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the Engineer.

3.03 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted under the following conditions and them only after arranging to provide temporary utility services according to requirements indicated:

1. Notify the Owner not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Owners' writing permission.

3.04 CLEARING AND GRUBBING

A. Remove obstructions, grass, and other vegetation to permit installation of new construction. Removal includes digging obstructions and grubbing roots.

1. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade. Completely remove stumps and roots under pavement and sidewalks/walking areas.

2. Use only hand methods for grubbing within tree protection zone(s) (where applicable).

3. All debris to be removed from site and properly disposed of.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth and compact each layer to a density equal to adjacent original ground.

3.05 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

1. Burning and burying on site is prohibited.

2. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store and stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. All excavation, trenching, sheeting, bracing, etc shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations" (Chapter 454 CMR 10.00 et seq.), State and local requirements. Where conflict between OSHA, State and local regulations exists, the most stringent requirements shall apply.

C. The Contractor shall notify Dig Safe at 1-888-DIG-SAFE (1-888-344-7233) at least 72 hours prior to any excavation activities.

1.02 *SCOPE OF WORK*

A. Furnish all labor, materials, equipment and incidentals required and perform all excavation work and grading; place and compact backfill and fill including excavation for new hardscape surfaces and all other items shown, and restoration of surface materials as specified herein, or as directed by the Engineer.

B. Proof compact the excavated subgrade below all pathways and surfaced areas. Notify Engineer and Owner in advance of these activities for required observation. Contractor shall be responsible for all compaction testing.

C. The work shall include, but not necessarily be limited to; excavation for concrete walkways, paving, footings, pipes, utility structures and all other items shown including all backfilling and fill; embankment preparation and grading; disposal of waste materials; and all related work.

D. Wherever the requirement for percent compaction is referenced to herein, it shall mean "at least the required percent of maximum density as determined by ASTM D 1557, Method D."

E. The Contractor shall remove from the excavation all materials which the Engineer may deem unsuitable for backfilling, the bottom excavation shall be firm, dry, and in all respects, acceptable. If conditions warrant, the contractor may be ordered to deposit sand refill for excavation below grade, directly on the bottom of the excavation immediately after excavation has reached the proper depth and before the bottom of the excavation has become softened or disturbed by any cause whatsoever.

1.03 *SPECIAL REQUIREMENTS*

A. The Contractor shall satisfy him/her as to the character, quantity, and distribution of all material to be excavated. No payment will be made for the placement of any excavated material, which is used for purposes other than those designated and as specified herein.

B. The Contractor shall be familiar with the locations of all existing utilities, such as electrical conduits and water lines and verify as necessary to protect them.

C. All exploratory excavation to locate existing subsurface utilities shall be at the Contractor's discretion to assist with the work of this project and no extra payment shall be made for such verification. This does not constitute a waiver of the Contractor's responsibility to verify all utilities and is intended for verification of existing services.

1.04 *RELATED SECTIONS AND DOCUMENTS*

A. SECTION 31 10 10 – Site Clearing

B. SECTION 31 25 00 – Erosion and Sediment Control

C. SECTION 33 41 00 – Subdrainage Piping

D. Carefully examine all of the Contract Documents for requirements which affect the Work of this section.

1.05 *DEFINITIONS*

A. **Engineer:** Authorized Representative(s) of the Owner

B. **Owner:** As Specified in Contract Documents

C. **Contractor:** The person or organization identified in the Agreement as being responsible for the work under this Section. The term Contractor shall also refer to an authorized representative of the Contractor.

D. **Earthwork**: All excavation, handling, conditioning, and backfilling operations of all soil, boulders, and other materials for new below-grade construction and site development, including obstructions and utility relocation and construction, regardless of the nature of the material encountered, the water content thereof, and type of equipment required for excavation.

E. **Subgrade Elevation or Level:** The vertical excavation level and slopes indicated on the Drawings to which the excavation shall be conducted. For foundation bearing subgrades, this level will be to the elevations indicated on the Drawings.

F. **Zone of Influence:** The zone beneath a structure or utility defined by imaginary lines extending outward 2-ft laterally beyond the bottom edge of a footing or slab or from the springline of a utility and down on a one horizontal to one vertical slope to the top of the naturally deposited soils.

G. **Unclassified Bulk Excavation:** Removal of all materials for non construction including soil, boulders, obstructions, regardless of the nature of the material encountered, the water content thereof, and type of equipment required for excavation; and the proper disposal of excavated material not required or suitable for use as specified backfill material.

H. **Rock/Ledge:** Rock or Bedrock is defined as naturally occurring, intact material which cannot be broken and removed by large power equipment, and requires the use of hoe rams, impact hammers, systematic drilling and blasting, or other mechanical means to fracture and remove. Rock does not include loose, broken, weathered, fractured, or fragmented rock that can be excavated with a large backhoe or excavator. **Rock/Ledge is not anticipated to be encountered on-site.**

I. **Boulders:** Boulders encountered in any site excavation, of any dimension, and of any hardness or geometry, are considered part of Unclassified Bulk Excavation. The Contractor is responsible for the means and methods of removal and excavation of boulders, and the proper disposal of boulders not suitable for reuse at the site as determined by the Engineer.

J. **In-the-dry:** a soil condition such that the in-place moisture content of the soil at the time is no more than two percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction.

1.06 *REFERENCE STANDARDS*

A. ACI: American Concrete Institute

B. ASTM: Specifications of the American Society for Testing Materials.

1. ASTM D1557-Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

2. ASTM D 2922 – Density of Soil in Place by Nuclear Methods for shallow depths.

3. ASTM D 3017 – Standard Test Method for Water Content of Soil in Place by Nuclear Methods for shallow depths.

4. ASTM C 136 – Sieve Analysis of Fine and Coarse Aggregates

5. ASTM D 422 – Particle Size Analysis of Soils
6. ASTM D 698 – Laboratory Compaction Characteristics of Soil Using Standard Effort

7. ASTM D 1556 Density of Soil in Place by the Sand – Cone Method.

8. ASTM D 2487 – Classification of Soils for Engineering Purposes (Unified Soil Classification System)
9. ASTM D 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils
10. ASTM E 329 – Agencies Engaged in Testing and/or Inspection of Materials Used in Construction
11. ASTM E 548 – General Criteria Used for Evaluating Laboratory Competence.

C. AASHTO: American Association of State Highway and Transportation Officials

1. T 191 – Density of Soil In-Place by the Sand Core Method
2. T 239 – Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (shallow depth)

D. Latest Edition of Massachusetts Highway Department Standard Specifications for Highways and Bridges

E. Code: Current Edition of Massachusetts State Building Code.

F. DEP: Massachusetts Department of Environmental Protection

G. EPA: Environmental Protection Agency

H. MHD: Massachusetts Highway Department

I. BOH: Board of Health

J. OSHA: Occupational Safety and Health Administration

K. PCI: Prestressed Concrete Institute.

L. Where reference is made to one of the above standards, the revision in effect at the time of the Bid opening shall apply.

1.07 *SITE INVESTIGATION*

A. The Contractor shall thoroughly assess the nature and location of the work, including general and local conditions that may impact transportation, disposal, handling, and storage of materials. Contractor shall consider factors such as the availability of labor, water, electric power, roads, and potential uncertainties related to weather, groundwater table, or site-specific physical conditions. The Contractor must verify the subsurface materials expected to be encountered and evaluate the necessary equipment and facilities required before and during the execution of the work. It is essential for the Contractor to acquire complete information regarding these conditions. Failing to do so

will not exempt the Contractor from responsibility of accurately estimating the difficulty or cost associated with successfully performing and completing the work.

1.08 *SUBSURFACE DATA*

A. Variances in existing ground conditions, including subsurface soil conditions, different from those indicated, including test pit or boring logs (if applicable), shall not justify modifications to the contract price or completion dates of this contract.

1.09 *SUBMITTALS*

A. Submit to the Engineer, in accordance with Section 01 33 00, the proposed methods of construction, including excavation, excavation support systems designs, backfilling and filling and compaction for the various portions of the work. Excavation support system designs shall be prepared by a licensed professional engineer, registered in the state in which the work is located, having a minimum of 5 years of profession experience in the design and construction of excavation support systems. Review will be for information only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.

B. **Fill Materials:** For each off-site source of fill material the Contractor shall notify the Engineer of the source of the material and shall deliver test results and a representative 1-gallon sample at least 14 calendar days prior to the date of anticipated use of such material. All testing shall be performed by an experienced soil testing laboratory approved by Owner at the Contractor's own expense. Contractor shall obtain approval of placement and compaction of all material before next lift is placed.

C. For each non-structural fill material, the Contractor shall also submit a representative grain size analysis to the No. 200 sieve. All testing shall be performed by an experienced soil testing laboratory at the Contractor's own expense.

1.10 *QUALITY ASSURANCE*

A. Perform Work and materials testing in accordance with the Massachusetts Highway Department Standard Specifications for Highway and Bridges (Latest Edition).

B. Prior to completion of filling, and during such placement, Contractor shall perform soils compaction testing as specified herein. The Engineer may select areas for testing the degree of compaction obtained. The Contractor shall cooperate fully in obtaining the information desired and verify that all areas meet requirement of paver installation.

C. Compaction and materials testing results shall be submitted to the Engineer for review as outlined in the following sections.

D. The Contractor shall bear the responsibility for conducting all necessary testing, as directed by the designated third-party testing entity, until the identified drainage issues

have been effectively addressed and the field demonstrates proper drainage capabilities.

E. If test results are unsatisfactory to Owner, or Engineer, all cost involved in correcting deficiencies in compacted materials to the satisfaction of the Engineer will be born by the Contractor.

1.11 *CONSTRUCTION CONTROL*

A. Contractor shall not interrupt existing utilities serving facilities occupied by the Owner or others unless permitted in writing by the Engineer and the Owner and then only after arranging to provide temporary utility services according to requirements indicated.

1. Provide the Owner with at least 5 days' notice in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Owner's written approval.

3. Contact utility location services for the project site area before excavation commences.

B. Contractor is responsible for all construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, cutting, filling, grading, drainage and utilities installation, fencing, curbing, and all other appurtenances required for the completion of the construction work and acceptance of the Contract as specified and as shown on the Drawings. The Contractor shall verify that survey benchmark and elevations of existing utilities are as indicated on the Contract Drawings.

C. All construction layout and staking shall be performed by a Professional Land Surveyor or Professional Engineer registered by the Commonwealth of Massachusetts, experienced and skilled in construction layout and staking of the type required under this Contract, and acceptable to the Engineer and Owner.

D. The Contractor shall be responsible for the placement and preservation of adequate ties to all control points necessary for the accurate re-establishment of all base lines or center lines shown on the Drawings.

E. The Engineer or Owner may check the control of the work as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but in so doing, the Engineer in no way shall relieve the Contractor of responsibility for the accuracy of the layout work.

PART 2 - PRODUCTS

2.01 *MATERIALS*

A. All soil materials proposed for importing to the site shall be clean, newly borrowed mineral soil materials from approved borrow sources, free of any contamination. Materials from construction sites or other non-commercial borrow sources shall not be imported to the site without prior approval of Engineer. All materials being imported to the site shall not contain metals with concentrations above Massachusetts rural background concentrations, nor detectable amounts of oil and/or other hazardous materials as defined by the Massachusetts Contingency Plan.

B. **Common Fill or Ordinary Fill:** Common fill shall consist predominately of mineral, granular soil, free of organic materials, loam, trash, wood, snow, ice, frozen soil, clay, bottles, cans, and other compressible, decomposable, or deleterious materials. Common Fill shall have physical properties such that it may be readily spread and compacted without excessive weaving or instability.

1. Common Fill shall not contain particles larger than 6-inch size when compacted with heavy self-propelled vibratory compaction equipment.

2. Not larger than 2 inches in size when compacted using hand-operated equipment.

3. Common fill shall not contain greater than 15 percent by weight of material passing a No. 200 sieve.

4. On-site excavated fill may be reused as Common Fill provided it is processed to meet the above requirements.

C. **Gravel Borrow:** Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. Gradation requirements for gravel shall be determined by AASHTO T 11 and T 27 and shall conform to the following:

Percent Passing	
Sieve (ASTM D422)	By Weight
½ in.	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-10

D. **Three Quarter Inch Stone (¾ in.):** Imported ¾-inch stone to meet MassDOT Standard Specifications for Highways and Bridges.

Percent Passing	
Sieve (MassDOT M.2.01.4)	By Weight
1 in.	100

¾ in.	90-100*
½ in.	10-50
3/8 in.	0-20
No. 4	0-5

* ¾" Maximum Stone

E. **Pea Stone**: Shall be natural stone or crusher meeting the following gradation:

Percent Passing	
Sieve	By Weight
½ in.	100
3/8 in.	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

E. **Engineered Fill / Structural Fill / Granular Fill / Pipe Bedding**: Structural Fill from off-site sources shall consist of suitable natural bank-run sand and gravel. Structural Fill shall be free of organic material, clay, debris, loam, trash, wood, snow, ice, and other compressible, decomposable or deleterious materials or other unsuitable materials and shall be well-graded within the following limits:

Percent Passing	
Sieve (ASTM D2940)	By Weight
8 in.	100
3 in.	70-100*
¾ in.	45-95
No. 4	30-90
No. 10	25-80
No. 40	10-50
No. 200	0-10

* 3" Maximum Stone within twelve (12) inches of the underside of footings or slabs

F. **Sand Borrow:** Sand Borrow shall consist of clean, inert, hard durable grains of quartz or other hard, durable rock, free from loam or clay, surface coatings and deleterious materials. The maximum size for Sand Borrow shall be ¼ inch. The following amount of material passing a No. 200 sieve shall not exceed 8 percent by weight.

G. **Dense Graded Crushed Stone or Aggregate Base Course (Base Course):** Dense Graded Crushed Stone or Aggregate Base Course shall consist of off-site angular stone material that is hard, durable and free of deleterious materials. Dense graded crushed stone shall conform to MHD Standard Specifications for Highways and Bridges Designation M2.01.7 and the following:

Percent Passing	
Sieve (ASTM D422)	By Weight
2 in	100
1½ in.	70-100
¾ in.	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

1. Dense Graded Crushed Stone shall be used as the aggregate base course material underneath the following athletic facilities:

    a. Tracks
    b. Tennis Courts
    c. Basketball Courts
    d. Synthetic & Grass Fields

H. **Rip Rap or Modified Rockfill:** Rip Rap shall consist of hard, durable angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable. Stone shall be free from overburden, spoil, shale, and organic material. Rip Rap shall conform to MHD Standard Specifications for Highways and Bridges Designation M2.02.4 "Modified Rockfill" and meet the following gradation requirements:

Percent Passing	
Sieve (Size of Stone)	By Weight
8 in.	95-100
4 in.	0-25
2-½ in.	0-5

I. **Rock Dust (for shot-put landing area if applicable):** The shot-put landing area shall consist of a material that is firmly compacted, yet porous to allow vertical drainage. The Contractor shall provide a one-gallon sample of the proposed material for approval by the Owner prior to installation. The material shall be compacted to at least 90 percent of Standard AASHTO Density with discing, sprinkling, and rolling as necessary.

1. All material aggregate larger than 1/4-inch in diameter that comes to the surface during discing shall be removed prior to compacting operations.

2. **Rock dust** shall meet the below sieve analysis:

Percent Passing	
Sieve (Size of Stone)	By Weight
3/8	100
4	100

8	86
16	65
30	45
50	35
100	25
200	15

PART 3 - EXECUTION

3.01 *GENERAL*

A. The ground adjacent to excavation shall be graded to direct surface water away form excavations. The Contractor shall remove by pumping or other means approved by the Engineer groundwater to a depth of 2-ft below bottom of excavations at all times. Prevent erosion at all times.

B. Contractor shall provide all bracing and shoring necessary to perform excavations as required to protect adjacent features, or to conform to governing laws. No extra payment will be made for any bracing, shoring, or underpinning.

C. Examine the site and all work prepared by others and become familiar with existing site conditions. Report to the Owner in writing any conditions detrimental to the proper and timely completion of the work of this Section. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 *USE OF MATERIALS*

A. Existing on-site Topsoil and subsoil shall be stripped, segregated, screened, and stockpiled for reuse as landscape materials as directed by the Engineer or the Owner. Topsoil and subsoils are not suitable bearing materials for site structures. Any excess topsoil or subsoil shall be removed and disposed by the Contractor at no cost to the Owner.

B. Common Fill: it is anticipated that some existing on-site soils may be suitable for re-use as Common Fill. If deemed suitable by the Engineer, the on-site materials shall be placed and compacted in a manner conforming to the applicable Specifications. For use to raise general grades outside of the hardscape and other structures; in landscaped areas' and as otherwise indicated on the Drawings, provided the material can be readily spread and compacted, without instability. Oversize particles and unsuitable debris shall be removed during or prior to placement.

C. Gravel Borrow: Use for sidewalk and pavement base course, utility bedding as shown on the Drawings as well as fill areas noted on the Drawings.

D. Sand Borrow: Use for pipe bedding only as indicated on the Drawings; Depending on the application, filter fabric may be required in conjunction with Sand Borrow placed within a course backfill zone to prevent particle migration.

E. Dense Graded Crushed Stone: Use as indicated on the Drawings.

F. Boulders, if encountered, shall be segregated and stockpiled on site for the potential use as landscape features, or for optional on-site crushing. The Contractor shall save, segregate and stockpile such boulders as indicated by the Engineer or Owner and dispose of the remaining boulders as part of this Contract. Unused boulders remain the responsibility of the Contractor, who is responsible for removal and proper disposal away from the job site.

G. All unsuitable material, and suitable material not required for the proper completion of this Contract, will become the property of the Contractor and shall be removed and properly disposed of away from the job site as part of this Contract.

H. If contaminated material is suspected or encountered during an excavation, the Contractor shall contact the Owner or Engineer as soon as possible. Direction on how to proceed and disposition of the excavated material will be provided by the Engineer or Owner.

3.03 *EXCAVATION*

A. Perform all excavations in accordance with OSHA requirements. The Contractor shall be solely responsible for maintaining site safety, in accordance with OSHA, the Contractor's Health and Safety Plan and other applicable regulations.

B. Excavation shall include the removal of all materials encountered including earth, boulders, rock, pavement, demolition debris, incidental structures, utilities, and other materials as required to complete the Work specified in this Section and as shown on the Drawings.

C. The Contractor shall handle, segregate to prevent intermixing of materials, protect, and stockpile as required to complete the Work specified in this Section and as shown on the Drawing.

D. Where soil has been softened, frozen or otherwise disturbed, due to the presence of water or as a result of unfavorable weather, remove the unstable, disturbed material and replace with suitable material as directed by the Engineer, at no additional cost to the Owner.

E. Where excavation is carried out below indicated grade or beyond the lines of excavation, backfill to the indicated grade and compact with acceptable materials, at no additional cost to the Owner and at the direction of the Engineer.

F. When excavation has reached required subgrade elevations, notify the engineer who will observe the excavation and bearing conditions. Excavations required to proceed deeper due to disturbance of the subgrade, or variation in subsurface condition shall be completed at no cost to the Owner.

G. Excavate trenches to the depth indicated or required. Carry the depth of trenches sufficiently deep to install required bedding materials and to establish the indicated flow lines and invert elevations. Maintain all trench excavations in a safe manner and in accordance with applicable laws and regulations. Dimensions of trench excavation shall be maintained as small as practical to safely conduct the work.

3.04 *SUBGRADE PREPARATION*

A. General:

1. Complete the excavations to the required subgrade elevations.

2. All final excavated subgrades shall be proof-rolled prior to placing any fill materials or continuing with construction. Proof-rolling in open areas shall consist of minimum of 6 passes of a suitable sized static, self-propelled roller. Proof-rolling in confined areas such as within trenches shall consist of a minimum of 4 passes of a large vibratory-plate compactor imparting a centrifugal dynamic force of 11,000 lbs.

3. Soft or weaving soils or other materials observed during proof-rolling shall be over excavated and replaced with compacted lifts of common fill or other materials as directed by the Engineer.

4. Protect all subgrades after final preparation and during filling or other construction. Disturbance to approved subgrades shall be rectified by the Contractor prior to continuing with the work as directed by the Engineer.

B. Cold Weather Subgrade Protection:

1. When the atmospheric temperature is less than 32 degrees Fahrenheit, the Contractor shall protect excavation subgrades and concrete from freezing. Cold weather subgrade protection may consist of an earth fill cover, hay cover, insulation cover, heating, or other means of protecting the subgrade materials from freezing.

C. Wet Weather:

1. If fill material placement, spreading, rolling, or compaction operations are interrupted by rain or other unfavorable conditions, do not resume such operations until ascertaining that the moisture content and density of the previously-placed soil are as required by these specifications.

3.05 *SHORING, SHEETING, AND BRACING*

A. Provide shoring, sheeting, and bracing at excavations, as required, to assure complete safety against collapse of earth at sides of excavations or earthen slopes.

B. If, at any place, sufficient or proper supports have not been provided, additional supports shall be placed at the expense of the Contractor. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

C. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities, or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density.

D. The portion of sheeting driven below mid-diameter of any pipe shall not be withdrawn and under no circumstances shall any sheeting be cut off at a level lower than one foot above the top of the pipe.

E. Shoring or sheeting shall not constitute a condition for which an increase may be made in the contract price with the exception that if the Engineer directs in writing that certain shoring or sheeting shall be left in place.

F. Excavation support system shall be designed to support the earth pressures, hydrostatic pressures, surcharge loads and other forces from existing site conditions stored material and construction equipment.

G. Shoring and bracing of trenches and other excavations shall, at a minimum, be in accordance with the latest requirements of the Occupational Safety and Health Administration regulations.

3.06 *PLACEMENT OF BACKFILL MATERIALS*

A. General:

1. Backfilling activities, including placement and compaction, shall not be performed when air temperatures are at or below 32 degrees Fahrenheit.

2. Backfill excavations as promptly as work permits, but not until the subgrade, or below grade construction, is acceptable to the Engineer.

3. Previously placed, and possibly accepted, backfill shall be excavated and replaced at no additional cost if the backfill does not conform to the Contract Documents or is damaged or disturbed by construction activity.

B. Backfill Materials:

1. All backfill materials brought to the site must be obtained from a borrow source(s) approved by the Engineer.

2. Backfill placed outside the limits of the structure in landscaped areas shall consist of compacted common fill or other materials as indicated on the Drawings.

C. Placement, Compaction and Protection:

1. All backfill material shall be placed “in the dry” on subgrades acceptable to the Engineer. The Contractor shall dewater excavated areas as required to perform the work in such a manner as to preserve the undisturbed state of the approved subgrade material.

2. Backfill materials shall not be placed on snow, ice, frozen subgrades or uncompacted frozen soil.

3. Backfill materials shall not be frozen when placed or be allowed to freeze prior to or after compaction, placement, or curing. At the end of each day’s work during freezing weather, the last lift of fill, after compaction, shall be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil.

4. Unless otherwise specified herein, place fill materials in layers not exceeding 6 inches in thickness measured prior to compaction in open areas, and 4 inches in thickness in confined areas, such as in trenches. Compact each layer with a minimum of six coverages of the equipment described below to obtain at least 95 percent of maximum dry unit weight as determined by ASTM test D 1557.

5. Maintain the moisture content of the fill material during placement within plus or minus two percent of the material’s optimum moisture content per ASTM D 1557, and as required to achieve the specified compaction.

6. Within 3 feet below paved areas such as roadways, sidewalks, parking areas, etc., place required fill materials in layers not to exceed 6 inches in depth measured prior to compaction and compact each layer by suitable compaction equipment to at least 95 percent of the material’s maximum dry unit weight as determined by ASTM Test D 1557.

7. Under landscaped areas, place required fill materials in layers not exceeding 12 inches in thickness prior to compaction and compact by suitable compaction equipment to achieve at least 92 percent of the material’s maximum dry unit weight, as determine by ASTM D 1557 or as required by the Engineer.

8. The Contractor shall not begin backfilling against concrete until the concrete has sufficiently aged to attain the strength required to resist backfill pressures without damage. The Contractor shall correct any damage to the structures caused by backfilling at no added cost to Owner.

9. Moisture Control: Where exposed subgrades or fill materials must be moisture conditioned before compaction, uniformly apply water to surface soil material, to prevent free water from appearing on the surface during or subsequent to compaction operations.

    a. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

    b. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing, until moisture content is reduced to a satisfactory value.

10. If weaving or instability is observed during compaction, as judged by the Engineer, compaction efforts shall be discontinued until the Contractor stabilizes the subgrade. if required, the Contractor shall excavate and replace the unsuitable fill material with acceptable compacted material, at no additional cost to the Owner.

11. Compaction by paddling or jetting is prohibited.

12. Control groundwater and surface run-off to minimize disturbance of material being placed. Slope fill surfaces at the end of each day to provide for free surface drainage. Dewater all subgrades prior to filling. Place all fill in a dry state.

13. Provide suitable transition layers or non-woven filter fabric, as required to prevent the migration of fine material into void spaces or coarser fill materials. Transition layers may consist of limited thickness of dense-graded crushed stone, (less then 6 inches thick) lean concrete or other methods approved by the Engineer. Clean crushed stone shall not be placed directly on soil subgrades beneath structures.

D. Trench Backfill

1. Trenches shall be backfilled as soon as practicable.

2. Utility bedding material shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench as shown on the Drawings. The backfill material shall be placed by hand shovels, in layers not more than 4 inches thick in loose depth, and each layer shall be thoroughly end evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.

3. Trench backfill material above the utility bedding material shown on the Drawings may consist of the excavated soils, provided the excavated soils meet the specific requirements for fill for the intended area (e.g., below slabs, foundations, parking areas, etc.) and can be readily spread and compacted. Landfill debris materials shall not backfill within any utility trenches. Peat and other organic soils shall not be used as trench backfill. Particles larger than 2 inches shall not be placed within 8 inches of any utility pipe. The maximum particle size within any trench backfill material shall be 6 inches.

4. All trench backfilling shall be done so as not to disturb the work at any time. The moisture content of the backfill material shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted.

5. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.

6. During filling and backfilling operations, pipelines may be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the inspection of the pipeline shows poor alignment, displaced pipe or any other defects, the work shall be remedied in a manner satisfactory to the Engineer at no additional cost to Owner.

3.07 *COMPACTION REQUIREMENTS*

A. Relative compaction is expressed as percentage of the maximum dry density at the optimum moisture content as determined by ASTM Test D 1557, Method C. Compact fill materials in successive lifts in accordance with the following requirements:

Area	Compaction Requirements
Under Paved Areas and sidewalks	92 % up to 3 feet below finished grade
Under Paved Areas and sidewalks	95 % within 3 feet of finished grade
Trench backfill	93 %
Landscape and lawn areas	90 %

B. Fill placed within landscape islands, in areas abutting pavements, and within 5 feet of pavements shall be compacted according to the compaction requirements for fill below pavements.

C. The gradation and nature of some on-site materials are such that field unit weight testing methods (sand cone and nuclear density equipment) may not provide representative compaction results. In these cases, the Engineer will use judgment in evaluating if the Contractor achieved the intent of the specification.

D. Compaction and materials testing results shall be submitted to the Engineer for review as outlined in the following sections. Approval in writing must be obtained from the Engineer before next phase of work begins. Failure to do so will not indemnify the Contractor or their subcontractor(s) from addressing and fixing any issues that may occur.

3.08 *TOLERANCES*

A. Top Surface of Proposed Subgrade: Plus or minus ½-inch from finished elevations.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus one half (1/2) inch from required elevations.

C. Top Surface of General Backfilling: Plus or minus one (1) inch from required elevations.

3.09 *MOISTURE CONTROL AND REUSE OF ON-SITE MATERIALS*

A. Fill that is too wet for proper compaction shall be harrowed or otherwise dried or treated to achieve a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier material, at no additional cost to the Owner.

B. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.

C. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

3.10 *PROTECTION OF FILLS AND SUBGRADES*

A. Protect all compacted fills from disturbance and traffic. Repair any subgrades that become disturbed or unstable.

B. Upon completion of the Work, ground surface shall be left in a firm, stable, unyielding, uniform condition, free of ruts and surface irregularities, in accordance with the grading requirements shown on the Drawings.

C. Uniformly smooth-grade all areas to be graded, as indicated and as directed, including excavated sections and all areas disturbed as a result of the Contactor's operations.

3.11 *DEWATERING*

A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.

B. The Contractor shall excavate interceptor swales and ditches as necessary prior to the start of major earthmoving operations to insure minimal erosion and to keep areas as free from surface water as possible.

C. Should surface, groundwater or precipitation be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties from such water. All piping exposed above surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

D. Presence of groundwater in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, soil fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.

E. The Contractor shall verify that the construction and/or operation of a watering system will not adversely affect any well, pond, stream, structure, utility, etc., on or adjacent to the area being dewatered.

3.12 *EROSION AND SEDIMENTATION CONTROL*

A. Contractor shall be responsible for all control measures necessary to prevent damage resulting from erosion and sedimentation to on-site and off-site areas.

B. Temporary hay bales or other provisions such as de-silting basins, terraces, contour furrow, channel linings, waterways or other measures shall be installed in a manner satisfactory to the Engineer and maintained in good operating conditions.

C. Contractors shall provide adequate protection and complete the grading as specified without delay on the areas that may be potential contributor to pollution or natural waterways or cause damage because of sedimentation.

3.13 *DUST CONTROL*

A. The Contractor shall employ methods and/or materials to prevent spread of dust. Chemical materials may not be used on subgrades of areas to be sodded or planted.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *SUMMARY*

A. This Section specifies equipment and materials for an erosion and sediment control program for minimizing erosion and siltation during the construction phase of the project. The erosion and sediment control provisions detailed on the Drawings and specified herein are the minimum requirements for an erosion control program. The Contractor must review the Order of Conditions (if applicable) for the project to ensure compliance with any orders required above and beyond those described in this specification section.

1.03 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. SECTION 31 10 10 – Site Clearing

2. SECTION 31 20 00 – Earth Moving

3. Section 33 41 00 – Subdrainage Piping

1.04 *REFERENCES*

A. Commonwealth of Massachusetts highway Department “Standard Specifications for Highways and Bridges” (MHD Specifications).

1.05 *SUBMITTALS*

A. Proposed methods, materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage shall be submitted for approval. Submittals shall include:

1. List of proposed materials including manufacturer’s product data.

2. Schedule of erosion control program indicating specific dates from implementing programs in each major area of work.

B. Samples:

The following samples shall be submitted:

Sample	Size
Silt - sock	12 X 12 in.
Filter Fabric	12 X 12 in.

1.06 *EROSION CONTROL PRINCIPLES*

A. Erosion Control Principles

The following erosion control principles shall apply to the land grading and construction phases:

1. Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.

2. Whenever feasible, natural vegetation shall be retained and protected.

3. Extent of area which is exposed and free of vegetation and duration of its exposure shall be kept within practical limits.

4. Temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during prolonged construction or other land disturbance. Prolonged exposure of unstabilized soil shall not exceed 60 days.

5. Drainage provisions shall accommodate increased runoff resulting from modifications of soil and surface conditions during and after development or disturbance. Such provisions shall be in addition to existing requirements.

6. Sediment shall be retained on-site.

7. Erosion control devices shall be installed prior to start of clearing and grubbing operations and excavation work.

B. Cut and fill slopes and stockpiled materials shall be protected to prevent erosion. Slopes shall be protected with permanent erosion protection when erosion exposure period is expected to be greater than or equal to two months, and temporary erosion protection when erosion exposure period is expected to be less than two months.

1. Permanent erosion protection shall be accomplished by seeding with grass and covering with an erosion protection material, as appropriate for prevailing conditions.

2. Temporary erosion protection shall be accomplished by covering with an erosion protection material, as appropriate for prevailing conditions.

3. Except where specified slope is indicated on Drawings, fill slopes shall be limited to a grade of 2:1 (horizontal: vertical) cut slopes shall be limited to a grade of 2:1.

PART 2 - PRODUCTS

2.01 *SILT FENCE*

A. Silt fence shall be made of filter fabric. Fence shall be 2 ft high minimum.

1. Silt fence shall be Mirafi silt fence or approved equal.

2. Silt fence shall be supported by wooden posts, driven a minimum of 1 ft. into the ground. Posts shall be spaced 10 ft. on center maximum.

3. Fencing other than that specified above shall be subject to review and acceptance by the City's/Town's Representative and/or the Conservation Commission.

2.02 *SILT SOCKS*

A. The silt socks for construction of erosion control devices shall be 12" in diameter.

B. In areas of slopes greater than 2:1 (horizontal: vertical) silt sock must be secured in place by stakes.

C. Silt socks shall be either lapped or butted at the ends to create a continuous line of defense.

D. Any degraded or torn silt socks must be promptly replaced at no extra cost to the Owner.

E. Silt socks showing sediment accumulation up to 25% or above of their height, must be promptly replaced at no additional cost to the Owner.

2.03 *HAY BALES*

A. Hay bales for construction of erosion control devices shall be new, firm, bound livestock feed-grade bound with biodegradable twine.

2.04 *TEMPORARY SEED COVER*

A. Seed mixture for temporary cover by hydroseeding application shall conform to the following:

Quantity per 1000 sq. ft. Coverage	Material
27-1/2 lb.	Wood Fiber Mulch
4 lb.	Seed
1/2 lb.	Annual Ryegrass
22 lb.	10-6-4 Fertilizer
69 gal.	Water

B. Hydroseeding equipment may be either portable or truck mounted, with dual agitation, a minimum working volume of 1000 gallons and a minimum spray range of 80 feet.

1. Hydroseeding equipment must be capable of uniformly applying the slurry mix including wood fiber mulch if required, at the specified rate, and at the required locations.

2. Hydromulching equipment, either trailer or truck mounted, must be capable of uniformly applying straw or hay mulch at a minimum mulching rate of 8 tons per hour, at a distance of not less than 80 ft.

2.05 *FILTER BASKETS*

A. Filter baskets:

1. Shall be Metal-Era Inlet Baskets, manufactured by Metal-Era Inc., Waukesha, WI 53186 or approved equal. Baskets shall be installed at all catch basins in lieu of hay bale catch basin filters. Filter baskets shall include a nonwoven geotextile filter fabric material with a minimum Grab Strength of 45 lb., Mullen Burst Strength of 60 psi minimum, a minimum permeability of 120 gpm/sq. ft., and an opening no greater than No. 20 U.S. Standard Sieve.

PART 3 - EXECUTION

3.01 *SILT FENCE*

A. Silt fence shall be constructed and installed as indicated on the Drawings, prior to start of work on the site.

B. Silt fences shall be installed around all stockpiled soils and catch basins.

3.02 *SILT SOCKS*

A. Siltation Barrier shall be constructed and installed as indicated on the Drawings prior to start of clearing and grubbing operations.

3.03 *HAY BALE DIKE*

A. Bales shall be constructed and installed as indicated on the Drawings or as necessary. Bales shall be placed in a row with ends tightly abutting the adjacent bales. Each bale shall be embedded in the soil a minimum of 4 in. Bales shall be securely anchored in place by wooden stakes driven through the bales. The first stake in each bale shall be angled toward the previously laid bale to force the bales together.

3.04 *HAY BALE CHECK DAM*

A. Check dams shall be constructed and installed as indicated on the Drawings or as necessary.

3.05 *HAY BALE FILTER*

A. Hay bale filters shall be placed at all inlets to drainage structures or pipes as they are installed. Outlet protection work shall be constructed before runoff is allowed to enter the drainage system. Filters must be inspected regularly and replaced as necessary.

3.06 *HYDROSEEDING*

A. Seed for temporary cover shall be spread by the hydroseeding method, utilizing power equipment commonly used for that purpose. Seed, fertilizer, mulch and water shall be mixed and applied to achieve application quantities specified. Material shall be applied in 2 equal applications, with the equipment during the second pass moving perpendicular to direction employed during the first pass. Hydroseeding shall not be done when it is raining or snowing, or when wind velocity exceeds 5 mph.

B. If the results of hydroseeding application are unsatisfactory, the mixture and/or application rate and methods shall be modified to achieve the required results.

C. After the grass has appeared, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded and such areas and parts of areas seeded repeatedly until all areas are covered with a satisfactory growth of grass.

3.07 *FILTER BASKETS*

A. Baskets may be installed at all catch basins in lieu of Hay Bale Catch Basin Filters. Filter baskets shall be installed in accordance with manufacturer's recommendations. Maintain filter baskets as required and as follows. Baskets shall be inspected within 24 hours after each rainfall or daily during extended periods of precipitation. Repairs shall be made immediately, as necessary, to prevent particles from reaching the drainage system. Sediment deposits shall be removed after each storm event, or more often if the fabric becomes clogged. Clean clogged fabric and repair or replace damaged filter fabric.

3.08 *MAINTENANCE AND REMOVAL OF EROSION CONTROL DEVICES*

A. Wetland area, water courses, and drainage swales adjacent to construction activities shall be monitored weekly for evidence of silt intrusion and other adverse environmental impacts, which shall be corrected immediately upon discovery.

B. Culverts and drainage ditches shall be kept clean and clear of obstructions during the construction period.

C. Erosion Control Devices

1. Sediment behind the erosion control device shall be checked twice each month and after heavy rain. Silt shall be removed if greater than 6 in. deep.

2. Condition of the erosion control device shall be checked twice each month or more frequently as required. Damaged and/or deteriorated items shall be replaced. Erosion control devices shall be maintained in place and in effective condition.

3. Hay bales shall be inspected weekly and maintained or replaced as required to maintain both their effectiveness and essentially their original condition. Underside of bales shall be kept in close contact with the earth below at all times, as required to prevent water from washing beneath bales.

4. Sediment deposits shall be disposed of off-site, in a location and manner which will not cause sediment nuisance elsewhere.

5. Maintenance of silt socks are required if:

    a. Deformation is present.

    b. Sock is rolling due to hydraulic force

    c. Loss of ground contact

    d. Sediment accumulation of ½ sock height.

6. Repair of silt socks is required if:

    a. Holes, rips, or tears are present.

    b. Pinch or localized diameter reduction of more than ½ the original diameter is present.

D. Removal of Erosion Control Devices

1. Erosion control devices shall be maintained until all disturbed earth has been paved or vegetated, at which time they shall be removed. After removal, areas disturbed by these devices shall be regraded and seeded.

2. Erosion protection material shall be kept securely anchored until acceptance of the entire Project.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. The general contractor is required to meet all the design tolerances specified for the construction of the subbase, drainage layer and base material.

C. Topographic surveys of the various courses shall be conducted by a Licensed Professional Land Surveyor or Licensed Professional Engineer to show spot elevation on a grid (as specified for each course) over the entire paved surface. A flat "topo shoe" shall be used to avoid damaging the paved surface during survey operations. A plan with the spot elevations shall be provided to the Engineer for review and approval prior to installation of the following course. All survey and plan preparation costs shall be carried by the General Contractor.

D. Contractor responsible for the specific course shall remove and replace all areas with deviations in excess of specified tolerances at no additional cost to the Owner and as Directed by the Engineer.

1.02 DESCRIPTION

A. Work under this section includes the installation of bituminous concrete pavement. All existing pavement damaged or displaced as a result of the construction operations shall be restored in accordance with the requirements for this section.

B. Related Work Specified Elsewhere:

1. Section 31 20 00 – Earthwork Moving

1.03 QUALITY CONTROL

A. **Submittals:** Refer to Section 01 33 00 – Submittal Procedues for procedures. Include data showing gradation and composition of materials proposed. Product pavement slips to include all material by percentage and weight.

B. **Conformance:** All work specified in this Section and materials testing shall conform to "Standard Specifications for Highways and Bridges" Department of Transportation, Division of Public Works, State of Massachusetts, 1973 Edition, Latest Revision, including latest supplements,

hereinafter called the "Standard Specifications".

C. **Manufacturer Qualifications:** A paving-mix manufacturer must be registered with and approved by the Massachusetts Department of Transportation Highway Division (MassDOT).

D. **Compliance with MassDOT Requirements:** Unless otherwise specified by this section, contractor shall comply with materials, workmanship and all other requirements of the Massachusetts Department of Transportation Highway Division (MassDOT) for hot mix asphalt paving.

E. **Accessibility Standards:** Comply with requirements of the Massachusetts Architectural Access Board and the Americans with Disabilities Act. If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Engineer immediately.

F. **Local Authority Compliance:** Comply with requirements of the local authority having jurisdiction concerning the location and construction of accessible curb cuts.

G. **Subgrade Review:** Contractor shall review the condition of the prepared subgrade with the engineer prior to paving.

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM).

B. American Association of State Highway and Transportation Officials (AASHTO).

C. Massachusetts Highway Construction and Traffic Standard Details (CTSD), latest edition.

D. **Revision Applicability:** Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

E. Ensure that all materials and construction methods comply with the latest MassDOT specifications and standard details.

F. Maintain open communication with the Engineer to address any discrepancies between the project plans and applicable standards.

1.05 SUBMITTALS

A. Proposed Job Mix certified by authorities having jurisdiction over production of material.

B. Compaction test results for base stone.

C. Shop Drawings showing dimensions, layouts and details of construction and accessories required in accordance with Submittals Section of Specifications.

1.06 ALTERNATE 4

A. Provide bituminous concrete walkways in lieu of concrete walkways. Contractor to provide credit amount.

PART 2 - PRODUCTS

2.01 BANK OR CRUSED GRAVEL

A. Conform to Standard Specifications, subsection M1.03.1.

2.02 GRAVEL BASE

A. Subbase and base Aggregate as specified in Section 32 11 23 Aggregate Base Course.

2.03 MINERAL AGGREGATE

A. Conform to subsection M3.11.04 of the Standard Specifications.

B. Coarse Aggregate Shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock, free from detrimental quantity of thin or elongated pieces, free from dirt or other objectionable materials, and shall have a percentage of wear, as determined by the Los Angeles Abrasion Test (MSHTO-T96), of not more than 30. It shall be surfaced dry and shall have a moisture content of not more than 0.5% after drying. The use of crushed gravel stone will not be permitted.

C. Fine Aggregate shall consist of one of the following:

1. 100% natural sand.

2. 100% stone sand.

3. A blend of sand and stone screenings, the proportions of which shall be approved by the engineer.

4. A blend of natural sand and stone sand.

5. Natural sand shall consist of inert, hard, durable grains of quartz or other hard, durable rock, free from topsoil or clay, surface coatings, organic matter or other deleterious materials. When the primary source of material, passing the No. 200 sieve, is obtained from natural sand, these fines must be approved prior to use. Stone sand shall be a processed material

prepared from stone screenings to produce a consistently graded material conforming to the specification requirement. The stone screening shall be the product of a secondary crusher and shall be free from dirt, clay, organic matter, excess fines or other deleterious material. The fine aggregate as delivered to the mixer shall meet the following requirements:

Sieve Size	Percent Passing
3/8 inch	100-95
No. 8	70-95
No. 50	20-40
No. 200	2-16

D. Hot Poured Joint Sealer: Sealer shall be composed of a mixture of materials which will form a resilient and adhesive compound capable of effectively sealing joints in concrete and shall conform to the requirements of AASHTO M 173.

E. Tack coat shall consist of either emulsified asphalt, Grade MS-I conforming to Section M3.03.0, or cutback asphalt, Grade MC-70 or MC-250 conforming to Section M3.02.0 of the Standard Specifications.

F. **No RAP** - Recycled Asphalt content is NOT allowed, including in the Athletic Court per specification section 32 18 33 (if applicable).

2.04 BITUMINOUS MATERIALS

A. Bituminous material shall conform to Subsection M3.1100 and Section M3.11.06 of the Standard Specifications.

B. Bitumen delivered to a project or to a mix plant must be accompanied by proper certification signed by the producer's authorized representative. Shipment of material not accompanied by a certificate will not be accepted for use in the work.

C. Bituminous Concrete Paving shall be Class I Type 1-1, as specified in Section 460 and M3.11.0 of the Standard Specifications and constructed to the thicknesses shown on the Drawings for the following mixes:

1. **Athletic Court**:

   a. Bituminous Concrete Pavement for court areas, shall be 1-1/2 inch "Top Course" over 2 inch "Binder Course" per gradations of M3.11.03.

2. **Walkways, Driveways, etc.:**

   a. Bituminous Concrete Pavement for walkways, driveways, etc., shall be 1-¼ inch "Top Course" over 2 inch "Binder Course" per gradations of M3.11.03.

D. Proportioning of bituminous Concrete Mixture: The bituminous concrete mixture shall contain from 6.5 to 7.0 (+/- 0.5%) percent by weight of bitumen for surface course and 6.0 to 6.5 (+/- 0.5%) percent by weight of bitumen for binder course.

a. HMA Interim Dense Binder

b. HMA 3/8" Top

E. RAP – Recycled Asphalt content shall **NOT** be used in the design mix.

2.05 BITUMINOUS CONCRETE BINDER COURSE

A. Standard Specifications subsection M 3.11.

B. For Athletic Courts, percent asphalt by weight shall be 6.0 to 6.5 (+/- 0.5%) percent.

2.06 BITUMINOUS TACK COAT

A. Standard Specifications subsection M 3.03.0.

B. Asphalt Tack Coat shall consist of either emulsified asphalt, grade RS-1 conforming to Section M 3.03.0, or cutback asphalt, grade RC-70 or RC-250, conforming to Section M3.02.0 of SSHB. The contact surface of castings and other structures shall be painted with a tack coat.

1. Tack Coat Application Mechanism:

a. Tack Coat shall be applied using a Tack Coat Distributor Truck

2. Tack Coat Application Rates:

Existing Pavement Condition	Application Rate Based on a 57/43 Residual Water Ratio*
	Residual
New Asphalt (not open to traffic)	0.06 – 0.08
New Asphalt Patches	0.06 – 0.09
Existing Tight Smooth Pavement	0.06 – 0.08
Milled Surface (Asphalt)	0.07 – 0.09

* The residual amount of tack is defined as the remaining asphalt after the tack coat has set and all the water has evaporated. The application rate of the tack coat emulsion shall be set at a rate that achieves the specified residual amount.

3. **Area of Tack Coat Coverage:** Tack Coat shall be applied to cover a minimum of 95% of the pavement surface.

4. **Court:** The Tack Coat application rate shall be 0.06 to 0.08 gallons per square yard.

2.07 BITUMINOUS CONCRETE WEARING COURSE

A. Standard Specifications subsection M 3.11.

B. For Athletic Courts, percent asphalt by weight shall be 6.5 to 7.0 (+/- 0.5%) percent.

PART 3 -EXECUTION

3.01 EXAMINATION

A. Examine exposed Subbase and Base surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.02 COLD MILLING (If Applicable)

A. If applicable, clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

3.03 PATCHING (If Applicable)

A. Existing Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Existing Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. **Tack Coat:** Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt

paving at a rate of 0.05 to 0.15 gal./sq. yd.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. **Patching:** Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.04 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Regulate paver machine speed to obtain smooth, continuous surfacefree of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

D. The permanent bituminous concrete pavement surface courses shall be provided in accordance with details and the applicable requirements of Massachusetts Standard Specifications Section 460, Subsection 460.40 and Section M.3.11 for "Materials" and Subsection 460.60 for "Construction Methods". The surfaceshall be rolled free of any roller marks, ridges, and voids, and shall be repaired if directed.

E. Per Section 460.61 of the MHD Standard Specifications, the temperature of asphalt at time of placement shall be as follows:

BaseTemp°F when mix is placed	Mat Thickness						
	½"	¾"	1"	1 ½"	2"	3" +	
35-40				305	295	280	TEMP
40-50			310	300	285	275	
50-60		310	300	295	280	270	
60-70	310	300	290	285	275	265	
70-80	300	290	285	280	270	265	
80-90	290	280	275	270	265	260	
90+	290	275	270	265	260	255	

3.05 SUB-GRADE PREPARATION

1. A. Provide sub-grade preparation in accordance with Section 31 20 00 – Earthwork Moving.

3.06 GRAVEL BASE PLACEMENT

1. 5 days prior to Gravel base placement, the Contractor MUST notify the Engineer and the Owner to review specs and paving expectations. A schedule shall be provided in advance of the paving work.

2. Place Gravel in accordance with Section 31 20 00 – Earthwork Moving.

3. A topographic survey of the gravel base course shall be conducted by a Licensed Professional Land Surveyor or Licensed Professional Engineer to show spot elevation on a grid 10-ft apart over the entire surface. A flat "topo shoe" shall be used. A plan with the spot elevations shall be provided to the Engineer for review and approval prior to paving operations, no exceptions.

    a. Survey and plan preparation costs shall be carried by the Contractor.

3.07 BITUMINOUS CONCRETE BINDER COURSE

A. A plant-mixed bituminous concrete binder course shall be placed on the approved base course at a compacted thickness as shown on the plans. The bituminous concrete binder course shall be provided in accordance with the applicable requirements of Massachusetts Standard Specifications Section 420, Subsection 420.40 and Section M.3.11 for "Materials", and Subsection 420.60 for "Construction methods". Surface of the binder course as thus compacted shall not vary more than one-quarter (¼") inch in then (10) feet measured in any direction.

B. A topographic survey of the bituminous concrete binder course shall be conducted by a Licensed Professional Land Surveyor or Licensed Professional Engineer to show spot elevation on a grid 10-ft apart over the entire paved surface. A flat "topo shoe" shall be used to avoid damaging the paved surface during survey operations. A plan with the spot elevations shall be provided to the Engineer for review and approval prior to installation of sports surfacing material. Survey and plan preparation costs shall be carried by the General Contractor.

3.08 BITUMINOUS CONCRETE WEARING COURSE

A. Place bituminous concrete Class I-1 (Hot – Mix) pavement in one (1) course. The course shall have a compacted thickness as shown on the plans. The finished pavement surface shall conform to the proposed slope and shall not vary more than one-eighth (1/8") inch in ten (10) feet measured in any direction. The Contractor will not be allowed to correct areas of pavement failing to meet this specification by patching or use of fillers. Deficient asphalt areas shall be

removed and repaved to an extent approved by the Engineer.

B. The permanent bituminous concrete pavement surface course shall be provided in accordance with details and the applicable requirements of Massachusetts Standard Specifications Section 460, Subsection 460.40 and Section M.3.11 for "Materials" and Subsection 460.60 for "Construction Methods". The surface shall be rolled free of any roller marks, ridges, and voids, and shall be repaired if directed.

C. A topographic survey of the bituminous concrete wearing course shall be conducted by a Licensed Professional Land Surveyor or Licensed Professional Engineer to show spot elevation on a grid 10-ft apart over the entire paved surface. A flat "topo shoe" shall be used to avoid damaging the paved surface during survey operations. A plan with the spot elevations shall be provided to the Engineer for review and approval prior to installation of sports surfacing material. Survey and plan preparation costs shall be carried by the General Contractor.

D. Contractor is responsible for individual portions of the work and shall remove and replace all areas with deviations in excess of specified tolerances at no additional cost to the Owner and as Directed by the Engineer.

3.09 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.

2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.

3. Offset transverse joints, in successive courses, a minimum of 24 inches.

4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to Al MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.10 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: ASTM D 2041, per MHD Specifications.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.11 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus 1/4 inch, no minus.

2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within MHD Specification tolerances as determined by using a 10- foot straightedge applied transversely or longitudinally to paved areas.

3.12 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with the Engineer.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.13 FIELD QUALITY CONTROL

A. Test the plane of the finished surfaces of base, binder, and surface courses with a 16-foot straightedge, except use a 10-foot straightedge on vertical courses and on the top course of resurfaced streets which contain manhole covers, valve boxes, and the like.

B. Carefully apply the straightedge immediately after the first compaction by rolling, and from then on as may be necessary until and after the final compaction of the material in place. Hold the straightedge in successive positions parallel to the road centerline and in contact with the road surface; check the entire area from one side of the pavement to the other.

C. Correct irregularities which vary 3/8 inch from a true finished surface in base and binder courses, and 1/4 inch in top courses.

D. Irregularities which may develop before the completion of rolling and while the material is still workable, may be remedied by loosening the surface mixture and removing or adding material as necessary. Should any unsatisfactory irregularities or defects remain after final compaction, correct the defective work by removing and replacing with new material to form a true and even surface.

3.14 OPENING TO TRAFFIC (If Applicable)

A. No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained, and the material has cooled sufficiently to prevent distortion or loss of fines, and the pavement has achieved a maximum temperature of 140 degrees F.

B. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Designer.

3.15 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

3.16 WARRANTY

A. Contractor shall remove and replace all areas with deviations in excess of specified tolerances at no additional cost to the Owner and as Directed by the Engineer.

3.17 CLOSE-OUT

A. Contractor shall clean, seal, and repair any cracks in the asphalt prior to final completion and as part of the final punch list at no additional cost to the Owner and as Directed by the Engineer.

END OF SECTION

SECTION 32 16 13

CURBS AND GUTTERS

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. Include GENERAL CONDITIONS and applicable parts of Division 1 as part of this Section.

B. Examine all Drawings and other Sections of the Specifications for requirements, which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 *SCOPE OF WORK*

A. The work of this Section includes, but is not limited to, the following:

1. Granite Curbing

2. Bituminous Concrete Curbing

1.03 *RELATED WORK UNDER OTHER SECTIONS*

A. The following items of related work are specified and included in other Sections of the Specifications:

1. SECTION 31 10 00 – SITE CLEARING

2. SECTION 31 20 00 – EARTH MOVING

3. SECTION 32 12 16 – ASPHALT PAVING

1.04 *DEFINITIONS*

A. The following related items are included herein and shall mean:

1. Standard Specifications: Commonwealth of Massachusetts, MHD, Standard Specifications for Highways and Bridges, latest edition.

2. ASTM: American Society for Testing and Materials.

3. AASHTO: American Association of State Highway and Transportation Officials.

1.05 *SAMPLES AND SUBMITTALS*

A. Samples and Submittals: At least thirty (30) days prior to intended use, the Contractor shall provide the following submittals and samples for approval. Do not order materials until Engineer's approval of samples, certifications or test results have been obtained. Delivered materials shall closely match the approved samples.

B. Design mix for the following:

1. Bituminous concrete pavement.

C. Shop Drawings: The Contractor shall submit the following for approval by the Engineer prior to ordering materials for the project.

1. Prior to ordering materials for this project, submit manufacturer's detailed drawings and layout configuration plan, which is site verified for layout and dimensions by Contractor's registered surveyor, for all curbing. Drawings shall show all lengths, angles, transitions, pertinent dimensions, radius and corner sections as applicable, closure sections and typical cross sections. Layout shall be based upon the Contractor's confirmation of on-site layout conditions including any required amendments thereto by the Surveyor.

2. Provide schedule for quantities, lengths, and size of curbing.

D. Manufacturer's Literature: Submit the following manufacturer's literature for the products:

1. Granite curbing showing standard lengths and cross section detail with all permanent dimensions.

1.06 *STORAGE AND PROTECTION*

A. All materials shall be stored to prevent damage from the elements and other causes.

B. Cement and aggregates shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Any materials which have deteriorated, or which have been damaged, shall not be used for concrete.

C. Curbing shall be packaged to manufacturer's standard and delivered on pallets. Curbing damaged in any manner will be rejected and shall be replaced with new material.

1.07 *QUALITY ASSURANCE*

A. Bituminous Concrete:

1. MHD Specifications Section 460 for bituminous pavement for roadways and

parking areas, Section 701 for bituminous sidewalks, and Section 402 for dense graded crushed stone for base course.

2. MHD Specifications Section 472 for repairs to existing pavements after installation of new curb.

3. The existing bituminous concrete pavement to be removed shall be removed from the site, legally disposed of.

PART 2 - PRODUCTS

2.01 VERTICAL GRANITE CURBING

A. New granite curbing shall be hard, durable stone conforming to the requirements of VA-4 curb Mass. Highway Department Standard Specifications of Highway Specifications, latest ed. (Standard Specification). Provide straight and curved curb sections as required in the plans. Curb sections to be set in transition or flush with pavements shall be cut to full depth with parallel sides. Curbing shall conform to the following:

1. Curbing shall have smooth sawn tops, split sides, and bottom.

2. All curbing shall have sawn ends.

3. Any exposed edges shall be eased one sixteenth inch (1 /16").

4. No curbstone sawn surfaces shall exhibit markings from the cutting process, including but not limited to band marks from the saw. All sawn faces shall be smooth and uniform.

5. No curbstone shall contain veins or intrusions or obviously dissimilar characteristics including color, texture, and physical make-up. Stones that show obvious veins or intrusions of dissimilar materials will be rejected.

6. All exposed sawn surfaces shall have an additional non-slip finish.

7. Split face surfaces shall not be flame finished.

B. Flush granite curb shall conform to the requirements for VA-4 curb of the Standard Specification.

C. Cement mortar shall meet the requirements of Section M4, Paragraph M4.02.15 of the Standard Specification.

D. Concrete where designated for setting curbs shall be 4000 psi concrete conforming to Section M4 of the Standard Specifications except that it shall have zero slump and be placed essentially dry. It should be delivered in a cement truck.

2.02 BITUMINOUS CONCRETE CURBING

A. Bituminous Concrete Curbing shall be Class I conforming to the applicable requirements for Dense Mix, MHD Specification, Paragraph M3.12.0 and M3.11.03, Table A.

B. Asphalt Tack Coat shall conform to MHD Specification M3.11.06.

C. Cape Cod style berm shall be monolithic with the finish driveway and parking area pavement.

2.03 VERTICAL CONCRETE CURBING

A. Vertical concrete curbing shall be precast or cast-in-place concrete conforming to MassDOT Standard Specifications, Section 901, and Section M4 for concrete materials. Curbing shall meet the following requirements:

1. Concrete shall have a minimum compressive strength of 4000 psi at 28 days, per MassDOT Section M4.02.00.

2. Curbing dimensions shall conform to MassDOT Standard Drawings for Type A vertical curb (6-inch reveal, 6-inch width, 18-inch depth) unless otherwise specified in the Drawings.

3. Reinforcement, if required by the Engineer, shall consist of steel bars or wire mesh meeting ASTM A615 or ASTM A1064, as specified in MassDOT Section M8.

4. Joints shall be spaced at 10-foot intervals maximum, with 1/2-inch expansion joints every 30 feet, filled with pre-molded joint filler per MassDOT Section M9.04.0.

5. Curbing shall be free of visible cracks, honeycombing, or other defects affecting structural integrity or appearance.

B. Precast Concrete Curbing (if applicable):

1. Shall be manufactured in accordance with ASTM C139 and MassDOT Section 901.

2. Units shall be uniform in color and texture, with no visible seams or casting marks on exposed faces.

3. Handling and lifting devices shall not damage the curb during transport or installation.

C. Cast-in-Place Concrete Curbing (if applicable):

1. Forms shall be steel or wood, rigidly supported to maintain line and grade, and removed after initial set without damaging the curb.

2. Concrete shall be placed and consolidated to eliminate voids, per MassDOT Section 901.

D. Cement mortar for joints or repairs shall meet the requirements of MassDOT Section M4, Paragraph M4.02.15.

PART 3 - EXECUTION

3.01 VERTICAL GRANITE CURBING

A. Install curbing in the locations and in accordance with the details shown on the Drawings.

B. Excavate to the lines and grades required to establish the subgrade limits.

C. Provide grade stakes to check alignment for curb setting. Install the granite curb true to line and grade.

D. Each unit shall meet the next with a common tangent. Curb sections that are not plumb or are discontinuous or broken after installation will not be approved and shall be reset as required by the Engineer.

E. Placement and compaction of dense graded crushed stone shall be as specified under SECTION 31 20 00 EARTH MOVING.

F. Set granite curb as follows:

1. All spaces under the curb shall be filled with dry-placed, zero slump concrete so that the curb will be completely supported throughout its length.

2. After proper alignment of curbing and concrete base has been established, place additional concrete, of slightly wetter consistency, to extend the concrete up the face of the curbing as detailed.

G. Joints between curb stones shall be filled full depth with cement mortar and neatly pointed in the top and exposed faces. After pointing, clean off all excess Mortar and tool joints slightly below adjacent stone surfaces as approved by the Engineer.

3.02 BITUMINOUS CONCRTET CURBING

A. Bituminous concrete curb shall consist of machine formed bituminous concrete to the dimensions and details shown on the drawings. Bituminous concrete curb shall be installed monolithically with the top course of bituminous pavement, except as permitted under 3.04.C.

B. Immediately prior to laying the curb, the underlying bituminous pavement surface shall be cleaned of all foreign or objectionable matter. The portion of the surface prepared for immediate treatment shall be dry and in a satisfactory condition. Immediately following the preparation of the surface, the bituminous material for tack coat as

specified herein shall be applied.

C. In those areas where forming the bituminous curb monolithically with the top course of pavement is not feasible, (e.g. at tight curves, ends of parking rows, etc.) an automatic curbing machine must be utilized. In such cases, upon arrival at the site, the mixture shall be transferred from the truck to the hopper of an automatic curbing machine and the mixture shall be kept clean and free from dirt and foreign materials at all times. The automatic curb-forming machine shall be a self-propelled type, capable of shaping the hot bituminous mixtures to the cross-sections as shown on the plans, without tearing, shoving or gouging. It shall produce a finished surface of uniform evenness.

D. Asphalt mixtures that have a temperature of less than 225 degrees F when dumped into the hopper will be rejected. The mechanical curb machine shall be adjusted to the speed regulated in order to obtain the maximum degree of compaction and density and to insure that the surface will be smooth and in conformance with the cross section, line and grade as shown on the drawings. Placing of the mixture shall be as nearly continuous as possible. The surface of the curbing shall be tested with a (10 ft.) straight edge and any variation from true line exceeding ¼ inch shall be satisfactorily corrected.

E. After completion of the curbing, traffic shall be kept away from the work for at least 24 hours until the curbing is sufficiently set.

F. If at any time before acceptance of the work, any soft or imperfect spots develop in the exposed surface of the curb, such material shall be removed and replaced with new curb, without additional compensation to the Contractor.

END OF SECTION

SECTION 32 18 16.13

PLAYGROUND PROTECTIVE SURFACING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SUMMARY

A. Section Includes:

1. Unitary synthetic poured dual density rubber seamless surface

B. Related Sections:

1. Division 31 Section "Earthwork" for filling and grading and for **drainage course and subbase courses**.

2. Division 33 Section "Utilities" for playground sub drainage system.

1.03 DEFINITIONS

A. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."

B. TPV: Thermoplastic Vulcanizate.

1.04 PERFORMANCE REQUIREMENTS

A. Impact Attenuation: According to ASTM F 1292-13 or latest version.

B. Accessibility of Surface Systems: According to ASTM F 1951-13 or latest version.

C. IPEMA certified: Product and crew chiefs must be IPEMA certified

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals: Copyright 2009 AIA Master Spec Full Length 08/09.

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.

C. Shop Drawings: For each playground surface system, include materials, plans, cross sections, drainage, installation, and edge termination. Include patterns made by varying colors of surfacing. Include details of graphics.

D. Samples for Initial Selection:

1. Include similar samples of playground surface system and accessories involving color selection.

E. Samples for Verification: For each type of playground surface system indicated.

1. Minimum 4-inch disc Sample of synthetic rubber seamless surface.

F. Product Schedule: For playground surface systems.

1.06 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Extent of surface systems and use zones for equipment.

2. Critical heights for playground surfaces and fall heights for equipment.

B. Qualification Data: For qualified Installer and testing agency.

C. Product Certificates: For each type of unitary synthetic playground surface system, from manufacturer.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each unitary synthetic playground surface system.

E. Field quality-control reports.

F. Warranty: Sample of Warranty. Minimum of 7 years, **NOT PRO-RATED**.

1.07 CLOSEOUT SUBMITTALS

A. Maintenance Data: For playground surface system to include in maintenance manuals.

B. Material Certificates: Material certificates will be filled out and signed by specified manufacturer/supplier that specified materials were shipped and in proper amounts for square footage/thickness/color.

1.08 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.09 QUALITY ASSURANCE

A. Installer Qualifications: **An employer of workers trained and approved by manufacturer. Crew Chief must be IPEMA Certified.**

B. Source Limitations: Obtain playground surface system materials, including primers and binders, from manufacturer specified

1. Provide secondary materials including adhesives, primers**,** and repair materials of type and from source recommended by manufacturer of playground surface system materials.

C. Standards and Guidelines: Comply with CPSC No. 325, "Handbook for Public Playground Safety"; ASTM F 1292; and ASTM F 1487.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit playground surface system installation to be performed according to manufacturers' written instructions and warranty requirements. **Temperature should be 40 degrees and rising during the installation period. The installer shall use their best judgment to proceed or to halt the installation. The Engineer shall be notified and shall have the final authority.**

1.11 WARRANTY

A. Warranty Period: Seven years from Substantial date of completion.

1. Failures include, but are not limited to, the following:

a. Failure for impact attenuation as per ASTM 1292-13

b. Deterioration of surface and other materials beyond normal weathering.

c. Excessive UV fade/Loss of color

2. Impact attenuation warranted for 7 years

PART 2 – PRODUCTS

2.01 UNITARY SYNTHETIC DUAL-DENSITY SEAMLESS SURFACE

A. Surface System: Poured-in-place, two-layer system with wearing course over cushion course. Provide manufacturer's standard thickness for each layer as required for overall thickness indicated, tested for impact attenuation according to ASTM F 1292-04 and for accessibility according to ASTM F 1951.

1. Products: Subject to compliance with requirements, provide the following:

Sport Surface Specialties, **DuraTurf ® PIP**
PO BOX 577
East Aurora, NY 14052
716-652-2039 office
716-805-1450 fax
www.sportsurface.net

Or approved equal

2. **Statement/letter needed from the manufacturer that the PIP material is safe and clean. Statement/Letter to be submitted to Engineer prior to product installation commencing.**

3. Wearing Course: Minimum ½" thick using TPV granules 1-4mm manufactured by Rosehill Polymers as distributed by American Recycling Center in Owosso, Michigan or approved equal. Urethane shall be 11.5 lbs per 55 lb bag or 21% of the weight of the rubber used if partial bags are required. All colors must be UV stable for a minimum of 7 years. Polymer content must be 25% minimum**.**

4. Cushion Course: Manufacturer's standard formulation of 5/8" chunk rubber with correct amount of urethane for impact attenuation and longevity. Chunk rubber may not be recycled SBR rubber from tires. It must be high quality pre-consumer recycled rubber containing EPDM.

5. Binder: Weather-resistant, flexible, non-hardening, 100 percent solids polyurethane complying with requirements of authorities having jurisdiction for nontoxic and low VOC content. Binders allowed are Prem Arc urethanes as distributed by American Recycling Center in Owosso, Michigan as well as DOW Voramer MR urethanes. No TDI urethanes will be permitted.

6. Critical Height: Per playground manufacturer's recommendations.

7. Overall Thickness: **as required for critical heights indicated**

8. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.

9. Wearing Course Color(s): **To be selected by Owner from manufacturer's standard colors.**

   a. Color **Pattern**: Consisting of up to 3 different colors. Color selection and PIP playground design to be provided during submittal process and Owner approval.

   b. Colors Mix shall Consist of:

      i. Up to three (3) solid colors.

      ii. Colors to be selected by Owner during submittal and construction process.

      iii. Provide color samples to Owner prior to final approval.

10. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by playground surface system manufacturer.

2.02 ALTERNATE 1

A. If Alternate 1 deduct is selected, color mix shall be comprised of 66% color / 33% Black Mix. Contractor to provide credit amount.

B. Up to 3 colors to be selected by Owner during submittal and construction process.

C. Provide color samples to Owner prior to final approval.

PART 3 - EXECUTION

3.01 EXAMINATION:

A. **Hard-Surface Substrates**: Verify that substrates are satisfactory for unitary playground surface system installation and that substrate surfaces are dry, cured, and uniformly sloped to drain within recommended tolerances according to playground surface system manufacturer's written requirements for cross-section profile.

B. **Stone Substrates**: Verify that substrates are a minimum of 12" thick with proper drainage and compacted to 95%. Stone used shall be #57 Limestone or suitable equivalent and shall vary no more than 1/8" within a 10 ft radius. Core drillings for equipment poles shall

be filled flush to the top of the stone with concrete to prevent sinkholes after installation of PIP surface.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. General: Prepare substrates to receive surfacing products according to playground surface system manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions.

B. Stone Substrates: Provide sound surface free of laitance, efflorescence, curing compounds, and other contaminants incompatible with playground surface system.

1. Repair unsatisfactory surfaces and fill holes and depressions.

2. Mechanically scarify or otherwise prepare concrete substrates to achieve recommended degree of roughness.

3. Confirm slope and drainage are correct and in place.

3.03 INSTALLATION, GENERAL

A. General: Comply with playground surface system manufacturer's written installation instructions. Install playground surface system over area and in thickness indicated.

3.04 INSTALLATION OF SEAMLESS PLAYGROUND SURFACE SYSTEMS

A. Seamless Surface: Mix and apply components of playground surface system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface and impact-attenuating system of total thickness indicated.

1. Poured Cushion Course: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints. Thickness of cushion course should meet ASTM 1292-04 guidelines and shall be a minimum of 1” thick. Varying thickness **is allowed to match fall height.**

2. Intercoat Primer: Over cured cushion course, apply primer at manufacturer's standard spreading rate.

3. Wearing Course: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, except where color changes, with **no** cold joints. Finish surface to produce manufacturer's standard wearing-surface texture. Minimum thickness of wear course shall be ½” after being troweled. A minimum of 5/8 screed rod shall be used when leveling wear course.

a. Where **colored pattern is** indicated, place adjacent colored material as soon as placed colored material is sufficiently cured, using primer or adhesive if required by manufacturer's written instructions.

4. Edge Treatment: **As indicated**. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with safety performance requirements.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of completed applications of playground surface system shall take place according to ASTM F 1292-04 or latest version.

1. Testing services to include but not limited to HIC testing and CPSI Inspection. Reports to be provided to Engineer.

2. Testing services to include but not limited to Spectrometry testing. Testing method is intended for use with other standards that address the collection and preparation of samples (dried chips, dusts, soils, and air particulates) that are obtained during the assessment or mitigation of lead hazards from playgrounds and related structures.

C. Remove and replace applications of playground surface system where test results indicate that it does not comply with requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with requirements.

3.06 PROTECTION

A. **IMPORTANT**:

1. Overnight protection measures MUST be implemented to prevent unauthorized access by individuals or large animals, to eliminate the risk of footprints, tracks, or damage to the surfacing before it fully cures.

2. The contractor shall be held responsible for the complete repair of any sections or the entire surfacing, as deemed necessary by the Owner and the Engineer.

3. **Repair work may include redoing the entire surfacing to the satisfaction of the Owner and the Engineer**.

4. Note: It is crucial for the contractor to strictly adhere to these requirements to maintain the integrity and quality of the surfacing and ensure a satisfactory outcome.

END OF SECTION

SECTION 32 18 16.15

TEXTURED ACRYLIC COLOR SURFACING FOR BASKETBALL COURT AND SPLASHPAD

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 DESCRIPTION

A. Work under this section includes the installation of textured acrylic surfacing for basketball courts.

B. Objective:

1. To provide a weather resistant durable non-glare finish.

2. To provide color, contrast, and other aesthetic values.

C. The work shall include, but is not limited to, the following:

1. Color coating and line marking of basketball court and splashpad.

1.03 REFERENCES

A. National Asphalt Paving Association (NAPA)

B. American Sports Builders Association (ASBA)

1.04 QUALITY CONTROL

A. Surface course repairs, and sub-surface material must have been installed to proper slope requirements and specifications and must be thoroughly cured (minimum of fourteen (14) days), before application of any filler or color finish materials.

B. All surface coating products shall be supplied by a single manufacturer.

C. The contractor shall record the batch number of each product used on the site and maintain it throughout the warranty period.

D. The contractor shall provide the Engineer, upon request, an estimate of the volume of each

`

product used on the site.

E. The installer shall be an authorized applicator of the specified system.

F. The manufacturer's representative shall be available to help resolve material questions.

G. Product Substitutions: If other than the product specified is proposed for installation, the contractor shall submit at least 14 days prior to application date

H. Contractor may submit substitution request a minimum of **5 days** prior to bid with above stated requirements to avoid approval issues during construction.

1.05 MATERIAL HANDLING AND STORAGE

A. Store materials in accordance with manufacturer specifications and MSDS requirements.

B. Deliver product to the site in original unopened containers with proper labels attached.

C. All surfacing material shall be non-flammable.

1.06 GUARANTEE

A. Provide a guarantee against defects in the materials and workmanship for a period of two (2) years from the date of substantial completion.

1.07 INSTALLER QUALIFICATIONS

A. Installer shall be regularly engaged in construction and surfacing of acrylic basketball court of similar size and surface.

B. Installer shall be an Authorized Applicator of the specified surface system.

C. Installer shall be a builder member of the ASBA.

1.08 MANUFACTURER QUALIFICATIONS

A. System manufacturer shall provide documentation that the surface to be installed has been classified by the ITF as a medium pace surface.

B. System manufacturer shall be a member of the ASBA.

1.09 ALTERNATES 2 and 3

A. If Alternate 2 deduct is selected, Eliminate Acrylic Surfacing from Basketball Court and provide

striping on asphalt pavement. Contractor to proivde Credit Amount.

B. If Alternate 3 is selected, eliminate acrylic surfacing from splash pad. Contractor to provide credit amount.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. California Products Corp,. Andover, MA 01810/ Plexipave System, or approved equal.

B. Substitutions: Submit request for substitution in writing at least **5 days** prior to bid. Provide sufficient data, drawings, samples and literature to demonstrate to the Engineer's and Owner's satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. The color system shall have a n ITF pace rating in Category 2.

1. Under no circumstances will systems from multiple manufacturers be considered in combination.

C. Contractor may submit substitution request a minimum of **5 days** prior to bid with above stated requirements to avoid approval issues during construction.

D. The contractor shall note that failure to obtain prior approval from the Owner and/or the Engineer before submitting bids shall not ensure product approval during the submittal process. It is the contractor's responsibility to seek and obtain necessary approvals from the designated parties before proceeding with the procurement or installation of any products or materials, including the acrylic color surfacing system.

1.10 COLORS

A. BASKETBALL: Up to 2 colors to be selected by Owner during submittal and construction process.

B. SPLASHPAD: Up to 1 color to be selected by Owner during submittal and construction process.

C. Provide color samples to Owner prior to final approval.

1.11 MATERIALS

A. Patch Mix (California Court patch Binder, or approved equal) – for use in patching cracks, holes, depressions and other surface imperfections.

B. Crack Filler (Plexipave Crack Filler, or approved equal) – For use in filing fine cracks.

`

C. Acrylic Filler Course (California Acrylic Resurfacer, or approved equal) – for use as a filler for new or existing surfaces. The 1005 acrylic filler shall be blended with approved silica sand at the job site.

D. Acrylic Color Paving Surface (Plexichrome/Plexipave Color Base, or approved equal) – for use as the finish color and texture. Plexichrome and Plexipave Color Base are blended at the job site to achieve the correct surface texture. *Factory Fortified plexipave may be used as an alterntive material.

E. Line Paint (California Line Paint, or approved equal) – for use as the line marking on the court/playing surface.

F. Water – for use in dilution/mixing shall be clan and potable.

1.12 MATERIAL SPECIFICATIONS

A. Court Patch Binder – 100% acrylic resin blended with Portland Cement and silica sand.

1. Percent solids by weight (minimum) 46%

2. Weight 8.7-8.9 lbs./gallon

B. Plexipave Crack Filler – 100% acrylic resin heavily filled with sand.

1. Percent solids by weight (minimum) 85%

2. Percent solids by weight (minimum) 15 lbs./gallon

C. California Acrylic Resurfacer – 100% acrylic resin (no vinyl copolymerization constituent). The product shall contain not less than 3.5% attapulgite.

1. Percent solids by weight (minimum) 26.7%

2. Weight 8.7-8.9 lbs./gallon

D. Plexichrome – 100% acrylic resin (no vinyl copolymerization constituent) with selected light fast pigments. Green shall contain not less than 8% chrome oxide.

1. Percent solids by weight (minimum) 36.5%

2. Weight 10.0-10.2 lbs./gallon

E. Plexipave Color Base – 100% acrylic resin containing no vinyl copolymerization constituent. Contains not more than 63% rounded silica sand.

1. Percent solids by weight (minimum) 74%

2. Weight 13.1-14.1 lbs./gallon

F. California Line Paint – 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.

1. Percent solids by weight (minimum) 60.5%

2. Weight 12-12.3 lbs./gallon

G. All surfacing materials shall be non-flammable and have a VOC content of not less than 100g./ltr. Measured by EPA method 24.

H. Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to ensure quality and stability.

PART 3 -EXECUTION

3.01 WEATHER LIMITATIONS

A. Do not install when rainfall is imminent or extremely high humidity prevents drying.

B. Do not apply unless surface and air temperature are 50 degrees Fahrenheit and rising.

C. Do not apply if surface temperature is in excess of 140 degrees Fahrenheit.

3.02 PREPARATION FOR ACRYLIC COLOR PLAYING SYSTEM

A. Clean surfaces of loose dirt, oil, grease, leaves, and other debris in strict accordance with manufacturer's directions. Pressure washing will be necessary to adequately clean areas to be coated. Any areas previously showing algae growth shall be treated with Clorox or approved product to kill the organisms and then be properly rinsed.

B. Holes and cracks: Cracks and holes shall be cleaned and a suitable soil sterilant, as approved by the owner, shall be applied to kill all vegetation 14 days prior to use of **Court Patch Binder** according to manufacturer's specifications.

C. Depression: Depressions holding enough water to cover a five-cent piece shall be filled with Court Patch Binder Patching Mix. 3 gallons of Court Patch Binder, 100 lbs. 60-80 silica sand, 1-gallon Dry Portland Cement (Type I). **This step shall be accomplished prior to the squeegee application of Acrylic Resurfacer.** The contractor shall flood all the courts and then allow draining. Define and mark all areas holding enough water to cover a nickel. After defined areas are dry, prime with tack coat mixture of 2 parts water/l part Court Patch Binder. Allow tack coat to dry completely. Spread Court Patch Binder mix true to grade using a straight edge (never a squeegee) for strike off. Steel trowel or wood float the patch so that the texture matches the

`

surrounding area. Never add water to mix. Light misting on surface and edges to feather in is allowed as needed to maintain work ability. Allow to dry thoroughly and cure.

1. NO WORK FROM THIS STAGE ON SHALL COMMENCE UNTIL THE ENGINEER HAS INSPECTED AND ACCEPTED THE SURFACE.

D. Filler Course. (Acrylic Resurfacer): Filler course shall be applied to the clean underlying surface in one application to obtain a total quantity of not less than .06 gallon per square yard based on the material prior to any dilution. Acrylic Resurfacer may be used to pre-coat depression and crack/hole repairs to achieve better planarity prior to filler course application.

1. Over a properly repaired surface of asphalt on existing courts, apply one coat of Acrylic Resurfacer according to the following mix:

Acrylic Resurfacer	55 gallons
Water	20 - 40 gallons
Sand	600-800 pounds / 60-80 mesh
Liquid Yield	112 – 138 Gallons

2. On new asphalt, two coats of Acrylic Resurfacer shall be used to properly fill all voids in the asphalt surface. Use clean, dry 50-60 mesh sand and clean, potable water to make mixes. The quantity of sand and water in the above mix may be adjusted within above limits to complement the roughness and temperature of the surface.

3. Mix the ingredients thoroughly using accepted mixing devices and use a 70 Durometer rubber bladed squeegee to apply each coat of Acrylic Resurfacer as required.

4. Allow the application of Acrylic Resurfacer to dry thoroughly. Scrape off all ridges and rough spots prior to any subsequent application of Acrylic Resurfacer or subsequent cushion or color surface system.

3.03 APPLICATION OF ACRYLIC COLOR PLAYING SURFACE

A. All areas to be color coated shall be clean, free from sand, clay, grease, dust, salt or other foreign matters. The Contractor shall obtain the Engineer's approval, prior to applying any surface treatment.

B. Blend color base and Plexichrome with a mechanical mixer to achieve a uniform Fortified Plexipave mixture. The mix shall be:

Color Base	30 gallons
Plexichrome	20 gallons
Water	20 gallons

C. Application shall be made by 50 durometer rubber faced squeegees. The Fortified Plexipave

mixture should be poured on to the court surface and spread to a uniform thickness in a regular pattern.

D. A total of 3 applications of Fortified Plexipave shall be made to achieve a total application rate of not less than .15 gal./sy. No application should be made until the previous application is thoroughly dry.

3.04 LINE PAINTING (IF APPLICABLE)

A. Line shall be 2" wide unless otherwise noted on the drawings. Lines hall be carefully laid out in accordance with ASBA and USTA guidelines. The area to be marked shall be taped to insure a crisp line. The California Line Paint shall have a texture similar to the surrounding play surface. Application shall be made by brush or roller at the rate of 150-200 sg./gal. (3/4 gal. per court).

3.05 PROTECTION

A. Erect temporary barriers to protect coatings during drying and curing.

B. Provide Locks for Owner and Lock gates to prevent use until acceptance by the owner's representative.

3.06 CLEAN UP

A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.

B. Leave site in a clean and orderly condition.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *WORK INCLUDED*

A. Provide all labor, equipment and materials for the installation of all fences, line posts, end posts, rails, fabric and gates as designated on the Contract Drawings

1.03 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. SECTION 31 20 00 – Earth Moving

2. SECTION 03 20 00 – Concrete Reinforcing

1.04 *REFERENCES*

A. ASTM – American Society for Testing and Materials

B. Commonwealth of Massachusetts Highway Department – Standard Specifications for Highways and Bridges.

1.05 *LAWS, ORDINANCES, PERMITS AND FEES*

A. The Contractor shall:

1. Give necessary notices, obtain all permits and pay all Governmental taxes, fees and other costs in connection with this work, file all necessary plans, prepare documents and obtain all necessary approvals of the local Building Department having jurisdiction.

2. Obtain all required certificates of inspection for this work and deliver same to the Engineer before request for acceptance and final payment for the work.

3. Include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, drawings (in addition to Contract Drawings and Documents)

in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on the Drawings and/or specified.

1.06 *QUALITY ASSURANCE*

A. Source: For each type of product required for the work of this Section, provide products of one manufacturer and source for consistency

B. Codes and Standards: Perform site improvements work in compliance with applicable requirements of governing authorities having jurisdiction. Workmanship and finish shall be equal to the best practice of modern shops for each item of work.

C. Qualifications of Workers: Use adequate numbers of skilled workers who are trained in the necessary craft and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

D. The work of this Section shall be completely coordinated with the work of other Sections. Verify dimensions and work of other trades which adjoin materials of this Section before installing items specified.

1.07 *SUBMITTALS*

A. Submit shop drawings and manufacturer's specifications and installation instructions for all materials to be used including gate assembly.

B. Certificates: Statement signed by an official authorized to certify on behalf of the manufacturer attesting that the chain link fence and component materials meet the specified requirements.

C. Material Sections and Samples: Submit samples showing the complete range of colors, textures and finishes available for all components required for construction. Provide the following

1. 12" x 12" sample of fence fabric

2. 12" section of each type of fence or gate pipe required

3. 6" sample of fabric tie material.

PART 2 - PRODUCTS

2.01 *MATERIALS*

Materials shall conform to the following:

A. PVC Coated Fence Fabric

Fabric shall be PVC coated thermally fused and bonded to a primer which is thermally cured onto galvanized steel core wire conforming to ASTM F 668, Class 2b. Color of vinyl coating shall be black as specified in the plan set. Minimum coating thickness shall be 0.006 in. Color sample shall be submitted to the Owner for approval.

1. Fabric shall be woven with the following parameters:

    a. **For perimeter fencing and walkways around a facility, etc:** Fabric shall be woven into a two (2") inch mesh of 6-core gauge (or as noted on drawings) galvanized wire with a minimum breaking strength of 1290 lbs. In accordance with ASTM F 668, Class 2b.

    b. **For fencing around splash pads and/or playgrounds:**Fabric shall be woven into a one and three-quarters (1-3/4") inch mesh of 6-core gauge (or as noted on drawings) galvanized wire with a minimum breaking strength of 1290 lbs. In accordance with ASTM F 668, Class 2b. Fencing shall have a Knuckle - Knuckle (K&K) top and bottom finish. No more than 1 - 1/2" gaps allowed at perpendicular points near fence posts, etc. Fence is to be properly grounded per local and state code.

    c. Zinc for galvanized coating shall conform to ASTM B 6, galvanized by hot dipped method AISI Type I, before vinyl coating; coating shall be smooth. Minimum weight of zinc coating shall be 1.2 oz. per sq. ft.

    d. Polyvinyl chloride coating shall meet the following requirements.

    e. Specific gravity shall be 1.30 maximum, tested in accordance with ASTM D 792.

    f. Hardness shall have a minimum Durometer reading of A 95 in accordance with ASTM D 2240. Ultimate elongation shall be 275% in accordance with ASTM D 412.

2. Tensile strength shall have a test minimum of 3,300 psi in accordance with ASTM D 412.

3. Vinyl shall be a dense and impervious covering free of voids, having a smooth, lustrous surface without pinholes, bubbles, voids, or rough or blistered surface.

B. Fence Posts, Hardware, and Fittings - General

1. Fittings shall be of best quality malleable iron castings, wrought iron forgings, or pressed steel and provided with pin connections. Equipment shall be designed to carry 100% overload.

a. Malleable iron castings shall be hot-dipped galvanized in accordance with ASTM A 153.

b. Wrought iron forgings or pressed steel fitting and appurtenances shall be hot-dipped galvanized in accordance with ASTM A 123.

c. Fence Hardware Coatings: shall match fence fabric coating.

2. Piping for fence posts shall be steel conforming to ASTM A 53 except that pipe shall be unthreaded and untested for water pressure.

3. Galvanized items shall be galvanized in accordance with ASTM A 123, A 153, or A 385, as applicable.

4. Bolts, which are installed six (6') feet or less above grade shall not protrude more than ¼ in. beyond the nut after tightening. All cut bolts shall be painted with Cold galvanized paint to prevent rusting (see paint specifications below). Rough edges shall be filed smooth to the satisfaction of the Engineer. Peen ends of all bolts after tightening.

C. Posts:

1. 4 ft. , 6 ft., 8 ft., and 10 ft. High Fencing:

a. Line posts shall be 2.375 in. O.D., Schedule 40 pipe weighing 3.56 lb./ft.

b. End and corner posts shall be 3.0 in. O.D. Schedule 40 pipe weighing 5.79 lb./ft.

c. Gatepost for gate leaf 6 ft. wide and less shall be 3.0 in. O.D. Schedule 40 pipe weighing 5.79 lb./ft.

2. Posts shall be PVC coated thermally fused and bonded to a primer which is thermally cured onto galvanized steel posts. Color of vinyl coating shall be black. Minimum coating thickness shall be 0.006 in.

D. Rails and Post Braces:

Top rail, mid rail (where required) and Bottom rails shall be 1.66 in. O.D., Schedule 40 pipe weighing 2.27 lb./ft.

Rails and post braces shall be PVC coated thermally fused and bonded to a primer which is thermally cured onto galvanized steel rails and post braces. Color of vinyl coating shall be black as specified in the plan set. Minimum coating thickness shall be 0.006 in.

E. Gates and Gate Frames:

Fabrication: Assemble gate frames by welding connections. Use same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at edges, (and tie wire at top and bottom edges, if stretcher is not used). Attach stretcher bars to gate frame at not more than 12 in. O.C. Attach hardware with rivets or by other means, which will provide security against removal or breakage.

1. Framing:

   a. Fabricate perimeter frames of minimum 1.90 in. O.D. Schedule 40 pipe, hot-dip galvanized with minimum 2.0 oz. zinc per sq. ft. of surface area.

2. Bracing:

   Provide diagonal cross bracing consisting of 3/8 in. diameter adjustable length truss rods on gates where four-sided tension rods are not used. Provide frame rigidity without sag or twist.

   Gate hardware: Galvanize per ASTM A 153 (each gate).

F. Gate Hardware Coatings Shall Match Fence Fabric Coating:

1. **Hinges:** Pressed steel or malleable iron to suite gate size, non-lift-off type, offset to permit 180° gate opening. Provide one pair of hinges for each leaf.

2. **Latch:** Forked type to permit operation from either side of gate: Provide padlock eye as integral part of latch. Latch(es) shall be heavy duty, industrial grade, fulcrum style, strong arm latch(es) and matching fence mesh color. Latch submittal must be submitted to Engineer prior to ordering to ensure they are industrial grade.

3. **Keeper:** Provide keeper for gates, which automatically engages the gate leaf and holds it in the open position until manually released.

4. **Drop Rod:** Provide heavy duty drop rod, matching fence fabric coating.

Gates and gate frames shall be PVC coated thermally fused and bonded to a primer, which is thermally cured onto galvanized steel components. Color of vinyl coating shall be black as specified in the plan set. Minimum coating thickness shall be 0.006 in.

G. Stretcher Bars:

Stretcher bars shall not be less than 3/16 in. x ¾ in. and be full height of the fabric with which they are being used.

1. Provide stretcher bars for each gate, end, corner, and pull post stretcher bar bands and clips shall be heavy pressed steel, or malleable iron.

H. Caps:

Posts shall have caps, which shall be designed to exclude water from post. Caps shall have holes suitable for the through passage of the top rail where necessary.

Caps for posts shall be PVC coated thermally fused and bonded to a primer, which is thermally cured onto galvanized steel caps. Color of vinyl coating shall be black as specified in the plan set. Minimum coating thickness shall be 0.006 in. All caps shall be securely fastened to posts.

I. Tension and Tie Wire:

PVC Coated Fence: **Tie wire** shall be:

a. 9-gauge O.D. vinyl-clad galvanized steel wire
b. Or 6-guage O.D. vinyl-clad galvanized aluminum wire.

J. Galvanized Paint:

Cold galvanized paint shall be one of the following:

Product	Manufacturer
Galvicon	Galvicon Corporation
Zinc Shield	Stanley Chemical Division of The Stanley Works

Touch-up for Galvanized Surfaces: Touch-up damaged or abraded galvanized surfaces with products equal to one of the following:

1. Cold Galvanizing Compound; ZRC.

2. Speedhide Galvanized Steel Paint; PPG.

3. Series 90-97 Zinc-Rich Primer; Tnemec.

K. Concrete:

ASTM C 94, using ¾ inch maximum size aggregate, and having minimum compressive strength of 4000 psi at 28 days. Grout shall consist of one part Portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

PART 3 - EXECUTION

3.01 *GENERAL*

A. Fence shall be installed to the lines and grades indicated. The area on either side of the fence line shall be cleared to the extent indicated. Line posts shall be spaced equidistant at intervals not exceeding 10 feet. Terminal (corner, gate, and pull) posts shall be set at abrupt changes in vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 500 feet. Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A 780.

3.02 *POSTS*

A. Posts shall be poured-in-place into the proposed concrete footings as shown on the plans and details.

3.03 *RAILS*

A. Top Rail, Mid (where required) and Bottom Rails

Top, mid (where required), and bottom rails shall be supported at each post to form a continuous brace between terminal post. Where required, sections of top rail shall be joined using sleeves or couplings that will allow expansion or contraction of the rail. Bottom tension wire is not acceptable.

B. Mid Rail: Required on fencing higher than 6 FT.

C. Bottom Rails: Required on all fencing.

3.04 *BRACES AND TRUSS RODS*

A. Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished. Braces and truss rods shall extend from terminal posts to line posts. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal.

B. No bracing is required on fences six feet high or less if a top rail is installed. For fencing higher than 6FT, bracing and truss rods are required.

3.05 *CHAIN LINK FABRIC*

A. Fabric Side Installation:

1. For projects where fencing is required on tennis courts, pickleball courts, basketball courts, etc., the chain link fabric shall be installed on the court playing side of the fence.

2. For projects where fencing is required around the perimeter of a field, track, etc., the Owner shall select the side of the fence fabric to be installed.

3. For projects where fencing is required around the perimeter of the facility and near walkways, the chain link fabric shall be installed on the walking side of the fence, facing out of the facility.

B. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 15-inch intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 14-inch intervals and fastened to all rails at approximately 12-inch intervals. Fabric shall be cut by untwisting and removing pickets. Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. Top and bottom of installed fabric shall be as indicated on the Drawings. After the fabric installation is complete, the fabric shall be exercised by applying a 50-pound push-pull force at the center of the fabric between posts. The use of a 30-pound pull at the center of the panel shall cause fabric deflection of not more than 2.5 inches when pulling fabric from the post side of the fence. Every second fence panel shall meet this requirement. All failed panels shall be resecured and retested at the Contractor's expense.

3.06 *GATES*

A. Gates shall be installed plumb, level and secure at the locations shown. Hinged gates shall be mounted to swing as indicated. Latches, stops, and keepers shall be installed as required. Slide gates shall be installed as recommended by the manufacturer. Hinge pins, and hardware shall be welded or otherwise secured to prevent removal. All gates shall be tested by the Engineer for proper functionality prior to final approval.

3.07 *TOUCH UP*

A. Following installation scratches and marred spots in vinyl-coated surfaces shall be field coated with a vinyl coating supplied by the fence manufacturer.

B. Following installation scratches and marred spots in galvanized surfaces shall be power wire brushed and painted with a cold-applied galvanized paint at a rate of 2 oz. zinc per sq. ft. of surface.

3.08 *CLOSE-OUT*

A. As part of the punch list and final close-out, the Contractor shall clean, repair, and paint any scratches on all fencing. Bolts shall be cut to be no more than ¼ of an inch and painted to prevent rust. Note: Contractor may request to use Flexible Bolt End Caps Covers with Engineer approval only.

1. If hydroseeding is used during project, Contractor shall clean and remove overspray debris from all fencing and posts before substantial completion.

B. Following installation scratches and marred spots in vinyl-coated surfaces shall be field coated with a vinyl coating supplied by the fence manufacturer.

3.09 *FOLLOW UP VISITS*

A. The Fence Contractor shall make two follow-up visits within the warranty period, at the request of the owner, to make repairs and touch-ups as necessary at no additional cost to the Owner.

END OF SECTION

SECTION 32 33 23

SITE TRASH AND LITTER RECEPTACLES

PART 1 – GENERAL

1.1 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 *WORK INCLUDED*

A. Provide all labor, equipment and materials for the installation of all benches, concrete pads, etc. as designated on the Contract Drawings

1.3 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. DIVISION 32 30 00 – Site Improvements

1.4 *QUALITY ASSURANCE*

A. Installer Qualification: An experienced installer who has completed installation of site furnishings and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Experienced site furniture manufacturer since 1984.

1.5 *SUBMITTALS*

A. Product Data: Include physical characteristics such as shape, dimensions, and finish for each receptacle.

B. Shop Drawings: Provide details for each product.

C. Samples for Verification: For the following product, show the color of the powder coat finish.

D. Maintenance Data: For each product.

a. Provide recommended methods for repairing damage and abrasions to the powder coat finish.

1.6 *DELIVERY, STORAGE, AND HANDLING*

A. Store products in original undamaged packaging in a dry location until ready for installation.

B. Handle powder coated products with carefully to prevent any damage to the finish.

1.7 *WARRANTY*

A. All products manufactured are warrantied against defect in materials and/or workmanship and in accordance with published specifications. Warranty of products as follows:

1. Limited twenty-year warranty against structural failure of all steel litter receptacle frames.

2. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies, table frames, litter receptacle frames, steel planters and all cast iron and aluminum bench supports.

3. Limited five-year warranty against structural failure of wood slats (where applicable).

4. Limited ten-year warranty against structural failure of recycled plastic. It is further warrantied not to degrade, split, crack or splinter during this period.

5. Limited one-year warranty on any item not specifically discussed above.

PART 2 – MATERIALS

2.01 *PRODUCTS*

A. Trash and Litter/Recycling Receptacle(s):

1. As manufactured by:

Dumor Inc.
138 Industrial Circle
Mifflintown, PA 17059
Phone: 800-598-4018
Fax: 717-436-9839
Email: sales@dumor.com
Website: www.dumor.com

2. DuMor Receptacle Model 287 Series

a. Trash Receptacle with shield model:
    a. Model 287-32SH-S0.
    b. Provide 2 receptacles.
    c. Receptacles are to be placed on a concrete pads with the following dimensions unless otherwise noted on the drawings. Any discrepancies shall be clarified with the Engineer prior to bid submission:
    d. Length: 3FT
    e. Width: 3FT

b. Recycling Receptacle with shield model:
    a. Model: 287-32SH-RC002
    b. Provide 2 receptacles.
    c. Receptacles are to be placed on a concrete pads with the following dimensions unless otherwise noted on the drawings. Any discrepancies shall be clarified with the Engineer prior to bid submission:
    d. Length: 3FT
    e. Width: 3FT

3. Or Approved Equal

4. The above listed acceptable manufacturer/supplier does not disqualify other substitute manufacturers/suppliers seeking approval. Substitute manufacturers/suppliers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to the bid date.

5. The above listed as an acceptable manufacturer/supplier does not exclude the contractor from meeting the specifications outlined.

2.02 *RECEPTACLE*

A. Materials:

1. Receptacle Body:

    a. Receptacle body shall be manufactured from 1/4” x 1 1/2” ASTM A36 carbon steel flat bar, 3/8” x 3” ASTM A36 carbon steel flat bar, 5/8” diameter ASTM A36 steel round bar and 1/4” thick ASTM A36 steel plate.

2. Internal Shields (Optional, Unless Specified):

    a. Internal Shields shall be manufactured from 18 gauge ASTM A1008 steel sheet.

3. Cover:

a. Cover shall be manufactured from 12 gauge ASTM A1011 steel plate.

4. Liner:

a. Liner shall be HDPE with 32-gallon capacity.

5. Anchoring:

a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.

B. Dimensions:

1. Overall: 27 5/8" diameter x 43 1/2" high

C. Finish:

1. Powder Coating

a. All parts are processed through an 8-stage iron phosphorous wash system.

b. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.

c. Parts are then finished with a top coat of TGIC-polyester powder to an AVERAGE of 4-5 mils.

d. Powder is cured at the powder manufacturers specifications using combination of infrared and convection heat for approximately 20 minutes.

e. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.

PART 3 – EXECUTION

3.01 *INSTALLATION*

A. Handle and install benches according to manufacturer's recommendations and installation instructions.

END OF SECTION

SECTION 32 33 43.13

SITE SEATING

PART 1 – GENERAL

1.1 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 *WORK INCLUDED*

A. Provide all labor, equipment and materials for the installation of all benches, concrete pads, etc. as designated on the Contract Drawings

1.3 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. DIVISION 32 30 00 – Site Improvements

2. SECTION 32 33 43.53 – Site Tables

1.4 *QUALITY ASSURANCE*

A. Installer Qualification: An experienced installer who has completed installation of site furnishings and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Experienced site furniture manufacturer since 1984.

1.5 *SUBMITTALS*

A. Product Data: Include physical characteristics such as shape, dimensions and finish for each bench.

B. Shop Drawings: Provide installation details for each product.

C. Samples for Verification: For the following product, show the color of the powder coat finish.

D. Maintenance Data: For each product.

a. Provide recommended methods for repairing damage and abrasions to the powder

coat finish.

1.6 *DELIVERY, STORAGE, AND HANDLING*

A. Store products in original undamaged packaging in a dry location until ready for installation.

B. Handle powder coated products with carefully to prevent any damage to the finish.

1.7 *WARRANTY*

A. All products manufactured are warrantied against defect in materials and/or workmanship and in accordance with published specifications. Warranty of products as follows:

1. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies, table frames, litter receptacle frames, steel planters and all cast iron and aluminum bench supports.

2. Limited ten-year warranty against structural failure of recycled plastic. It is further warrantied not to degrade, split, crack or splinter during this period.

3. Limited one-year warranty on any item not specifically discussed above.

PART 2 – MATERIALS

2.01 *PRODUCTS*

A. Benches:

1. As manufactured by:

Dumor Inc.
138 Industrial Circle
Mifflintown, PA 17059
Phone: 800-598-4018
Fax: 717-436-9839
Email: sales@dumor.com
Website: www.dumor.com

2. DuMor Model 58 Series

a. With Center Arm Rest

3. Specialized Nut Locking Mechanisms

a. Nyloc Nuts:

1. Contractor to replace and provide nyloc-type nuts for seating benches to prevent nuts from loosening.

2. NOTE: nyloc-type nuts shall be provided for all site furnishings that are susceptible to vibration and movement like site tables and benches.

b. Loctite: High strength thread locker:

1. Contractor to apply Loctite adhesive, or approved equal, to secure nuts and bolts to seating benches to prevent nuts from loosening.

2. NOTE: Thread locking adhesive shall be provided for all site furnishings that is susceptible to vibration and movement like site tables and benches.

4. Or Approved Equal

5. The above listed acceptable manufacturer/supplier does not disqualify other substitute manufacturers/suppliers seeking approval. Substitute manufacturers/suppliers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to the bid date.

6. The above listed as an acceptable manufacturer/supplier does not exclude the contractor from meeting the specifications outlined.

2.02 *BENCHES*

A. Materials:

1. Supports:

a. End supports shall be ASTM A48 Class 30 cast iron.

2. Seat Assembly:

a. Seat straps shall be manufactured from 1/4" x 1 1/2" ASTM A36 carbon steel flat bar.

b. Support pipes shall be manufactured from 2" (2 3/8" OD)ASTM A513 schedule 40 steel tubing.

c. Pipe brace shall be manufactured from 3/4" (1 1/16" OD) ASTM A500 schedule 40 steel tubing.

3. Intermediate armrests:

a. Intermediate armrests shall be manufactured from ASTM A48 Class 30 cast iron.

4. Anchoring:

a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.

B. Dimensions

1. 8-foot bench Benches Needed for This Project)

a. Overall: 98 1/4" long x 27 9/16" deep x 31 11/16" high

C. Finish:

1. Powder Coating

a. All parts are processed through an 8-stage iron phosphorous wash system.

b. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.

c. Parts are then finished with a top coat of TGIC-polyester powder to an AVERAGE of 4-5 mils.

d. Powder is cured at the powder manufacturers specifications using combination of infrared and convection heat for approximately 20 minutes.

e. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.

PART 3 – EXECUTION

3.01 *INSTALLATION*

A. Handle and install benches according to manufacturer's recommendations and installation instructions.

B. Contractor shall use nyloc-type nuts and apply adhesive to nuts and bolts to properly secure seating. Contractor shall be responsible for painting nuts and bolts to match seating/bench color.

3.02 *MAINTENANCE:*

A. NOTE: Contractor is required to re-tighten and apply adhesive to benches, seats, tables, and corresponding site furniture twice a year at 6-month intervals (or at the request of the Owner) for 3 years.

B. Schedule of this maintenance shall be provided to the Owner upon final completion of the project.

END OF SECTION

SECTION 32 33 43.53

SITE TABLES

PART 1 – GENERAL

1.1 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 *WORK INCLUDED*

A. Provide all labor, equipment and materials for the installation of all benches, concrete pads, etc. as designated on the Contract Drawings

1.3 *RELATED WORK*

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. DIVISION 32 30 00 – Site Improvements

2. SECTION 32 33 43.13 – Site Seating

1.4 *QUALITY ASSURANCE*

A. Installer Qualification: An experienced installer who has completed installation of site furnishings and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Experienced site furniture manufacturer since 1984.

1.5 *SUBMITTALS*

A. Product Data: Include physical characteristics such as shape, dimensions and finish for each table.

B. Shop Drawings: Provide installation details for each product.

C. Samples for Verification: For the following product, show the color of the powder coat finish.

D. Maintenance Data: For each product.

a. Provide recommended methods for repairing damage and abrasions to the powder coat finish.

1.6 *DELIVERY, STORAGE, AND HANDLING*

A. Store products in original undamaged packaging in a dry location until ready for installation.

B. Handle powder coated products with carefully to prevent any damage to the finish.

1.7 *WARRANTY*

A. All products manufactured are warrantied against defect in materials and/or workmanship and in accordance with published specifications. Warranty of products as follows:

1. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies, table frames, litter receptacle frames, steel planters and all cast iron and aluminum bench supports.

2. Limited five-year warranty against structural failure of wood slats.

3. Limited ten-year warranty against structural failure of recycled plastic. It is further warrantied not to degrade, split, crack or splinter during this period.

4. Limited one-year warranty on any item not specifically discussed above.

PART 2 – MATERIALS

2.01 *PRODUCTS*

A. Tables:

1. As manufactured by:

Dumor Inc.
138 Industrial Circle
Mifflintown, PA 17059
Phone: 800-598-4018
Fax: 717-436-9839
Email: sales@dumor.com
Website: www.dumor.com

2. DuMor Model 448 Series

a. 3 Seat Table - One (1) Table with ADA Accessible Opening)

b. 4 Seat Table - One (1) Table

3. Or Approved Equal

4. The above listed acceptable manufacturer/supplier does not disqualify other substitute manufacturers/suppliers seeking approval. Substitute manufacturers/suppliers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to the bid date.

5. The above listed as an acceptable manufacturer/supplier does not exclude the contractor from meeting the specifications outlined.

2.02 *TABLES*

A. Materials:

1. Table Support:

a. Table supports shall be 4" x 4" x 3/16" wall ASTM A500 steel tubing and 3/8" thick ASTM A36 steel plate.

2. Table Top Assembly:

a. Table top assembly shall be manufactured from 2" (2 3/8" OD)ASTM A513 schedule 40 steel tubing and 1/4" x 1 1/2" ASTM A36 carbon steel flat bar.

3. Seat Assembly:

a. Seat assembly shall be manufactured from 2" (2 3/8" OD)ASTM A513 schedule 40 steel tubing and 1/4" x 1 1/2" ASTM A36 carbon steel flat bar.

4. Anchoring:

a. Stainless steel expansion anchors (1/2" x 3 3/4") provided.

B. Dimensions:

1. 3-foot square table top **3 seat table** (448-33GM – Game Table)

a. Overall: 67" long x 51 1/4" deep x 30 5/16" high

b. Per Owner, One (1) seat ADA table(s) must be included.

2. 3-foot square tabletop **4 seat table** (448-34GM – Game Table

a. Overall: 67” long x 67” deep x 30 5/16” high

C. Finish:

1. Powder Coating

a. All parts are processed through an 8-stage iron phosphorous wash system.

b. Parts are coated with a zinc-rich epoxy primer to an AVERAGE of 4-5 mils.

b. Parts are then finished with a top coat of TGIC-polyester powder to an AVERAGE of 4-5 mils.
c. Powder is cured at the powder manufacturers specifications using combination of infrared and convection heat for approximately 20 minutes.

d. Finished parts shall comply with the following American Standard Test Method (ASTM) for coating and coating method: ASTM-D-523, ASTM-D-3363, ASTM-D-1737, ASTM-D-3359, ASTM-D-2794, ASTM-B-117 and ASTM-D-3451.

PART 3 – EXECUTION

3.01 *INSTALLATION*

A. Handle and install Tables according to manufacturer’s recommendations and installation instructions.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.

1.02 SUMMARY

A. Provide all labor, materials, equipment, services, and perform all operations necessary to complete the work of this section as indicated within the drawings and specified herein which shall include, but is not limited to, the following:

1. Selection, procurement, and planting of all plant materials indicated within the Drawings including:

   a. Trees

   b. Shrubs

   c. Perennials, groundcovers, and bulbs

2. Seeding and Sodding: lawns

3. Topsoil

4. Planting medium

5. Maintenance

B. Related Work:

1. Excavation, filling, rough grading, and compaction required to establish elevations shown on drawings is specified in Section 31 10 10, Site Clearing.

1.03 REFERENCE

A. American Association of Nurserymen (AAN): ANSI Z 260.1 “American Standard for Nursery Stock.”

B. Pruning Standards: “Standards for Pruning Shade Trees,” by the National Arborist Association, 174 Route 101, Bedford, New Hampshire 03102.

C. American National Standards Association and National Arborist Association, Inc.: ANSI/ANAA A300 "Tree, Shrub and Other Woody Plant Maintenance - Standard Practices."

D. Bailey Hortorium of Cornell University, Hortus Third, A Concise Dictionary of Plants Cultivated in the United States and Canada (for nomenclature).

1.04 SUBMITTALS

A. Submit the following items, demonstrating complete conformance with the requirements specified for approval by the Engineer prior to ordering or delivering those items to the site:

1. Certificates of Inspection required by governmental authorities.

2. Topsoil analysis with results and amendment recommendations.

3. Seed vendors certified statement for each grass seed mixture specified stating botanical and common name, percentages by weight, percentages of purity and percentages of germination.

4. Manufacturer's or vendor's certified analysis for soil amendments including standard and slow-release fertilizers.

5. Product information for anti-desiccant material.

B. Submit samples of the following materials for approval by the Engineer prior to ordering or delivering those items to the site:

1. Topsoil: One (1) pint per sample lot labeled indicating source with analysis and amendment recommendations certified by the testing laboratory.

2. Bark Mulch: One (1) quart bag with label indicating source of supply.

C. Planting Schedule: Proposed planting schedule, indicating dates for each type of landscape work to be completed, maintenance periods and anticipated Provisional Acceptance date.

1.05 QUALITY ASSURANCE

A. Lawn and planting work to be performed only by experienced workers, familiar with planting procedures, and under the full-time supervision of a qualified supervisor. The Contractor must show previous evidence of having successfully installed and maintained landscape projects of similar scope to the subject project with regards to quantities and

sizes of plants specified, anticipated cost, complexity, and a demonstrated minimum of five (5) years' experience on similar projects.

1. The Engineer shall have the right to review the qualifications and references of the Contractor for work on this project.

2. At least ten (10) days in advance of the first day of planting operation, arrange for a preconstruction meeting between the Engineer, General Contractor, and Planting Subcontractor to discuss the proposed planting schedule, source of plants, consideration of proposed substitutions and general review of procedures.

B. Topsoil and/or Loam Borrow Testing and Analysis: The Contractor shall submit representative samples of topsoil and/or loam borrow to a public extension service agency or a certified private testing laboratory for testing and analysis, in conformance with the Standards of the Association of Official Agricultural Chemicals.

1. Two (2) samples each shall be taken and analyzed from the existing stockpiled topsoil on site and two (2) samples each shall be taken and analyzed from each potential loam borrow pit. Deliver samples to testing laboratory and have testing report sent directly to the Engineer and pay all costs.

    a. Report shall be submitted at least one (1) month before any material is to be delivered or installed on the project site.

2. Soil test report which shall include:

    a. Mechanical sieve analysis with soil classification.

    b. Organic content.

    c. Chemical analysis which shall include: pH (1:1 soil-water ratio), buffer pH, Soluble Salts (1:2 soil-water ratio), Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Manganese, Ferric Iron, Sulfate and toxins including but not limited to lead, cadmium, arsenic, and mercury.

    d. Inform the Soil Testing Laboratory that soil tests are for specific applications, i.e. tree and shrub plantings, turf-grass, wetland restoration and retention areas.

3. Test and analysis reports shall include the laboratory's recommendations for amending the topsoil, if necessary, to meet these Specifications herein for each planting area.

4. Obtain written approval from the Engineer before delivering materials to the site. Do not use topsoil until test results have been received by the Engineer and amendments per specifications and laboratory recommendations required have been completed.

5. The Engineer reserves the right to retest materials and to reject materials not meeting specifications. If the material does not meet the specifications, cost for the tests shall be paid by the Contractor at no additional cost to the Owner.

    a. The Engineer reserves the right to request topsoil analysis (up to 10 additional tests) after the material has been placed on site.

C. Certificates: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.

D. Substitutions: No substitutions shall be made by the Contractor. If the specified plant material is not obtainable, submit proof of non-availability to the Engineer, together with proposal for use of equivalent material, a minimum of one (1) month prior to installation.

E. Provide trees, shrubs, and plant of quantity, size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 “American Standard for Nursery Stock”.

1. Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.

2. Label at least one (1) tree and one (1) shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

    a. Where formal arrangements or consecutive order or trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.

1.06 <u>QUALITY CONTROL AT THE SOURCE OF SUPPLY</u>

A. The Engineer shall have the right to inspect and select all plant materials at the source of supply for compliance with requirements for genus, species, variety, size, and quality. The Engineer further retains the right to inspect trees and shrubs for size and condition of root balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work.

1. Plant selection at the source does not affect the Engineer's right of re-inspection and rejection of plant material during the progress of the work.

B. Make pre-selection arrangements at the source to insure a ready supply of materials, equipment, and manpower required for an efficient selection procedure. The Contractor shall pay all Engineer's expenses for all visits to the source beyond a one hundred (100) mile radius from the Engineer's office.

1. Notify the Engineer ten (10) days prior to the scheduled date for plant selection.

1.07 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in manufacturer's original containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Trees and Shrubs: Provide freshly dug trees and shrubs, balled and burlap(B&B) or container grown plant materials (CG) firm in their containers, loose root ball will not be accepted. Do not prune prior to delivery unless otherwise directed by the Engineer. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery. Handle balled and bur lapped stock with care; do not drop or handle roughly.

C. Deliver trees and shrubs only after preparations for planting have been completed. Place plant material in the ground on the same day as it is delivered. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with soil, mulch, burlap or other acceptable means of retaining moisture. Do not remove container-grown stock from containers until immediately before setting the plants into the ground.

D. Herbaceous Plants: Provide only plugs or dormant propagules in sizes noted. No bare root materials will be accepted.

1.08 JOB CONDITIONS

A. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing and maintaining plants temporarily and/or rehandling plants prior to final installation.

B. Utilities: Verify all public and private utility locations and elevations prior to excavation. Contact "DIG SAFE" 1-800-322-4844 seventy-two (72) hours prior to any excavation.

1. Report any discrepancies in writing to the Engineer and receive written instructions prior to proceeding.

2. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

3. Coordinate with Contractor and other trades regarding on site utilities that wrap around building. Review utility plans prior to commencement of work.

C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Engineer before planting.

1.09 SEQUENCING AND SCHEDULING

A. Planting Time for Trees, Shrubs and Ground Cover: Proceed with, and complete work as rapidly as portions of site become available, working within planting season as follows:

1. Spring planting:

a. Deciduous materials: April 1 through June 15

b. Evergreen materials: April 1 through June 15

2. Fall planting:

a. Deciduous materials: September 1 through December 1

b. Evergreen materials: September 1 through November 15

C. Seeding: Complete seeding operations within the period noted below unless the Engineer approves another seeding time in writing.

1. Spring seeding: April 15 through June 15

2. Fall seeding: August 15 through October 15

D. Variance: If special conditions exist which may warrant a variance in the above planting dates, a written request shall be submitted to the Engineer stating the special conditions for the proposed variance. Permission for the variance will be given if warranted in the opinion of the Engineer.

E. Schedule tree selection and digging operations so as to comply with nursery industry recognition of “Spring Dig Only” or “Fall Hazard” plant materials. No substitutions of plant materials will be allowed for fall planting based on unavailability due to the “Spring Dig Only” or “Fall Hazard” restrictions. Contractor shall have selected and had the material dug during the previous spring.

F. Coordination between Plants and Lawns: Plant trees and shrubs after final grades are established and before planting lawns, unless otherwise acceptable to Engineer. If

planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.10 PLANT MATERIAL ACCEPTANCE AND GUARANTEE

A. Provisional Acceptance and Instructions to Owner:

1 When all plant material is installed and at the end of the maintenance period specified in Part 3 of this section, the Contractor shall request the Engineer, in writing, to inspect the work for Provisional Acceptance. Notify the Engineer at least ten (10) days prior to the anticipated date of inspection.

a. For provisional acceptance, all plantings must be installed as specified in the locations indicated on the plans or as directed in the field by the Engineer, they must be in good, living condition, true to name and specified size.

2. Furnish written instructions for maintenance of the planting to the Owner at the time of inspection for Provisional Acceptance. Maintenance instructions shall consist of complete typed instructions indicating specific operations in watering, fertilizing, spraying, and pruning that will be necessary to maintain plants and lawn areas in a healthy condition.

3 When the plant material and workmanship are acceptable or upon the completion of the documented corrective work has been completed and maintenance instructions have been received by the Owner the Engineer will certify in writing the Provisional Acceptance of the planting and initiating the beginning date of the Guarantee Period.

4. Retainage: A sum of ten (10) percent of the cost of the planting contract will be retained until the end of the Guarantee Period. This retainage will be released after Final Acceptance.

B. Guarantee Period and Replacements:

1. The Guarantee Period shall be one (1) year from the date of Provisional Acceptance. During the Guarantee Period the owner shall maintain the plant materials and it shall be the Contractors obligation to inspect the plant materials to confirm that they are receiving proper maintenance and care.

2. The Contractor is to perform inspections at frequent intervals so that he may observe problems which can be identified and remedied to maintain healthy plant growth. If the Contractor is of the opinion that the care being given these areas by the Owner is insufficient or may cause them to die prematurely, the Contractor

shall immediately notify the Engineer in writing; otherwise, no consideration will be given this claim.

3. Remove and replace trees, shrubs and other plants found to be dead or unhealthy during the Guarantee Period. Remove dead plants immediately. Make replacements during the normal planting season. The replacement plant material shall be guaranteed for an additional period of one (1) year.

    a. Pay for the cost of replacement, unless it can be definitely shown that the loss resulted from vandalism or Owner's failure to maintain planting as instructed.

    b. Restore areas damaged or disturbed by replacement operations to their original condition.

    c. All replacement plant material shall be of the same species; cultivar size as specified in the Plant Schedule. They shall be furnished and planted as specified herein.

C. At the end of the Guarantee Period or as directed by the Engineer at the Provisional Acceptance, remove and dispose of guys, wires, rubber hose sections, stakes, and tree trunk wrapping off site.

D. Final Inspection and Final Acceptance:

1. At the end of the Guarantee Period, the Engineer upon written request submitted by the Contractor will make inspection. Notify the Engineer at least 10 days before the anticipated date.

2. If the plant material and WORKMANSHIP are acceptable or upon the completion of the documented corrective work including plant replacement, the Engineer will certify in writing the Final Acceptance of the planting.

1.11 *SEEDING INSPECTION AND ACCEPTANCE*

A. Inspection of the seeded areas shall be made at the end of the maintenance period specified in Part 3 of this section, and a determination made by the Engineer whether maintenance shall continue. Acceptance shall be granted if a thick, uniform and well-developed stand of grass has been developed.

B. If the work is unsatisfactory, continue the maintenance period until the Engineer determines the work to be acceptable.

PART 2 – PRODUCTS

2.01 TOPSOIL

A. New Topsoil: Topsoil shall be natural, fertile, friable soil, without admixture of subsoil, clean and reasonably free from clay, lumps, stones, stumps, roots, or similar materials one (1) inch or more in diameter and free from debris or other objects which might be a hindrance to planting operations, and as follows:

1. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the project site. Obtain topsoil only from naturally, well drained sites where topsoil occurs at a depth of not less than four (4) inches.

2. Texture: Topsoil shall be a "loamy sand" as determined by mechanical analysis and based on the "USDA Textural Classification". It shall conform to the following grain size distribution for material passing the #4 sieve:
   a. Percent passing by weight:

U.S. Standard Sieve	Minimum	Minimum
#4	100	
#40	60	85
#100	35	60
#200	22	35
#.002 mm	0	5

3. Organic Matter: Portion of the sample which passes 1/4-inch sieve shall contain not less than five (5) percent nor more than twenty (20) percent organic matter, as determined by the wet combustion method on a sample directed at 105°C.

   a. To adjust organic matter content, the soil may be amended, prior to site delivery, by the addition of composted humus. Use of organic amendments is acceptable only if random soil sampling indicates thorough incorporation.

4. pH value: Portion of the sample that passes a 1/4-inch sieve shall fall within a range of pH 5.5 to pH 7.0.

2.02 SOIL AMENDMENTS

A. Aluminum Sulfate: Commercial grade.

B. Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.

C. Commercial Fertilizer: Provide as follows:

1. Trees and Shrubs: Low nitrogen, slow-release water-soluble fertilizer packets or tablets, designed and certified by the manufacturer to provide controlled release of fertilizer over a minimum three-year period.

a. Lawns: Fertilizer that conforms to standards of the Association for Official Agricultural Chemists, with at least 50% of the nitrogen content derived from organic nitrogen and the remainder from urea foam or equivalent. Deliver in sealed and labeled bags or in bulk with certification as to quality and analysis. www.organicainc.com

D. Compost: Well-composted, stable and weed-free organic matter with the following properties:

1. Screen size less than ½", density =/-1000lbs/cy, ph 8.0, organic matter 63%, TKN nitrogen 1.2%, Organic-N .97%, Carbon /Nitrogen ratio 25:1, total Phosphorous .54%, total Potassium .56%. For topsoil production and plant beds mix 10-30% uniformly by volume. Compost supplier; New England Organics, Earthlife Products, Dartmouth, MA (207) 781-5011, or approved equal.

E. Lime: Provide natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

F. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.

G. Peat Humus: Humus shall be natural humus, reed peat or sedge peat, finely divided peat, so completely decomposed and free of fibers that its biological identity is lost. Provided in granular form, free of hard lumps, with pH range approximately 5.5 pH to 7.5 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.

H. Perlite: Horticultural grade, conforming to National Bureau of Standards PS 23.

I. Sand: Sand shall be clean and washed consisting of clean, inert, hard, durable grains of quartz or other hard durable rock, free from clay or loam, surfacing coatings, and deleterious materials, with the following gradation limitations:

1. Percent passing by weight:

U.S. Standard Sieve	Minimum	Minimum
½"	100	
3/8"	85	100
#4	60	100
#16	35	80
#50	10	55
#100	2	10

J. Shredded Bark Mulch: Natural pine, fir, spruce bark mix which has been machine shredded into fibrous, pliable slices generally not exceeding 1/2 inch in width and generally longer than wide, clean, and free of weed seeds.

K. Super-phosphate: Soluble mixture of treated minerals; 20 percent available phosphoric acid.

L. Water: Suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for the work shall be furnished by the Contractor.

M. Microbial Soil Conditioner: Provide Microbial Soil Conditioner by Organica Inc. as a beneficial microbial inoculant formulated to enhance soil biology. The soil microbial soil conditioner establishes colonies of beneficial soil microbes. The microbes minimize nutrient leaching, aid in nutrient recycling and absorption, improve soil structure and convert soil elements into plant available form. The Microbial Soil Conditioner will also stimulate root growth and formation, improve nutrient absorption, improve seed germination and viability, naturally accelerate cell division and provide energy for plant metabolism.

N. Hydrogel: Super absorbent polyacrylamide, non-toxic, biodegradable granules for reducing irrigation frequency, as supplied by: Soil Moist (800) 441-2847, or Stockasorb (800) 334-5930, Smyrna GA, or approved equal.

O. Weed barrier: For controlling weed growth and tree seedlings, contractor may use either Corn Weed Blocker, 9-1-0, a pre-emergent weed blocker and slow-release fertilizer, or a weed barrier mat installed under mulch.

2.03 PLANT MATERIALS

A. A complete list of plants, including a schedule of sizes, quantities and other requirements, shall be shown on the Drawings. In the event that quantity discrepancies or material omissions occur between the plant materials schedule and the Drawings, the Contractor shall be responsible in providing the higher quantity of plants.

B. Furnish plants which have been nursery grown in accordance with American Nurserymen's Association and ANSI Z60.1, which have been grown under climate conditions similar to those in the locality of the Project for at least two (2) years, and which have been transplanted or root pruned at least once in the last three (3) years. Furnish freshly dug plants; heeled-in plants and plants from cold storage will not be accepted.

C. Furnish plants which are sound, healthy, vigorous, have straight trunks, are well branched and densely foliated when in leaf, and which have healthy, well developed root systems. Furnish plants which are typical of their species or variety and which have normal habit of growth. Furnish plants which are free of disease, insect pests, their eggs or larvae and defects such as knots, sun scald, injuries and disfigurement.

D. All plants shall be balled and bur lapped unless otherwise specified and must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated eight-ounce burlap, firmly held in place by a stout cord or wire. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant.

1. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and root balls shall remain intact during all operations.

E. Measurements:

1. Measure trees and shrubs when branches are in their normal position.

2. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip.

3. The branching height for shade trees need not be the height specified if the required branching height may be obtained by pruning after delivery without affecting the shape and form of the trees, or causing large, unsightly scars.

4. Measure the caliper of trees up to four (4) inch caliper at six (6) inches above the ground level. Measure trees larger than four (4) inch caliper one (1) foot above ground level.

5. Number of canes specified for shrubs shall be the minimum acceptable. A cane shall be considered a primary stem which starts from or close to the ground, or at a point not higher than one-fourth the height of the plant. No trees which have had their leaders cut, or so damaged that cutting is necessary, will be accepted.

F. Plants larger than specified in the plant list may be used if approved by the Engineer, but use of such plants shall not increase the contract price. If the use of larger plants is approved, the spread of roots or ball of earth shall be increased in proportion to the size of the plant.

G. Groundcover: Furnish established plants, well-rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed.

2.04 SEEDING & SOD

A. Sod shall be a shade tolerant disease-resistant mixture of 50% minimum Kentucky Bluegrass cultivars and 50% Red Fescue or Chewing's Fescue, or as approved by the Engineer.

1. Sod shall be at least two years old from time of original seeding.

2. Sod shall be good quality, of good color and density, and free of weeds, disease, and insect. Sod shall be machine cut at a uniform soil thickness necessary for plant viability during the harvest, transportation, and installation. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4" at time of cutting; minimum thickness of sod and planting soil shall be 1.5 inches. Individual pieces of sod shall be cut to the supplier's standard width and length; maximum allowable deviation from standard widths and lengths shall be 5%. Standard size sections of sod shall be strong enough to support their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.

3. Sod shall be harvested, delivered, and installed within a period of 36 hours. Soil shall be kept moist at all times.

4. Stakes for pegging sod shall be sound hardwood about 1" by 2" and long enough to penetrate the grass mat, soil bed and at least 2 inches of subsoil. Stakes shall be free from insects and fungi and capable of remaining in the ground at least 2 years.

B. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall weed seed content exceed 1% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers.

1. All seed shall comply with State and Federal seed laws. Submit manufacturer's certificate of Compliance. Seed, which has become wet, moldy or otherwise damaged will not be acceptable.

2. Seed may be mixed by an approved method on the site or may be mixed by a dealer. If the seed is mixed on site, each variety shall be delivered in the original containers, which shall bear the dealers guaranteed statement of the composition of the mixture.

Seed Mix for Lawns:

Northeast Sun/Shade Mix. 170 lbs./acre of the following seeds thoroughly mixed:

Common Name	Proportion By Weight Min	Germination Min	Purity Min
Sydsport Kentucky Bluegrass	25 %	90	95
Affirmed Perennial Rye	20 %	90	90
Exacta Perennial Rye	20 %	90	90
Chewing's Fescue	25 %	90	90
Churchill Perennial Ryegrass	10 %	90	90

B. Seed shall be mixed off-site by dealer. Contractor shall submit in accordance with Division 1 with the dealer's certificate of the mixture composition for review and approval before seeding operations begin.

2.05 ACCESSORY MATERIALS

A. Staking and Guying:

1. Stakes for supporting trees: Sound wood, uniform in size, free of knots and holes, nominal two (2) inches by two (2) inches and eight (8) feet long. Stain stakes dark brown.

2. Wire for tree bracing and guying: Pliable No. 12-gauge galvanized steel. Contractors' option: "Deep-root Arbor tie" 1 800-458-7668 or approved equal, installed per manufacturers' recommendations guying system utilizing a water-knot to tie off trees to stalks in place of guying items below.

3. Wire cable for bracing and guying trees: Pliable five strand 3/16-inch galvanized steel cable. Furnish galvanized malleable cable clamps or approved equal to secure ends of cable.

4. Turnbuckles: 5/16 inch by 4-1/2-inch galvanized steel turnbuckles.

5. Pedestrian warning flags: Two (2) inch by twelve (12) inch white plastic strips or one half (1/2) inch by three (3) inch by twelve (12) inch marine plywood painted white.

6. Hose for covering wire: New or used and in good condition, two-ply reinforced black rubber hose not less than 1/2 inch inside diameter.

B. Anti-desiccant: Anti-desiccant shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

PART 3 - EXECUTION

3.01 PROTECTION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Do not drive trucks or other heavy equipment over walks without putting down heavy planking to distribute the load and keep from breaking the edges of walks.

B. Transport plants to the site in closed or covered trucks, with tarpaulins placed to permit ventilation of the load. Protect roots or balls at all times from sun and/or drying winds. If balled and bur lapped plants are not planted immediately upon delivery, set them on the ground and protect the roots or balls with soil, mulch, burlap or other acceptable means of retaining moisture. Take care when binding with wire or rope not to damage the bark or break branches.

3.02 LAYOUT OF PLANTING AREAS

A. Locate and stake all plants and outlines for planting areas on the ground for approval by the Engineer before any plant pits or plant beds are dug.

1. Notify the Engineer five (5) days prior to the first day of planting operations and after the completion of plant locations.

2. Be prepared to make minor adjustments to the plant arrangements in the field from those indicated on the plans if directed to do so by the Engineer.

B. In case underground obstructions are encountered, notify the Engineer in writing and obtain direction. Be particularly careful to avoid damaging underground electrical lines and irrigation pipes. If any damage occurs, notify the Owner immediately. The Contractor shall be responsible for all repairs and associated costs to the satisfaction of the Engineer.

3.03 PREPARATION OF SUBGRADE

A. Prior to dumping and spreading topsoil, install grade stakes on a 25-foot grid in open areas, bottom of swales, top of slopes and sufficiently spaced in other areas to insure correct line and grade of subgrade and finished grade. Verify subgrade elevations and grade as necessary to bring the subgrade to a true, smooth slope parallel to the finish grade for all areas to receive topsoil. Remove rocks, boulders, and debris greater than two (2) inches in any dimension which are within the subgrade surface.

1. Request inspection of subgrade and secure the Engineer's written approval before placing and spreading topsoil.

B. After acceptance of subgrade, loosen the subgrade by discing or by scarifying to a depth of at least four (4) inches to permit bonding of the topsoil to the subsoil.

3.04 PLACING TOPSOIL

A. Place and spread topsoil over approved areas to minimum depth as specified below so that after natural settlement and rolling, the complete work shall be smooth, uniform, and will conform to the lines, grades and elevations indicated on the Drawings.

1. Areas to be seeded: Minimum six (6) inch depth.

2. Areas to receive shrubs, ground covers, and perennials: Minimum twenty-four (24) inch depth.

B. Place approximately 1/2 of total amount of topsoil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil.

C. The entire surface shall then be rolled for compaction, filling all depressions caused by settlements or rolling activities with additional topsoil until it presents a smooth and even finish to the required grade.

D. No subsoil or planting soil shall be handled in any way if it is in a wet or frozen condition.

E. Request inspection of the fine grading and bed preparation and secure the Engineer's written approval before commencing any planting or seeding work.

3.05 DIGGING AND HANDLING PLANTS

A. Dig balled and bur lapped (BB) plants with firm, natural balls of earth of sufficient diameter and depth to include all the fibrous and feeding roots. Meet ANSI Z 260.1 standards for nursery stock. Plants will not be accepted if the ball is cracked or broken before or during planting operations Bind balls with rope or wire cages. Container grown plants shall be firmly rooting within the container and not loose.

B. Fill excavations for trees and shrubs with water and allow to percolate out before planting. Water thoroughly when excavation is approximately 2/3 full and water again after placing final layer of backfill.

C. Remove burlap, rope, wires, and other ties from sides and tops of root balls. Do not pull burlap out from underneath root balls.

D. Backfill: Deliver topsoil mixture ingredients to the site separately. Mix them uniformly on the site. Add soil amendments per testing results and mix in following proportion:

1. Three (3) parts topsoil.

2. One (1) part composed manure, peat humus or compost.

3. Ten pounds of bone meal per cubic yard of mixture.

E. Prune: Thin out and shape all existing and newly planted trees in accordance with ANSI A300, as directed by the Engineer. Prune trees to retain required height and spread. Unless otherwise directed by the Engineer, do not cut tree leaders, and remove only injured or dead branches from any specified flowering trees. Do not cover wounds with dressing or tree paints.

F. Anti-desiccant: Apply to plant materials, except grass, to keep them from drying out during the maintenance period. Apply in accordance with manufacturer's instructions for time and rate of application.

G. Fertilize only at time of planting. Place slow-release fertilizer in planting hole prior to placement of plant at a rate as follows:

1. Herbaceous Plants:

a. Container/peat pot: 1.0 oz. per plant
b. Plug: 0.5 oz. per plant

2. Woody Plants:
   a. 1-quart container: 1.0 oz. per plant
   b. 1-gallon container: 3.0 oz. per plant: each additional gallon: 1.0 oz.
   c. Seedling: 0.5 oz. per plant

3. Garden Phlox (Summer Phlox):

   a. Fertilize with a shovel-full of compost for each plant or a light application of 10-10-10 fertilizer at planting time and again just before the flowers open. If you fertilize once more after the flowers fade, you may get another flush of flowers.

H. Alternatively, topdressing may be applied as follows:

1. When pH is below 4.0 apply lime at a rate of 50 lbs./acre or top-dress with Ammonium sulfate at 100 lbs./acre

2. Superphosphate at 100 - 200 lbs./acre

I. Remove plastic containers from plants. If spiraling of primary woody roots exist on the outside of the soil/root mass upon the removal of the plants from the containers, either cut these roots or separate and spread them out from the soil/root masses prior to planting. Do not remove plants from peat pots prior to planting. Peat pots may be broken slightly, but may not be separated from the roots.

3.07 SEEDING

A. Sow seed within the planting season specified in Part 1, “Sequencing and Scheduling” of this section.

B. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create muddy soil conditions.

C. Seeding: Prepare soil, sow seed, rake, roll, weed and water, until acceptable turf is established.

1. Dry method: Sow grass seed uniformly in two directions by means of a mechanical seeder or other method which will sow the seed at the required rate over the entire area to be seeded. The mechanical seeder shall be capable of being operated to avoid the growth of grass in rows and shall be so operated. After seeding, lightly rake by hand to mix the seed and topsoil. Roll lawn areas on the same day as seeding, with a roller weighing not more than 100 pounds per feet of roller width to firm the soil but not to pack it.

2. Hydraulic spray method: Hydraulic spraying of sowing seed may be used where approved by the Engineer. Use an approved machine, capable of distributing seed and fertilizing materials evenly and uniformly on the designated areas at the required rates, operated by a competent crew.

    a. Mix seed and fertilizing materials with water in the tank of the spraying machine and keep the mixture thoroughly agitated so the materials are uniformly mixed and suspended in the water all times during operation.

    b. If the Engineer finds the application uneven or otherwise unsatisfactory, the Engineer may require the hydraulic spray method to be abandoned and the balance of the work done by the dry method. Lightly rake seed into the surface of the soil unless seeding is to be followed within 24 hours by mulching.

    c. When the hydraulic method is used, compaction or rolling will not be required.

3. In areas having slopes of 3:1 or steeper, and in drainage swales, overseed with the same mixture in a separate operation immediately after sowing. Apply overseeding mixture at the rate of 3 pounds per 1,000 square feet. Cover areas that require additional erosion control with an approved erosion netting properly anchored. Remove non-degradable netting after an acceptable stand of grass has been achieved.

3.08 MAINTENANCE FOR TREES, SHRUBS AND OTHER PLANT MATERIAL

A. Begin maintenance immediately after each plant is planted. Water, mulch, weed, prune, spray, fertilize, cultivate, clean areas, and otherwise maintain and protect plants until Provisional Acceptance. Tighten and repair tree turnbuckles and stakes. Correct defective work as soon as possible once weather and season permit. Reset settled plants to proper grade, plumb and position, restore planting saucer, and remove dead material.

    1. Maintain all trees, shrubs, and other plants until provisional acceptance, but in no case, less than the following period:

        a. Sixty (60) days after substantial completion of planting.

B. Water all plant material by applying water twice within the first twenty-four (24) hours of the time of planting and all plants during the maintenance period shall be watered at least twice each week unless sufficient rainfall has occurred. At each watering the soil around each tree or shrub shall be thoroughly saturated. If sufficient moisture is retained in the soil, as determined by the Engineer, the required watering may be reduced.

    1. Trees will require a minimum of ten (10) gallons of water each week.

2. Shrubs will require a minimum of five (5) gallons of water each week.

3. Garden Phlox (Summer Phlox):

   a Water garden phlox plants weekly for the first few weeks and often enough to keep the soil lightly moist thereafter. Keep the foliage as dry as possible by applying the water to the soil rather than the foliage. Spread a 2- to 3-inch (5 to 7.5 cm.) layer of mulch around the plants to help the soil hold moisture.

3.09 *MAINTENANCE FOR SEEDED AREAS*

A. Maintenance shall begin immediately after any area is seeded and/or sodded and shall continue until acceptance by the Engineer, but in no case, less than the following period.

1. Ninety (90) days after substantial completion of seeding or sodding operations.

   a. Seeded lawns shall be maintained until all areas have a close stand of grass which has received a minimum of three (3) mowings, has no bare spots greater than three (3) inches in diameter, and at least 90% of the grass established shall be permanent grass species as determined by the Engineer.

B. Maintenance shall include but is not limited to; reseeding, mowing, watering, weeding and fertilizing.

1. Weed as necessary to maintain seeded areas ninety-nine (99) percent weed free.

C. Watering of Seeded Areas:

1. First Week: The Contractor shall provide all labor and arrange for all watering necessary to establish seeded areas. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least two (2) inches.

2. Second and Subsequent Weeks: The Contractor shall water the seeded areas as required to maintain adequate moisture, in the upper two (2) inches of soil, necessary for the promotion of deep root growth.
3. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.

D. Protection:

1. Protect seeded areas from trespassing and damage of any kind by the use of temporary fences. Repair any damage including those resulting from erosion and washouts. Replant bare spots with the specified seed mix or sod. Secure orange flagging to the temporary fencing/barriers.

2. Barriers shall be raised immediately after seeding or sodding operations and shall be maintained until acceptance.

E. Reseeding: After grass in seeded areas has appeared, all areas and parts of areas which, in the opinion of the Engineer, fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded repeatedly until all areas are covered with a satisfactory growth of grass.

F. Mowing: The first mowing of seeded areas shall not be attempted until the grass height has reached a minimum of three (3) inches or as directed by the Engineer. Grass height shall be maintained at two and one half (2-1/2) inch height unless otherwise specified. Thereafter grass shall be mowed at least once a week until written acceptance by the Engineer.

G. Liming: If more than one initial application of limestone is required by the soils analysis to bring the pH of the stockpiled topsoil/loam borrow to a specified range, the Contractor shall be responsible for all additional required lime applications.

3.10 CLEANUP AND PROTECTION

A. During operations, keep pavements clean and work areas in an orderly condition. Protect lawns and plant materials from damage by other contractors, trades, and trespassers. Maintain protection during installation and maintenance periods. Clean up debris, materials, and rubbish. Treat, repair, or replace damaged work.

B. Upon completion of planting, and prior to Provisional Acceptance, remove from site excess soil and debris and repair damage resulting from planting operations.

C. Restore other work, plants, lawns and property damaged during the course of landscaping work, including, but not limited to, lawn areas inside and outside the contract limit lines, existing trees, walks, and walls.

END OF SECTION

SECTION 32 91 19.13

TOPSOIL PLACEMENT AND GRADING

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.

1.02 *SUBMITTALS*

In accordance with Section 01 33 00– Submittal Procedures

A. Submit soil analysis report for imported topsoil or amended in place, on-site topsoil from an approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay) with an additional analysis of the sand fraction of the soil and include additive recommendations (organics, micro nutrients, etc.).

B. Submit grass seed mix for approval.

C. Submit particle size distribution analysis (Test Method ASTM D 422 or F 1632) of sand to be used in the sand based rootzone.

D. Contractor will retain and submit shipping labels and receipts for all inorganic amendments added to the topsoil. Labels will include source address, quantities, and product description.

E. Submit mechanical analysis of any soil amendments.

1.03 *PRODUCT HANDLING*

A. Do not deliver topsoil in frozen, wet, or muddy condition.

B. Use all means necessary to protect fertilizers, amendments, and other materials from moisture and other contaminates which may adversely affect their effectiveness.

PART 2 - MATERIALS

2.01 *ON-SITE TOPSOIL*

A. All topsoil that is stripped from the existing site and stockpiled on-site may be reused as topsoil after being screened to ½-inch minus. Existing topsoil to be reused and blended

into the rootzone mix must be tested by an approved testing agency for required blending mix, soil amendments, and approved by the Engineer.

2.02 *IMPORTED TOPSOIL (Disturbed Areas/Non-Athletic Field Areas)*

A. If imported topsoil is required it shall be friable loam, typical of fertile local topsoil; free from pure clay, weeds, noxious weed seeds, sod, clods and stones larger than 3/8 inch, toxic substances, litter, or other deleterious material.

B. Topsoil shall have mildly alkaline to medium acid pH between 6.0 and 7.0.

C. Soluble salts shall not exceed 500 parts per million.

D. Soil Texture: 0% Greater than 3/8”, Sand, less than 52 percent; silt, 28 to 50 percent; clay 7 to 27 percent.

E. Additives: As required by soil analysis.

F. Organic content shall be no less than 5% and no greater than 8%.

PART 3 - EXECUTION

3.01 *PLACING TOPSOIL*

A. Scarify compacted subgrade in areas outside of the limits of the filter fabric, to a 2-inch depth to bond topsoil to subsoil. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading. Use all on-site topsoil before importing topsoil.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *DESCRIPTION*

The work of this section consists of the following:

A. Seeding, fertilizing, irrigating, and mulching the following:

- Low maintenance, non-athletic surrounding and sloped areas, and where specified on drawings.

1.03 *REFERENCES*

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01 (Amended thru: August 1988) Federal Seed Act Regulations (Part 201-202)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 977 (1991) Emulsified Asphalt

ASTM D 2028 (1976; R 1992) Cutback Asphalt (Rapid-Curing Type)

ASTM D 2607 (1969) Peats, Mosses, Humus, and Related Products

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1909 (Basic; Notice 1) Fertilizer

1.04 *SUBMITTALS*

A. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES

1. Manufacturer's Literature:

   Manufacturer's literature discussing physical characteristics, application and installation instructions for erosion control material, and for chemical treatment material.

2. Equipment List:

   A list of proposed seeding and mulching equipment to be used in performance of turfing operation, including descriptive data and calibration test.

3. Certificates:

   Certificates of compliance certifying that materials meet the requirements specified, prior to the delivery of materials. Certified copies of the reports for the following materials shall be included:

   a. Seed: For each mixture, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, date tested and state certification. For species mixture percentage, percent purity, field location.

      For cultivar genetic purity, field location.

   b. Fertilizer: For chemical analysis, composition percent.

   c. Agriculture Limestone: For calcium carbonate equivalent and sieve analysis.

   d. Peat: For compliance with ASTM D 2028.

   e. Asphalt Adhesive: For compliance with ASTM D 977 and ASTM D 2028.

   f. Topsoil: For pH, particle size, chemical analysis and mechanical analysis.

1.05 *DELIVERY, INSPECTION, STORAGE, AND HANDLING*

A. Delivery:

   1. Topsoil: A soil test performed by an approved testing agency at Contractor's expense shall be provided for both topsoil delivered to the site and utilized from the site.

   2. Soil Amendments: Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

B. Inspection: Seed, fertilizer, and mulch shall be inspected upon arrival at the job site by the Owner's representative for conformity to type and quality in accordance with paragraph

MATERIALS. Other materials shall be inspected for meeting specified requirements and unacceptable materials shall be removed from the job site. Turf areas found to be deficient shall be replanted with same material as originally specified.

C. Storage: Materials shall be stored in areas designated by the Contracting Officer. Seed, lime and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment materials shall not be stored with other landscape materials.

D. Handling: Except for bulk deliveries, materials shall not be dropped or dumped from vehicles. Deliveries shall be received in original, unopened containers with any pertinent information attached.

PART 2 - PRODUCTS

2.01 *MATERIALS*

A. Seed:

1. Seed Classification: State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws.

2. Seed Mixtures: Seed mixtures: Standard grade seen of the most recent season's crop. Seed shall be dry and free of mold. Seed shall be inoculated with endophytes. Seed mixture shall be as follows:

2.02 *Seed Mix No. 1, Athletic Field Mix (If Applicable):*

A. Within the limits of the athletic field, shall be Premium Athletic Field Mix (or Approved Equal)

Seed Name	% By Weight in Mixture	Minimum % Purity	Minimum % Germination
Kentucky Bluegrass Blend (3-D sod Blend by Summit Seed, Inc. Midnight, Blacksburg, Challenger, Cobalt, and America)	65	95	85
Perennial Ryegrass Blend (Country Club seed blend by Lebanon Turf, Secretariat, Affirmed, and Affinity)	35	95	85

Or approved equal.

2.03 *Seed Mix No. 2, Open Space Mix:*

A. In low maintenance, non-athletic Field turfed areas shall be Proscape Superior Sun And Shade Mix (or Approved Equal):

Seed Name	% By Weight in Mixture	Minimum % Purity	Minimum % Germination
Perennial Ryegrass	55	95	85
Chewings Fescue	20	95	85
Kentucky Bluegrass	15	95	85
Creeping Red Fescue	10	95	85

2.04 *Seed Mix No.3, Slope Mix:*

A. Steep slopes, as shown on the plans, shall be New England Erosion Control/Restoration Mix for Dry Sites, as manufactured by New England Wetland Plants, Inc., Amherst, MA or Approved Equal.

B. This seed mix will provide an appropriate selection of native and non-native grasses to ensure that dry, recently disturbed areas will be quickly re-vegetated and the soil surface stabilized.

1. Quality:

a. Weed seed shall not exceed one (1) percent by weight of the total mixture. Wet, moldy, or otherwise damaged seed shall be rejected.

2. Seed Mixing:

a. The field mixing of seed shall be performed on-site in the presence of the Owner's Representative.

C. Soil Amendments

Soil amendments shall consist of lime, fertilizer, organic soil amendments and soil conditioners meeting the following requirements and shall be applied in accordance with the topsoil testing analysis.

1. Lime:

a. Lime shall be agricultural limestone and shall have a minimum calcium carbonate equivalent of 90 percent and shall be ground to such a fineness that at least 90

percent will pass a 10-mesh sieve and at least 50 percent will pass a 60-mesh sieve.

2. Fertilizer:

    a. Fertilizer shall be commercial grade, free flowing, uniform in composition and conforming to CID A-A-1909. Granular Fertilizer: As recommended by the soil test. Fertilizer shall contain a minimum of 35% water insoluble Nitrogen or "slow release" Nitrogen and shall be manufactured specifically for use on lawn and turf areas.

3. Organic Soil Amendments:

    a. Topsoil: Off-site topsoil, if required, shall conform to topsoil requirements specified in SECTION 31 91 19.13 TOPSOIL PLACEMENT AND GRADING, and shall be amended as recommended by soil test.

    b. Peat: Peat moss derived from a bog, swampland or marsh shall conform to ASTM D 2607.

    c. Sand: Clean, free of toxic materials; 95 percent by weight shall pass a No. 16 sieve.

    d. Rotted Manure: Well rotted, horse or cattle manure containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials, free of stones, sticks, soil and containing no chemicals or ingredients harmful to plants.

D. Soil Conditioner:

Soil conditioner shall be for single use or in combination to meet requirements for topsoil. Gypsum shall be commercially packaged, free flowing, minimum 95 percent calcium sulfate by volume.

1. Mulch:

    a. Mulch shall be free from weeds, mold, and other deleterious materials.

2. Straw:

    a. Straw shall be stalks from oats, wheat, rye, barley or rice furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

3. Hay:

    a. Hay shall be native hay, sudan-grass hay, broomsege hay, or other herbaceous moving furnished in an air-dry condition suitable for placing with commercial mulch-plowing equipment.

4. Wood Cellulose Fiber:

    1. Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate visual metering during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

5. Paper Fiber Mulch:

    a. Paper fiber mulch shall be recycled newsprint that is shredded for the purpose of mulching and seed.

E. Asphalt Adhesive:

1. Asphalt adhesive shall conform to the following:

    a. Emulsified Asphalt

        i. Conforming to ATM D 977, Grade SS-1.

    b. Cutback Asphalt

        i. Conforming to ASTM D 2028, designation RC-70.

F. Water:

1. Water shall not contain elements toxic to plant life.

PART 3 – EXECUTION

3.01 *SEEDING TIMES AND CONDITIONS*

A. Seeding Time:

1. Seed shall be sown from 8/15 to 10/1 for fall planting and 3/1 to 4/30 for spring planting.

B. Turfing Conditions:

1. Turf operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant, a variance to the turf operations, proposed times shall be submitted to and approved by the Owner's Representative.

3.02 *SITE PREPARATION*

A. Grading:

1. The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil and the smooth grading has been completed in accordance with Section 02920.

B. Application of Soil Amendments:

1. Soil Test:

Soil testing for all imported topsoil shall be performed by an approved testing agency at Contractor's expense for pH, chemical analysis and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for type and variety of turf specified. A minimum of 1 test per 100 cubic yards of imported topsoil shall be performed.

2. Lime:

Lime shall be applied at the rate recommended by the soil test. Lime shall be incorporated into the soil to a minimum depth of four (4) inches or may be incorporated as part of the tillage operation.

3. Fertilizer:

Fertilizer shall be applied at the rate recommended by the soil test. Fertilizer shall be incorporated into the soil to a minimum depth of four (4) inches and may be incorporated as part of the tillage operation.

C. Tillage:

1. Minimum Depth:

Soil on slopes gentler than 3 horizontal to 1 vertical shall be tilled to a minimum depth of 4 inches. On slopes between 3 horizontal to 1 vertical and 1 horizontal to 1 vertical, the soil shall be tilled to a minimum depth of two (2) inches by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1 horizontal to 1 vertical and steeper, no tillage is required.

D. Finished Grading:

1. Preparation:

Turf areas shall be filled as needed or have surplus soil removed to attain the finished grade. Drainage patterns shall be maintained as indicated on drawings. Turf areas

compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of erosion or grade deficiencies shall conform to topsoil-to-topsoil requirements specified below. New surfaces shall be blended to existing areas.

2. Topsoil:

   Topsoil shall meet the requirements of Section 02920

3. Lawn Area Debris:

   Lawn areas shall have debris and stones larger than one (1/2) inch in any dimension removed from the surface.

4. Field Area Debris:

   Field areas shall have debris and stones larger than one (1/2) inch in any dimension removed from the surface.

5. Protection:

   Finished graded areas shall be protected from damage by vehicular or pedestrian traffic and erosion.

3.03 *SEEDING*

A. General:

1. Prior to seeding, any previously prepared seedbed areas compacted or damaged by interim rain, traffic or other cause, shall be reworked to restore the ground condition previously specified. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

B. Equipment Calibration:

1. The equipment to be used and the methods of turfing shall be subject to the inspection and approval of the Owner's representative prior to commencement of turfing operations. Immediately prior to the commencement of turfing operations, the Contractor shall conduct turfing equipment calibration tests in the presence of the Owner's representative.

C. Applying Seed:

1. Broadcast Seeding in non-athletic fields with Seed Mix No. 1:

   Seed shall be uniformly broadcast at the rate of 5.0 lbs./1000 square feet using broadcast seeders. Half of seed shall be broadcast in one direction, and the remainder

at right angles to the first direction. Seed shall be covered to an average depth of ¼ inch by disk harrow, steel mat drag, cultipacker, or other approved device.

2. Rolling:

   Immediately after seeding all areas, except for slopes 3 horizontal to 1 vertical and greater, the entire area shall be firmed with a roller not exceeding 90 pounds for each foot of roller width.

D. Mulch:

1. Straw or Hay Mulch:

   Straw or hay mulch shall be spread uniformly at the rate of two (2) tons per acre. Mulch shall be spread by hand, blower-type mulch spreader or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of a steep slope and continued uniformly until the area is covered. The mulch shall not be bunched. All seeded areas shall be mulched on the same day as the seeding.

2. Asphalt Adhesive Tackifier:

   When asphalt adhesive is applied to the in-place mulch, spraying shall be at the rate of between 10 to 13 gallons per 1000 square feet.

3. Non-Asphaltic Tackifier:

   Hydrophilic colloid shall be applied at a rate recommended by manufacturer. Apply with hydraulic equipment suitable form mixing and applying uniform mixture of tackifier.

4. Spreading Asphalt Adhesive Coated Mulch:

   Straw or hay mulch shall be spread simultaneously with asphalt adhesive at the rate of two (2) tons per acre by using power mulch equipment, which shall be equipped with suitable asphalt pump and nozzle. The adhesive-coated mulch shall be applied evenly over the surface. Sunlight shall not be completely excluded from penetration to the ground surface.

E. Water:

1. Watering shall be started within thirty (30) minutes after completing the seeded area. Water shall be applied at a rate sufficient to ensure moist soil conditions to a minimum depth of four (4) to six (6) inches. Run-off and puddling shall be prevented.

3.04 *MOWING*

A. When the grass reaches a height of 2-1/2", mow with reel-type mower to a height of 2-inches and remove clippings.

B. The frequency of moving will depend upon the rate of growth of the grass.

C. The moving frequency should be spaced so that no more than 1/3 of the leaf area is removed at any one mowing.

D. Change the direction of mowing each time to help reduce soil compaction from the tractor wheels running in the same place each time, and the corrugation (washboard effect) when operated repeatedly and at high speeds on saturated soils.

3.05 *RESTORATION AND CLEAN UP*

A. Restoration:

1. Existing turf areas, pavements and facilities that have been damaged from the turfing operation shall be restored to original condition at the Contractor's expense.

B. Clean Up:

1. Upon completion of work, remove debris and leave area in a clean, acceptable condition. Excess and waste material shall be removed from the planting operation and shall be disposed of off the site. Adjacent paved areas shall be cleaned.

3.06 *PROTECTION OF TURFED AREAS*

A. Immediately after turfing, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed by the Owner and/or the Engineer.

3.07 *TURF ESTABLISHMENT PERIOD*

A. Commencement:

1. The Turf Establishment Period for establishing a healthy stand of turf shall begin on the first day of work under this contract and shall end three (3) months after the last day of turfing operations required by this contract. Written calendar time period shall be furnished to the Owner and/or the Engineer for the Turf Establishment Period. When there is more than one turf establishment period, describe the boundaries of the turfed area covered for each period.

B. Satisfactory Stand of Turf:

1. Seeded Area:

a. A satisfactory stand of tuf from the seeding operation for a lawn area is defined as a minimum of 15 grass plants per square foot. Bare spots shall be no larger than six (6) inches square. The total bare spots shall no exceed two (2) percent of the total seeded area.

C. Maintenance During Establishment Period:

1. General:

a. Maintenance of the turfed areas shall include eradicating weeds, eradicating insects and diseases, protecting embankments and ditches from erosion, maintaining erosion control materials and mulch, protecting turfed areas from traffic, moving, watering and fertilization as defined below.

2. Mowing:

a. Lawn Areas: Lawn areas shall be mowed to a minimum height of 1-1/2 inches when the average height of the turf becomes 2-1/2 inches. Clippings shall be removed when the amount of cut turf is heavy enough to damage the turfed areas.

3. Watering:

a. Watering shall be at intervals to obtain a moist soil condition to a minimum depth of 1 inch. Frequency of watering and quantity of water shall be adjusted in accordance with the growth of the turf. Run-off, puddling and wilting shall be prevented.

4. Fertilization:

a. Nitrogen carrier fertilizer shall be applied at the rate of 5 pounds per 1000 square feet after the first month and again prior to the final acceptance. The application shall be timed prior to the advent of winter dormancy and shall avoid excessively high nitrogen levels.

5. Repair:

a. The Contractor shall re-establish as specified herein, eroded, damaged or barren areas. Mulch shall also be repaired or replaced as required.

6. Maintenance Report:

a. A written record shall be furnished to the Owner's Representative of the maintenance work performed.

3.08 *FINAL ACCEPTANCE*

A. Preliminary Inspection:

a. Prior to the completion of the Turf Established Period, a preliminary inspection shall be held by the Owner's representative. Time for the inspection shall be established in writing. The acceptability of the turf in accordance with the Turf Establishment Period shall be determined. An unacceptable stand of turf shall be repaired as soon as turfing conditions permit.

B. Final Inspection:

a. A final inspection shall be held by the Owner's Representative to determine that deficiencies noted in the preliminary inspection have been corrected. Time for the inspection shall be established in writing.

END OF SECTION

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. All water service materials shall be in conformance with the City's Standards and Specifications and as specified herein.

1.02 *WORK INCLUDED*

A. Trenching, excavation, bedding and backfill, including compaction and testing, of water pipes and services.

B. Furnish all labor, materials and equipment required to chlorinate and test water distribution system.

1.03 *RELATED WORK UNDER OTHER SECTIONS*

A. SECTION 31 10 10 – Site Clearing

B. SECTION 31 20 00 – Earth Moving

C. SECTION 32 16 00 – Unit Paving

1.04 *REFERENCES*

A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:

1. ASME B16.18 – Cast Copper Alloy Solder Joint Pressure Fittings.

2. ASTM B88 – Seamless Copper Water Tube.

3. ASTM D 1557 – Test Methods of Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb Rammer and 18-inch Drop.

4. AWWA C104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

5. AWWA C111 – Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

6. AWWA C151 – Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

7. AWWA C500 – Gate Valves, 3 through 48 inch NPS, for Water and Sewage Systems.

8. AWWA C504 – Rubber Seated butterfly Valves.

9. AWWA C508 – Swing-Check Valves for Waterworks Service, 2 inch through 24 inch NPS.

10. AWWAC 509 – Resilient Seated Gate Valves 3 inch through 12 inch NPS, for Water and Sewage Systems.

11. AWWA C600 – Installation of Ductile-Iron Water Mains and Appurtenances.

12. AWWA C606 – Grooved and Shouldered Type Joints.

B. All work shall comply with the pertinent standards of the latest editions of the following Codes and Specifications, unless designated otherwise herein:

1. American Society for Testing and Materials (ASTM).

2. American National Standards Institute (ANSI).

3. American Association of State Highway and Transportation Officials (AASHTO).

4. The Commonwealth of Massachusetts, Highway Department, Standard Specifications of Highways and Bridges (MHD Standard Specifications).

1.05 *SUBMITTALS*

A. Shop Drawings

1. Submit six (6) sets of shop drawings or descriptive literature, or both, showing dimensions, joint and other details of all materials to be furnished under this Section. Shop Drawings shall be submitted to the Engineer for approval prior to ordering materials.

B. "As-Built" Drawings

1. Submit one reproducible of As-Built Drawings upon completion and acceptance of work.

2. "As-Built" Drawings shall be complete and shall indicate the true measurement and location, horizontal and vertical, of all new construction.

1.06 *QUALITY ASSURANCE*

A. Valves: Manufacturer's name and pressure rating marked on valve body.

1.07 *DELIVRY, STORAGE, AND HANDLING*

A. Deliver, store, protect and handle products to site under applicable Sections of this Specification.

B. Delivery and store valves in shipping containers with labeling in place.

1.08 *EXAMINATION OF CONDITIONS*

A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

PART 2 – PRODUCTS

2.01 GENERAL

A. Drawing and Specifications are intended to supplement and explain each other. Materials not specifically mentioned in the Specifications shall be as indicated on the Drawings. Where no specific kind of quality of material is given, a first-class standard article shall be furnished.

B. The Drawings are diagrammatic only and are intended to indicate the extent but not all details of the piping which shall be supplied. All offsets and materials are not shown; however, the Contractor shall furnish these items as if called for or shown.

2.02 *DUCTILE IRON PIPE*

A. Ductile iron pipe shall be designed in accordance with ANSI A21.50/AWWA C 150 and manufactured in accordance with ANSI A21.51/AWWA C151.

B. Ductile iron pipe shall be Pressure Class 52.

C. Restrained joint piping shall be U.S. Pipe "TR Flex" restrained push-on joint pipe, manufactured in accordance with the requirements of ANSI/AWWA C 141 A21.52, pressure class 35.

D. Pipe shall be cement-mortar lined in accordance with ANSI A 21.4/AWWA C104, except that the cement lining shall be double thickness.

E. The exterior of all pipe shall be factory coated, with a double coat of coal tar enamel conforming to ANSI A21.4/AWWA C 104. The interior of all pipes shall have a seal coat of asphaltic material applied in accordance with ANSI A214/AWWA C104.

2.03 *FITTINGS*

A. All fittings for use with cast iron or ductile iron pipe shall conform to ANSI/AWWA C110/A21.10.

B. Type of ends at the fittings in relating to valves and the connection piping shall be determined by the Contractor in accordance with the requirements of the Drawings and Specifications prior to ordering the fittings.

C. All fittings shall be cement-mortar lined in accordance with ANSI/AWWA C104/A21.4 and given a seal coat of asphaltic material.

2.04 *SLEEVE COUPLINGS*

A. Sleeve couplings and accessories shall be pressure rated at least equal to that of the pipe.

B. Transition couplings for joint pipe of different diameters shall be Dresser Style 162 or approved equal. Couplings shall be provided with corrosion resistant nuts and bolts.

C. After assembly, all exterior surfaces including the bolts and nuts shall be thoroughly coated with two coats of a heavy-duty protective asphaltic coating. The interior of the coupling shall be epoxy-coated. Epoxy coating shall conform to AWWA C550.

2.05 *JOINTS*

A. Joints shall be either push-on or mechanical joints conforming to ANSI A21.11/AWWA C111. Push-on and mechanical joints shall be provided with sufficient quantities of accessories conforming to ANSI A21.11/AWWA C111

2.06 *GATE VALVES*

A. Gate valves shall be either resilient seated conforming to the requirements of AWWA C509 or double disk, parallel, inclined or soiled wedge type valves conforming to the requirements of AWWA Standard C500.

B. Gate Valves shall be cast iron body, bronze mounted, double disk, non-rising stem, O-ring type stuffing box.

C. Gate valves shall open per City's standards and have mechanical joint ends.

D. Bolt, studs and nuts shall be made from a corrosion-resistant material such as low-zinc bronze, nickel copper alloy, or stainless steel.

E. Operating nut shall be 2 inches square at the base, tapering to 1-15/16 inches square at the top.

2.07 *VALVE BOXES*

A. Unless otherwise specified, each gate valve shall be provided with a valve box and cover.

B. Valve boxes shall be of the adjustable, telescoping, heavy-pattern type and shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.

C. Valve boxes shall be cast iron, tar coated with cast iron covers. The smallest inside diameter of the shaft shall not be less than 5-1/4 inches. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve. Provisions shall be made for adjustment through at least 6-inch vertical without reduction of lap between sections.

D. Covers shall be close fitting and substantially dirt tight. The top of the cover shall be flush with the top of the box rim. The word “Water” shall be cast in the top cover.

2.08 *HYDRANTS*

A. The Contractor shall furnish hydrants, if shown on Drawings, of the make and the type specified hereinafter, or approved equal.

B. Make and Model: Mueller Centurion.

1. Type of Thread: National Standard.

2. Number of Outlets:

a. Two 2-1/2 inch hose connection.

b. One 4-1/2 inch steamer connection.

3. Diameter of Opening: 5-1/4 inch.

4. Size and Type of Inlet Connection: 6-inch mechanical joint.

5. Direction of Opening: Open left.

6. Depth of Bury: 5’6” with a minimum of 5 feet of cover.

7. Size and Shape of Operating Nut: Pentagonal.

C. Hydrant shall conform to the requirements of ANSI/AWWA C502, latest issue.

D. Bolts and nuts shall be made from a corrosion-resistant material.

2.09 *THRUST BLOCKS*

A. Thrust restraints, cement concrete thrust blocks and/or clamps and tie rods shall be installed in accordance with the relevant provisions of the standard details shown on the Drawings and the directions of the Engineer.

B. The Contractor shall discuss with the Engineer the method(s) to be utilized to restrain thrust prior to installing bends, tees, hydrants and the like. Test pits may be required in areas of existing utilities to determine the exact location and dimensions of thrust restraint to be installed by the Contractor.

C. Concrete for thrust blocks shall have a minim 28 day's compressive strength of 4,000 psi.

2.10 *CORPORATION STOPS/CURB STOPS*

A. Corporation stops shall be bronze or brass with ground keys, threaded to receive compression-type fittings. The stop shall be of the size shown on the Contract Drawings and shall be as manufactured by Mueller, Red Head, Ford or equal.

B. Curb stops shall be Mueller Oriseal II curb stop or approved equal, threaded to receive compression-type fittings.

2.11 *SERVICE BOXES*

A. Curb boxes shall be cast iron improved extension type with arch pattern base. Covers shall he held in place with bronze bolts and the word "Water" shall be cast into the cover. Curb box shafts shall have a minimum 5-foot curb shut box with 30-inch rod and 2-hole cover. Curb boxes shall be as manufactured by Mueller Corp. or approved equal.

2.12 *WATER SERVICE PIPING*

A. Service lines two inches or smaller shall be copper water tubing, Type K, for underground water service and shall be in accordance with ANSI/AWWA C800, latest issue.

B. Type K copper tubing material shall be in conformance with ASTM B88.

C. Water service fittings including couplings and adapters, check valves and service saddles shall be in conformance with ANSI/AWWA C800, "Underground Service Line Valves and Fittings."

D. Joints in copper tubing shall be made with three-part compression couplings, flared tube fittings, or an approved equal.

E. Service line greater than 2 inches shall be ductile iron pipe.

PART 3 – EXECUTION

3.01 *GENERAL*

A. All water pipes, fittings, valves, hydrants, tapping sleeve and other water line appurtenances shall be installed as shown on the Drawings and City's Water and Sewer Standards. Backfill materials shall be as shown on the Drawings and as specified in Section 02200, Earthwork.

B. Accurately locate any existing or previously installed utilities before beginning excavation.

B. Check for conflict with underground utilities or structures. Notify the Engineer immediately of all discrepancies before proceeding with the Work.

D. Coordinate all water main connections and service instillation with the Owner.

3.02 *LAYING DUCTILE IRON PIPE AND FITTINGS*

A. Ductile iron pipe and fitting shall be installed in accordance with the requirements of ANSI/AWWA C600, except as otherwise provided herein.

B. Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 31 20 00 - EARTH MOVING of these Specifications. The type of materials to be used in bedding and backfilling and method of placement shall conform to the requirement of Section 31 20 00 - EARTH MOVING of these Specifications and as indicated on the Drawings.

C. All pipes shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has been eliminated.

D. Fittings, in addition to those shown on the Drawings, shall be provided if required in crossing utilities which may be encountered upon opening the trench.

E. When cutting of pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a push-on bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.

F. Maximum allowable deflection of pipe laid without fitting shall not exceed allowable established by the pipe manufacturer and shall not exceed those shown in AWWA C600.

G. The water main shall be laid so as to provide a minimum cover of 5 feet below finished grade.

3.03 *JOINTING DUCTILE IRON PIPE (PUSH-ON TYPE)*

A. Push-on joints shall be made in strict accordance with the manufacturer's instructions. A rubber gasket shall be inserted in the groove of the bell end of the pipe and the joint surface cleaned and lubricated using the pipe manufacturer's suggested methods and materials. The plain end of the pipe to be laid shall then be inserted in alignment with the bell of the pipe to which it is to be jointed and pushed home with a jack or by other means. After joining the pipe, a metal feeler gauge shall be used to make certain that the rubber gasket is correctly located.

3.04 *JOINTING MECHANICAL JOINT PIPE AND FITTINGS*

A. Mechanical joints shall be made in strict accordance with the manufacturer's instructions. Mechanical joints shall be made by first cleaning the surface against which the gasket will come in contact, with a wire brush. The gasket, bell, and spigot shall be lubricated buy washing with soapy water just prior to assembling the joint. After the nuts have been made up finger tight, the bottom nut, then top and then diametrically opposite nuts shall be progressively tightened. Bolts shall be tightened to the torques listed:

Bolt Size in Inches	Range of Torque in Feet Pounds
5/8	45-60
3/4	75-90
1	85-100

B. Under no conditions shall extension wrenches or a pipe over the handle of an ordinary ratchet wrench be used to secure greater leverage. After installation, a heavy bitumastic coating shall be applied to all bolts and nuts.

C. Restraining device shall be ductile iron and shall have dimensions such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA Z21.11 and ANSI/AWWA C 153 latest version.

3.05 *CONCRETE THRUST BLOCKS*

A. Where pipes change horizontal and vertical direction, at hydrants, tees and other fittings, and wherever abnormal thrust forces may be developed, the Contractor shall construct thrust and anchor blocks as detailed on the Drawings. They shall be Concrete, of minimum dimensions as detailed on the plans or of adequate additional size to suit actual conditions to withstand pressures anticipated and shall be founded in virgin soil.

B. Concrete for thrust blocks shall have a minimum 28 day's compressive strength of 4,000 psi. Transit mix concrete may be used subject to approval of the Engineer.

3.06 *RESTRAINED JOINTS*

A. Pie with restrained joints shall be installed at locations shown on the Drawings and as specified. Bends, reducers, tees, valves, dead ends, and hydrants are among the places where thrust forces create unbalanced forces in the piping and where the pipe and fittings shall be restrained. The minimum length of pie to be restrained on either side of the joint shall be as shown on the table below. The fittings of the new piping shall be for restrained joints, as marked on the Drawings.

Number of Joints to Restraint on Either Side of Fitting

Fitting	Based on 18-foot pipe length
90-degree bend	2
45-degree bend	1
22.5-degree bend	1
Tee	
Branch	2
Run	2

B. No restraining is required in the direction of the existing pipe if only a short length of it is exposed in the trench for making a connection.

C. Restrained joint assemblies for push-on pipe and fittings shall be made in strict accordance with the manufacturer's recommended installation procedures.

D. Restrained joint assemblies for mechanical joint pipe shall be EBAA Iron Sales MEGALUG or equal.

3.07 *HYDRANTS*

A. Hydrants, if shown, shall be installed as detailed on the Drawings and shall be set at the locations shown on the Drawings or designated by the Engineer.

B. Each hydrant shall be set in true vertical alignment and shall be properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the plans. Care shall be taken to ensure the concrete does not plug the drain ports.

2.08 *WATER SERVICES*

A. Copper Service Pipe: Care shall be exercised in placing and laying of service line to be sure that the pipe does not have kinks or sharp bends and to assure against its being in contact

with sharp stones or ledge which would cause damage to the pipe. At least 6 inches of sand shall be placed adjacent to, under and above the pipe, and no stone larger than 2 inches shall be placed over the pipe until the depth of backfill above the pipe is in excess of 1 foot.

B. Corporation Cock: Corporation cock shall be of a size equal to the size of the service pipe. Taps to the main shall be threaded and shall be made at the horizontal diameter of the main. The tap made in the main by means of a tapping machine manufactured for this purpose and supplied by the Contractor. Corporation cock shall be screwed firmly into the water main with the key upward and the inlet and projecting at least 1/8 inch beyond the inside face of the main. Corporation cock shall be left in the on (open) position.

C. Curb Stop and Curb Boxes shall be of a size equal to the size of the service pipe and shall be installed in the locations shown on the Drawings or as ordered by the Engineer.

D. Ductile Iron Service Pipe: Each ductile iron service pipe shall be valved with gate valve where and as directed, and a valve box shall be installed over the valve, all as specified elsewhere in these Sections. Connections of service lines at the main shall be made with appropriate size tees.

3.09 *PRESSURE TESTING*

A. Hydrostatic and leakage test shall be conducted in accordance with AWWA Standard C600, and as directed by the Engineer. Testing shall be conducted by an independent water testing company other than the contractor who installed the water main.

B. Conduct piping tests after thrust blocks have sufficiently hardened. Fill pipeline 24 hours prior to testing, and apply test pressure to stabilize system. Use only potable water.

C. Prior to pressure testing, the entire line shall be flushed or water jetted to remove any rocks or debris which may have inadvertently entered the pipe during construction.

D. Once the pipeline section has been filled at normal pressure and all entrapped air removed from the line, the Contractor shall raise the pressure to 150 psi by a special pressure pump, taking water from a small tank of proper dimensions for satisfactorily measuring the rate of pumped water into the pipeline. This pressure shall be maintained for a minimum of 2 hours, during which time the line shall be checked for leaks. Measured rate of water leakage shall not exceed the following leakage listed below.

1. Allowable leakage in gallons per hour, per 1,000 feet of exterior pipeline:

Test Pressure in PSI	Nominal Pipe Diameter In Inches					
150	4	6	8	10	12	16
	0.36	0.55	0.74	0.92	1.10	1.47

2. Interior piping in vaults, buildings, etc. shall have zero leakage.

3. Should leakage exceed this rate, the Contractor shall immediately locate the leak or leaks and repair same at his expense. Pipe shall be accepted only when leakage does not exceed above standard. Approval does not absolve the Contractor from his responsibility if leaks develop with the new main or water services later within the period of warranty.

3.10 *DISINFECTION OF COMPLETED LINES*

A. Before being placed in service, all new water pipelines shall be chlorinated in accordance with ANSI/AWWA C651 Standard for Disinfecting Water Mains.

B. The location of the chlorination and sampling points will be determined by the Engineer in the Field. Taps for chlorination and sampling shall be installed by the Contractor. The Contractor shall uncover and backfill the taps as required.

C. The general procedure of chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce a 24 mg/l chlorine solution in approved dosages through a tap at one end while water is being withdrawn at the other end of the line. The chlorine concentration in the water in the pipe shall be maintained at a minimum of 25 mg/l available chlorine during filling. To assure that this concentration is maintained, the chlorine residual shall be measured at regular intervals in accordance with procedures described in Standard Methods and AWWA M12, Simplified Procedure for Water Examination (section K).

D. During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main is filled with chlorine solution. The chlorinated water shall be retained in the main for at least a 24-hour period, the treated water shall contain a chlorine residual throughout the length of the main as indicated in AWWA C651.

E. Following the chlorination period all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. Prior to disposal of treated water, the Contractor shall check with local authorities to determine if the discharge will cause damage to the receiving body of sever and, if required to do so, the Contractor shall neutralize the chlorinated water in accordance with Appendix B, AWWA C650. Bacteriological sampling and analysis of the replacement water may then be made by the Contractor in full accordance with AWWA Specification C651. A minimum of 3 samples shall be taken by the Contractor at locations directed y the Engineer along the length of the water main being chlorinated and sent to a State approved private laboratory for analyses. The Contractor will be required to re-chlorine, if the samples show presence of coli form, and the line shall not be placed in service until all of the repeat samples show no presence of coli form.

F. Furnish two copies of a Certificate of Disinfection Report to the Engineer.

G. All costs for water required for all testing, flushing, chlorinating; laboratory analyses, sampling and testing cots shall be the responsibility of the Contractor at no additional cost to the Owner.

END OF SECTION

SECTION 33 13 00

DISINFECTING OF WATER DISTRIBUTION

PART 1 - GENERAL

1.01 *GENERAL PROVISIONS*

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 *WORK INCLUDED*

A. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Disinfection of potable water distribution system.

2. Testing and reporting results.

1.03 *SUBMITTALS*

A. Test Reports: Indicate results comparative to specified requirements.

B. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.04 *PROJECT RECORD DOCUMENTS*

A. Disinfection Report:

1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and time of completion.

3. Test locations.

4. Initial and 24-hour disinfectant residuals (quantity in treated water) in parts per million (ppm) for each outlet tested.

5. Date and time of flushing start and completion.

B. Disinfectant residual after flushing in ppm for each outlet tested.

C. Bacteriological report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.

2. Time and date of water sample collection.

3. Name of person collecting samples.

4. Test locations.

5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.

6. Coli form bacteria test results for each outlet tested.

7. Cortication that water conforms, or fails to conform, to bacterial standards.

1.05 *QUALITY ASSURANCE*

A. Perform work in accordance with AWWA.

B. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three-year documented experience.

C. Testing Firm: Company specializing in testing of potable water systems, certified by the local authority having jurisdiction.

D. Submit bacteriologist's signature and authority associated with testing.

1.06 *REGUALTORY REQUIREMENTS*

A. Conform to applicable code or regulation for performing the work of this Section.

B. Provide certificate of compliance from the local water Department indicating approval of water system.

PART 2 – PRODUCTS

2.01 *DISINFECTION CHEMICALS*

A. Chemicals: AWWA B300, Standard for Hypochlorite; AWWA B301, Standard for liquid Chlorine; AWWA B302, Standard for Ammonium Sulfate; and AWWA B303, Standard for Sodium Chlorite.

PART 3 – EXECUTION

3.01 *EXAMINATION*

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.02 *EXECUTION*

A. Provide and attach required equipment to perform the work of this Section.

B. Introduce treatment into piping system.

C. Maintain disinfectant in system for 24 hours.

D. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.

E. Replace permanent system devices removed for disinfection.

F. Pressure test system as required by the local Water Department. Repair leaks and retest.

3.03 *FIELD QUALITY CONTROL*

A. Test samples in accordance with AWWA C651, Standards for Disinfecting Water Mains.

END OF SECTION

SECTION 33 31 00

SANITARY UTILITY SEWERAGE PIPING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

B. Examine All Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

D. Provide all facilities, labor, materials, tools, equipment, appliances, transportation, supervision, and related work necessary to complete the work specified in this section, and as shown on the Drawings.

E. The work of this section includes the installation of a new sanitary sewer system including connections to the existing sewer system, as shown on the Drawings and as specified herein, work under this section shall comply with current local, state and federal regulations, including the City design standards.

1.02 WORK INCLUDED

A. Sanitary sewerage piping, manholes, fittings and accessories, including excavation, bedding, backfilling, compaction, and testing.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. SECTION 31 20 00 – EARTH MOVING

1.04 REFERENCES

A. All work shall comply with the pertinent standards of the latest edition of the following Codes and Specifications, unless designated otherwise herein:

1. ASTM - American Society of Testing and Materials
2. ANSI – American National Standards Institute
3. AASHTO – American Association of State highway and Transportation Officials
4. Requirements of the City's Department of Public Works (DPW).

B. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:

1. ASTM D3034 Standard Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

2. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

3. ASTM D2729 Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.

1.05 *SCHEDULING*

A. The Contractor shall submit to the Engineer a construction schedule detailing time and duration of anticipated sewer work, for approval by the Owner. All schedules shall be reviewed by the Contractor with the City for compliance with the City requirements.

1.06 *SUBMITTALS*

A. Product Data: Provide data indicating piping, pipe accessories, manholes, grease traps, cleanouts and frames and covers.

B. Manufacturer's Instructions: Indicate special procedures required to install products specified.

C. Certificates: Certify that products meet or exceed specified requirements.

1.07 *REGULATORY REQUIREMENTS*

A. All work under this Section of the Specifications shall be installed in accordance with the Laws, Ordinances, Rules and Regulations of all Local, State and Federal authorities having jurisdiction, the Rules and Regulations of the National Board of Fire Underwriters, and the Public Utility Companies.

1.08 *INSPECTION*

A. The supplier is responsible for the provisions and all test requirements as specified in ASTM D3034 for SDR 35 gravity pipe and ASTM D2241 for PVC pressure rated sewer pipe. In addition, all PVC pipe to be installed under this Contract may be inspected at the plant for compliance with these specifications by an independent testing laboratory selected by the Engineer. The Contractor shall require the manufacturer's cooperation in these inspections.

B. Inspection of the pipe may also be made by representatives of the Engineer after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though sample pipes may have been accepted as

satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall be removed from the job at once.

1.09 *DELIVERY, STORAGE AND HANDLING*

A. All materials furnished under this section shall be delivered to the job adequately protected from damage during transit. Pipes shall not be dropped. All pipes shall be examined before laying and no piece shall be installed which is found to be defective.

1. Pipe and other appurtenances which are defective from any cause, including damage caused by handling, and determined by the Engineer as unrepairable shall be unacceptable for installation and shall be replaced at no cost to the Owner.

2. Storage and handling of pipes, manholes and other sanitary sewer appurtenances shall be in accordance with the manufacturer's recommendations, subject to the approval of the Engineer.

1.10 *EXAMINATION OF CONDITIONS*

A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

PART 2 – PRODUCTS

2.01 PIPE MATERIALS

A. Plastic Pipe: ASTM D 3034, Polyvinyl Chloride (PVC) material; inside nominal diameter as indicated on plans with bell and spigot style solvent sealed joint end.

2.02 *PIPE ACCESSORIES*

A. Joints: PVC pipe shall have an integral wall bell and spigot push-on joint with elastomeric gaskets secured in place in the bell of the pipe. The bell shall consist of an integral wall section with a solid cross section elastomeric gasket, factory assembled, securely locked in place to prevent displacement during assembly. Elastomeric gaskets shall conform to ASTM D 3212.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tees, bends, elbows, cleanouts, reducers, traps and of the configurations required.

2.03 *SANITARY SEWER MANHOLES*

A. Precast Units

1. Structure: 48-inch diameter precast units, with 4,000 psi minimum compressive strength and eccentric cone section tapering to 24-inch diameter and one pour monolithic base section per ASTM C478.

2. Precast Unit Joint: Butyl rubber section joint per ASTM C443.

3. Steps: Steel reinforced copolymer polypropylene steps per ASTM C478, paragraph 11.

4. Exterior and Interior: Bituminous coating, 2 coats.

5. Manhole Frame and Cover: Grey iron casting per ASTM A48, heavy duty, with word "SEWER" on cover. Letter size shall be 2 inches. Frame and cover shall be 24 inch LeBaron LT 106 or approved equal.

6. Pipe Connections: Flexible sleeve or rubber gaskets, "Lock Joint", "Kor-n-Seal", or "A-Lok" or approved equal.

2.04 *MANHOLE COMPONENTS*

A. Frame and Cover: ASTM A48, Class 30B cast iron construction, machined flat bearing surface, removable lid, complying with the City's Department of Public Works (DPW) requirements.

B. Manhole Steps: Formed Fiber Reinforced Plastic rungs; ¾ inch diameter. Formed integral with manhole sections.

2.05 *MANHOLE CONFIGURATION*

A. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe or conduit sections.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: As indicated on Drawings.

D. Design Depth: As indicated on Drawings.

E. Clear Lid Opening: 24-inch diameter.

F. Pipe and Conduit Entry: Provide openings as indicated.

G. Steps: 12 inches wide, 12 inches on center vertically, set into manhole wall.

2.06 *BEDDING AND BACKFILLING MATERIALS*

A. Bedding: Crushed stone as specified in Section 33 41 00.

B. Cover: Gravel as specified in Section 33 41 00.

PART 3 - EXECUTION

3.01 *EXAMINATION*

A. Verify that trench cut and excavation base is ready to receive work and excavations, dimensions and elevations are as indicated on drawings.

B. Verify invert elevations of the structures the sewer line will be connected to. CONTACT ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE OBSERVED.

3.02 *PREPARATION*

A. Hand trim excavations to required elevations. Correct over excavation with coarse aggregate.

B. Remove large stone ore other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.03 *BEDDING*

A. Excavate pipe trench in accordance with Section 31 20 00 for work of this section. Hand trip excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom in accordance with Section 31 20 00. Level materials in continuous layers not exceeding 6 inches in loose depth and compact to 95 percent.

C. Maintain moisture content of bedding material to plus or minus 2 percent to attain required compaction density.

3.04 *INSTALLATION - PIPE*

A. Install pipe, fittings and accessories in accordance with ASTM D 2321 and manufacturer's instructions. Seal joints watertight.

B. All sewer piping shall be laid accurately to the lines and grades shown in the Drawings and/or as approved by the Engineer and in conformance with pipe manufacturer's recommended procedures.

1. Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand,

dirt and trash before installing in the line. Extreme care shall be taken to keep the ells of the pipe free from dirt and rocks so that joints may be properly assembled without overstressing the bells. No pipe is to be trimmed or chipped to fit.

2. No length of pipe shall be laid until the preceding length of pipe has been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.

C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1:1000.

D. Install bedding at sides and over top of pipe to minimum compacted thickness of 6 inches. Compact to 95 percent.

E. Refer to Section 31 20 00 for trenching requirements. Do not displace or damage pipe when compacting.

F. Connect to municipal sewer system through installed sleeves.

G. Pipe extension: When existing pipe is to be extended, the same type of pipe shall be used unless otherwise specified or approved by the Engineer.

H. Full Lengths of Pipe: Only full lengths of pipe are to be used in the installation except that partial lengths of pipe may be used at the entrance of structures where necessary to obtain a proper connection to the structure.

I. Pipe Entrances to Structures: All pipe entering structures shall be cut flush with the inside face of the structure, and the cut ends of the pipe surface within the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation. The method of cutting and finishing shall be subject to the approval of the Engineer.

J. Protection During Construction: The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.

K. At all times when pipe laying is not in progress, all open ends of pipes shall be closed by approved temporary water-tight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has passed.

L. Pipe shall be jointed in strict accordance with the Pipe manufacturer's instruction. Jointing of all pipe shall be done entirely in the trench.

M. Lubricant for jointing of PVC pipe shall be applied as specified by the pipe manufacturer. Use only lubricant supplied by the pipe manufacturer.

1. PVC Pipe shall be pushed home by hand or use of bar and block. The use of power equipment such as backhoe bucket is not recommended and shall only be used at the direction of the manufacturer.

2. To join field-cut pipe, pipe shall be cut square. The cut end of the pipe surface shall be properly beveled to the size and shape of a factory-finished beveled end. All sharp edges shall be rounded off.

3.05 *INSTALLATION – MANHOLES*

A. General Requirements: All manholes shall be built in accordance with the Details and in the locations shown on the Drawings and as specified herein.

1. Structures shall be constructed of precast concrete.

2. All masonry shall be installed by personnel experienced and skilled in this work, and any person not deemed to be such by the Engineer shall be removed and replaced by a person so qualified.

3. Manholes are to be constructed as soon as the pipe laying reaches the location of the manhole. Should the Contractor continue his pipe laying without marking provision for completion of the manhole, the Engineer shall have the authority to stop the pipe laying operations until the manhole is completed.

4. In constructing manholes, the Contractor shall accurately locate each manhole and set accurate templates to conform to the required line and grade. Any manhole which is mislocated or oriented improperly shall be removed and rebuilt in its proper alignment and orientation at the Contractor's expense.

B. Foundation: Unless otherwise specified, all manholes shall be constructed on a 12-inch layer of compacted bedding material. The excavation shall be properly dewatered while placing bedding material and setting the base.

C. Inverts: Brick invert channels shall be constructed in all manholes to ensure a smooth flow of water through the structure and shall correspond in shape to the lower half of the pipe. At changes in direction, the inverts shall be laid out in curves of the longest possible radii tangent to the centerline of the sewer pipes. Shelves shall be constructed to the elevation of the highest pipe crown and sloped to drain toward the flowing-through channel.

1. Special care shall be taken in laying brick inverts. Joints shall not exceed 3/16 inch in thickness and each brick shall be carefully laid in full cement mortar joints on bottom, side and end in one operating; no grouting or working in, of mortar, after laying of the brick will be permitted. Bricks forming the shaped inverts in manholes shall be laid on edge.

2. Invert channels shall be built for future extension where shown on the Drawings and/or where directed by the Engineer.

D. Frames and Covers: Frames and Covers for manholes shall be of the type and size indicated on the Drawings. Frames shall be well bedded in mortar and shall be set accurately to the correct alignment and grade.

E. Ladder Rungs: Ladder rungs shall be installed in all manholes, spaced 12 inches on center vertically. Rungs shall be set securely in place during the construction of the masonry wall.

F. Precast Manholes: Precast manholes shall be installed only after Shop Drawings have been approved.

1. The top grade of the precast concrete corbel section shall be set sufficiently below finished grade to permit a maximum of 5 and minimum of 2 courses of 8-inch brick to be used as risers to adjust the grade of casting. Manhole frames shall be set on a grout pad to make a watertight fit.

G. Bitumastic Coating: The entire exterior and interior surfaces of all manholes shall be coated with 2 coats of an approved bitumastic material to produce a dry film thickness of 0.07 inches per coat.

3.06 *CONNECTIONS TO EXISTING FACILITIES*

A. General Requirements: The Contractor shall make all required connections of the proposed sanitary sewer into existing sanitary sewer facilities, where and as shown on the Drawings and/or as approved by the Engineer.

B. Compliance with City's Requirements: Connections into existing sanitary sewer facilities shall be performed in accordance with the requirements of the Department of Public Works (DPW). The Contractor shall be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof.

3.07 *FIELD QUALITY CONTROL*

A. Request inspection prior to, and immediately after, placing bedding.

B. Compaction testing will be performed in accordance with ASTM D 1557.

C. Moisture content testing will be performed in accordance with ASTM D 1557.

3.08 *LEAKAGE TESTS*

A. General Requirements: The Contractor shall test the completed sewer, including manholes and laterals, for leakage by infiltration, exfiltration or low-pressure air

exfiltration tests as specified herein. The tests will be conducted as approved by the Engineer. The Contractor shall furnish all necessary equipment, materials and labor for performing the tests as specified.

1. The Contractor shall notify the Engineer at least 48 hours prior to the start of testing. Testing shall only be performed in the presence of the Engineer.

2. Sections of pipe tested for infiltration and exfiltration prior to completion of the Project shall be subject to additional leakage tests, if warranted in the opinion of the Engineer prior to acceptance of the Project.

B. Infiltration and Exfiltration Testing: The test length intervals for either type of leakage test shall be approved by the Engineer but in no event shall they exceed one thousand feet. In the case of sewers laid on steep grades, the length of line to be tested by exfiltration at any one time shall be limited by the maximum allowable internal pressure on the pipe and joints at the lower end of the line. the maximum internal pressure at the lowest end should not exceed 25 feet of water or 10.8 psi.

1. The test period, wherein the measurements are taken shall not be less than 4 hours in either type of test.

2. Depending on field conditions, the following tests for leakage shall be employed:

   a. Infiltration Test: The test may be used only when ground water levels are at least 5 feet above the top of the pipe for the entire length of section to be tested during the entire period of the test. Groundwater levels may be measured in an open trench or in standpipes previously placed in backfilled trenches during the backfilling operations. When standpipes are installed in the backfill for ground water measurement, the lower ends of these shall be satisfactorily embedded in a mass of crushed stone or gravel to maintain free percolation and drainage. Infiltration through joints shall be measured by using a watertight weir or any other approved device for volumetric measurement installed the lower end of the section under test.

   b. Exfiltration Test: this test consists of filling the pipe with water to provide a head of at least 5 feet above the top of the pipe or 5 feet above ground water, whichever is higher, at the highest point of the pipe line under test, and then measuring the loss of water from the line by the amount which must be added to maintain the original level in this test the line must remain filled with water for at least 24 hours prior to the taking of measurements. Exfiltration shall be measured by the drop of water level in a closed-end standpipe or in one of the sewer manholes available for convenient measuring.

c. When a standpipe and plug arrangement is used in the upper manhole of a line under test, there must be some positive method of releasing entrapped air in the sewer prior to taking measurements.

d. Leakage Requirements: The total leakage of any section tested shall not exceed the rate of 50 gallons per day per mile per inch of nominal pipe diameter. For purposes of determining the maximum allowable leakage, manholes shall be considered as sections of 48-inch diameter pipe, five feet long, and the equivalent leakage allowance shall be 2.25 gallons per manhole per 24 hours.

C. Low-Pressure Air Exfiltration Testing

1. The sewer mains and/or laterals shall be tested for leakage by the use of low-pressure air as specified hereinafter and as approved by the Engineer. The test length shall not exceed 1 interval of pipe between 2 manholes. Air test procedures may be dangerous and the Contractor shall take all necessary precautions to prevent blowouts.

2. Pneumatic plugs shall have a sealing length equal to or grater than the diameter of the pipe to be tested.

3. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.

4. All air used shall pass through a single control panel.

5. Three individual houses shall be used for the following connections.

   a. From control panel to pneumatic plugs for infiltration.

   b. From control panel to sealed line for introducing the low-pressure air.

   c. from sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

6. The following testing procedures shall be explicitly followed:

   a. All pneumatic plugs shall be seal tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 psi. The sealed pipe shall be pressurized to 5 psi. The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.

   b. After the pipe has been backfilled and cleaned, pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psi. Low-pressure

air shall be introduced into this sealed line until the internal air pressure reaches 4 psi grater than the average back pressure of any ground water that may be over the pipe. At least 2 minutes shall be allowed for the air pressure to stabilize.

c. After the stabilization period there shall be a minimum of 3.5 psi pressure in the pipe. The portion of line tested shall be acceptable if the time required in minutes for the pressure to decrease from 3.5 to 3 psi (greater than the average back pressure of any ground water that may be over the pipe) is not less than the time indicated in the following table:

Pipe Size in inches	Time in Seconds
4	0.190 L
6	0.427 L
8	0.760 L
10	1.187 L
12	1.709 L
15	2.671 L

Where L is the length of pipe being tested.

D. Correction of Defective Work: If leakage exceeds the specified amount, the Contractor shall at his own expense make the necessary repairs or replacements required to permanently reduce the leakage to within the specified limit, and the tests shall be repeated until the leakage requirement is met.

E. Any defects found in the system are to be repaired at the expense of the Contractor so as to conform strictly to the Specifications and to the satisfaction of the Engineer. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, and sanitary sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance by the Owner.

3.09 *CLEANING AND REPAIR*

A. The Contractor shall clean the entire sanitary sewer system of all debris and obstructions. This shall include, but not be limited to removal of all form work from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing sanitary sewers or stream; all debris shall be removed from the system.

B. All work of cleaning and repair as specified herein shall be performed at the Contractor's expense and to the complete satisfaction of the Engineer.

3.10 *FINAL INSPECTION*

A. Upon completion of the Work and before final acceptance by the Engineer, the entire sanitary sewer system shall be subject to a final inspection in the presence of the Engineer. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, leakage tests and workmanship have been met.

END OF SECTION

SECTION 33 41 00

STORM UTILITY SUBDRAINAGE PIPING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the test by basic designation only.

American Society for Testing and Materials (ASTM)

ASTM D 5034	(1995) Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM F 405	(1996) Corrugated Polyethylene (PE) Tubing and Fittings
ASTM F 667	(1985) Large Diameter Corrugated Polyethylene Tubing and Fittings.

Unibell Handbook of PVC Pipe

C32-73 (1984) Sewer and Manhole Brick

C62-85a Building Brick.

C76-85a Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

C139-73 (1985) Concrete Masonry units for Construction of Catch Basins and Manholes.

C270-86b Mortar for Unit Masonry

C443-85A Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

C478-85a Precast Reinforced Concrete Manhole Sections.

1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01 33 00 SUBMITTALS:

1. Filter Fabric, Pipe for Subdrains, PVC Manholes, PVC Cleanouts, Tees and fittings specifications.

2. Certifications from the manufacturers attesting that materials meet specification requirements and samples are required for filter fabric, drain pipe, and fittings.

B. Submit shop drawings and manufacturer's specifications and installation instructions for all pipe materials, precast concrete catch basins, manhole frames and covers, and catch basin frames and grates.

C. Each shipment of pipe, catch basins and metal castings shall be accompanied with the manufacturer's notarized certificate that the materials meet the specification requirements.

1.04 DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with minimum handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. During shipment and storage, filter fabric shall be wrapped in burlap or similar heavy duty protective covering. The storage area shall protect the fabric from mud, soil, dust and debris. Filter fabric materials that are not to be installed immediately shall not be stored in direct sunlight. Plastic pipe shall be installed within 6 months from the date of manufacture unless otherwise approved.

B. Handling

Material shall be handled in such a manner as to insure delivery to the trench in sound undamaged condition. Pipe shall be carried and not dragged to the trench.

PART 2 - PRODUCTS

2.01 PIPE MATERIALS

A. General: Ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of same type class of materials as piping unless otherwise indicated.

B. Reinforce Concrete Pipe: ASTM C76, Class III (unless otherwise specified on the project drawings), modified tongue-and-grove compression gasket joints complying with ASTM C443.

C. Corrugated Polyethylene (HDPE) Pipe and Fittings: Use ASTM F 405 for pipes three (3") to six (6") inches in diameter, inclusive, ASTM F 667 for pipes eight (8") to twenty-four (24") inches in diameter. Fittings shall be manufacturer's standard type and shall conform to the indicated specification.

D. Pipe Perforations: Water inlet area shall be a minimum of one-half (0.5 in^2/lf) square inch per liner foot. Manufacturer's standard perforated pipe which essentially meets these requirements may be substituted with prior approval of the Owner's Representative.

.

1. Slotted Perforations in Plastic Pipe: Circumferential slots shall be cleanly cut so as not to restrict the inflow of water and uniformly spaced along the length and circumference of the tubing. Width of slots shall not exceed 1/8 inch nor be less than 1/32 inch. The length of individual slots shall not exceed 1-1/4 inches on three (3") inch diameter tubing, ten (10%) percent of the tubing inside nominal circumference on four (4") to eight (8") inch diameter tubing, and 2-1.2 inches on ten (10") inch diameter tubing. Rows of slots shall be symmetrically spaced so that they are fully contained in two (2) quadrants of the pipe. Slots shall be centered in the valleys of the corrugations of profile wall pipe.

2.02 *CONCRETE MANHOLE AND CATCH BASIN MATERIALS*

A. The material to be used in the construction of storm manholes, catch basins, and drop inlets shall conform to MHD Standard Specifications and to the following requirements.

B. Precast Concrete Manholes and Catch Basins: ASTM C478, eccentric cone, flat slab precast top; precast riser section and monolithic base section with integral floor.

C. Concrete Compressive Strength: 4000 psi minimum. Type II cement.

D. Reinforcing Steel: ASTM A185, 0.12 sq. in./linear ft. and 0.12 sq. in. (both ways) base bottom.

E. Joints sealed with rubber gaskets conforming to ASTM C443.

F. Steps: Forged 6061B, T6 aluminum or Copolymer Polypropylene Plastic with 1/2-inch Grade 50 steel reinforcement.

2.03 *CAST IRON FRAMES AND COVERS*

A. Concrete Catch Basins: To be C.I. LeBaron LP246, or approved equal.

B. Concrete Drain Manholes: To be C.I. LeBaron LBW426, or approved equal. Where plans indicate "watertight" cover, provide inner cover LSW268A and locking bar LSW268B, or approved equal.

C. Nyloplast Manholes: To be in accordance with the manufacturer's standard specifications.

2.04 *MASONRY MATERIAL*

A. Concrete Masonry Units: ASTM C139.

B. Brick: ASTM C32, Grade MS or ASTM C62, Grade SW.

C. Mortar: ASTM C270, Type M.

2.05 PVC MANHOLES AND CATCH BASINS

A. PVC manholes and catch basins shall be manufactured by Nyloplast, or approved equal, and set to the grades and sized in accordance with the contract documents.

B. Existing manholes, drains, and catch basins not being replaced shall be protected.

C. Install filters in all catch basins during construction to protect them.

D. Remove filters and clean catch basins when project completion phase is reached.

2.06 PIPE BEDDING AND COVER MATERIALS

A. Bedding for concrete pipe: as specified in Section 31 20 00 – EARTH MOVING.

B. Cover for concrete pipe: as specified in Section 31 20 00 – EARTH MOVING.

2.07 FILTER FABRIC

A. Filter Fabric for wrapping trenches shall be a non-woven polypropylene fabric made specifically for use in subsurface drainage structures equal to Mirafi 14ON, manufactured by Mirafi, Inc., Charlotte, NC 28224, or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that the trench cut and excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on contract drawings.

3.02 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with gravel borrow in accordance with Section 31 20 00 – EARTH MOVING.

B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

C. Install filters in all catch basins during construction to protect them.

3.03 EXCAVATION AND BEDDING FOR DRAIN SYSTEMS

A. All HDPE and Reinforced Concrete piping shall be installed in strict conformance with the Manufacturer's recommendations. If these specifications conflict with the Manufacturer's recommendations, the Contractor shall request direction prior to installation.

B. Trenching and excavation, including the removal of rock and unstable material, shall be in accordance with Section 31 20 00 – EARTH MOVING. Bedding material shall be placed in the trench as indicated or as required as replacement materials used in those areas where unstable materials were removed. Compaction of the bedding material shall be as specified.

3.04 INSTALLATION OF FILTER FABRIC AND HDPE PIPE FOR SUBDRAINS

A. Installation of Filter Fabric

1. Overlaps on Perforated or Slotted Pipes

One layer of filter fabric shall be wrapped around perforated or slotted collector pipes in such a manner that longitudinal overlaps of fabric are in unperforated or unslotted quadrants of the pipes. The overlap shall be at least two (2") inches. The fabric shall be secured to the pipe in such a manner that backfill material will not infiltrate through any fabric overlaps.

2. Trenching Lining and Overlaps

Trenches to be lined with filter fabric shall be graded to obtain smooth side and bottom surfaces so that the fabric will not bridge cavities in the soil or be damaged by projecting rock. The fabric shall be laid flat but not stretched on the soil, and it shall be secured with anchor pins. Overlaps shall be at least twelve (12") inches, and anchor pins shall be used along the overlaps.

B. Installation of HDPE Pipe for Subdrains

1. Pipelaying

Each pipe shall be carefully inspected before it is laid. Any defective or damaged pipe shall be rejected. No pipe shall be laid when the trench conditions or weather is unsuitable for such work. Water shall be removed from any trenches by sump pumping or other approved methods. The pipe shall be laid to the grades and alignment as indicated. The pipe shall be bedded to the established gradeline. Perforations shall be centered on the bottom of the pipe. Pipes of either the bell-and-spigot type or the tongue-and-grove type shall be laid with the bell or groove ends upstream. All pipes in place shall be approved before backfilling.

2. Jointings

a. Perforated Corrugated Polyethylene Pipe: Perforated corrugated polyethylene drainage pipe shall be installed in accordance with the manufacturer's specifications and as specified herein. A pipe with physical imperfections shall not be installed. No more than five (5%) percent stretch in a section will be permitted.

3.05 INSTALLATION OF REINFORCED CONCRETE PIPE

1. Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Seal joints watertight.

2. Place pipe on minimum six (6) inch deep bed gravel bedding as specified in Section 31 20 00 – EARTH MOVING.

3. Lay pipe to slope gradients noted on drawings with maximum variation from true slope of 1/8 inch in 10 feet.

4. Install gravel borrow at sides to the midpoint of the pipe. Install gravel borrow from the midpoint of the pipe to the elevations indicated on the Contract Drawings, compacted to 95 percent maximum density at optimum moisture content.

5. Refer to Section 31 20 00 – EARTH MOVING for trenching requirements. Do not displace or damage pipe when compacting.

6. Connect to building storm drainage outlet, manholes, through installed sleeves.

3.06 INSTALLATION OF FILTER MATERIAL AND BACKFILLING FOR SUBDRAINS

A. After pipe for subdrains has been laid, inspected, and approved, filter material shall be placed around and over the pipe to the depth indicated. The filter material shall be placed in layers not to exceed eight (8") inches thick and each layer shall be thoroughly compacted by mechanical tampers or rammers to obtain the required density. Compaction of filter material and the placement and compaction of overlying backfill material shall be in accordance with applicable provisions specified in Section 31 20 00 – EARTH MOVING.

3.07 CONCRETE DRAINAGE STRUCTURES

A. Form bottom of excavation clean and smooth to correct elevation.

B. Install and level precast concrete sections with provision for storm drainage pipe and section.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount frame and cover level in grout, secured to top cone section to elevations indicated.

3.8 TESTS

A. Request inspection prior to and immediately after placing aggregate cover over pipe.

B. Compaction testing will be performed in accordance with ASTM D1557.

C. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.

D. Frequency of Tests: As directed by Engineer and/or Owner.

E. Pipe Test:

Strength tests of pipe shall conform to field service test requirements of Federal Specification, ASTM specification, or AASHTO specification covering the product.

END OF SECTION

APPENDIX A

ADDITIONAL INFORMATION

PlayCAD Quote

Date:09/13/2023 | Rep Organization: M.E. O'BRIEN & SONS, INC. | Quote No: MEO23810

By:JRA | Contact Person: JOHN McCONKEY

Project Title: FULLER STREET PARK | Location: EVERETT, MA

PlayBooster® and Forma™ (5-12 years)						
PHASE-1 Direct Bury Mixed Material			UNIT		TOTAL	
QTY	NO.	DESCRIPTION	WEIGHT (lb)		WEIGHT (lb)	
PlayBooster®						
Custom						
1	CP016776A	DTR PB Tree Tops w/Steel Post DB Only			5121.0	
Motion & More Fun						
1	193176A	Boogie Board DB Only			110.0	
1	166809A	E-Pod Seat			11.0	
Posts						
1	111404R	108"Steel Post DB 42" BURY			65.0	
Forma™						
Climbers						
1	307425A	Forge Climber DB Only			678.0	
Freestanding Play						
Custom						
1	CP001299A	DTR IND Recycled Board Oak Leaf Wobble Pod DB			285.0	
Motion & More Fun						
1	164075B	Double Bobble Rider DB			131.0	
2	152179A	Saddle Spinner DB 16"Height	40.0		80.0	
Swings						
1	174018A	Belt Seat ProGuard Chains for 8' Beam Height			8.0	
1	176038G	Full Bucket Seat ProGuard Chains for Toddler Swing			11.0	
1	177351A	Molded Bucket Seat (5-12 yrs) w/Harness ProGuard Chains for 8' Beam Height			48.0	
1	177332A	Single Post Swing Frame 8' Beam Height Only			213.0	
1	177337A	Toddler Swing Add-On Beam			31.0	

SUMMARY	CONCRETE (cu-ft)	FOOTINGS (count)	LABOR (hours)	WEIGHT (lb)	
PlayBooster® and Forma™ (5-12 years) PHASE-1	143.1	46	25.0	6,792.0	
Total Safety Zone Area = 3210 sq. ft.					

PlayCAD Quote

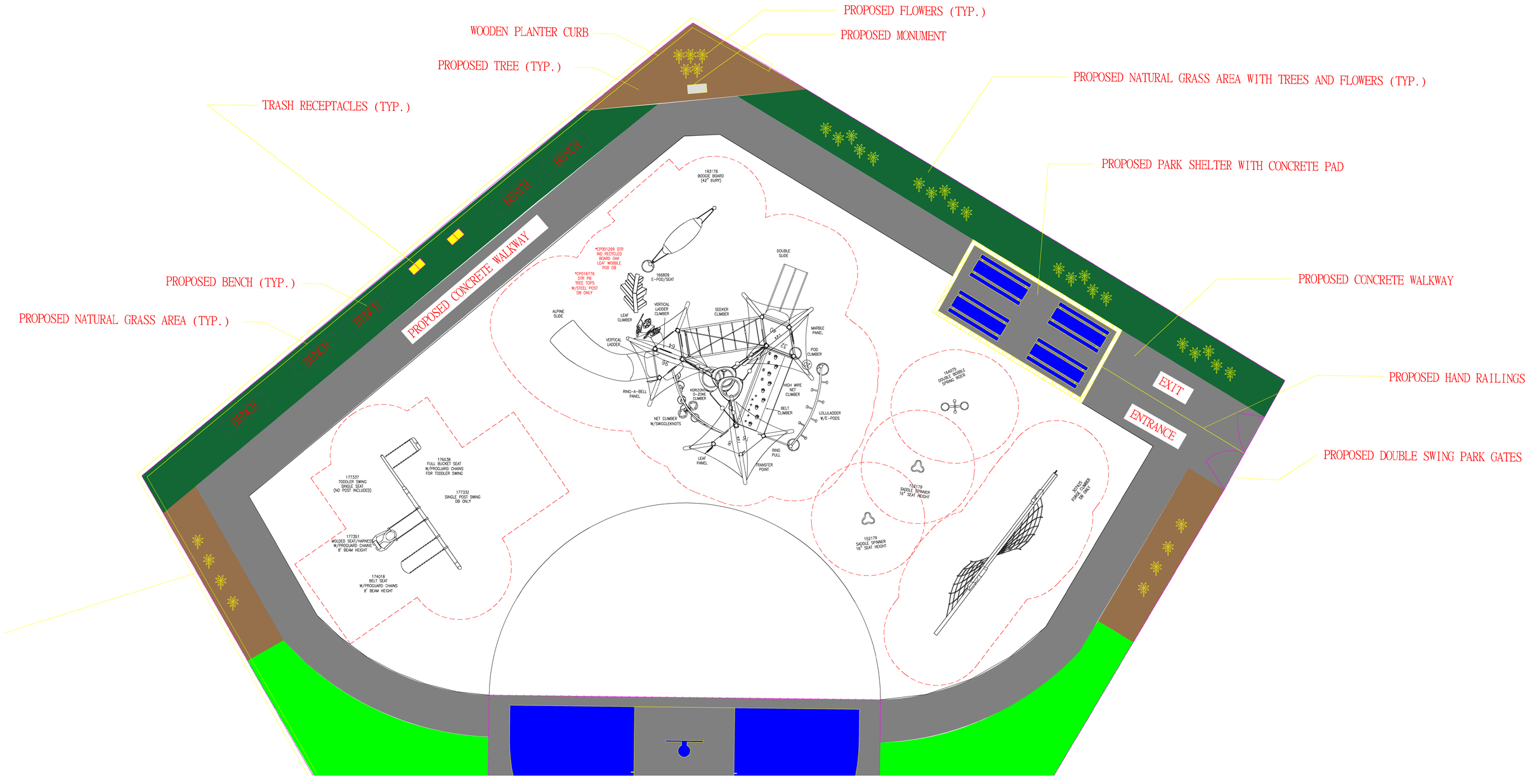
Date:09/13/2023 Rep Organization: M.E. O'BRIEN & SONS, INC. Quote No: MEO23810

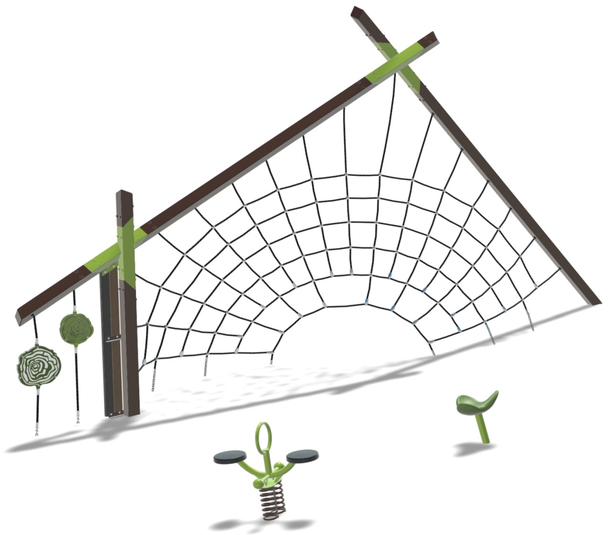
By:JRA Contact Person: JOHN McCONKEY

Project Title: FULLER STREET PARK Location: EVERETT, MA

ALL PHASES	PlayBooster®	88.1	29	4.3	5,307.0
	Forma™	24.7	10	8.0	678.0
	Freestanding Play	30.3	7	12.8	807.0
	Total	143.1	46	25.0	6,792.0

- Square Footage calculation provided by LSI is approximate and for estimation purposes only. LSI shall not be held liable for any costs, damages or requirements related to surfacing applications and/or site or subsurface preparation by third parties.
- Estimated labor-hours do not include hours for custom product installation and/or site or subsurface preparation – or errors in square footage calculations prepared by third parties.
- [1] Any Quote or products that have a total weight above 5,000 lbs shall require a freight quote. Freight tables cannot be used. Custom freight quotes are valid for thirty (30) days and are subject to changes set by the carrier. Unless stated otherwise or in any separate custom freight quote related to this Quote, all prices are FOB Origin (Delano, Minnesota or Dallas, TX).
- [1] The quoted price is protected for thirty (30) days if a Complete Order is placed prior to a price change effective date. A product order is a “Complete Order” if entered in the applicable LSI software portal and includes final product, colors, artwork and specifications identified, which is fully ready for LSI manufacturing within normal lead times.
- Manufacturing time for this project will be 6 weeks from the time of LSI’s order acceptance.
- View additional quote terms here.


PROPOSED FLOWERS (TYP.)
WOODEN PLANTER CURB
PROPOSED MONUMENT
PROPOSED TREE (TYP.)
PROPOSED NATURAL GRASS AREA WITH TREES AND FLOWERS (TYP.)
TRASH RECEPTACLES (TYP.)
PROPOSED PARK SHELTER WITH CONCRETE PAD
PROPOSED BENCH (TYP.)
PROPOSED CONCRETE WALKWAY
PROPOSED NATURAL GRASS AREA (TYP.)
PROPOSED HAND RAILINGS
PROPOSED DOUBLE SWING PARK GATES
BENCH
PROPOSED CONCRETE WALKWAY
EXIT
ENTRANCE
193176
BOOGIE BOARD
(42" BURY)
*CP001299 DTR
IND RECYCLED
BOARD OAK
LEAF MOBILE
POD DB
*CP016776
DTR PB
TREE TOPS
W/STEEL POST
DB ONLY
166809
E-POD/SEAT
DOUBLE
SLIDE
ALPINE
SLIDE
LEAF
CLIMBER
VERTICAL
LADDER
CLIMBER
SEEKER
CLIMBER
MARBLE
PANEL
VERTICAL
LADDER
POD
CLIMBER
RING-A-BELL
PANEL
HORIZONTAL
O-ZONE
CLIMBER
HIGH WIRE
NET
CLIMBER
BELT
CLIMBER
LOLLILADDER
W/E-PODS
NET CLIMBER
W/SWIGGLEKNOTS
RING
PULL
TRANSFER
POINT
LEAF
PANEL
164075
DOUBLE SADDLE
SPRING RIDER
176038
FULL BUCKET SEAT
W/PROGUARD CHAINS
FOR TODDLER SWING
177537
TODDLER SWING
SINGLE SEAT
(NO POST INCLUDED)
177332
SINGLE POST SWING
DB ONLY
177351
MOLDED SEAT/HARNESS
W/PROGUARD CHAINS
8' BEAM HEIGHT
174018
BELT SEAT
W/PROGUARD CHAINS
8' BEAM HEIGHT
152179
SADDLE SPINNER
14" SEAT HEIGHT
152179
SADDLE SPINNER
14" SEAT HEIGHT
307139
TURF CLIMBER
DB ONLY



FULLER STREET PARK

MEO23810 • 2.23.2024

© 2024 Landscape Structures. All Rights Reserved

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

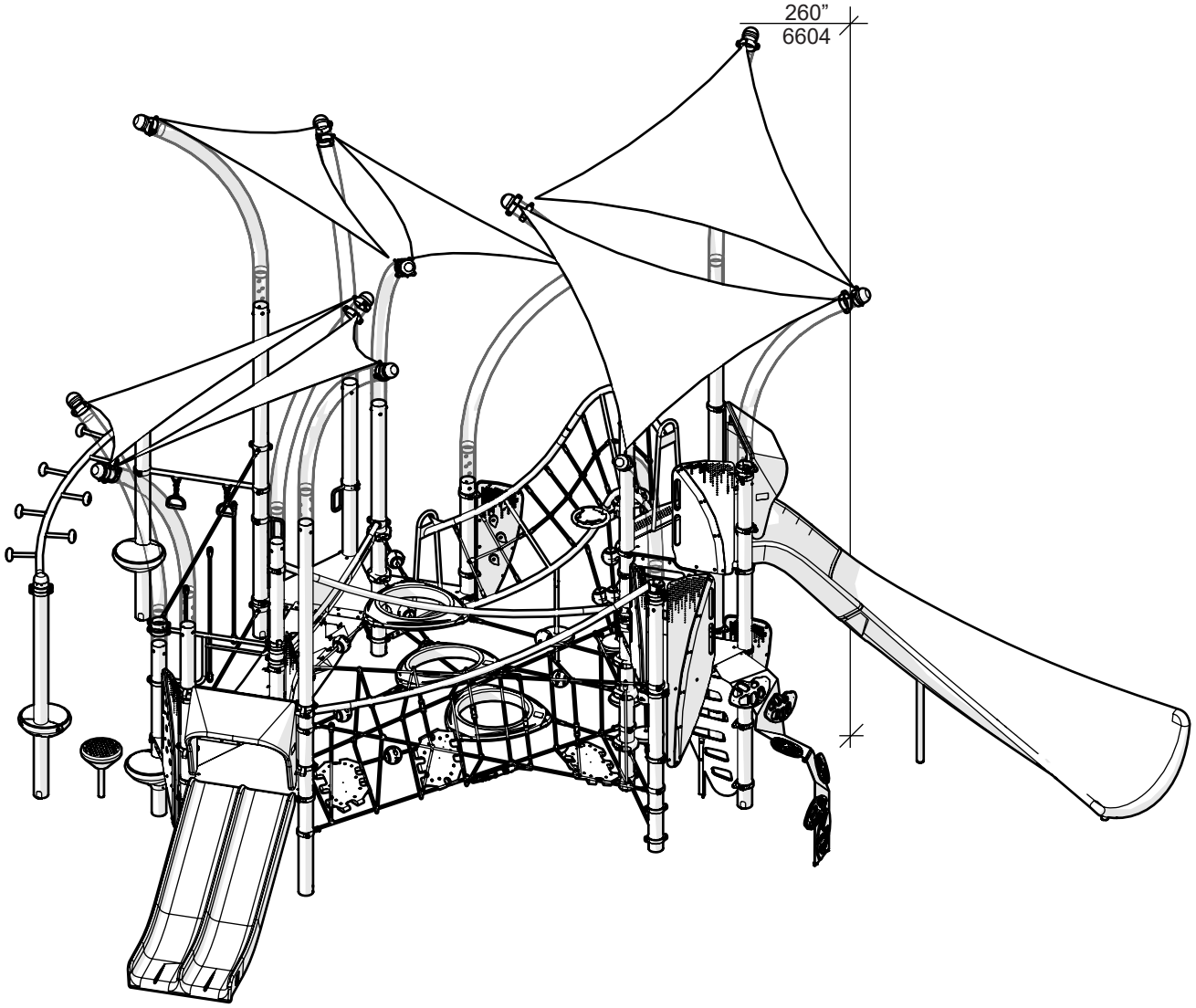
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Installation Instructions:

1) Erect the 3 clusters of posts and decks; use the 2D layout as a reference for locations and bury depths.

2) Assemble remaining components following the steps and details shown in this document.

3) Install protective surfacing before users are allowed to play on the structure.



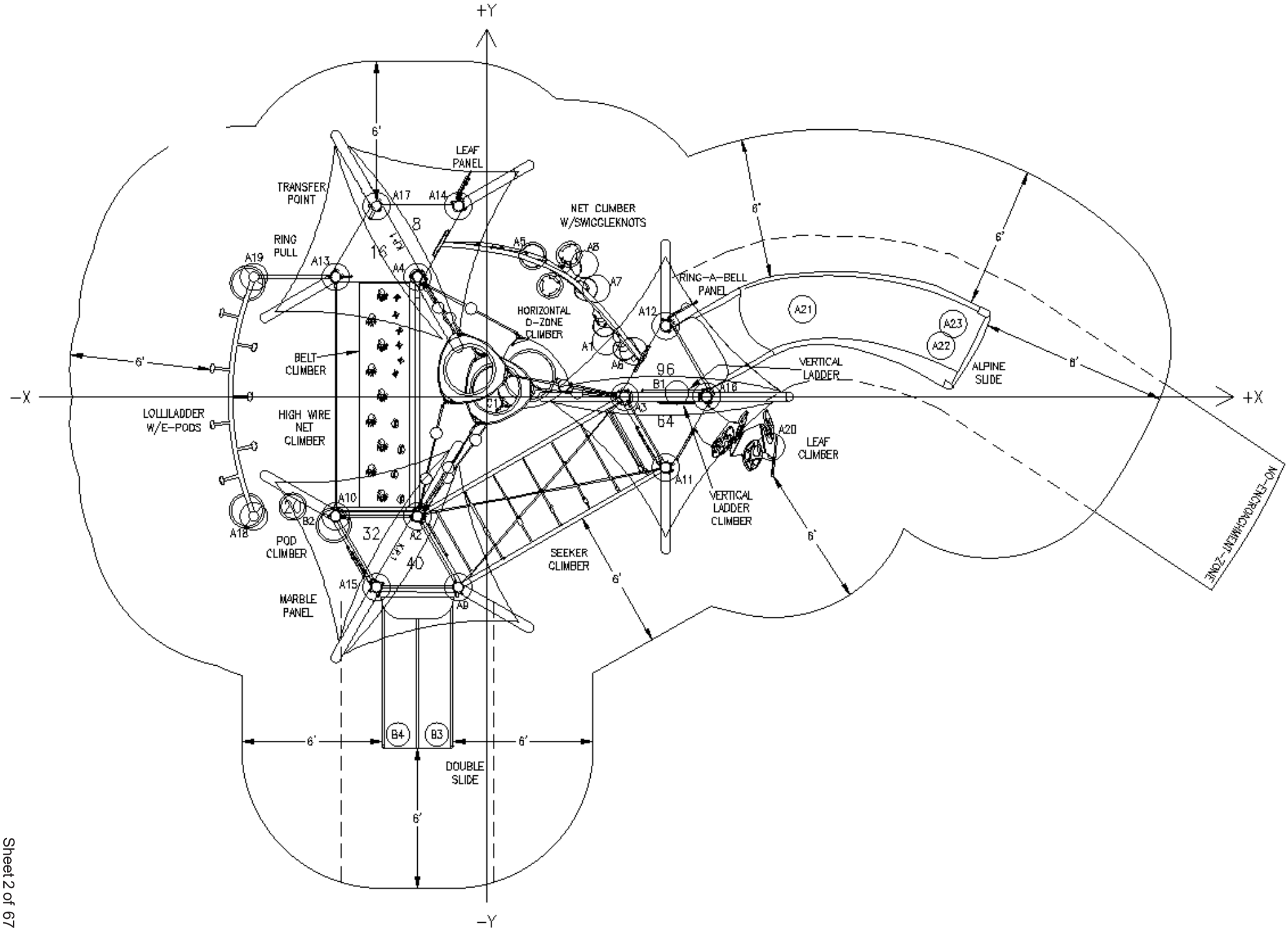
NOTE:
Concrete Required: 3 yards
Equipment Needed: Man Lift
Total Labor Hours: 125 hours

Tree Tops™ Structure

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203


+Y
-Y
-X
+X
6'
LEAF PANEL
TRANSFER POINT
RING PULL
NET CLIMBER W/SWIGGLEKNOTS
RING-A-BELL PANEL
HORIZONTAL D-ZONE CLIMBER
BELT CLIMBER
VERTICAL LADDER
ALPINE SLIDE
LOLLILADDER W/E-PODS
HIGH WIRE NET CLIMBER
LEAF CLIMBER
POD CLIMBER
SEEKER CLIMBER
VERTICAL LADDER CLIMBER
MARBLE PANEL
DOUBLE SLIDE
NO-ENCROACHMENT-ZONE
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
A20
A21
A22
A23
B1
B2
B3
B4
C1
8
16
32
40
64
96
20

N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	5'-1 1/2"	2'-4 1/2"	5'-7 1/2"	14
2	A2	-2'-11 1/2"	-5'-1 1/2"	5'-11"	14
3	A3	5'-11"	0"	5'-11"	14
4	A4	-2'-11 1/2"	5'-1 1/2"	5'-11"	14
5	A5	1'-11 1/2"	6'-0 1/2"	6'-4"	14
6	A6	6'-3 1/2"	1'-11 1/2"	6'-7"	14
7	A7	4'-8 1/2"	4'-7 1/2"	6'-7"	14
8	A8	4'-2"	5'-8"	7'-0 1/2"	14
9	A9	-1'-2 1/2"	-8'-2"	8'-3"	14
10	A10	-6'-5 1/2"	-5'-1 1/2"	8'-3"	14
11	A11	7'-8"	-3'-0 1/2"	8'-3"	14
12	A12	7'-8"	3'-0 1/2"	8'-3"	14
13	A13	-6'-5 1/2"	5'-1 1/2"	8'-3"	14
14	A14	-1'-2 1/2"	8'-2"	8'-3"	14
15	A15	-4'-8 1/2"	-8'-2"	9'-5"	14
16	A16	9'-5"	0"	9'-5"	14
17	A17	-4'-8 1/2"	8'-2"	9'-5"	14
18	A18	-9'-11 1/2"	-5'-1 1/2"	11'-2 1/2"	14
19	A19	-9'-11 1/2"	5'-1 1/2"	11'-2 1/2"	14
20	A20	12'-2"	-2'-1 1/2"	12'-4 1/2"	14
21	A21	13'-6 1/2"	3'-9"	14'-0 1/2"	14
22	A22	19'-5 1/2"	2'-2"	19'-7"	14
23	A23	19'-11 1/2"	3'-1 1/2"	20'-2 1/2"	14
24	B1	8'-1 1/2"	2"	8'-1 1/2"	12
25	B2	-8'-3 1/2"	-4'-8 1/2"	9'-6 1/2"	12
26	B3	-2'-1 1/2"	-14'-5 1/2"	14'-7 1/2"	12
27	B4	-3'-9 1/2"	-14'-5 1/2"	14'-11 1/2"	12
28	C1	0"	0"	0"	REF PT

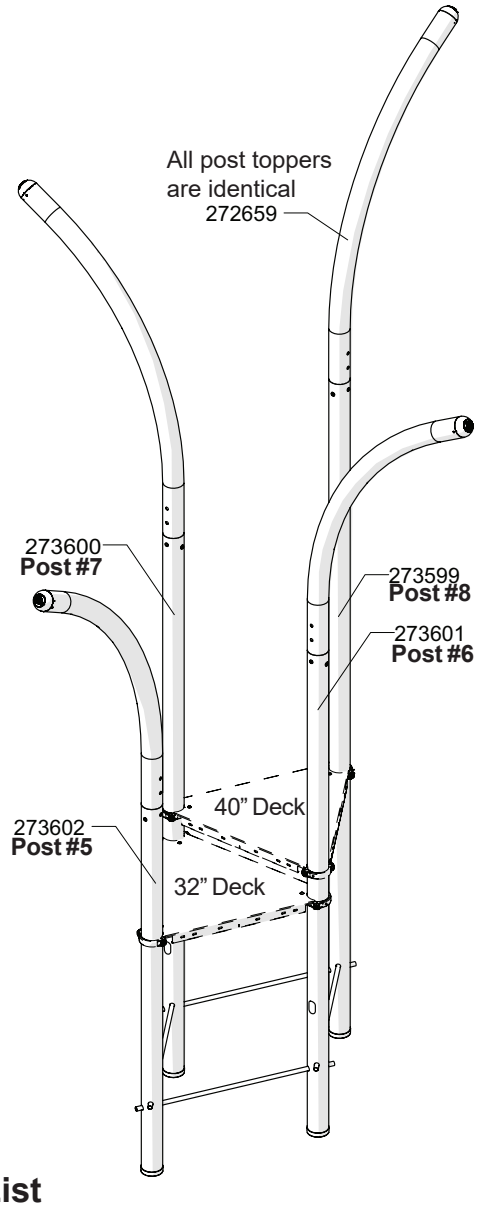
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

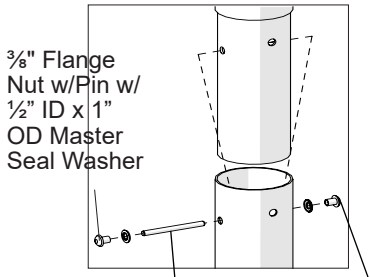
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

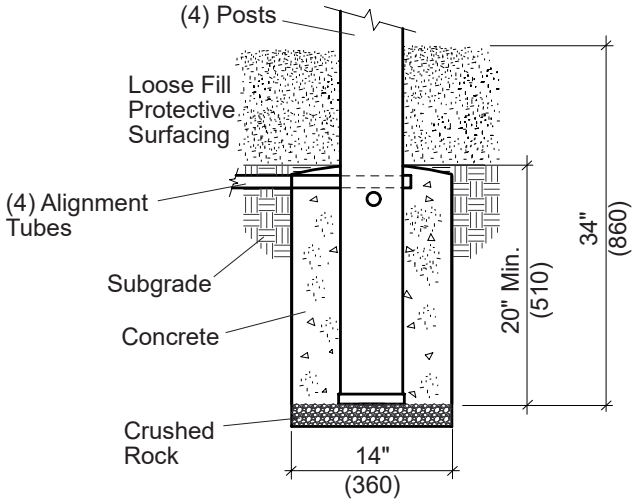


NOTE: Posts have the same length as other posts on structure, but they are NOT interchangeable. Refer to part numbers when placing posts into their location.

DETAIL
POST EXTENSION ATTACHMENT



DETAIL
DIRECT BURY



Parts List

PART NUMBER	DESCRIPTION	QTY.
273602	CUST POST PB TOPPER 102i STL 34i -Post #5	1
273601	CUST POST PB TOPPER 134i STL 34i -Post #6	1
273600	CUST POST PB TOPPER 150i STL 34i -Post #7	1
273599	CUST POST PB TOPPER 182i STL 34i -Post #8	1
272659	CUST CURVED PST TPR PNT	4

PART NUMBER	DESCRIPTION	QTY.
223098	Master Seal Washer 1/2i ID x 1i OD	16
171010	ALIGNMENT TUBE	4
148081	THD ROD 3/8X4 1/2 SST	8
100353	FLG NUT 6LP 3/8-16 SST	16

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 586 lbs

Custom 32”-40” Tri-Deck Curved Posts, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

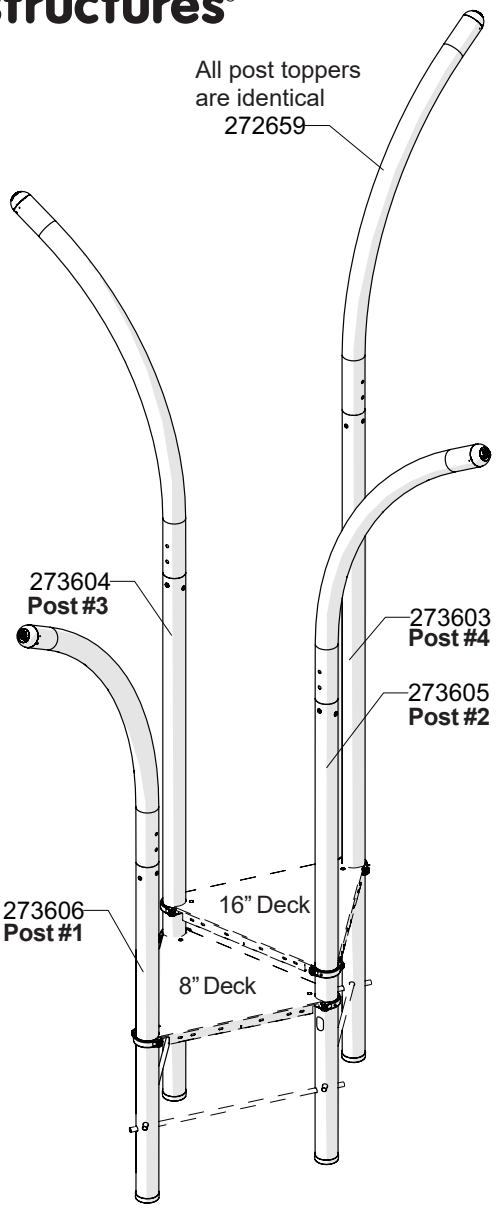
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

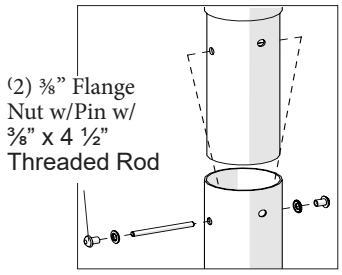
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

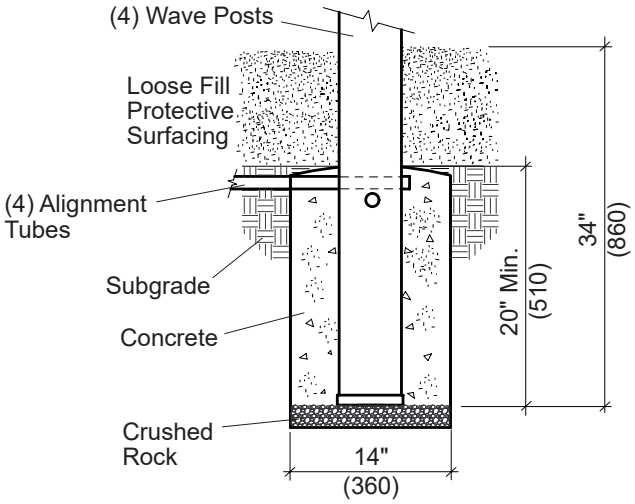


NOTE: Posts have the same length as other posts on structure, but they are NOT interchangeable. Refer to part numbers when placing posts into their location.

DETAIL
POST EXTENSION ATTACHMENT



DETAIL
DIRECT BURY



Parts List

PART NUMBER	DESCRIPTION	QTY.
273606	CUST POST PB TOPPER 86i STL 34i -Post #1	1
273605	CUST POST PB TOPPER 118i STL 34i -Post #2	1
273604	CUST POST PB TOPPER 134i STL 34i -Post #3	1
273603	CUST POST PB TOPPER 166i STL 34i -Post #4	1
272659	CUST CURVED PST TPR PNT	4

PART NUMBER	DESCRIPTION	QTY.
223098	Master Seal Washer 1/2i ID x 1i OD	16
171010	ALIGNMENT TUBE	4
148081	THD ROD 3/8X4 1/2 SST	8
100353	FLG NUT 6LP 3/8-16 SST	16

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 553 lbs

Custom 8”-16” Tri-Deck Curved Posts, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

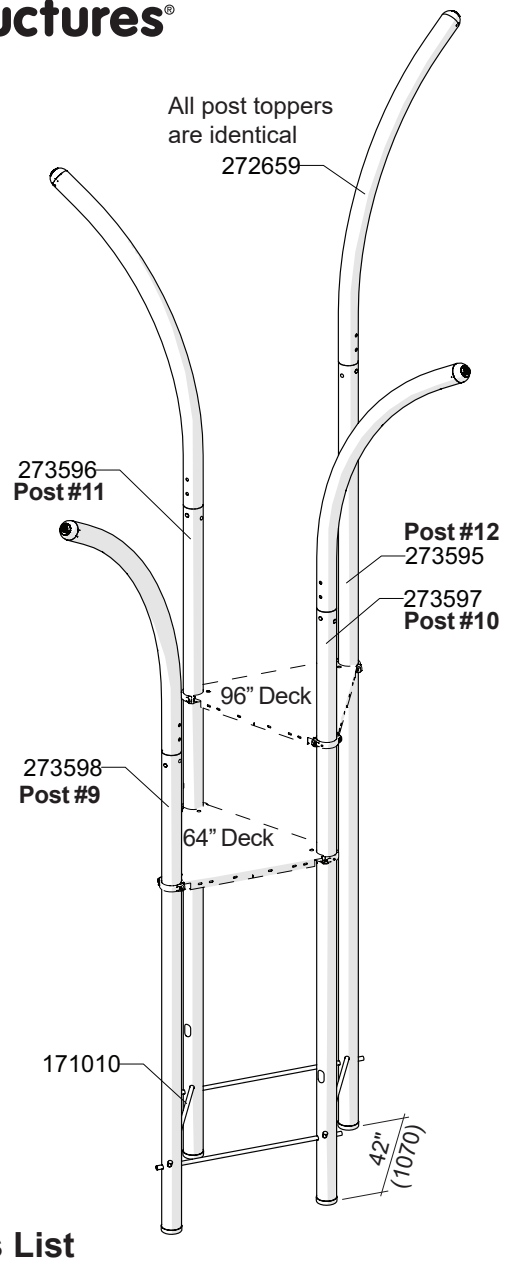
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

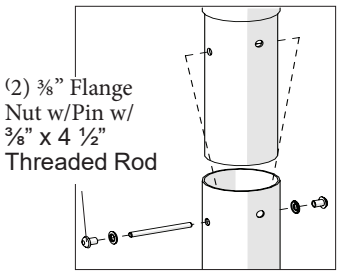
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

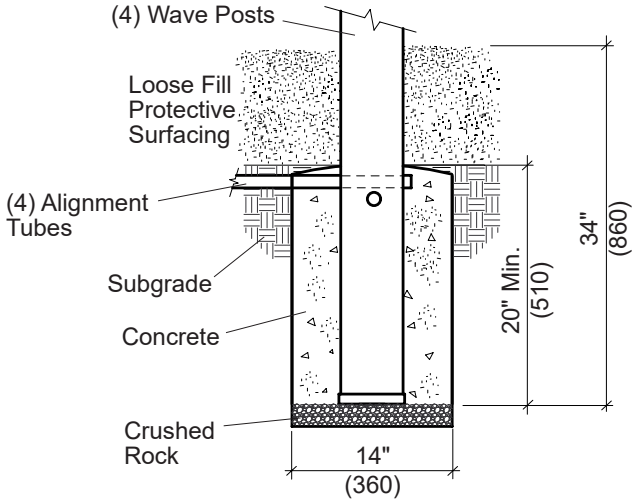


NOTE: Posts have the same length as other posts on structure, but they are NOT interchangeable. Refer to part numbers when placing posts into their location.

DETAIL
POST EXTENSION ATTACHMENT



DETAIL
DIRECT BURY



Parts List

PART NUMBER	DESCRIPTION	QTY.
273598	CUST POST PB TOPPER 134i STL 34i -Post #9	1
273597	CUST POST PB TOPPER 166i STL 34i-Post #10	1
273596	CUST POST PB TOPPER 182i STL 34i-Post #11	1
273595	CUST POST PB TOPPER 214i STL 34i-Post #12	1
272659	CUST CURVED PST TPR PNT	4

PART NUMBER	DESCRIPTION	QTY.
223098	Master Seal Washer 1/2i ID x 1i OD	16
171010	ALIGNMENT TUBE	4
148081	THD ROD 3/8X4 1/2 SST	8
100353	FLG NUT 6LP 3/8-16 SST	16

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 653 lbs

Custom 64”-96” Tri-Deck Curved Posts, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures

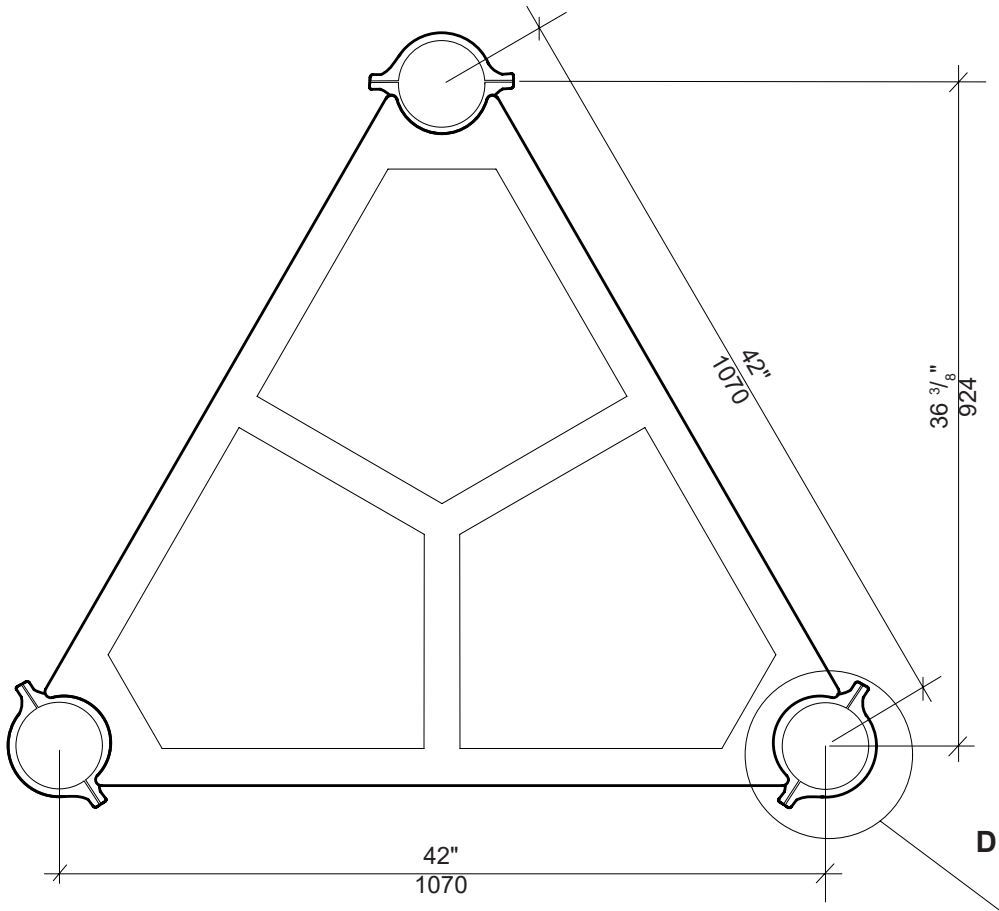
ISO 14001 CERTIFIED

ISO 9001 Certified

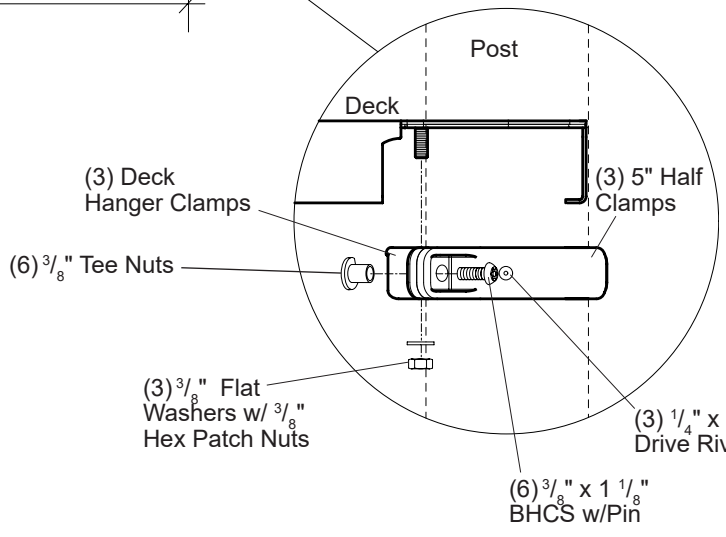
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

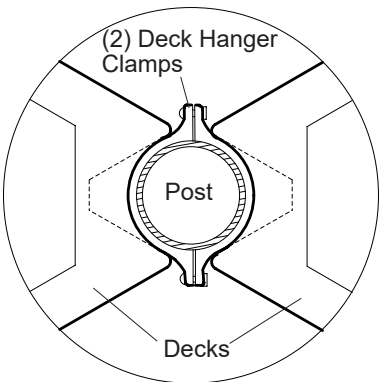
14582400



DETAIL
DECK HANGER CLAMP



DETAIL



Configuration for Back to Back Decks at Same Height.

PlayBooster® 111231 Triangular Tenderdeck

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 111231 Triangular Tenderdeck

Parts List

Part#	Description	Qty.
145657	Tri-Deck, Specify Color	1
105327	5" Half Clamp, Specify Color	3
106022	Deck Hanger Clamp, Specify Color	3
100198	3/8" x 1 1/8" BHCS w/Pin, SST	6
100321	3/8" Hex Patch Nut, SST	3
100351	3/8" Tee Nut, SST	6
100362	3/8" Flat Washer, SST	3
100610	1/4" x 5/8" Drive Rivet, AL/SST	3

Specifications

Triangular Deck: Flange formed from 12 GA (.105") sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8" x 37 3/4". Finish: TenderTuff™, color specified.

Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/2 man hour

Weight: 61 lbs.

Installation Instructions

1) Mark posts for the appropriate height of the deck you are installing.
2) Fasten deck hanger clamps to marked position on posts. See Detail on the front of this sheet.
3) Lift deck assembly into position, lining up stud underneath deck with deck hanger clamp as shown. Attach using 3/8" hex patch nuts with 3/8" flat washers. With deck level and posts plumb, final tighten all hardware.
4) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.
5) After attachment of enclosures and components is complete, pour concrete footings. Allow concrete footings to cure a minimum of 72 hours before users are allowed to play on the structure.
6) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #52268 Document #14582400 replaces #13954200. Replaced Tri-Deck.
Document #27511200

landscape structures

ISO 14001 CERTIFIED

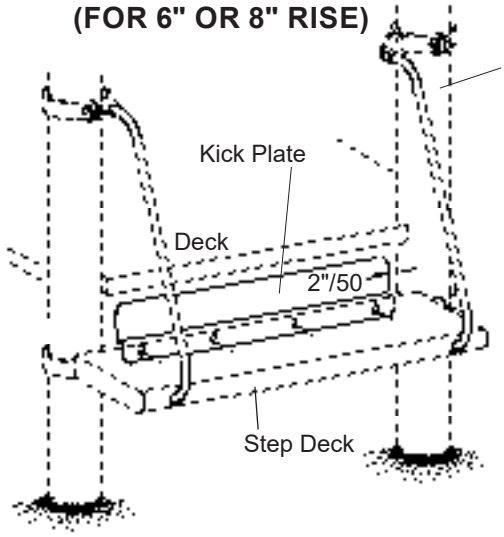
ISO 9001 Certified

SAFETY NOTE

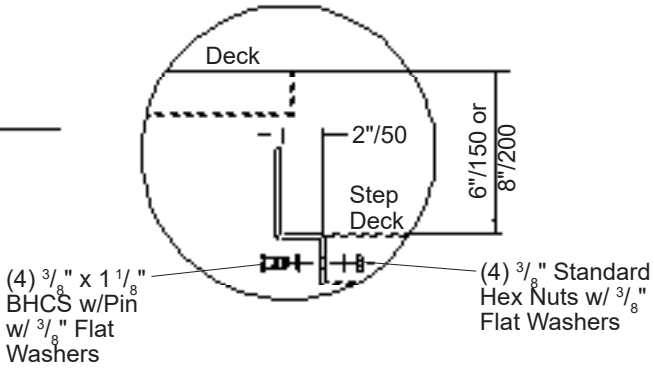
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

16574300

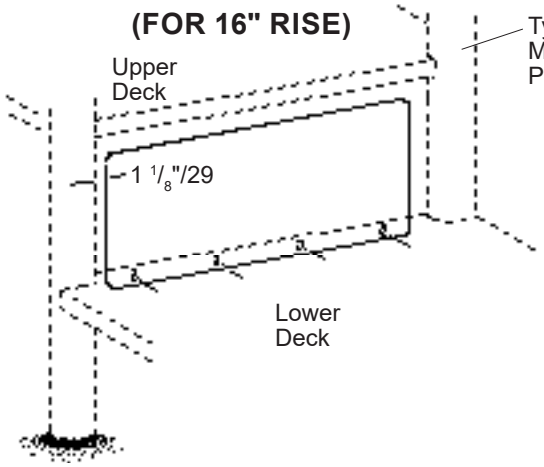
KICK PLATE
(FOR 6" OR 8" RISE)



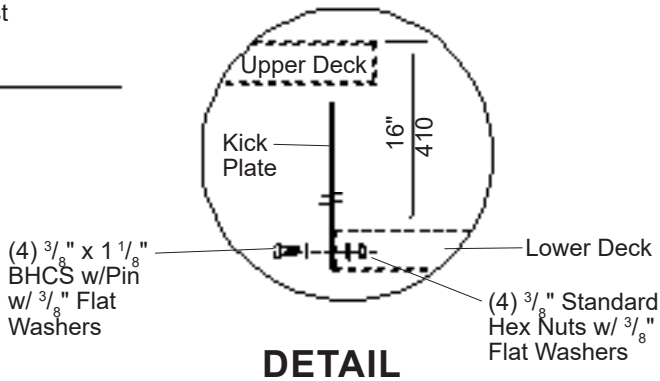
DETAIL
KICK PLATE ATTACHMENT (FOR 6" OR 8" RISE)



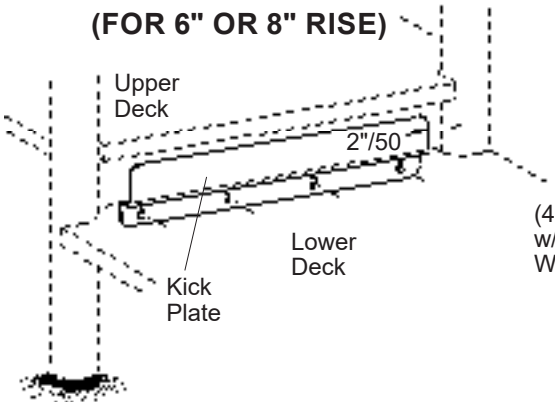
KICK PLATE
(FOR 16" RISE)



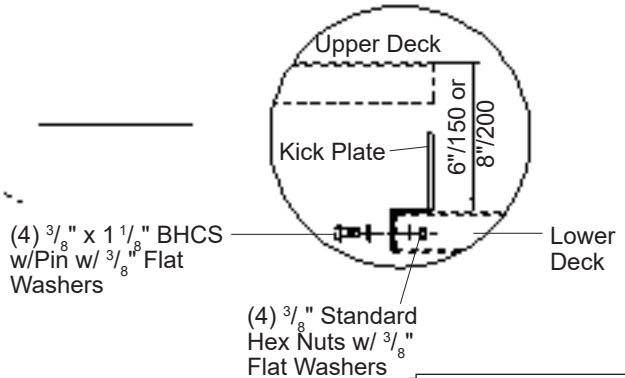
DETAIL
KICK PLATE ATTACHMENT (FOR 16" RISE)



KICK PLATE
(FOR 6" OR 8" RISE)



DETAIL
KICK PLATE ATTACHMENT (FOR 6" OR 8" RISE)



NOTE: Kick Plates mount to face of lower deck.

PlayBooster® 121948 Kick Plates, Tenderdecks, 6", 8" & 16"

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 121948 Kick Plates, Tenderdecks, 6", 8" & 16"

Parts List

Part#	Description	Qty.
121819	Kick Plate (For 6" or 8" Rise), Specify Color	1
121818	Kick Plate (For 16" Rise), Specify Color	1
100198	$^3/_8$" x 1 $^1/_8$" BHCS w/Pin, SST	4
100327	$^3/_8$" Standard Hex Nut, SST	4
100362	$^3/_8$" Flat Washer, SST	8

Specifications

Kick Plate: Fabricated from 11 GA (.120") HR flat steel. Finish: TenderTuff™, brown or gray in color.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. $^1/_4$ man hour

Weight: Kick Plate (For 6" or 8" Rise) 13 lbs.
Kick Plate (For 16" Rise) 23 lbs.

Installation Instructions

1) Locate kick plates as labeled on your plan drawing.
2) Attach kick plate using $^3/_8$" x 1 $^1/_8$" BHCS w/pin with $^3/_8$" flat washers and $^3/_8$" standard hex nuts with $^3/_8$" flat washers, as shown. **NOTE:** *Kick plates mount to face of lower deck.*
3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

landscape structures®

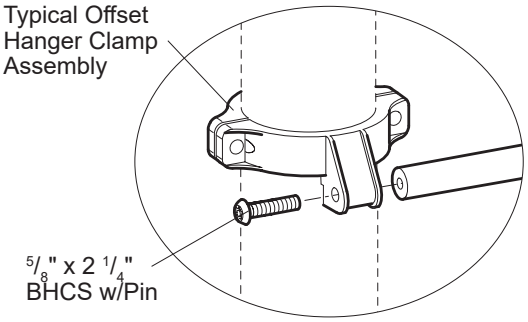
ISO 14001 CERTIFIED

ISO 9001 Certified

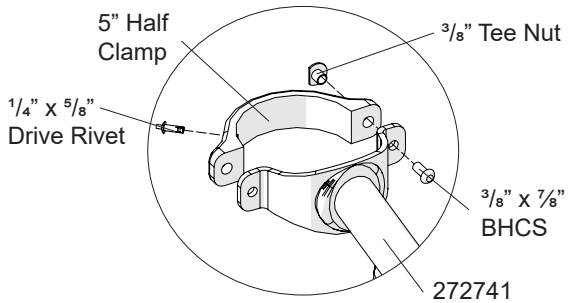
SAFETY NOTE

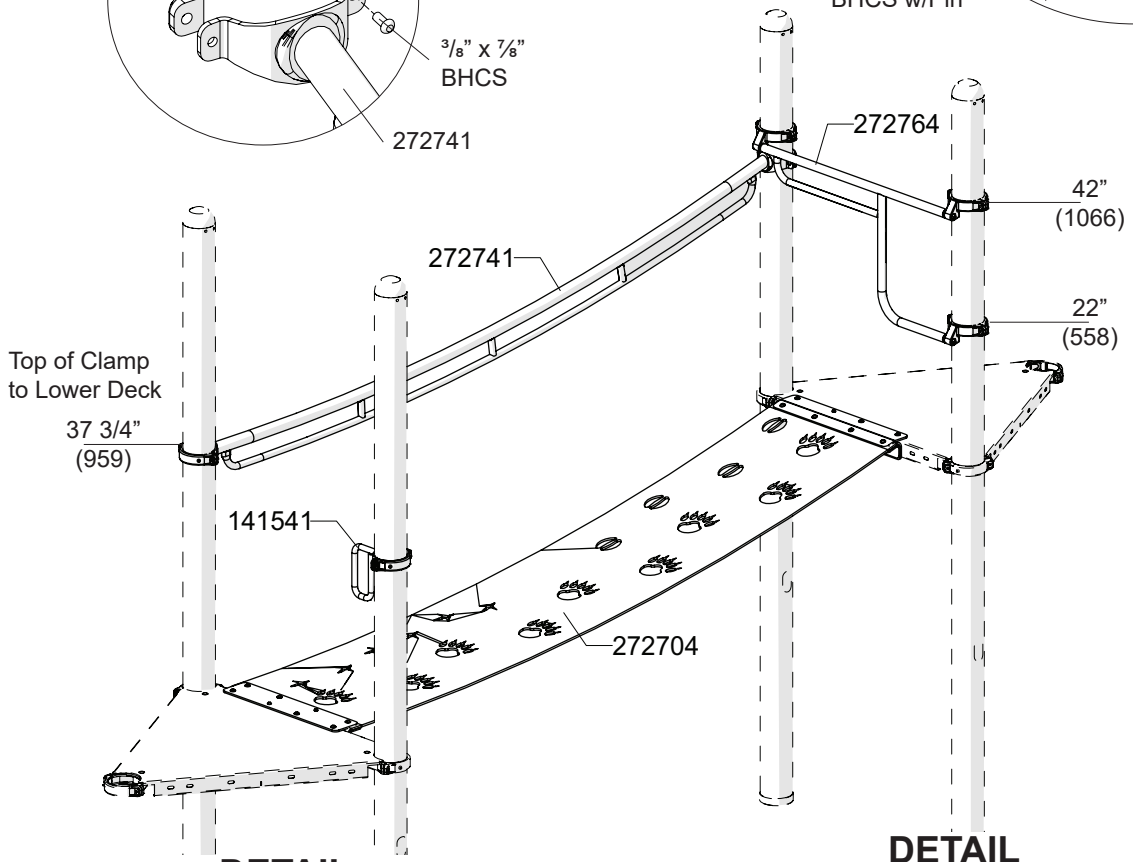
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
CLAMP ATTACHMENT

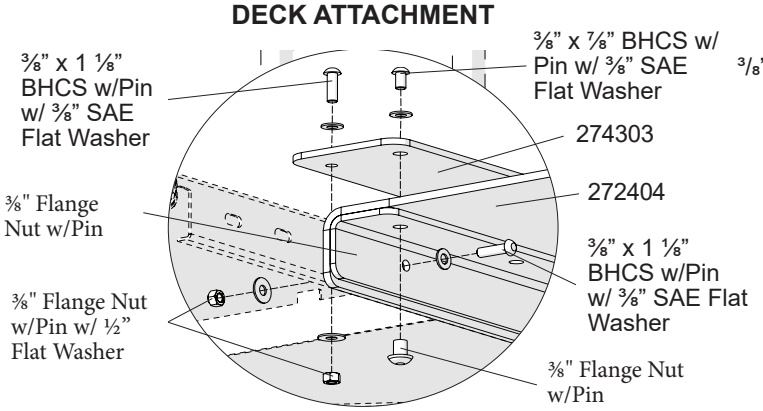


DETAIL
HANDRAIL CLAMP ATTACHMENT

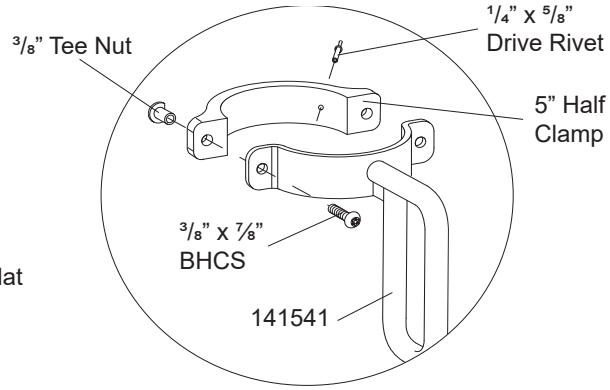




DETAIL
DECK ATTACHMENT



DETAIL
GRAB BAR ATTACHMENT



Custom 123" OC Belt Bridge w/ Railing

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

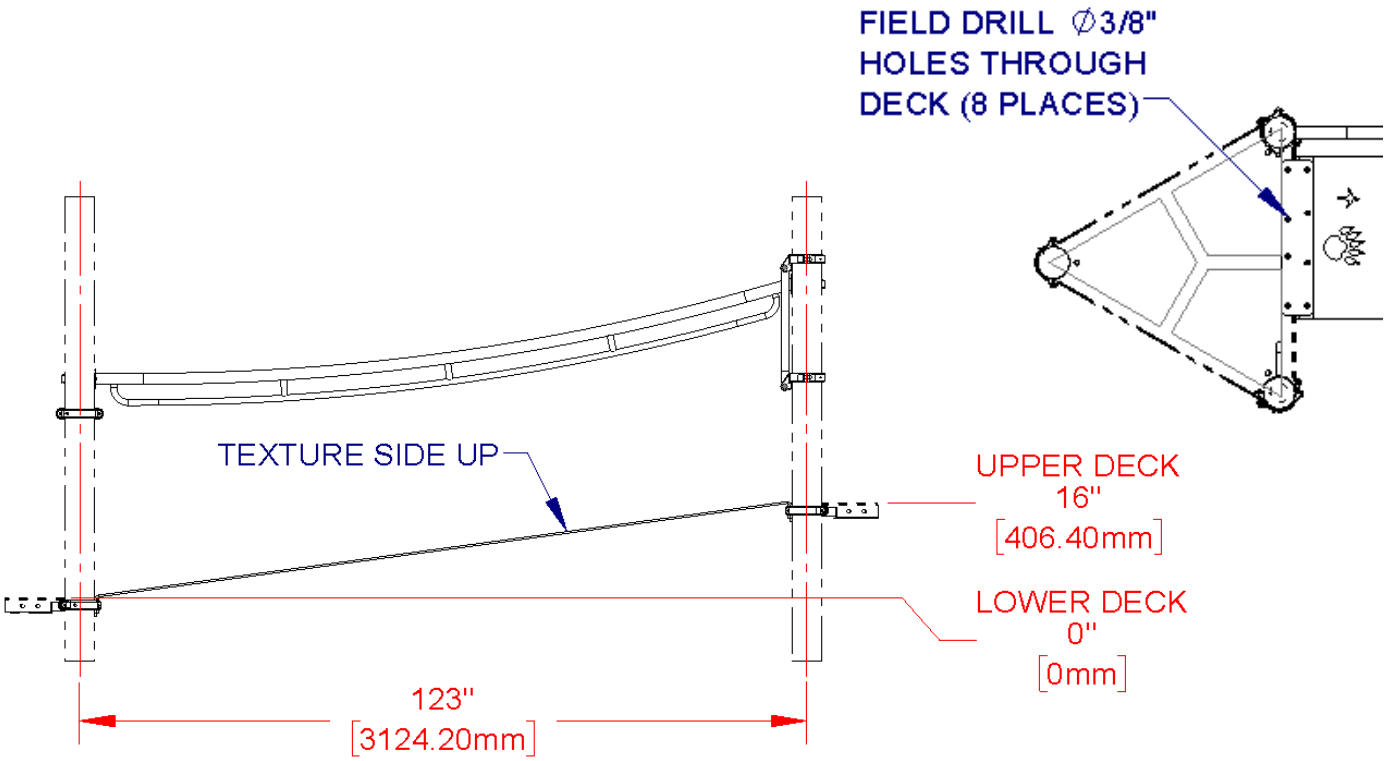
landscape structures®

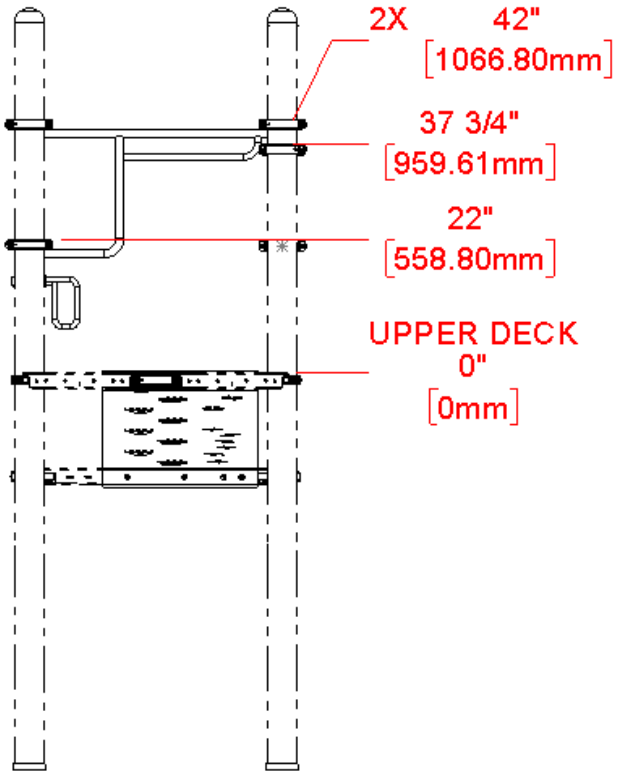
ISO 14001 CERTIFIED

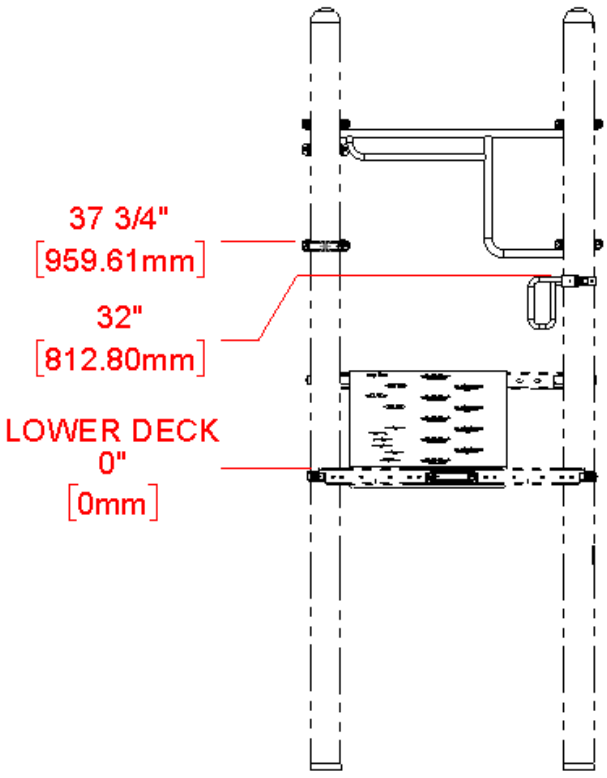
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)







Custom 123” OC Belt Bridge w/ Railing

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Parts List

PART NUMBER	DESCRIPTION	QTY.
274305	CUST BELT BRIDGE ATCH PLATE UPPER PNT	1
274303	CUST BELT BRIDGE ATCH PLATE LOWER PNT	1
274278	CUST BELT BRIDGE 26i ATCH BRKT LH PNT	1
274277	CUST BELT BRIDGE 26i ATCH BRKT RH PNT	1
272764	CUST GRAB RAIL SIT DOWN BAR PNT	1
272741	CUST HANDRAIL 123i 16i RISE PNT	1
272704	CUST 26i WIDE 123i OC ANIMAL TRACK BELT	1
141541	GRAB BAR PVC PB	1
113729	CLAMP OFFSET 5 RAIL HGR	3
113027	BHCS 6LP 3/8x1-3/8i SST	8
105327	CLMP HALF 5 AL	5
105327	CLMP HALF 5" AL	1

PART NUMBER	DESCRIPTION	QTY.
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	6
100365	WASHER FLAT SAE 3/8i SST	24
100362	WASHER FLAT 3/8i SST	16
100353	FLG NUT 6LP 3/8-16 SST	8
100351	MOD T-NUT 3/8-16 SST	12
100327	HEX NUT STD 3/8-16 SST	16
100203	5/8 X 2 1/4 BHCS 6LP SST W/PATCH	3
100198	BHCS 6LP 3/8x1-1/8i SST	18
100196	BHCS 6LP 3/8x7/8i SST	2
100195	BHCS 6LP 3/8x5/8i SST	8

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.
2) Mount belt and attach bent bracket to side face of upper deck.
3) Mount belt and attach bent bracket to side face of lower deck.
4) Mount attach plates to top side of belt and bolt to bent brackets.
5) Field drill holes in deck top face and then fasten in place.
6) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 119 lbs

Custom 123” OC Belt Bridge w/ Railing

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

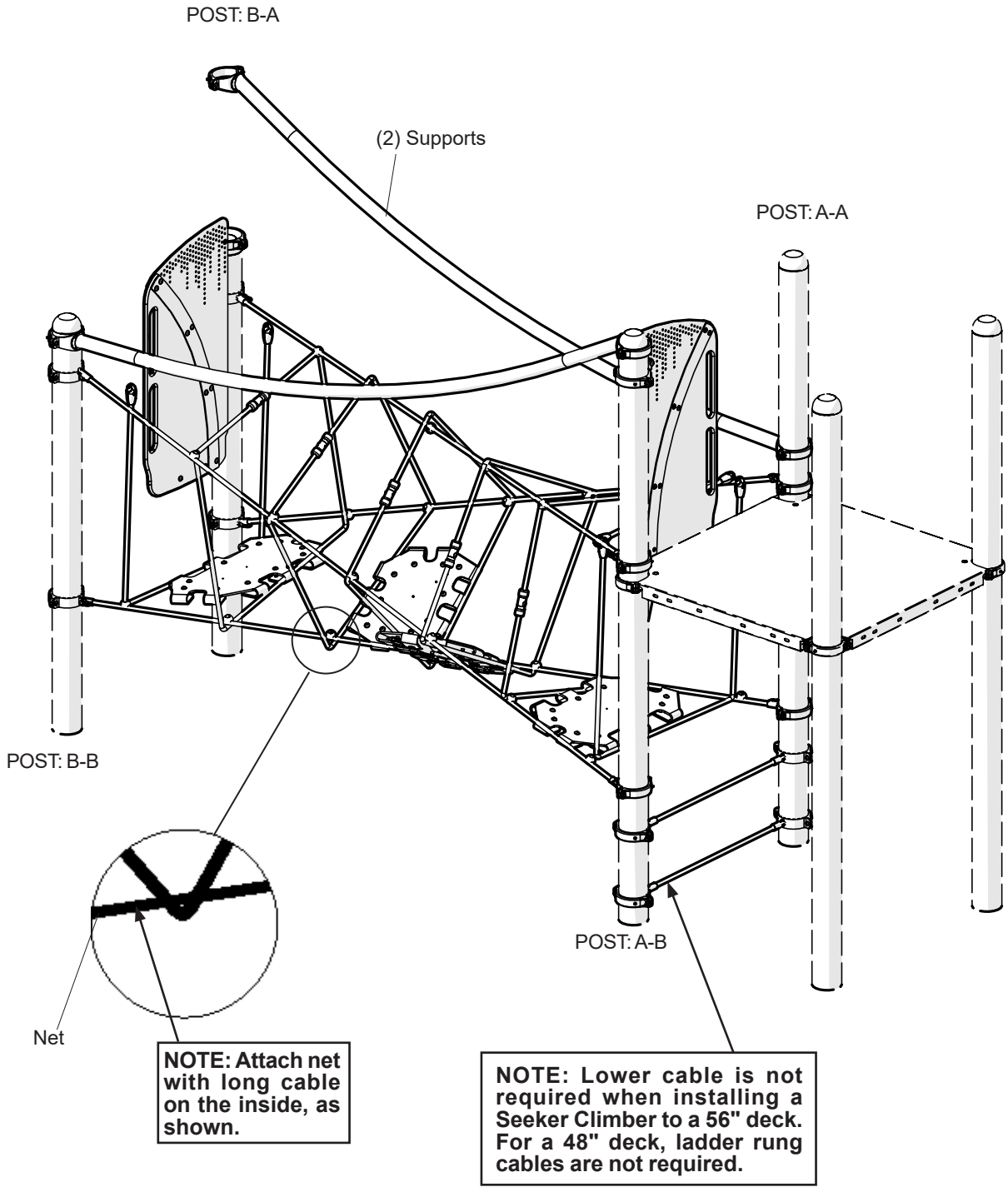
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

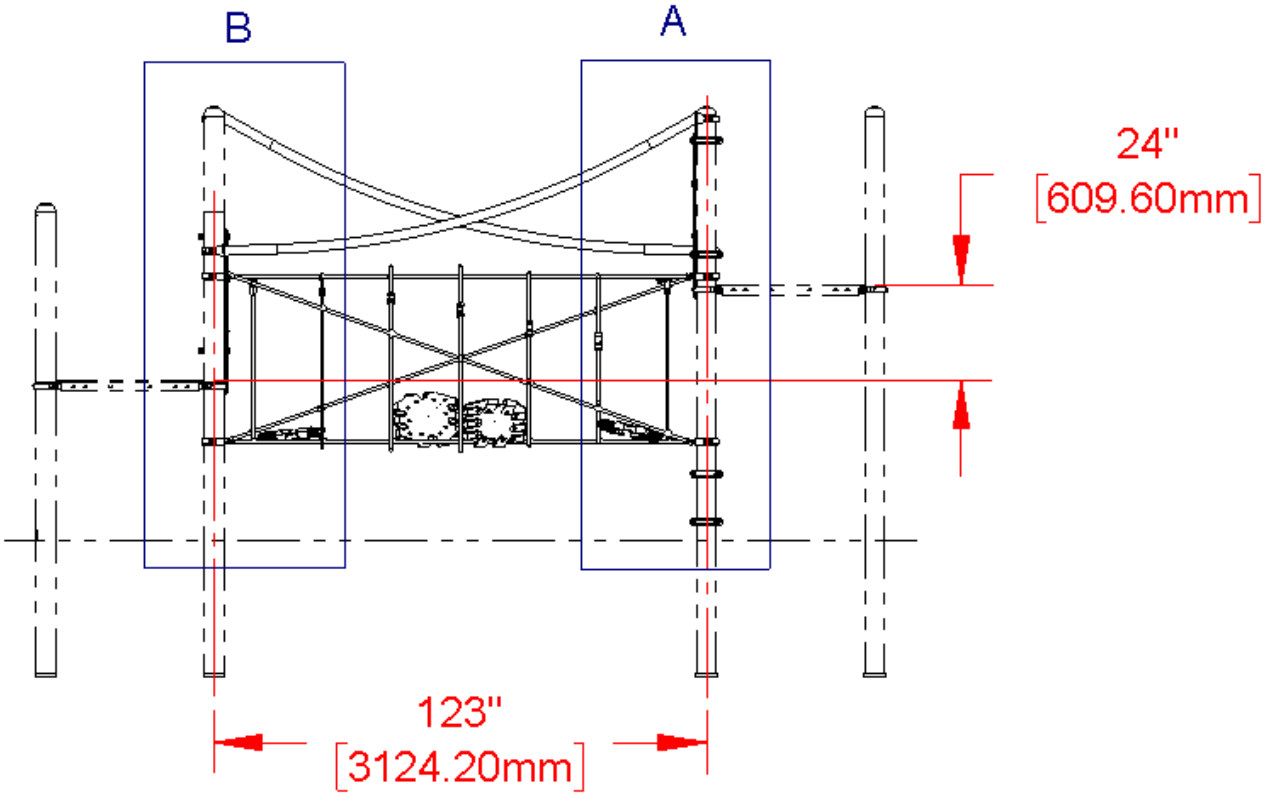
landscape structures®

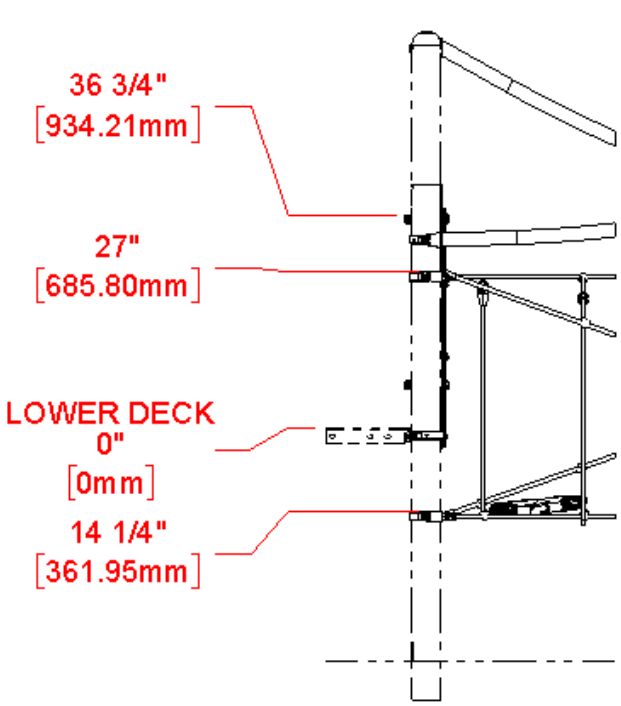
ISO 14001 CERTIFIED

ISO 9001 Certified

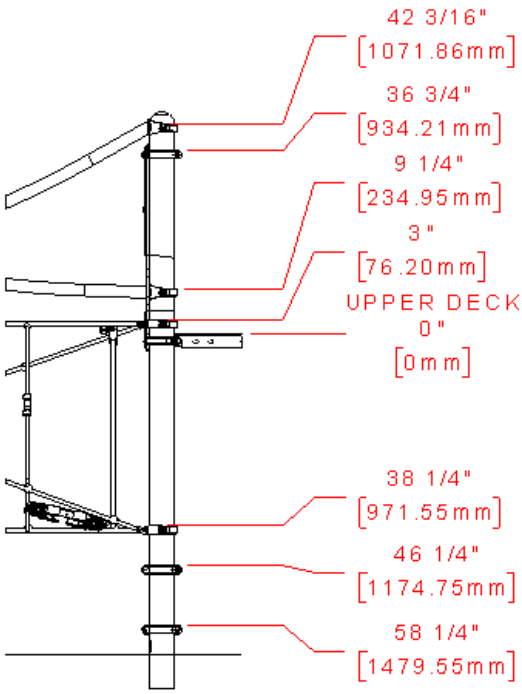
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)





DETAIL B



DETAIL A

Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

landscape structures®

ISO 14001 CERTIFIED

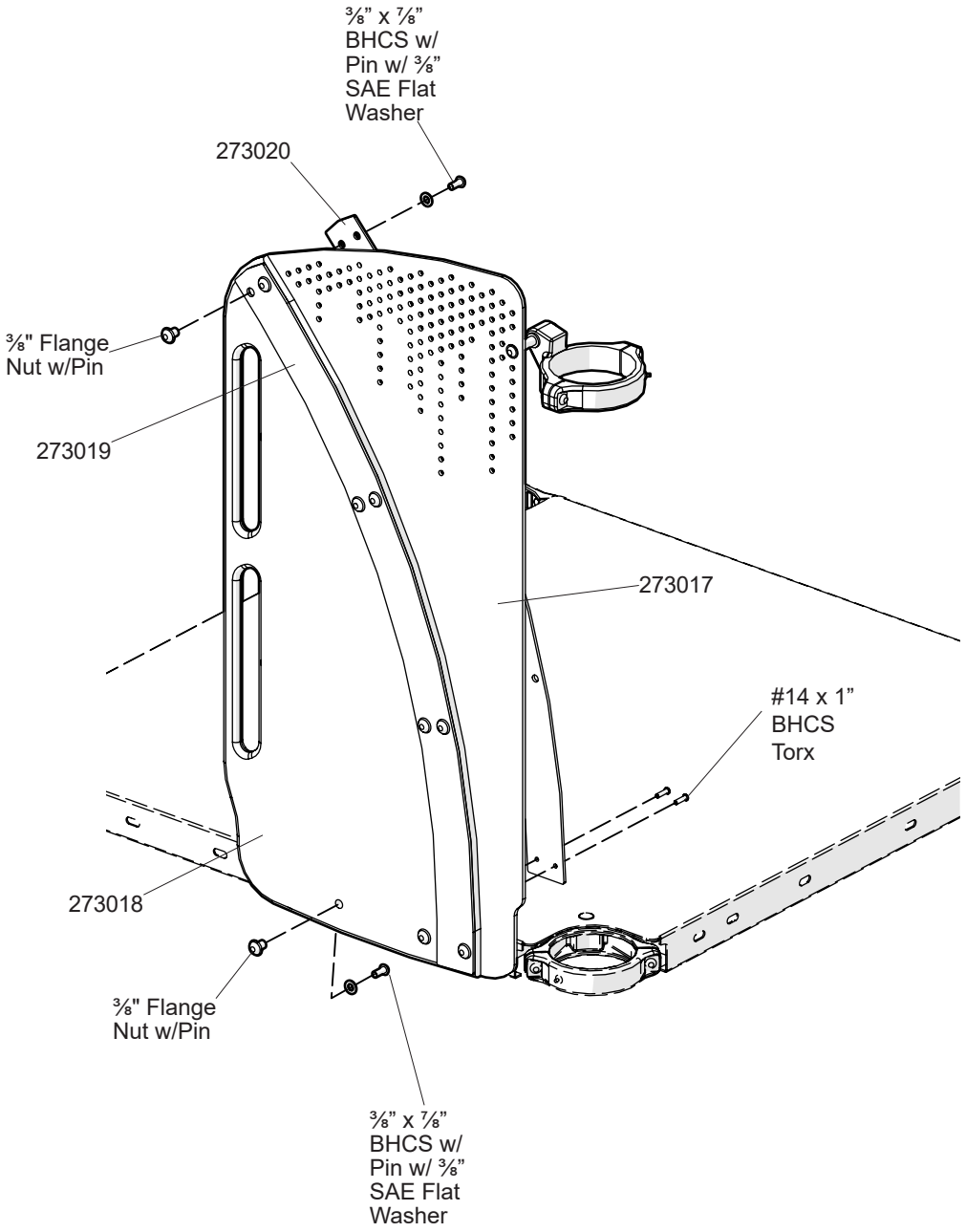
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL

BARRIER ATTACHMENT



601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

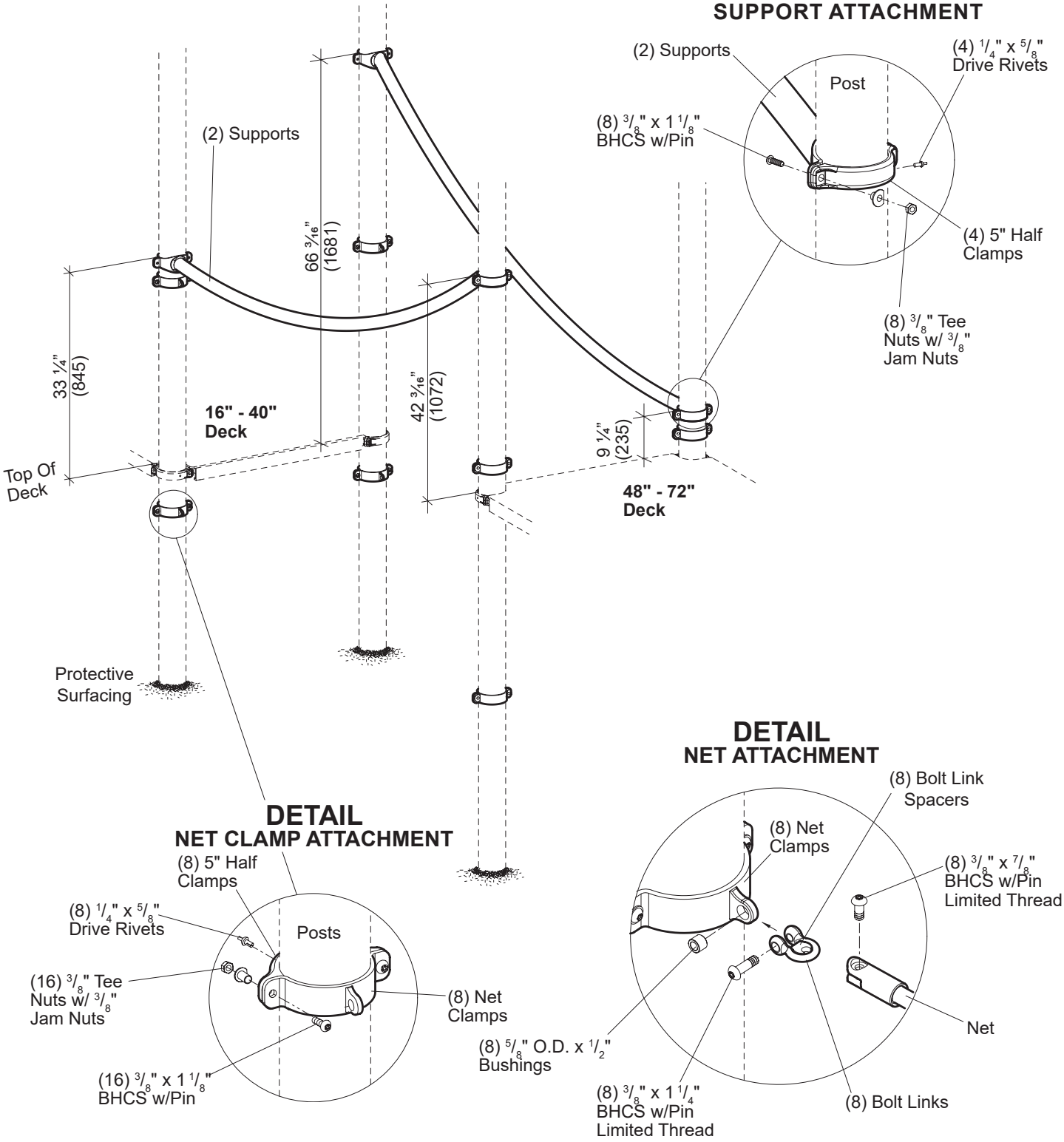
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



DETAIL
SUPPORT ATTACHMENT

DETAIL
NET CLAMP ATTACHMENT

DETAIL
NET ATTACHMENT

Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

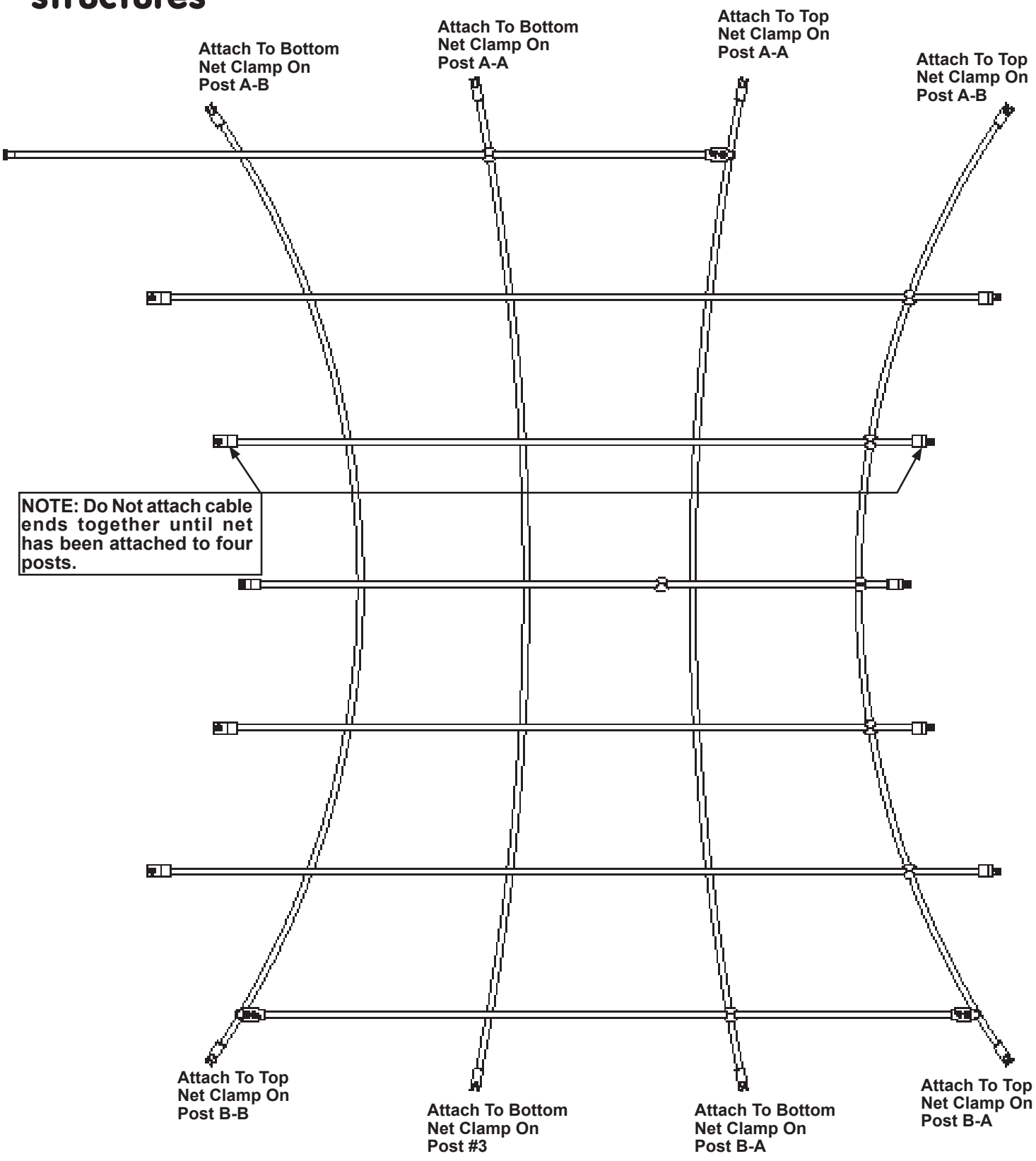
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

landscape structures®

ISO 14001 CERTIFIED

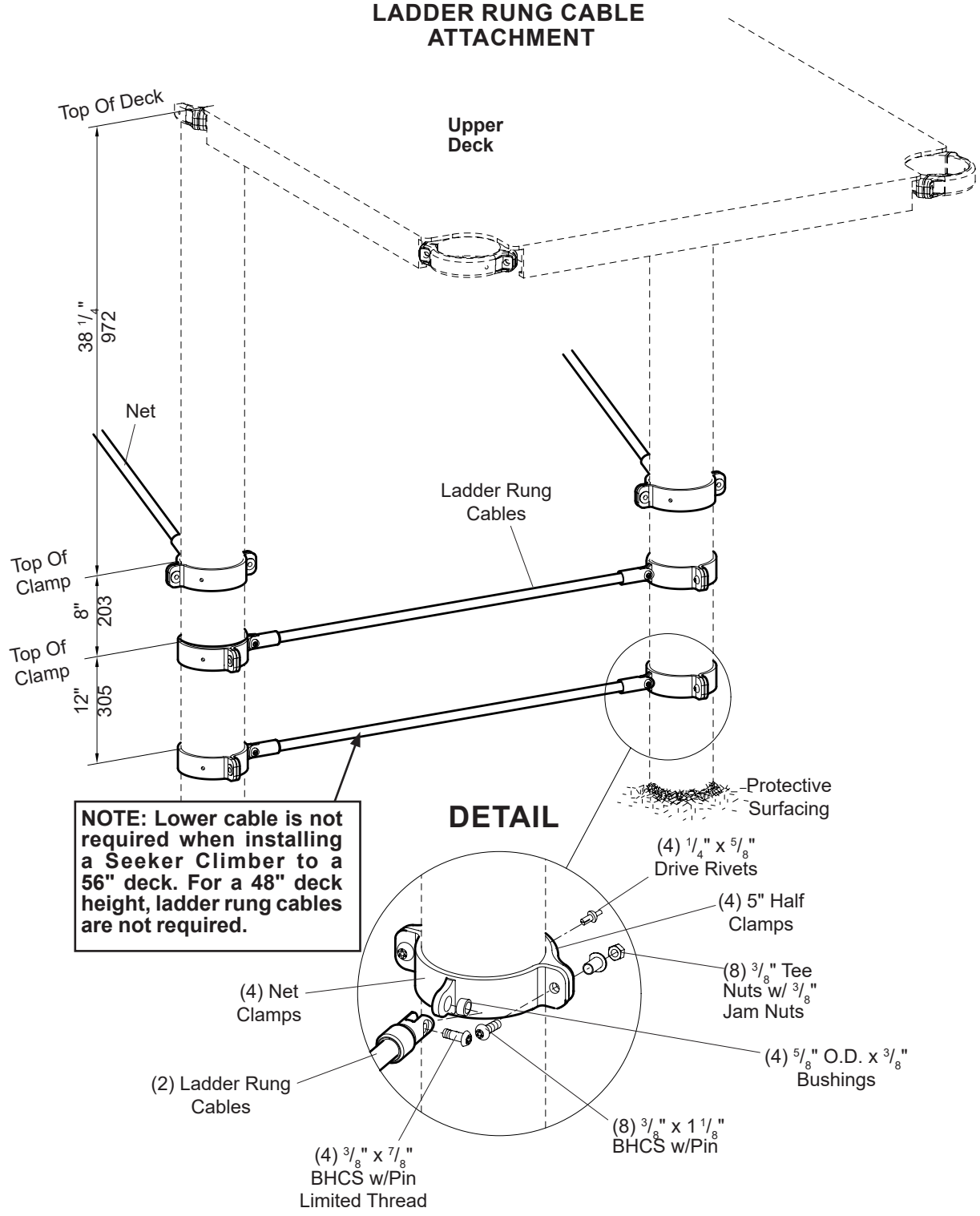
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL

LADDER RUNG CABLE ATTACHMENT



Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

landscape structures®

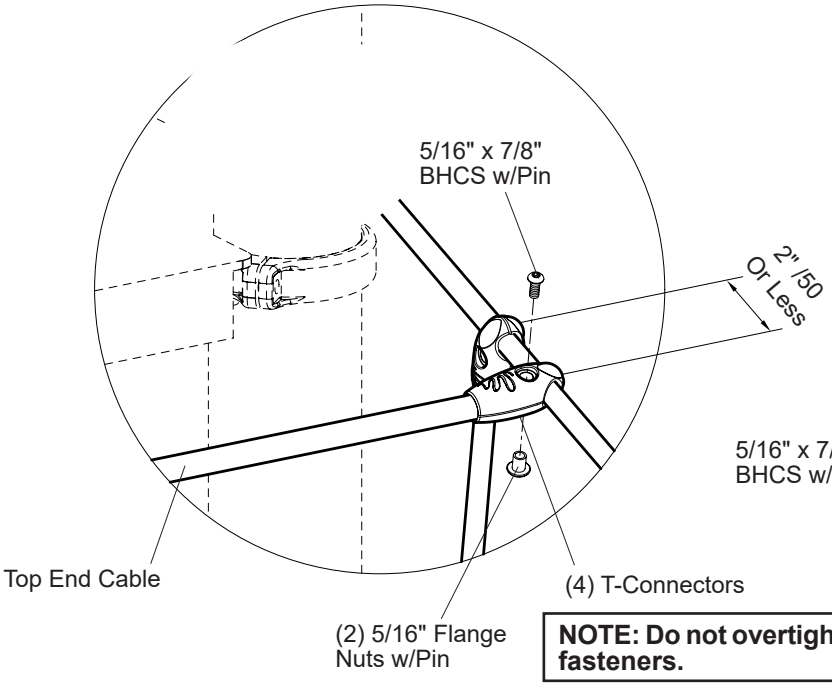
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

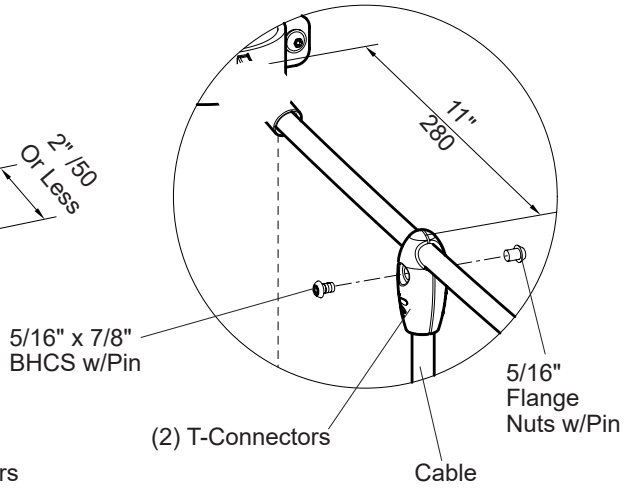
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
TOP END CABLE ATTACHMENT



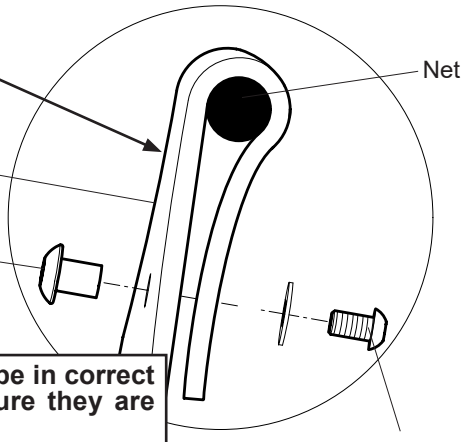
NOTE: Do not overtighten fasteners.

DETAIL
CABLE END ATTACHMENT



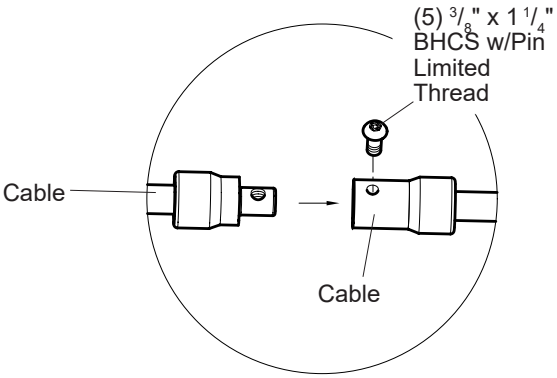
DETAIL
BELT ATTACHMENT

NOTE: Attach belt to net with textured side up.



NOTE: Belts must be in correct orientation to ensure they are installed properly.

DETAIL
CABLE TO CABLE CONNECTION



Custom Seeker Climber 24” Dk Diff. DGI

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Parts List

PART NUMBER	DESCRIPTION	QTY.
273020	CUST 3/4 HHOLD PNL ACCENT PLATE B PNT	2
273019	CUST 3/4 HHOLD PNL ACCENT PLATE A PNT	2
273018	CUST 3/4 HHOLD PNL PART B PERM	2
273017	CUST 3/4 HHOLD PNL PART A DGI	2
228424	Seeker Climber Belt Ball Knot Inne	2
228422	Seeker Climber Belt Ball Knot Oute	2
216761	#14 X 1 BHCS 6LP SST A THREAD	4
205507	LADDER RUNG CABLE	2
205506	Seeker Top End Cable	1
203696	BK SEEKER CLIMBER NET	1
196319	BOLT LINK SPACER	8
191086	T-CONNECTOR	6
190908	SEEKER CLIMBER SPRT PNT	2
175006	FLG NUT 6LP 5/16-18 SST	3
161898	PROPRIETARY NET CLMP	12
138915	BOLT LINK SST	8
132626	5/16 X 7/8 BHCS 6LP SST W/PATCH	3
128296	3/8-16 HEX JAM NUT SST	24
127463	BIT HEX TPP T-27 (TORX)	1
127179	BUSH 5/8OD X 3/8 LG SST	12
113729	CLAMP OFFSET 5 RAIL HGR	2
113468	TUBE 7/8OD X 1-11/16 PNT	2
105327	CLMP HALF 5 AL	18
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	18
100365	WASHER FLAT SAE 3/8i SST	52
100364	1/4 SAE WASHER	4
100362	WASHER FLAT 3/8i SST	40
100353	FLG NUT 6LP 3/8-16 SST	60
100351	MOD T-NUT 3/8-16 SST	36
100292	BHCS 6LP LTHD 3/8X1-1/4i SST W/PATCH (3/8" Thread)	13
100290	BHCS 6LP LTHD 3/8X7/8iSST	4
100198	BHCS 6LP 3/8x1-1/8i SST	28
100196	BHCS 6LP 3/8x7/8i SST	26
100195	BHCS 6LP 3/8x5/8i SST	40
100168	BHCS 6LP 3/8X3-1/4iSSTPAT	2

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference.

2) Install protective surfacing before users are allowed to play on the structure.

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

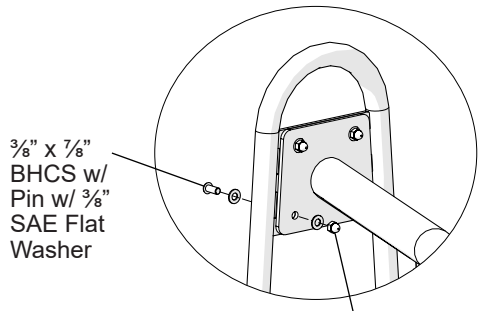
landscape structures®

ISO 14001 CERTIFIED

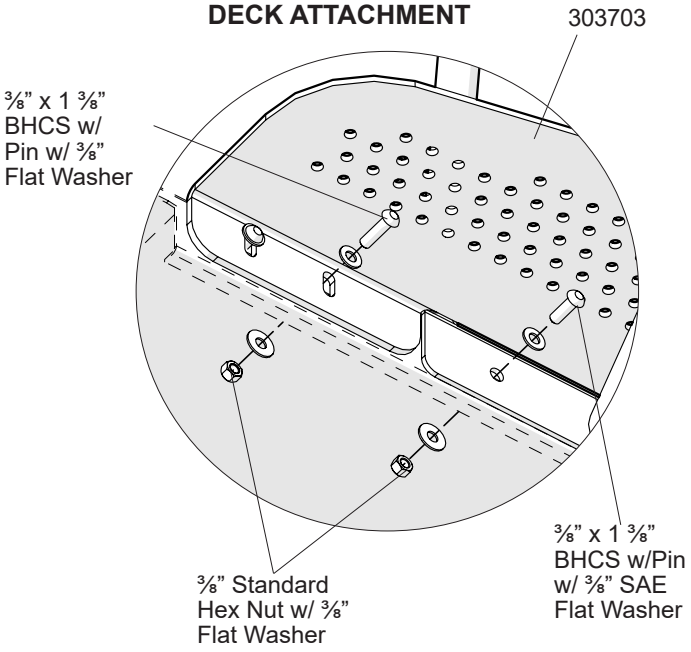
ISO 9001 Certified

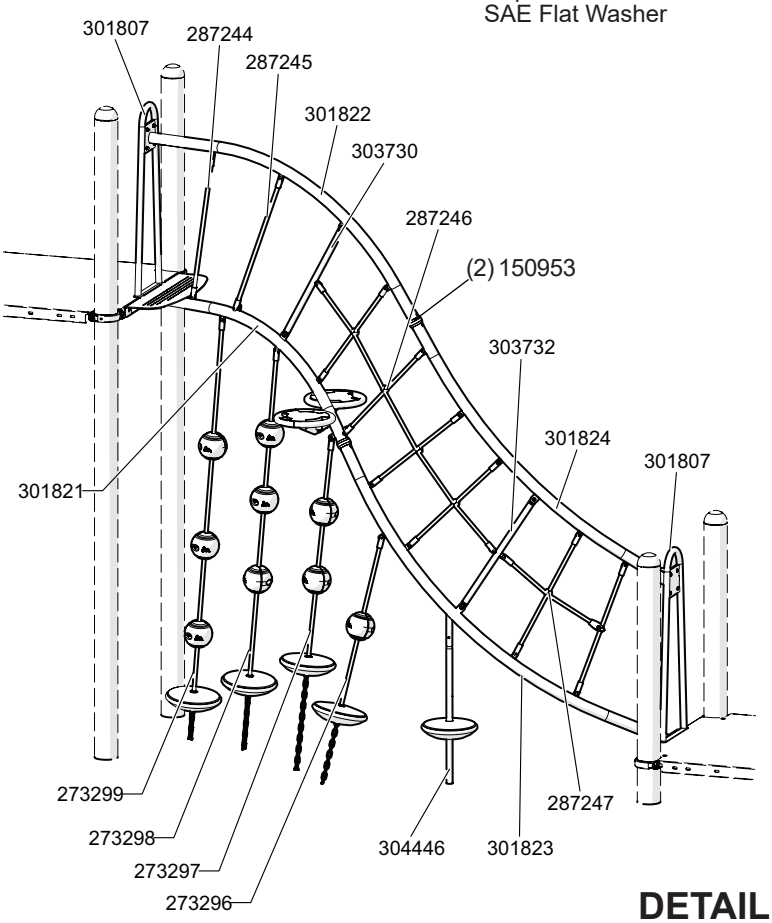
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

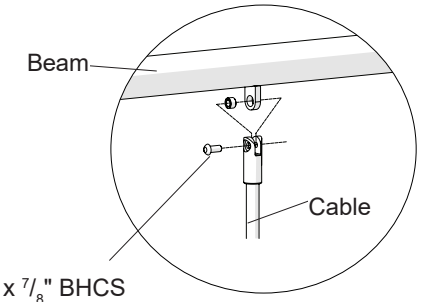


DETAIL
DECK ATTACHMENT

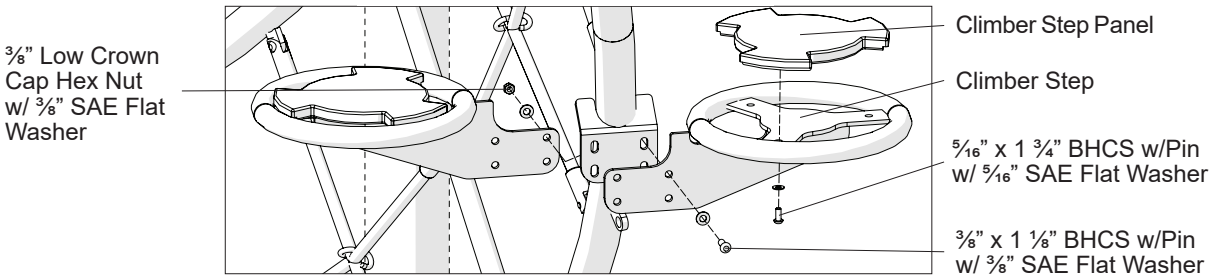




DETAIL
CABLE ATTACHMENT



DETAIL
CLIMBER STEP ATTACHMENT



Custom Vine Net Climber, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

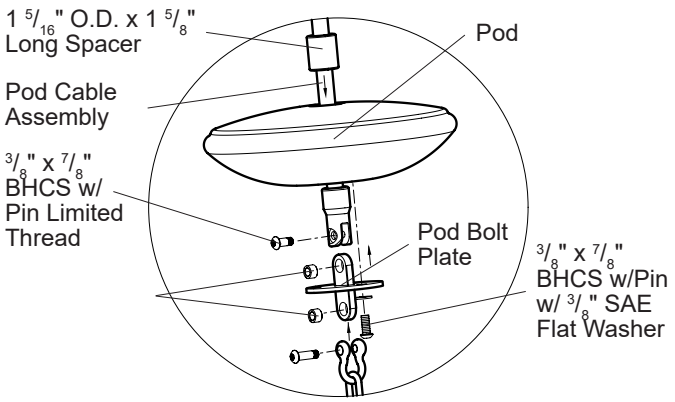
ISO 14001 CERTIFIED

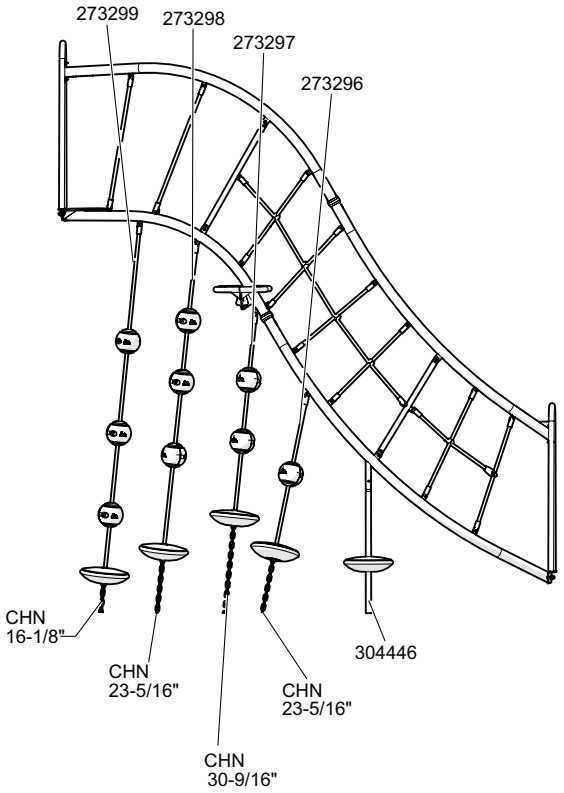
ISO 9001 Certified

SAFETY NOTE

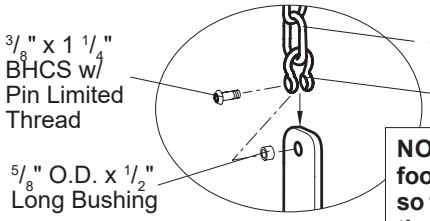
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
SWIGGLE STIX POD ATTACHMENT



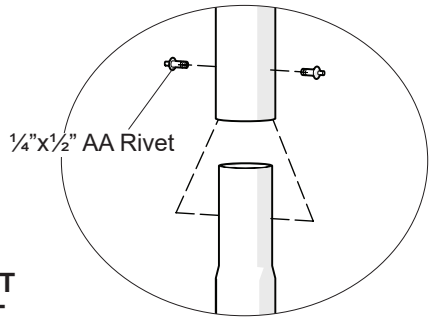


DETAIL
PLATE FOOTER ATTACHMENT

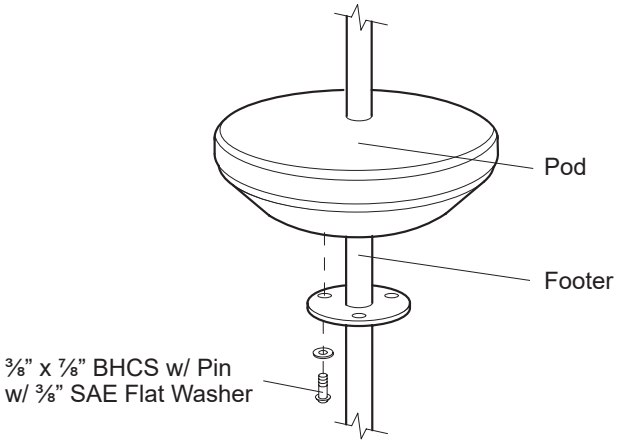


NOTE: The hole depth for the footer needs to be deep enough, so the footer plate doesn't contact the bottom of the hole. The weight of the concrete will force the footer plate down, tightening the cable.

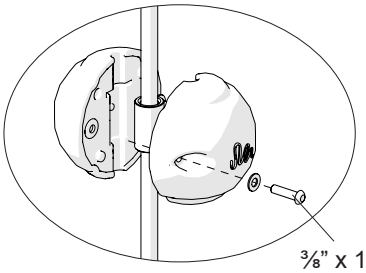
DETAIL
STATIONARY FOOTER EXTENSION ATTACHMENT



DETAIL
STATIONARY POD ATTACHMENT



DETAIL
SWIGGLEKNOT ATTACHMENT



Custom Vine Net Climber, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

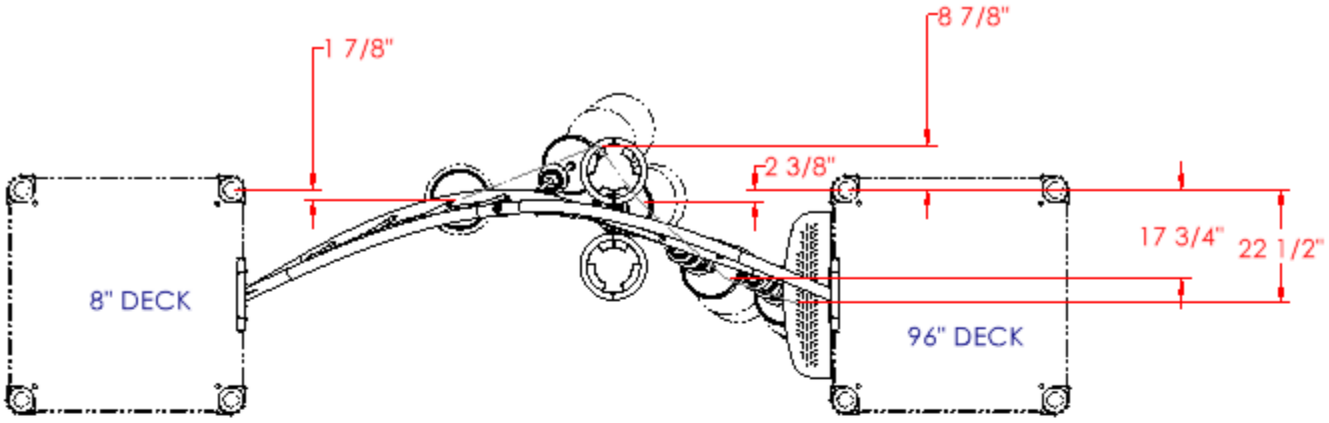
landscape structures®

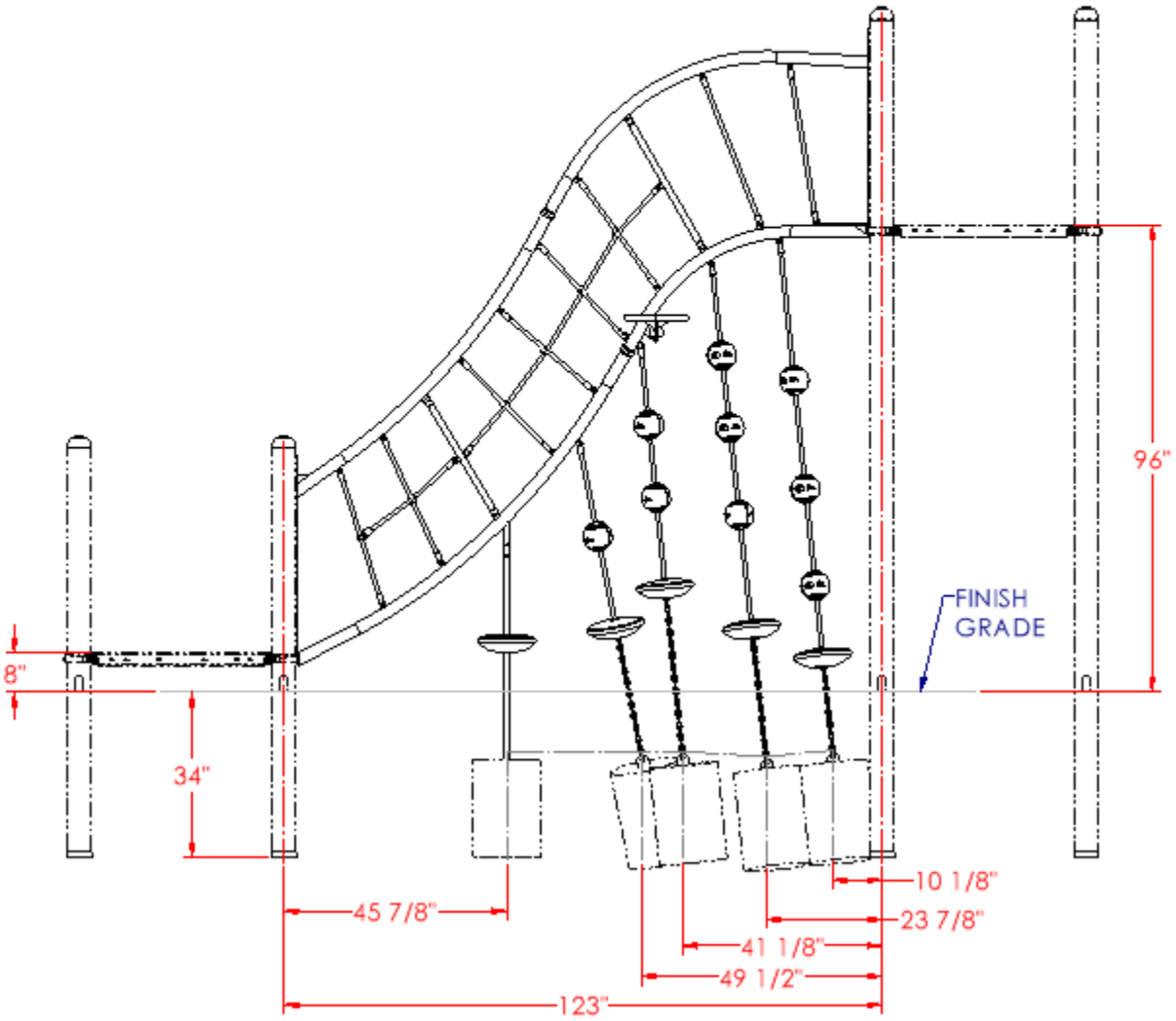
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)





Custom Vine Net Climber, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

ISO 14001 CERTIFIED

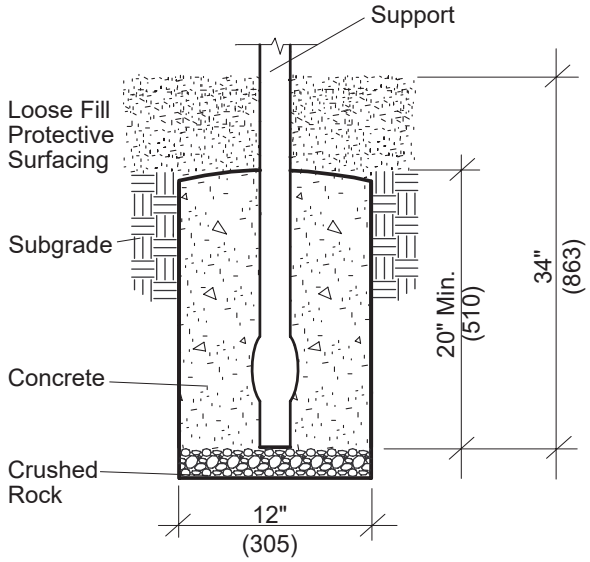
ISO 9001 Certified

SAFETY NOTE

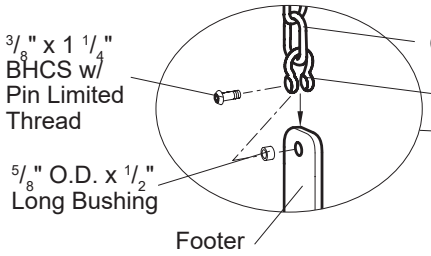
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
DIRECT BURY

IMPORTANT! Tension ropes/ nets before pouring concrete footings.



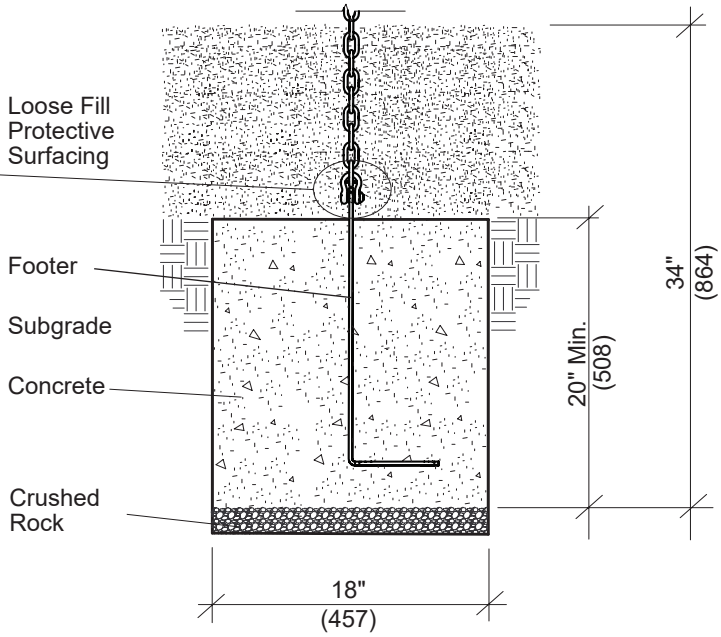
DETAIL
PLATE FOOTER ATTACHMENT



IMPORTANT! Tension ropes/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

DETAIL
DIRECT BURY



Custom Vine Net Climber, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Parts List

PART NUMBER	DESCRIPTION	QTY.
304446	POD FTR 65i LONG DB	1
303732	VINE CLMR SPRT	1
303730	VINE CLMR SPRT	1
303703	VINE CLMR LANDING PVC	1
303007	VINE CLMR STEP FRM	1
301824	VINE CLMR FRM	1
301823	VINE CLMR FRM	1
301822	VINE CLMR FRM	1
301821	VINE CLMR FRM	1
301807	VINE CLMR DECK FRM	2
287247	VINE NET CL LWR ROPE	1
287246	VINE NET CL MID ROPE	1
287245	VINE NET CL UPR 2 ROPE	1
287244	VINE NET CL UPR 1 ROPE	1
273299	SWIGGLE STIX POD 4 ROPE	1
273298	SWIGGLE STIX POD 3 ROPE	1
273297	SWIGGLE STIX POD 2 ROPE	1
273296	SWIGGLE STIX POD 1 ROPE	1
247871	SINGLE ROPE FOOTER HDG	4
228709	DECK CLMR 96i GRIPX STEP	2
223956	WASHER FLAT SAE 5/16i SST	6
223807	BHCS 6LP 5/16i -18 X 3/4i SST W/PATCH (for threaded inserts)	6
200441	CHN 1/4I P70 PGD, 30-9/16" 25 LINK	1
200438	CHN 1/4i P70 PGD, 23-5/16" 19 LINK	2
200435	CHN 1/4i P70 PGD, 16-1/8" 13 LINK	1
192748	CABLE BALL KNOT HALF	18
178586	SWIGGLE STIX SPACER TB	4
177932	POD BOLT PLATE	4
156962	BUSH 5/8 OD X 1/2 LG SST	8
154460	EVOS CLIMB ACROSS POD	5
150953	LADDER INSRT SLV PNT	2
148686	3/8 X 3/4 6LP SHCS SST W/PATCH	8
138915	BOLT LINK SST	8
127179	BUSH 5/8OD X 3/8 LG SST	27
113027	BHCS 6LP 3/8x1-3/8i SST	8
100609	RVT 1/4X3/16 AA (GRIP=.141/.234)	2
100365	WASHER FLAT SAE 3/8i SST	65
100362	WASHER FLAT 3/8i SST	12
100349	3/8 HEX NUT L/C CAP	12
100327	HEX NUT STD 3/8-16 SST	8
100292	BHCS 6LP LTHD 3/8X1-1/4i SST W/PATCH (3/8" Thread)	8
100290	BHCS 6LP LTHD 3/8X7/8iSST	27
100198	BHCS 6LP 3/8x1-1/8i SST	4
100196	BHCS 6LP 3/8x7/8i SST	27
100171	BHCS 6LP 3/8x1-1/2iSSTPAT	18

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Tree Tops™ Structure

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures

ISO 14001 CERTIFIED

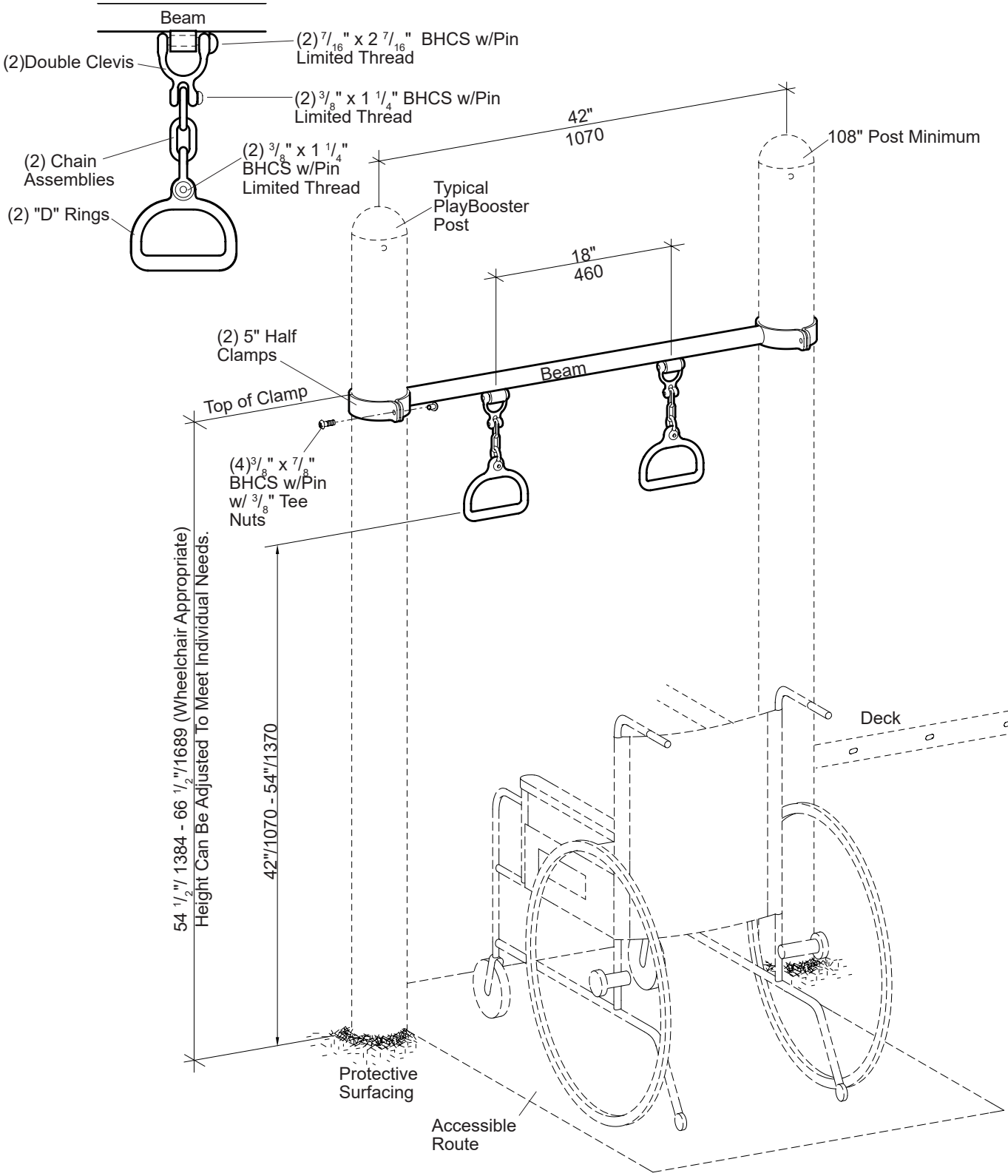
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

13114600

DETAIL



PlayBooster®

130873 Ring Pull

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 130873 Ring Pull

Parts List

Part#	Description	Qty.
130843	Ring Pull Beam, Specify Color	1
105327	5" Half Clamp, Specify Color	2
100610	1/4" x 5/8" Drive Rivet, AL/SST	2
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread,SST	2
108440	"D" Ring, Brown	2
128045	Chain Assembly, Brown	2
100196	3/8" x 7/8" BHCS w/Pin, SST	4
100292	3/8" x 1 1/4" BHCS w/Pin Limited Thread,SST	2
100351	3/8" Tee Nut, SST	4
138917	Double Clevis, SST	2
127068	7/16" x 2 7/16" BHCS w/Pin Limited Thread,SST	2

Specifications

Ring Pull Beam: Weldment comprised of 1.660" O.D. RS-20 (.085" - .095") galvanized steel tubing and 1/4" x 1 3/4" HRS clamps. Housings for double clevis are 1 1/4" O.D. x .312" wall steel tubing. SAE 841 dry bronze bushings are pressed into housings at factory. Finish: ProShield®, color specified.

"D" Rings: Cast from A356 aluminum alloy with a cast in place 841 bronze alloy bushing. Finish: Tender-Tuff™, brown in color.

Chain Assembly: 5/16" Low carbon steel straight link galvanized chain, with bolt link made from grade 316 stainless steel. Finish: TenderTuff, brown in color.

Double Clevis: Stainless Steel.

Half Clamp: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1 man hour

Weight: 15 lbs.

Max. Fall Height: 55" - 67" (1,40 m - 1,70 m)

Installation Instructions

1) Attach double clevis to housings on beam using 7/16" x 2 7/16" BHCS w/pin limited thread bolts. Attach chain assembly to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread bolts. Attach "D" ring with bolt link to chain assembly using 3/8" x 1 1/4" BHCS w/pin limited thread bolt.
2) Mark posts for the appropriate height.
3) Lift beam into position and attach to posts using 5" half clamps, 3/8" x 7/8" BHCS w/pin and 3/8" tee nuts.
4) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet.
5) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #52201 Document #14679600 replaces #14633400. Changed double clevis to SST.
Eco #54105 Updated specification for "D" Ring.

landscape structures

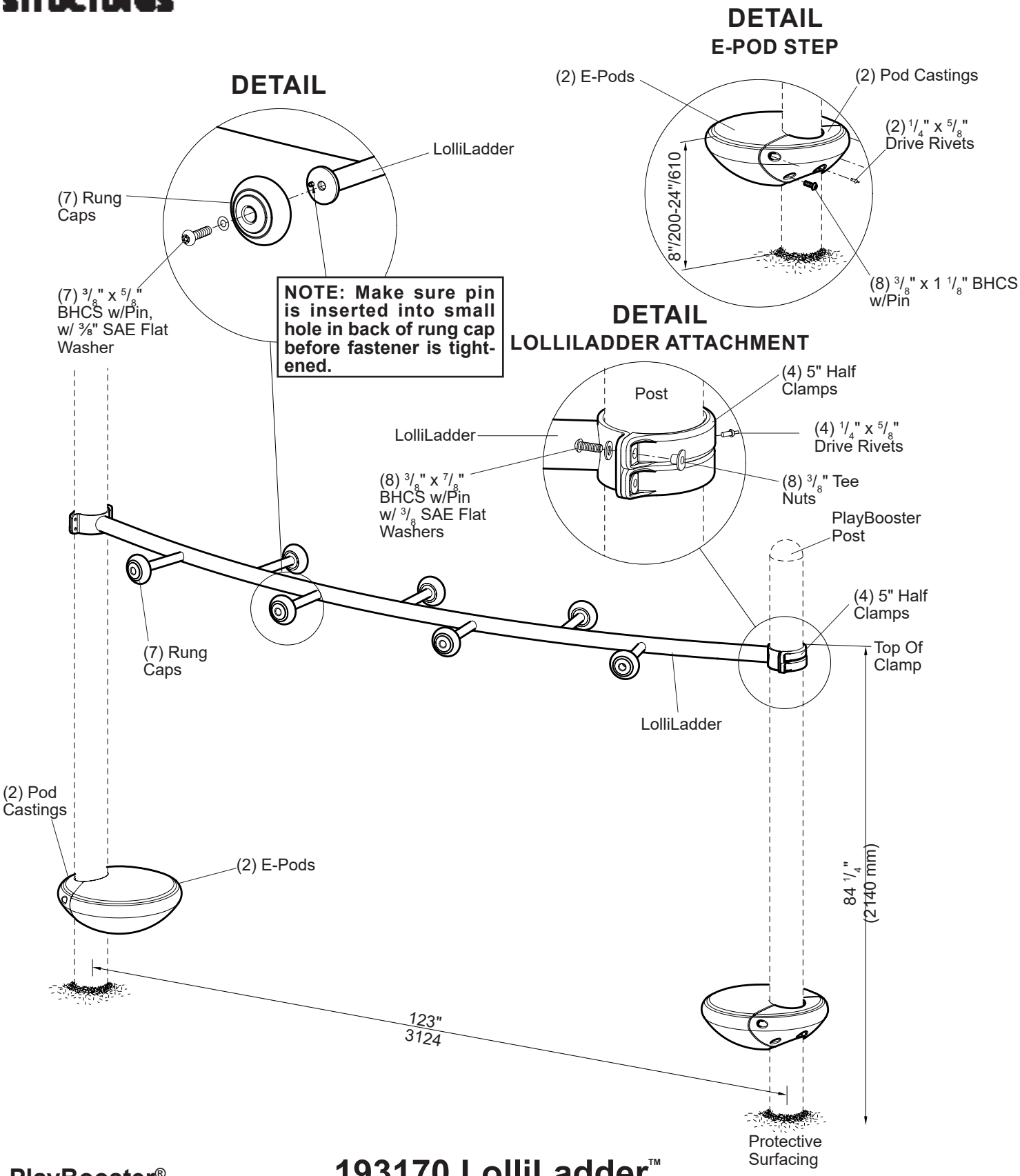
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

19496900



PlayBooster®

193170 LolliLadder™

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 193170 LolliLadder™

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
105327	5" Half Clamp, Specify Color	4
182262	Rung Cap, Black	7
190760	LolliLadder, Specify Color	1
154461	E-Pod, Specify Color	2
156806	Pod Casting, Specify Color	2
100196	3/8" x 7/8" BHCS w/Pin, SST	8
100195	3/8" x 5/8" BHCS w/Pin, SST	7
100351	3/8" Tee Nut w/Pin, SST	8
100365	3/8" SAE Flat Washer, SST	15
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100610	1/4" x 5/8" Drive Rivet, AL/SST	2

Specifications

LolliLadder: Weldment comprised of 1/4" (6,35 mm) stainless flat steel, 2.375" (60,33 mm) O.D. RS40 (.130"-.140") (3,30 mm-3,55 mm) wall galvanized steel tubing, and 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,29 mm) wall galvanized tubing. Finish: ProShield®, color specified.. Finish: ProShield, color specified.

Rung Cap: EPDM, black in color.

E-Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Half Clamp: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2 1/4 man hours

Weight: 81 lbs.

Max. Fall Height: 69" -72" (1,75 m-1,82 m)

Installation Instructions

1) **(Direct Bury) Refer to the Site Plan for footing locations.**

2) Attach rung caps to LolliLadder. Refer to Detail. **NOTE:** *Make sure pin is inserted into small hole in back of rung cap before fastener is tightened.*

3) Attach LolliLadder to posts at height shown. Refer to LolliLadder Attachment Detail.

4) Attach e-pods and pod castings to post as shown, using 3/8" x 1 1/8" BHCS w/pin. Refer to E-Pod Step Detail.

5) Drill through hole in pod casting and into post with a 1/4" or "F" (only) drill bit. Insert 1/4" x 5/8" rivet in hole and hammer rivet pin in until it is flush with head.

6) Install 1/4" x 5/8" drive rivets in all 5" half clamps. Drill through hole in 5" half clamps and into 5" post with a 1/4" or “F” (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.

7) Install protective surfacing before users are allowed to play on the structure.

landscape structures

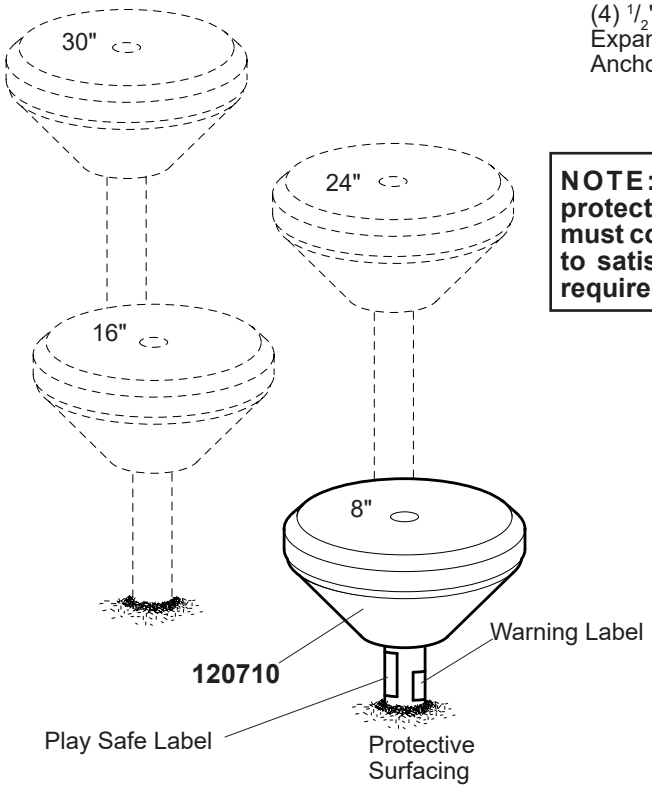
ISO 14001 CERTIFIED

ISO 9001 Certified

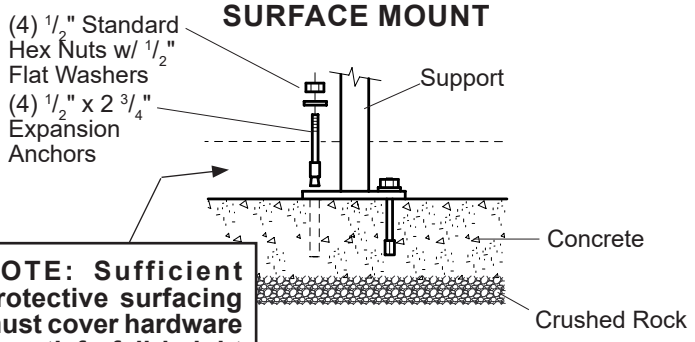
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

18381300

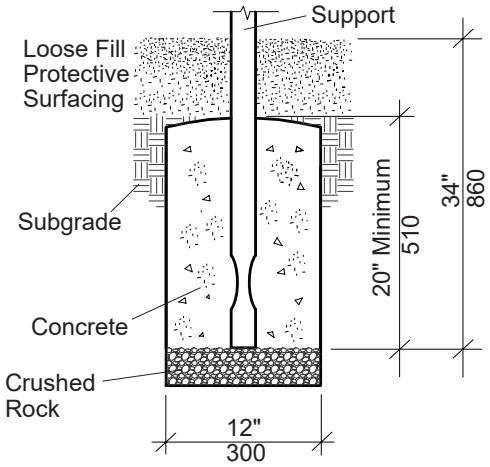


DETAIL
SURFACE MOUNT

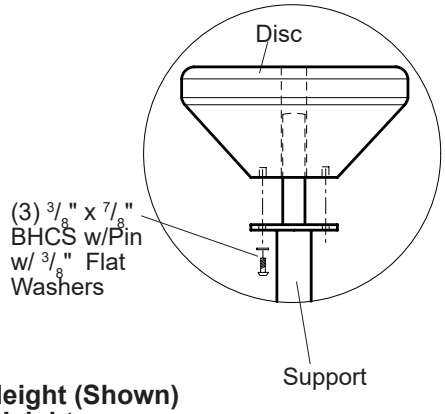


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

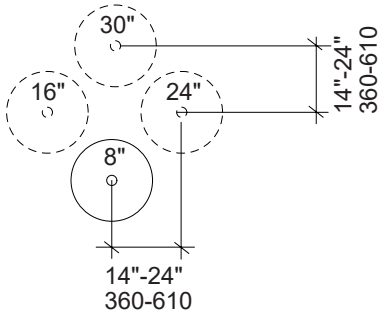
DETAIL
DIRECT BURY



DETAIL
DISC ATTACHMENT



PLAN VIEW/FOOTING LAYOUT
(Layout Varies - See Your Plan)



120710 8" Height (Shown)
158997 10" Height
120711 16" Height
158998 20" Height
120712 24" Height
120713 30" Height

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

Parts List

Part#	Description	Qty.
126956	Disc, Specify Color	*
169340	Support 8" (SM), Specify Color	*
169339	Support 8" (DB), Specify Color	*
169342	Support 10" (SM), Specify Color	*
169341	Support 10" (DB), Specify Color	*
169344	Support 16" (SM), Specify Color	*
169343	Support 16" (DB), Specify Color	*
156625	Support 20" (SM), Specify Color	*
156627	Support 20" (DB), Specify Color	*
120605	Support 24" (SM), Specify Color	*
120601	Support 24" (DB), Specify Color	*
153987	Support 30" (SM), Specify Color	*
153988	Support 30" (DB), Specify Color	*
100196	3/8" x 7/8" BHCS w/Pin, SST	3
100365	3/8" Flat Washer, SST	3
156847	Play Safe Label, 5-12 Yrs.	1
183064	Warning Label	1
100266	1/2" x 2 3/4" Expansion Anchor	4
100322	1/2" Standard Hex Nut, SST	4
100363	1/2" Flat Washer, SST	4

DB = Direct Bury
SM = Surface Mount
* = **Quantity Determined By Your Order**

Specifications

Disc: Rotationally molded from U.V. stabilized linear low density polyethylene, disc measures 14" in diameter x 7" high, color specified.

Support: Weldment comprised of 1.900" O.D. RS20 (.090" - .100" Wall), 1.315" O.D. RS20 (.080" - 090" Wall) and 3/16" x 5" diameter plate. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: SM - Approx. 1/2 man hour each
DB - Approx. 3/4 man hour each

Concrete Req.: Approx. 1.31 cu. ft. each

Weight: 8" - 12 lbs.
10" - 13 lbs.
16" - 14 lbs.
20" - 15 lbs.
24" - 15 lbs.
30" - 16 lbs.

Installation Instructions

1) **(Direct Bury)** Dig footing as shown. See your Plan View/Footing Layout.

2) Attach disc to support using 3/8" x 7/8" BHCS w/pin with 3/8" flat washers, as shown.

3) **(Direct Bury)** Position support in footing hole and pour concrete footing. With support post plumb, prop support to hold in position.

   (Surface Mount) Mark anchor bolt locations on concrete slab through holes in support plate. Remove disc climber. Drill 3" deep holes on marks into concrete slab using hammer drill and 1/2" masonry bit. Tap expansion anchors into holes and secure disc climber using 1/2" standard hex nuts with 1/2" flat washers.

4) Apply labels as shown.

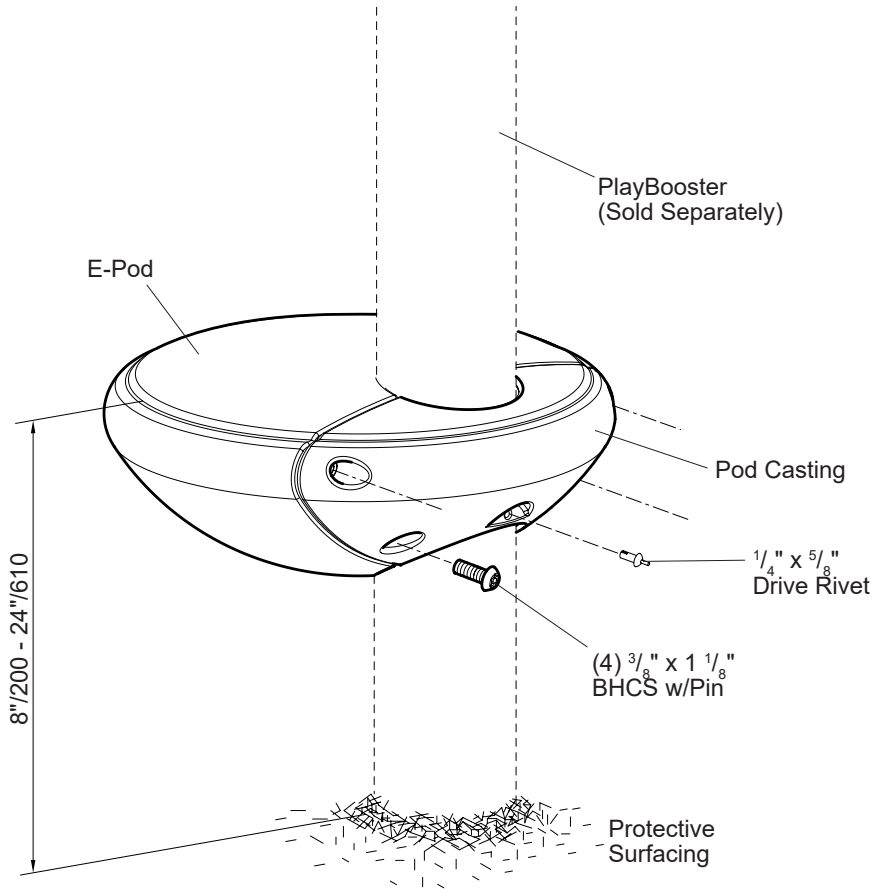
5) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

16681000



PlayBooster®

166809 E-Pod® Step

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 166809 E-pod® Step

Parts List

Part#	Description	Qty.
154461	E-Pod, Specify Color	1
156806	Pod Casting, Specify Color	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
100610	1/4" x 5/8" Drive Rivet, AL/SST	1

Specifications

E-Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/4 man hour
Weight: 11 lbs.
Fall Height: Pod Height

Installation Instructions

1) Attach e-pod and pod casting to post as shown, using 3/8" x 1 1/8" BHCS w/pin.
2) Drill through hole in pod casting and into post with a 1/4" or "F" (only) drill bit. Insert 1/4" x 5/8" rivet in hole and hammer rivet pin in until it is flush with head.
3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

landscape structures

ISO 14001 CERTIFIED

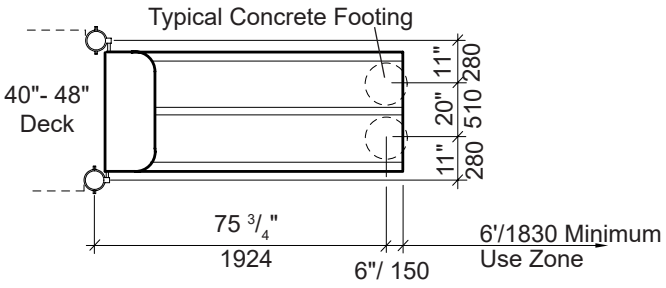
ISO 9001 Certified

SAFETY NOTE

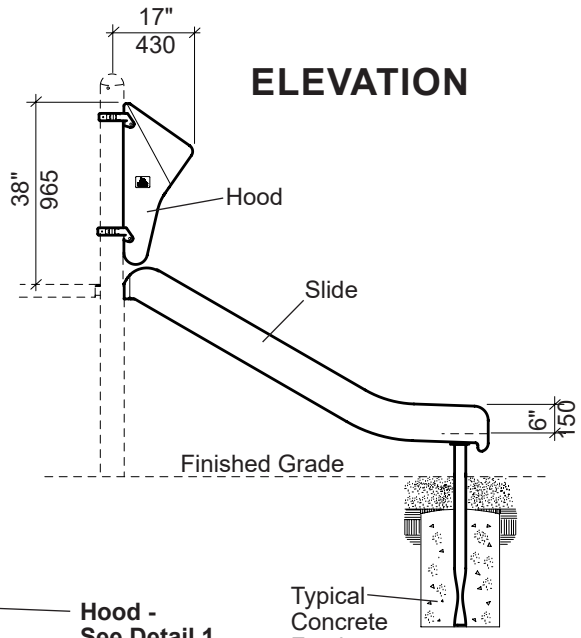
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

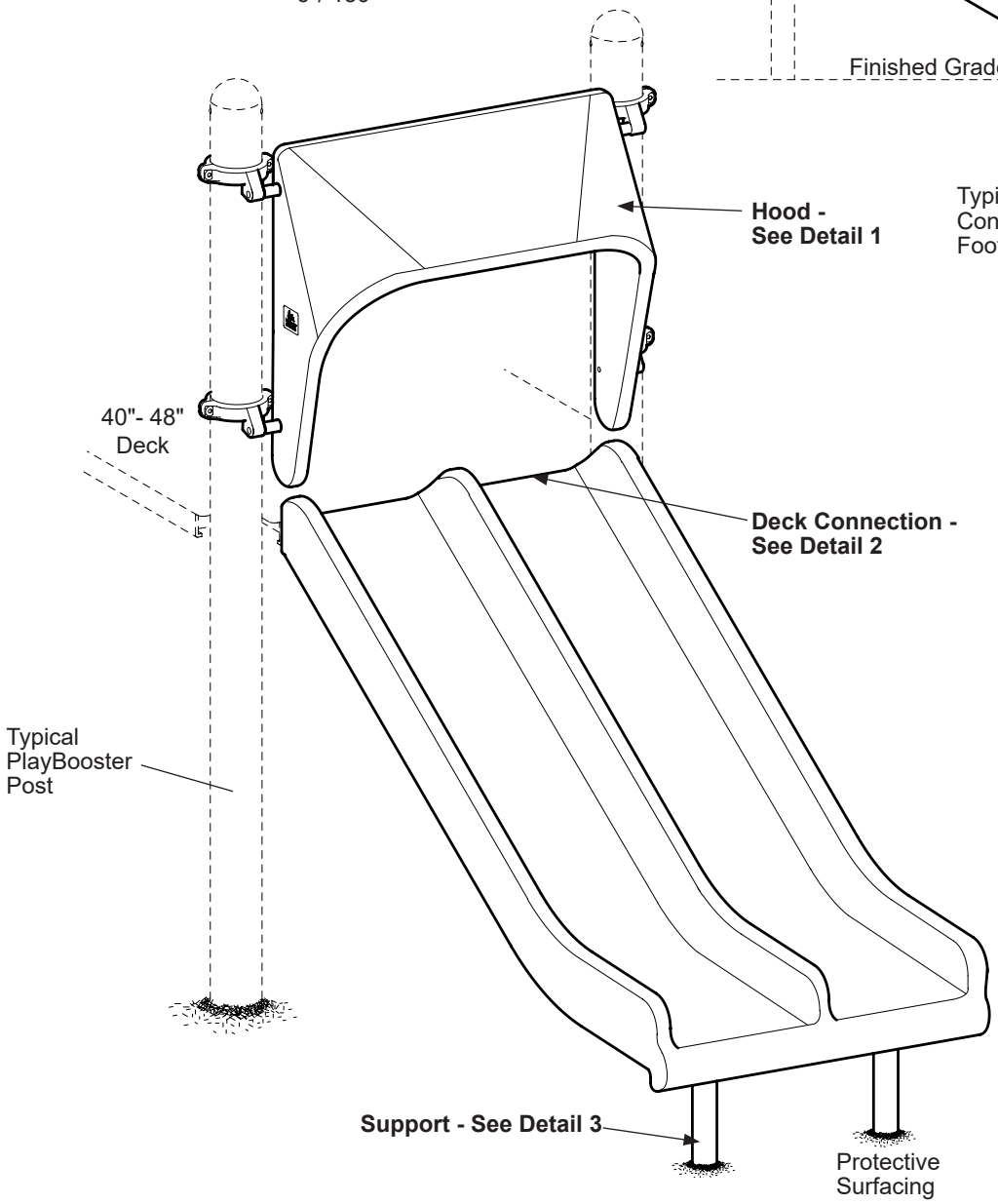
13320800

PLAN VIEW/FOOTING LAYOUT



ELEVATION





PlayBooster® 123331 Double Slide, 40"-48"

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 123331 Double Slide, 40"-48"

Parts List

Part#	Description	Qty.
127447	40"- 48" Double Slide , Specify Color	1
150941	Support, (DB), Specify Color	2
150996	Support, 40" Deck (SM), Specify Color	2
151003	Support, 48" Deck (SM), Specify Color	2
100583	40 7/16" Long Aluminum Rail, Specify Color	1
113468	Spacer Tube, Specify Color	2
105327	Half Clamp, Specify Color	4
113729	Offset Hanger Clamp, Specify Color	4
131987	Hood, Specify Color	1
132443	Rail Spacer, Specify Color	2
100196	3/8" x 7/8" BHCS w/Pin, SST	4
100362	3/8" Flat Washer, SST	8
100365	3/8" SAE Flat Washer, SST	4
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread Bolt, SST	4
111442	Rubber Bushing	4
100198	3/8" x 1 1/8" BHCS w/Pin, SST	8
100200	3/8" x 3 1/2" BHCS w/Pin, SST	2
100203	5/8" x 2 1/4" BHCS w/Pin, SST	2
100351	3/8" Tee Nut, SST	8
100362	3/8" Flat Washer, SST	2
100610	1/4" x 5/8" Drive Rivet, AL/SST	4
100266	1/2" x 2 3/4" Expansion Anchor	4
100322	1/2" Standard Hex Nut, SST	4
100363	1/2" Flat Washer, SST	4

DB = Direct Bury
SM = Surface Mount

Specifications

Slide: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Support: Weldment comprised of 2.375" O.D. RS20 (.095" - .105") galvanized steel tubing and 1/4" x 3" mounting plate. Finish: ProShield, color specified.

Hood: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Rail: Extruded from 1.125" O.D. x .312" W. 6061-T6 aluminum. Finish: ProShield, color specified.

Rail Spacer: Fabricated from 1.3125 O.D. x 16 Ga. (.065) steel tubing. Finish: ProShield, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8" O.D. x 1 11/16". Finish: ProShield, color specified.

Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 2.5 man hours
Concrete Req.: Approx. 2.4 cu. ft.
Area Req.: 6' (1,82 m) minimum use zone at exit
Weight: 136 lbs.
Fall Height: 40" Deck (1,02 m)
48" Deck (1,22 m)

Installation Instructions

1) **(Direct Bury)** Dig footings spaced as shown.

2) Insert 40 7/16" rail through top of hood, place rail spacer tube on each end of the 40 7/16" rail and attach to posts at height shown using offset hanger clamp assemblies. Refer to the Typical Offset Hanger Clamp Spec Sheet. Fasten bottom of hood to clamps using 3/8" x 3 1/2" BHCS w/pin, 3/8" flat washers and spacer tubes. Refer to Detail 1.

3) Attach supports to base of slide using 3/8" x 1 1/4" BHCS w/Pin limited thread bolts, 3/8" SAE flat washers, rubber bushings and 3/8" flat washers. Refer to Detail 3. **NOTE:** *Attach bolts in the center of the slots to allow for expansion and contraction. Snug bolts down only, do not over-tighten!*

4) Attach slide to the face of the deck using 3/8" x 7/8" BHCS w/Pin with 3/8" flat washers. Refer To Deck Connection Detail 2.

5) Install 1/4" x 5/8" drive rivets in all 5" half clamps, refer to the Typical Offset Hanger Clamp Spec Sheet.

6) **(Direct Bury)** With supports plumb pour concrete footings. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.

(Surface Mount) Mark anchor bolt locations on concrete slab through holes in anchor plate and remove slide. Drill 1/2" x 3" deep holes on marks into concrete using a hammer drill and 1/2" masonry bit. Tap expansion anchors into drilled holes. Reposition slide and reattach to the face of the deck following step 4. Fasten anchor plates to expansion anchors using 1/2" standard hex nuts with 1/2" flat washers.

7) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #0101379 Document #24808000 replaces #16108100. Lower location of slide hood.
Document #27511202

landscape structures

ISO 14001 CERTIFIED

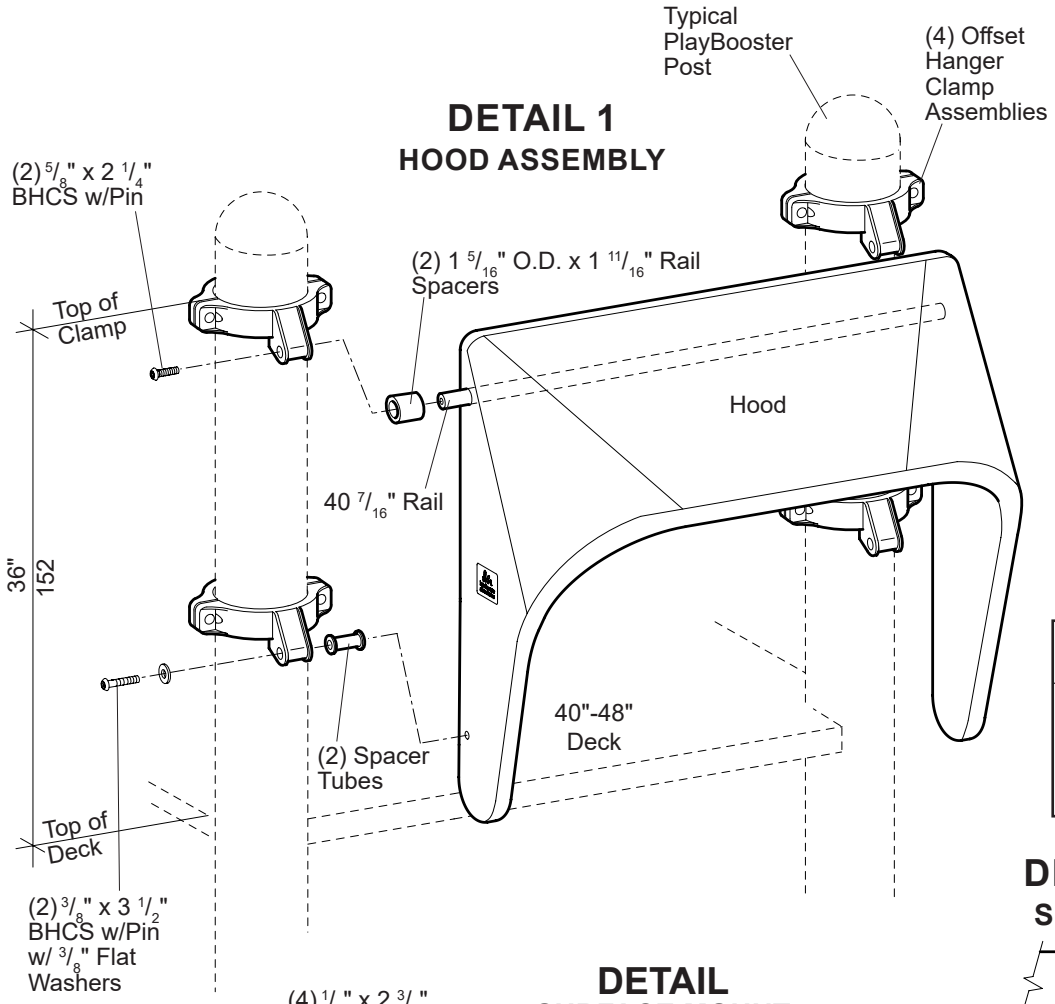
ISO 9001 Certified

SAFETY NOTE

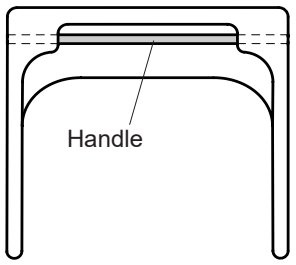
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

161080a

DETAIL 1
HOOD ASSEMBLY



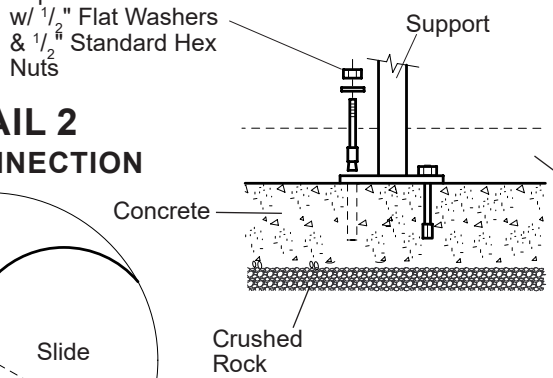
HOOD - HANDLE DETAIL



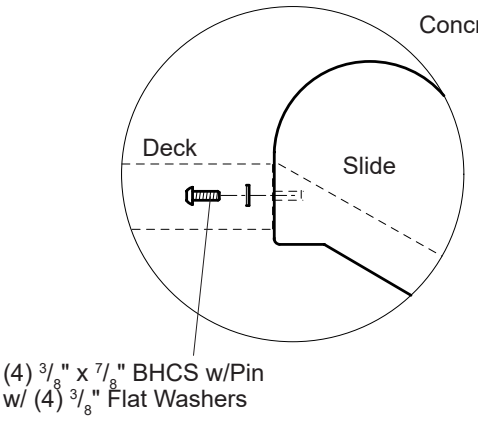
KEY:

Deck Hgt.	Dimension
40"	**A** = 6"/ 150
48"	**A** = 11"/ 280
40"	**B** = 36"/ 910
48"	**B** = 31"/ 790

DETAIL
SURFACE MOUNT

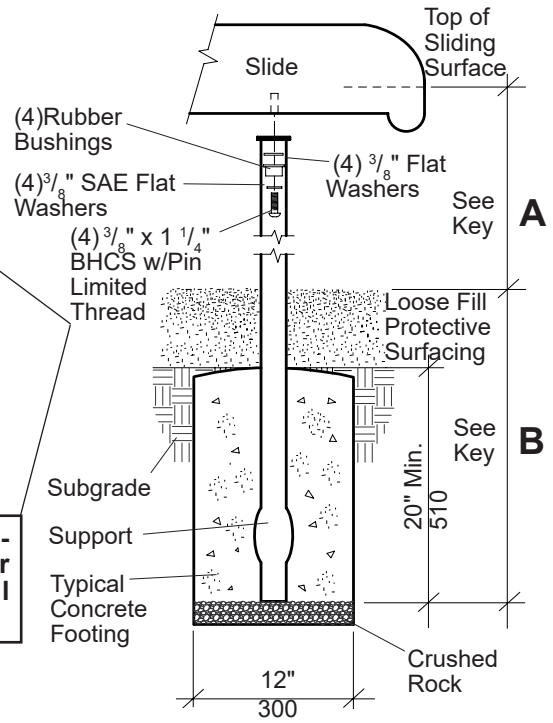


DETAIL 2
DECK CONNECTION



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL 3
SUPPORT



PlayBooster® 123331 Double Slide, 40"- 48"

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

Document #27511202

landscape structures

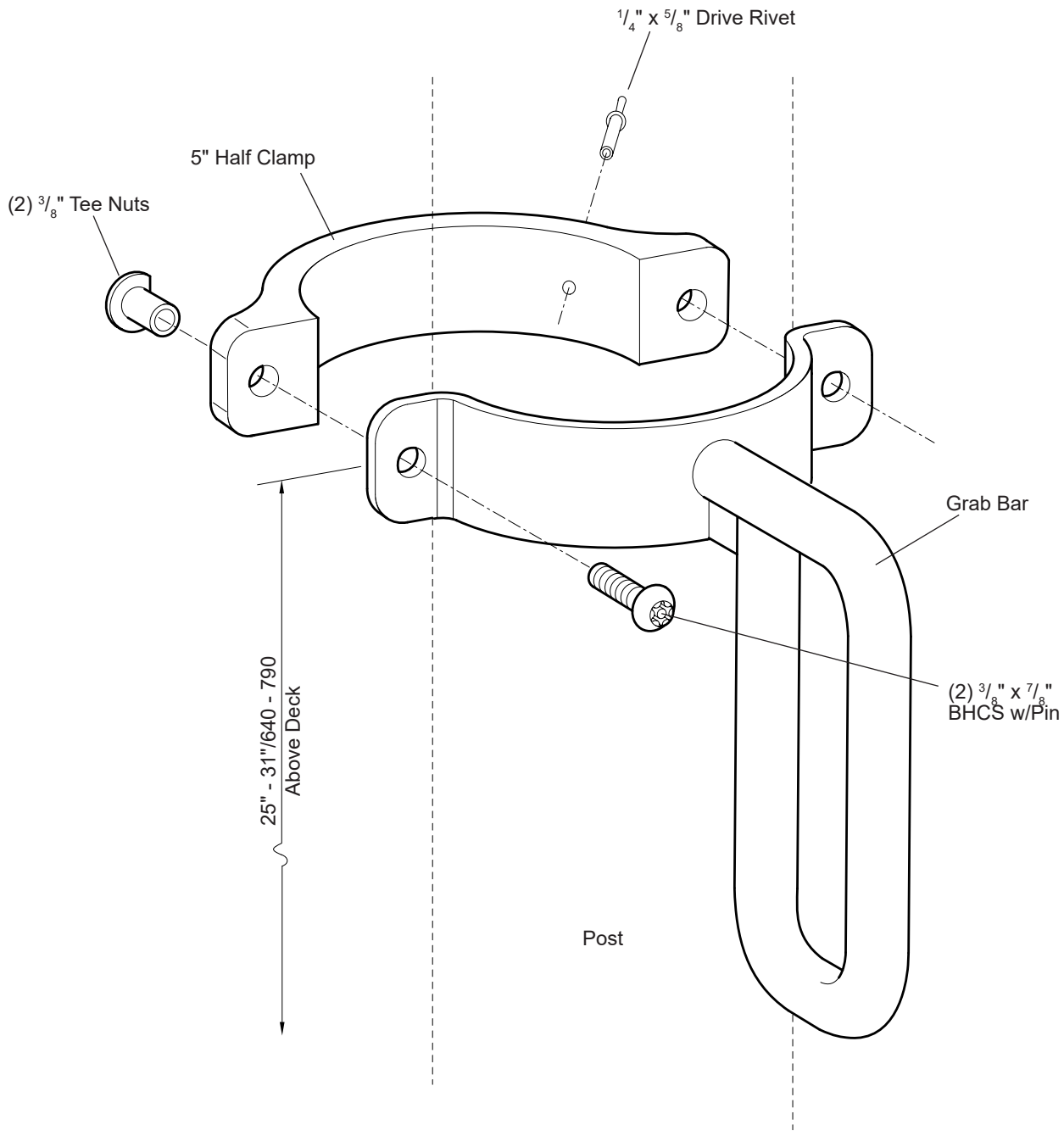
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

12125200



120901 Grab Bar

PlayBooster®

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2004 by Landscape Structures. All rights reserved.

PlayBooster® 120901 Grab Bar

Parts List

Part#	Description	Qty.
105327	5" Half Clamp, Specify Color	1
141541	Grab Bar, Specify Color	1
100196	3/8" x 7/8" BHCS w/Pin, SST	2
100351	3/8" Tee Nut, SST	2
100610	1/4" x 5/8" Drive Rivet, AL/SST	1

Specifications

Grab Bar: Weldment comprised of formed 7/8" O.D. 11 GA (.120") and 1/4" x 1 3/4" stainless steel half clamp. Finish: TenderTuff™, color specified.

Half Clamp: Cast aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/4 man hour

Weight: 5 lbs.

Installation Instructions

1) Attach grab bar to post at height shown, using a 5" half clamp, 3/8" x 7/8" BHCS w/pin and 3/8" tee nuts.

2) Install 1/4" x 5/8" drive rivet in 5" half clamp. Refer to the Offset Hanger Clamp Spec Sheet.

3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

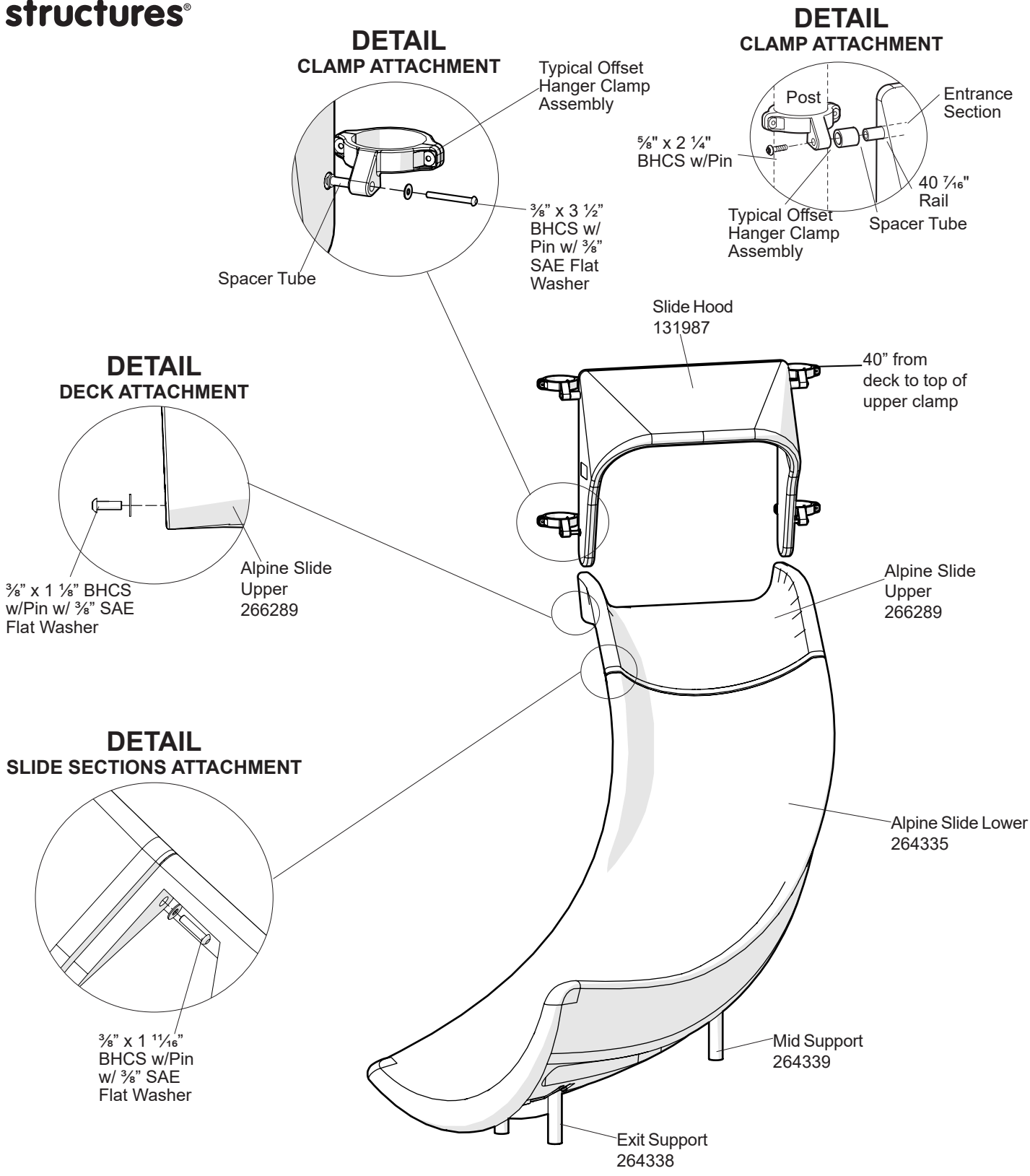
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Alpine Slide

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

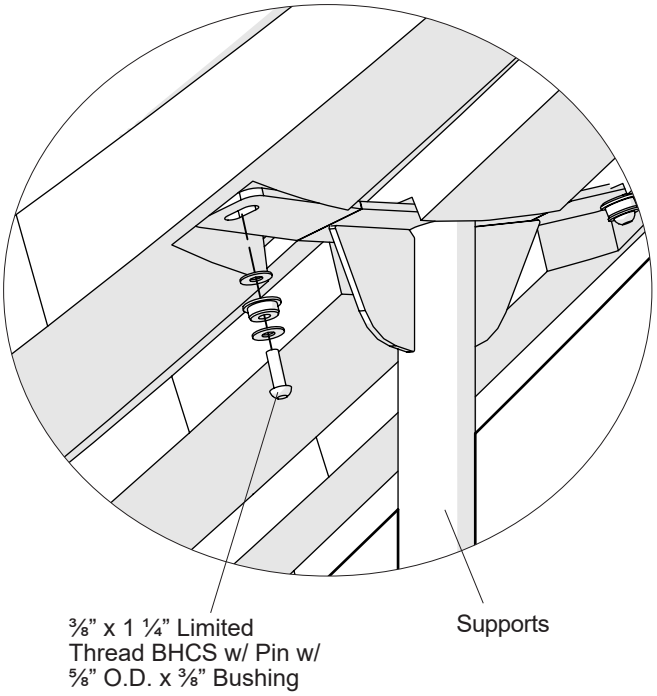
ISO 14001 CERTIFIED

ISO 9001 Certified

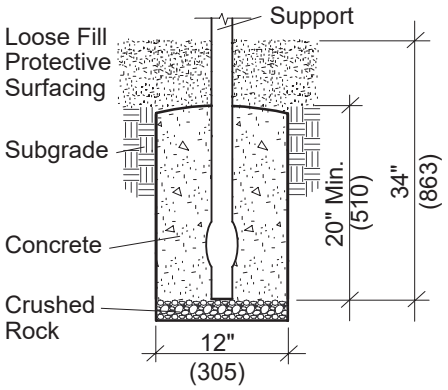
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
TYP. SUPPORT ATTACHMENT



DETAIL
DIRECT BURY



Alpine Slide

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures

Parts List

Part#	Description	Qty.
264337	Alpine Slide Upper 96" PB, Color Specified	1
264335	Alpine Slide Lower, Color Specified	1
264338	Alpine Slide Exit Support DB	1
264339	Alpine Slide Mid Support DB	1
100583	PBolt 40 7/16" AL PNT, Color Specified	1
105327	Clamp Half 5" AL	4
113729	Clamp Offset 5" Rail Hanger	4
131987	Hood Double Slide 34" x 37"	1
132443	Tube 1 3/8" OD x 1 11/16" PNT	2
113468	Tube 7/8" OD x 1 11/16" AL/PNT	2
100198	BHCS 3/8" x 1 1/8", SST	8
100200	BHCS 3/8" x 3 1/2", SST	2
100203	BHCS 5/8" x 2 1/4", SST	2
100351	Nut Mod-T 3/8", SST	8
100362	Washer Flat 3/8", SST	2
100610	Rivet 1/4" x 5/8" Drive AS	4
100999	Bag Poly 5 x 8 x 4 Mil	1
111442	Bush Rubber #871	4
100292	BHCS LTHD 3/8" x 1 1/4", SST	4
100198	BHCS 3/8" x1 1/8", SST	4
123224	BHCS 3/8" x 1 11/16", SST	7
100362	Washer Flat 3/8", SST	19
100999	Bag Poly 5 x 8 x 4 Mil	1

DB = Direct Bury

Specifications

Clamp: Cast aluminum. Finish: ProShield, metallic silver.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Slide: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Exit Support: Weldment comprised of 2.375" (60,32 mm) O.D. x .120" (3,04 mm) black steel tubing and 1/4" (6,35 mm) x 3" (76,2 mm)mounting plate. Finish: Hot dip galvanized per ASTM A123 Cat. 100.

Spacer Tube: Fabricated from 1.312 (33,33 mm) O.D. x 16 Ga. (.065) (1,65 mm) steel tubing. Finish: ProShield, metallic silver.

Hood: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Rail: Extruded from 1.125" (28,57 mm) O.D. x .312" (7,92 mm)W. 6005-T5 aluminum. Finish: ProShield, metallic silver.

Installation Instructions

1) Insert 40 7/16" rail through top of hood, place spacer tubes over each end of the 40 7/16" rail. Attach offset hanger clamps to ends of pipe bolt. Position hood against face of deck with offset hanger clamps against posts. Line up holes in face of deck with inserts in bottom of hood and fasten. Refer to Clamp Detail. Attach offset hanger clamps to posts.

2) Attach support to base of slide. **NOTE:** *Attach bolts in the center of the slots to allow for expansion and contraction. Snug bolts down only, do not over-tighten. Refer to Support Attachment Detail.*

3) Attach slide to the face of the deck. Refer to Deck Attahment Detail.

Specifications are subject to change without notice.

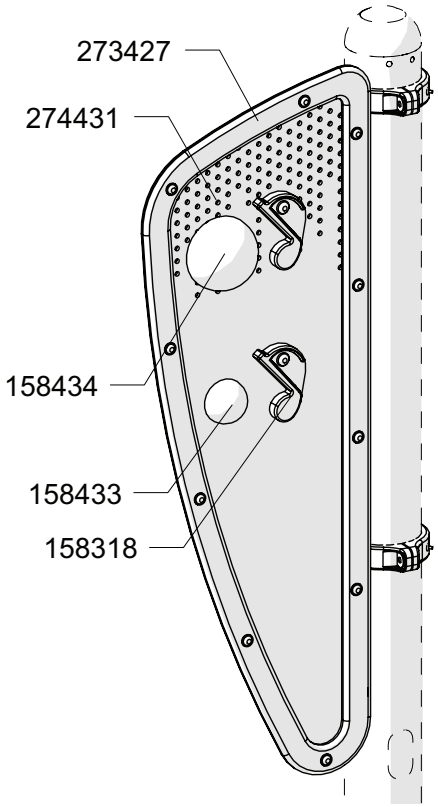
landscape structures®

ISO 14001 CERTIFIED

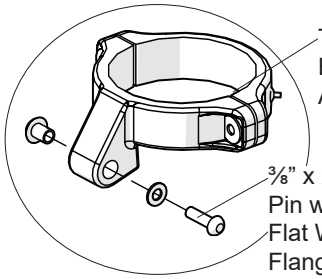
ISO 9001 Certified

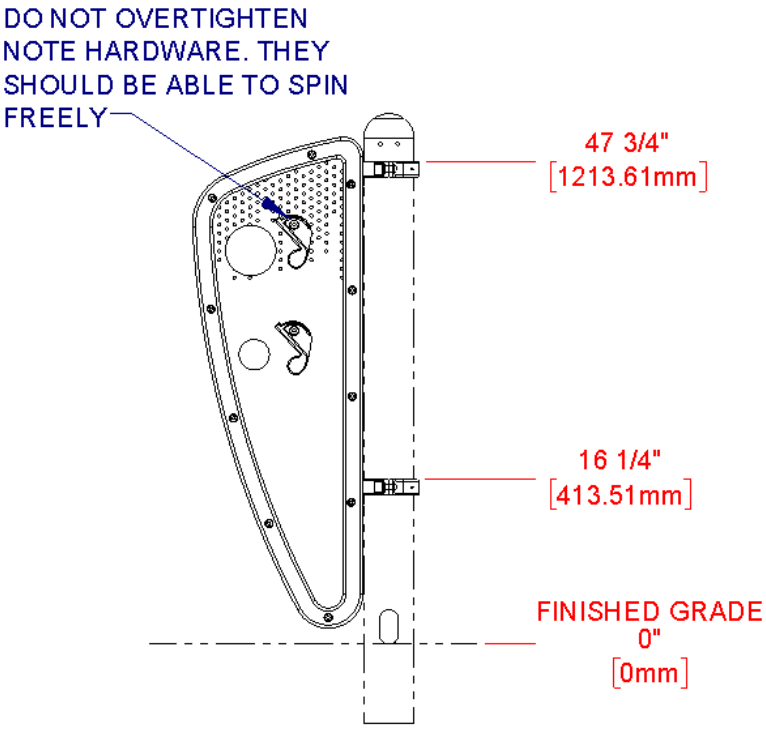
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



DETAIL
CLAMP ATTACHMENT





Custom Ring-A-Bell Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

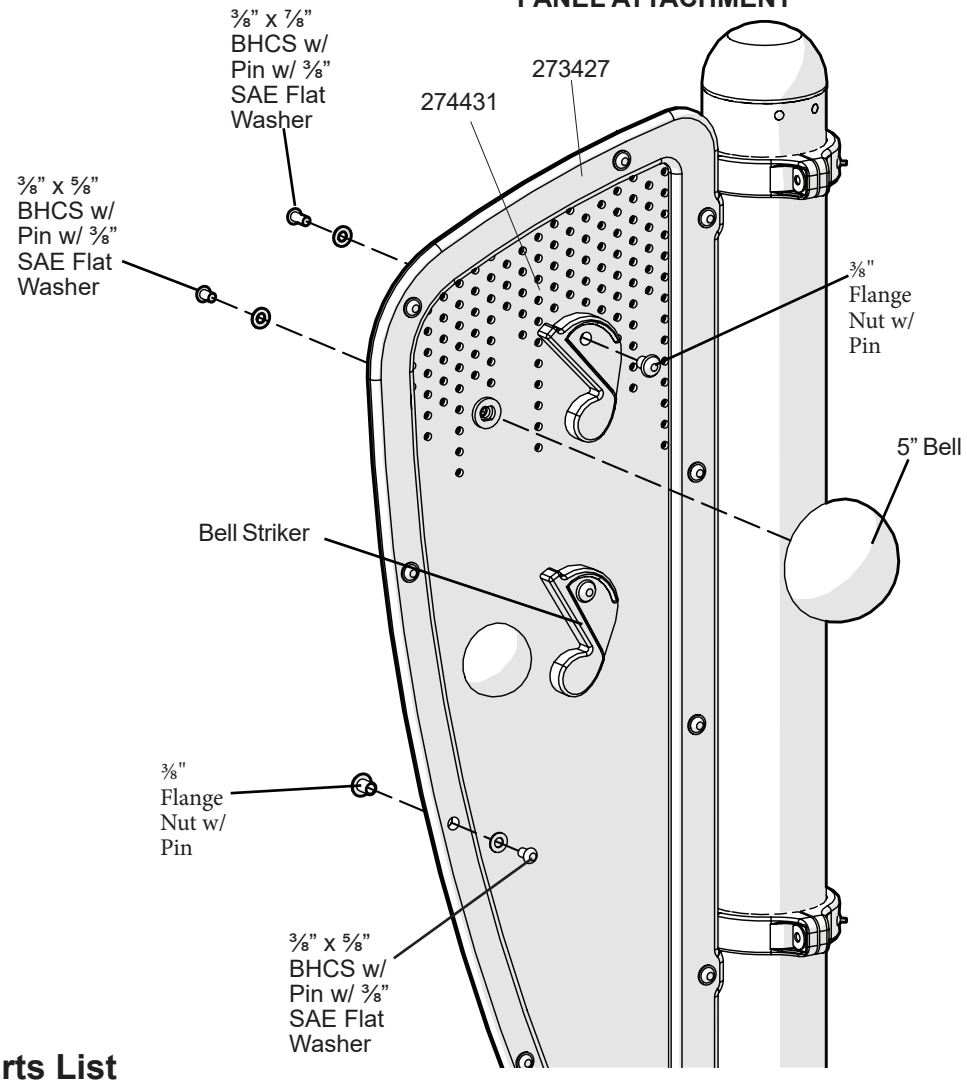
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
PANEL ATTACHMENT



Parts List

PART NUMBER	DESCRIPTION	QTY.
274431	CUST RING-A-BELL PANEL DGI	1
273427	CUST DGI SPINNER PNL TRIM A PERM	1
158434	BELL 5i PNT	1
158433	BELL 3i PNT	1
158318	BELL STRIKER ACCENT	2
113729	CLAMP OFFSET 5 RAIL HGR	2
105327	CLMP HALF 5 AL	2
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	2

PART NUMBER	DESCRIPTION	QTY.
100365	WASHER FLAT SAE 3/8i SST	14
100353	FLG NUT 6LP 3/8-16 SST	12
100351	MOD T-NUT 3/8-16 SST	4
100198	BHCS 6LP 3/8x1-1/8i SST	4
100196	BHCS 6LP 3/8x7/8i SST	2
100195	BHCS 6LP 3/8x5/8i SST	10
100173	BHCS 6LP 3/8x2i SST PAT	2

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Permalene: ⅜" (.375) Bolt torque to 15ft/lbs.
Approx. Weight: 25 lbs

Custom Ring-A-Bell Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

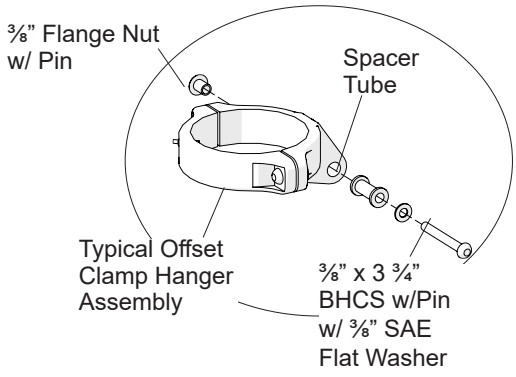
ISO 14001 CERTIFIED

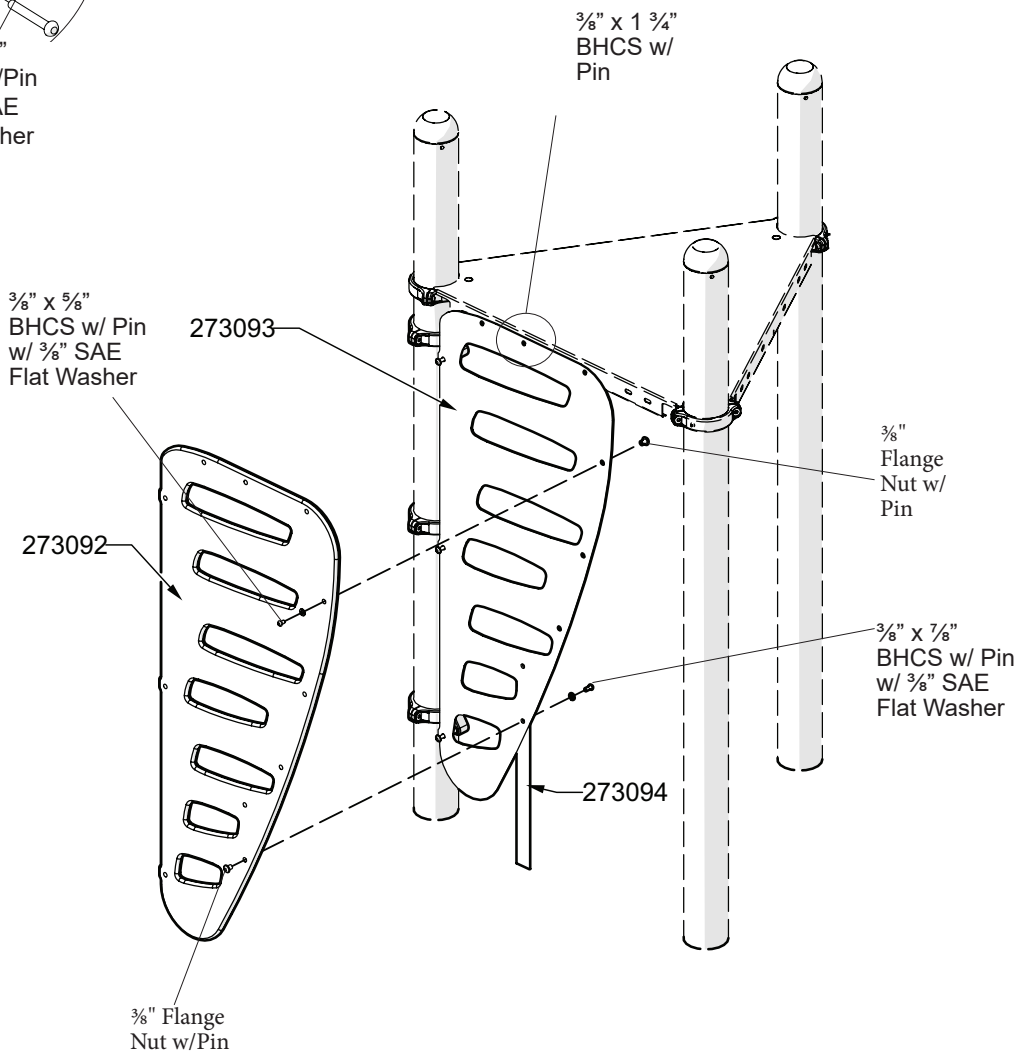
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
CLAMP ATTACHMENT





Custom 64" Half Climber

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

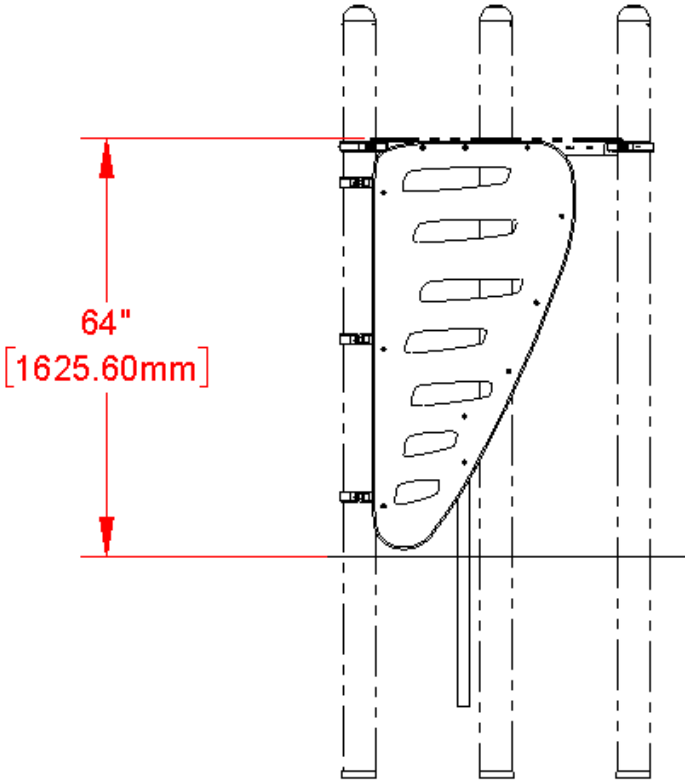
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Parts List

PART NUMBER	DESCRIPTION	QTY.
273094	CUST 64i HALF CLIMBER FTR PNT	1
273093	CUST 64i HALF CLIMBER BKR PNT	1
273092	CUST 64i HALF CLIMBER PERM	1
273090	CUST 64i HALF CLIMBER INST	1
124460	BHCS 6LP 3/8x3-3/4i SST	3
113729	CLAMP OFFSET 5 RAIL HGR	3
113468	TUBE 7/8OD X 1-11/16 PNT	3
105327	CLMP HALF 5 AL	3
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	3

PART NUMBER	DESCRIPTION	QTY.
100365	WASHER FLAT SAE 3/8i SST	8
100362	WASHER FLAT 3/8i SST	3
100353	FLG NUT 6LP 3/8-16 SST	11
100351	MOD T-NUT 3/8-16 SST	6
100198	BHCS 6LP 3/8x1-1/8i SST	9
100196	BHCS 6LP 3/8x7/8i SST	2
100195	BHCS 6LP 3/8x5/8i SST	3

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference.

   (Direct Bury) With structure square, plumb and level, pour concrete footings. Allow concrete to cure a minimum of 72 hours before users are allowed to play on the structure.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 106 lbs.

Custom 64” Half Climber

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

landscape structures®

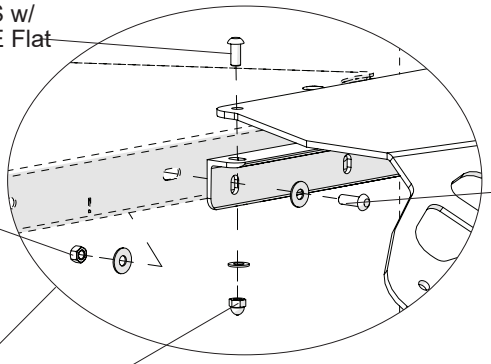
ISO 14001 CERTIFIED

ISO 9001 Certified

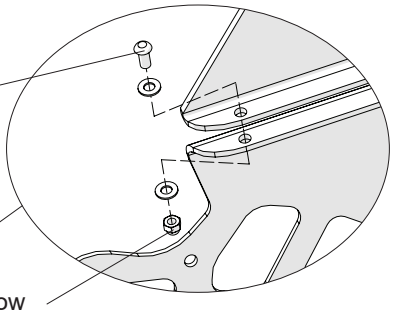
SAFETY NOTE

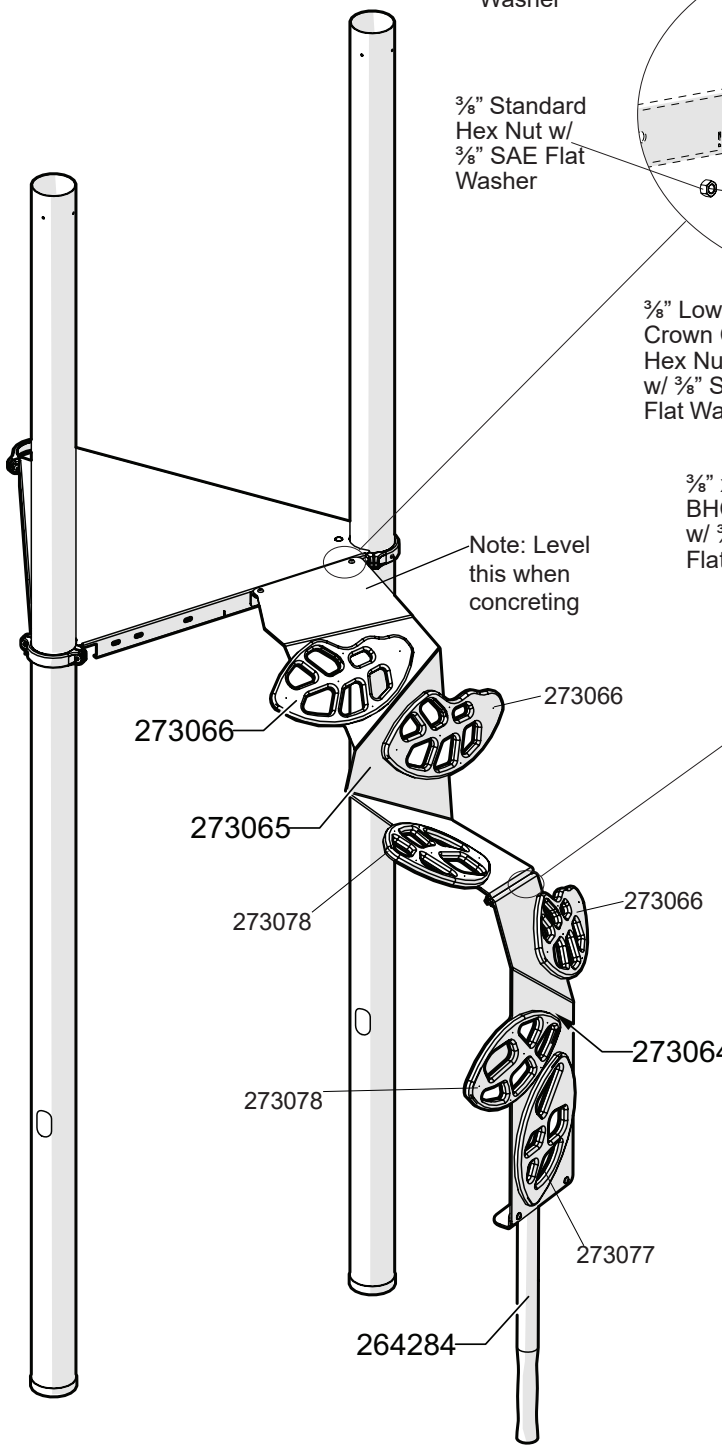
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
DECK ATTACHMENT

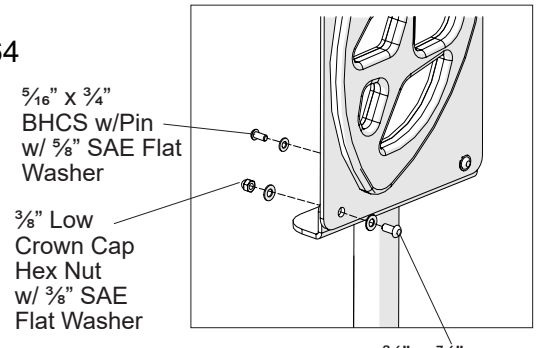


DETAIL
MID-CLIMBER ATTACHMENT





DETAIL
LEAF AND SUPPORT ATTACHMENT



Custom 64" Wrinkle Climber w/ Leaf Cutouts, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

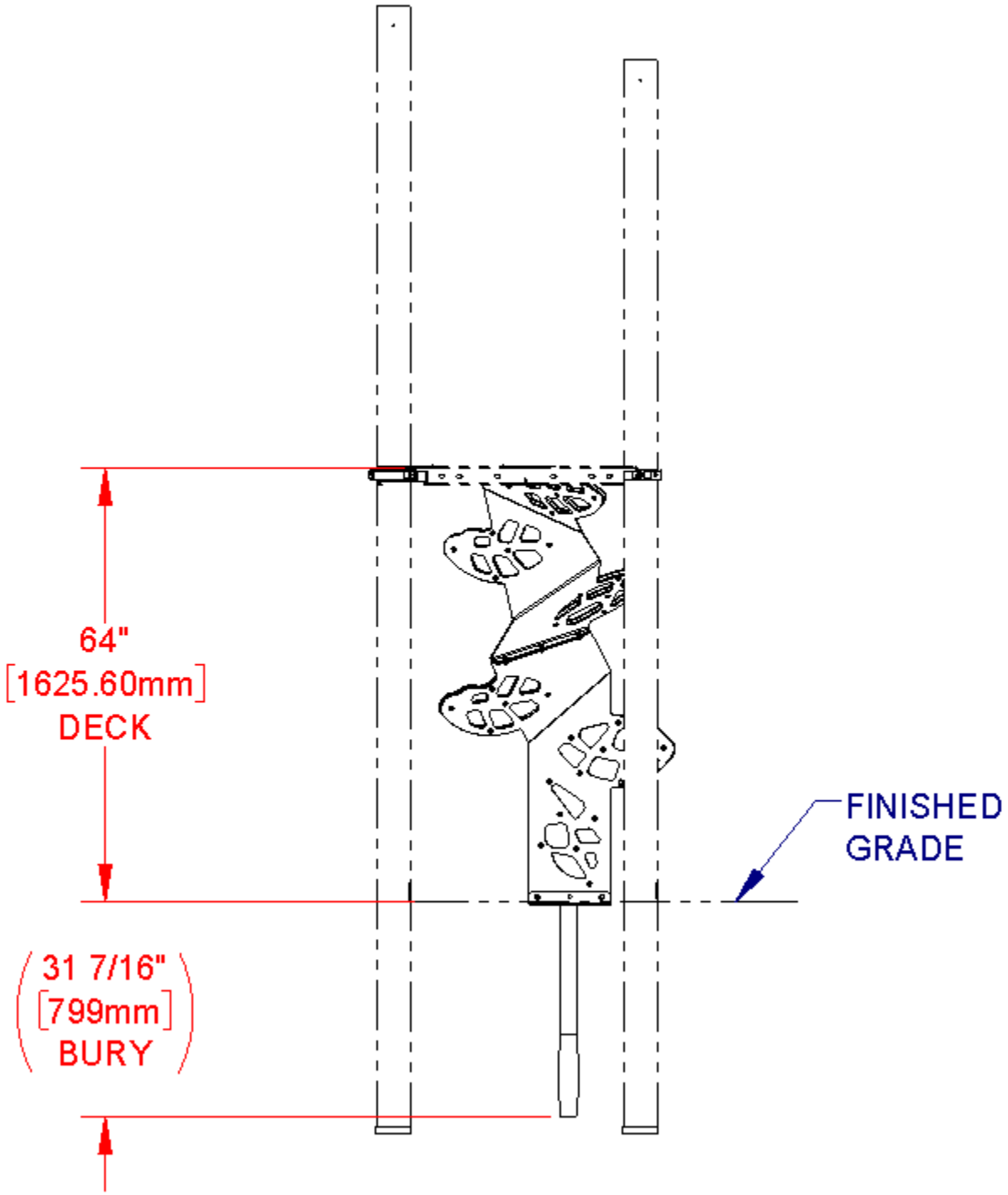
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom 64” Wrinkle Climber w/ Leaf Cutouts, DB

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

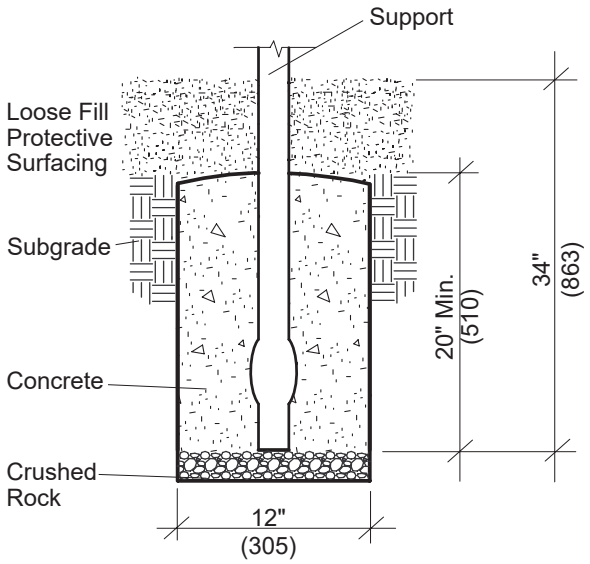
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
DIRECT BURY



NOTES:

- **If using 12” of loose fill material, the concrete footing will be 22” deep.**
- **Minimum 1.2 cubic feet of concrete required per support**

Parts List

PART NUMBER	DESCRIPTION	QTY.
273078	CUST 64i LEAF WRINKLE CL 3 PERM	2
273077	CUST 64i LEAF WRINKLE CL 2 PERM	1
273076	CUST 64i LEAF WRINKLE CL MTG ANG PNT	1
273066	CUST 64i LEAF WRINKLE CL 1 PERM	3
273065	CUST 64i LEAF WRINKLE CL UPR PNT	1
273064	CUST 64i LEAF WRINKLE CL LWR PNT	1
264284	HEDRA 2-5 HEX CLIMBER FTR	1
223956	WASHER FLAT SAE 5/16i SST	33

PART NUMBER	DESCRIPTION	QTY.
223807	5/16i -18 X 3/4i 6 LOBE BHCS	33
100365	WASHER FLAT SAE 3/8i SST	12
100362	WASHER FLAT 3/8i SST	6
100349	3/8 HEX NUT L/C CAP	7
100327	HEX NUT STD 3/8-16 SST	3
100198	BHCS 6LP 3/8x1-1/8i SST	3
100196	BHCS 6LP 3/8x7/8i SST	7

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

   With structure square, plumb and level, pour concrete footings. Allow concrete to cure a minimum of 72 hours before users are allowed to play on the structure.

2) Install protective surfacing before users are allowed to play on the structure.

Permalene: 3/8” (.375) Bolt torque to 15ft/lbs.
Approx. Weight: 261 lbs

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

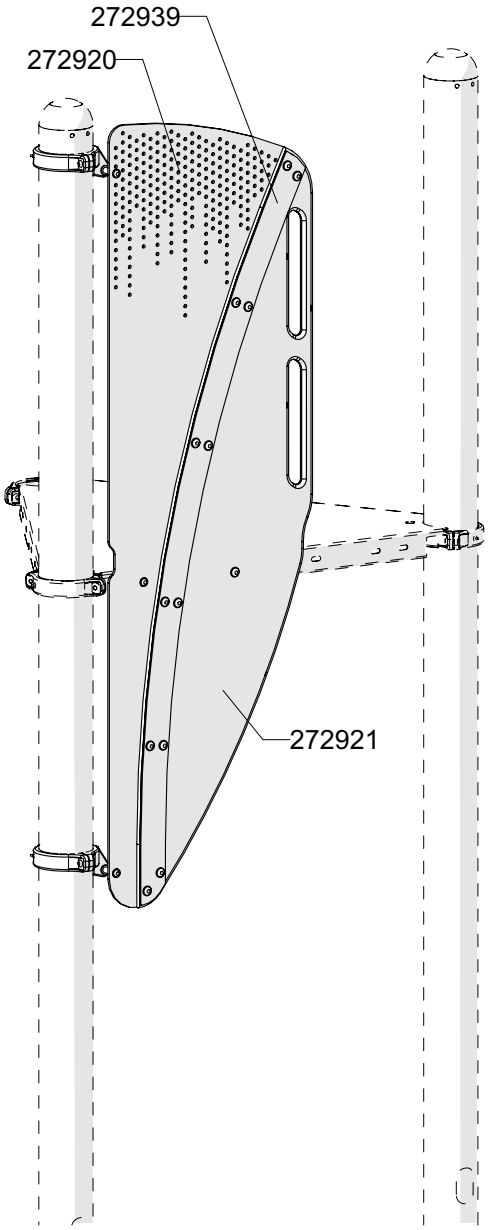
landscape structures®

ISO 14001 CERTIFIED

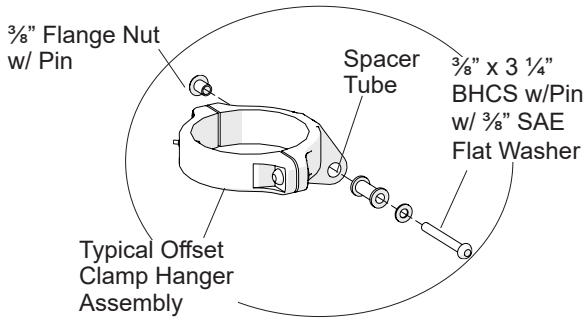
ISO 9001 Certified

SAFETY NOTE

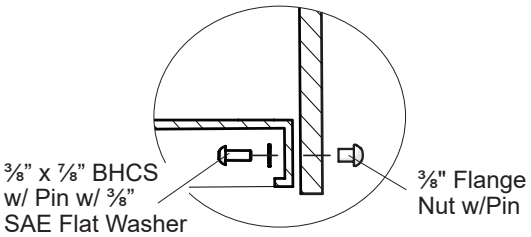
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



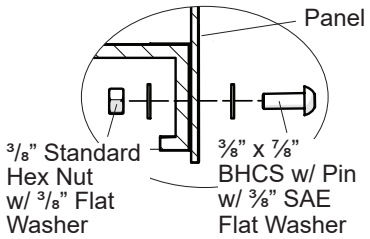
DETAIL
CLAMP ATTACHMENT



DETAIL
DECK ATTACHMENT



DETAIL
DECK ATTACHMENT



Custom 2-Level Digifuse® ¾ Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

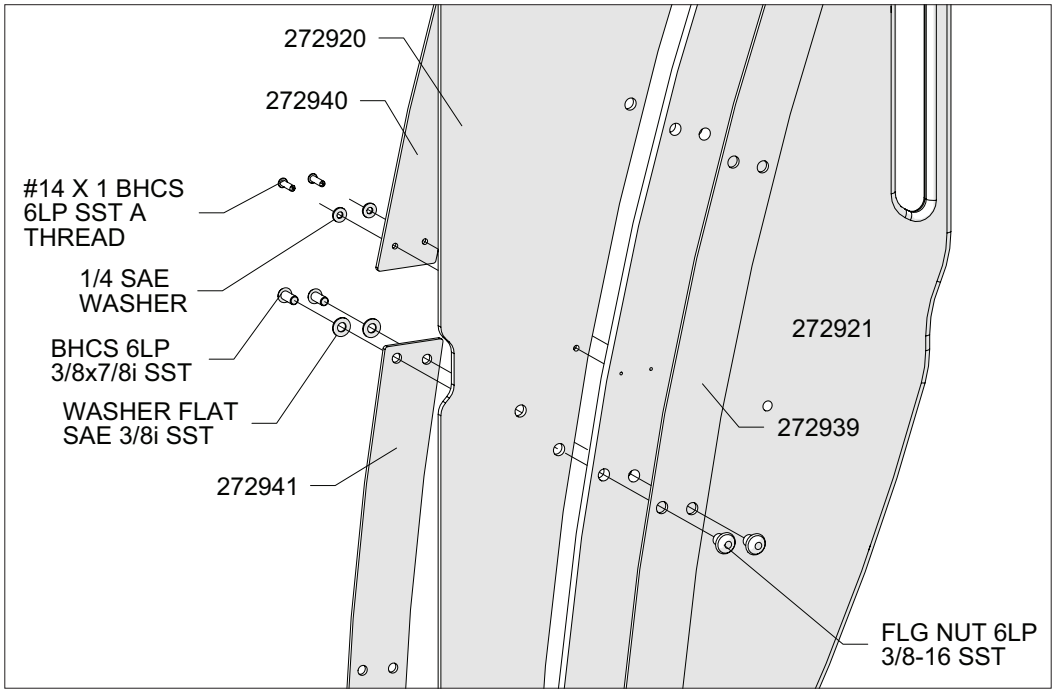
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
PANEL ATTACHMENT



Parts List

PART NUMBER	DESCRIPTION	QTY.
272941	CUST 2 LEVEL BARR PNL ACCENT PLATE C PNT	1
272940	CUST 2 LEVEL BARR PNL ACCENT PLATE B PNT	1
272939	CUST 2 LEVEL BARR PNL ACCENT PLATE A PNT	1
272921	CUST 2 LEVEL BARR PNL PART B PERM	1
272920	CUST 2 LEVEL BARR PNL PART A DGI	1
216761	#14 X 1 BHCS 6LP SST A THREAD	2
127463	BIT HEX TPP T-27 (TORX)	1
113729	CLAMP OFFSET 5 RAIL HGR	2
113468	TUBE 7/8OD X 1-11/16 PNT	2
105327	CLMP HALF 5 AL	2
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	2

PART NUMBER	DESCRIPTION	QTY.
100365	WASHER FLAT SAE 3/8i SST	16
100364	1/4 SAE WASHER	2
100362	WASHER FLAT 3/8i SST	1
100353	FLG NUT 6LP 3/8-16 SST	15
100351	MOD T-NUT 3/8-16 SST	4
100327	HEX NUT STD 3/8-16 SST	1
100198	BHCS 6LP 3/8x1-1/8i SST	4
100196	BHCS 6LP 3/8x7/8i SST	14
100168	BHCS 6LP 3/8X3-1/4iSSTPAT	2

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Permalene: 3/8" (.375) Bolt torque to 15ft/lbs.
Approx. Weight: 59 lbs

Custom 2-Level Digifuse® ¾ Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

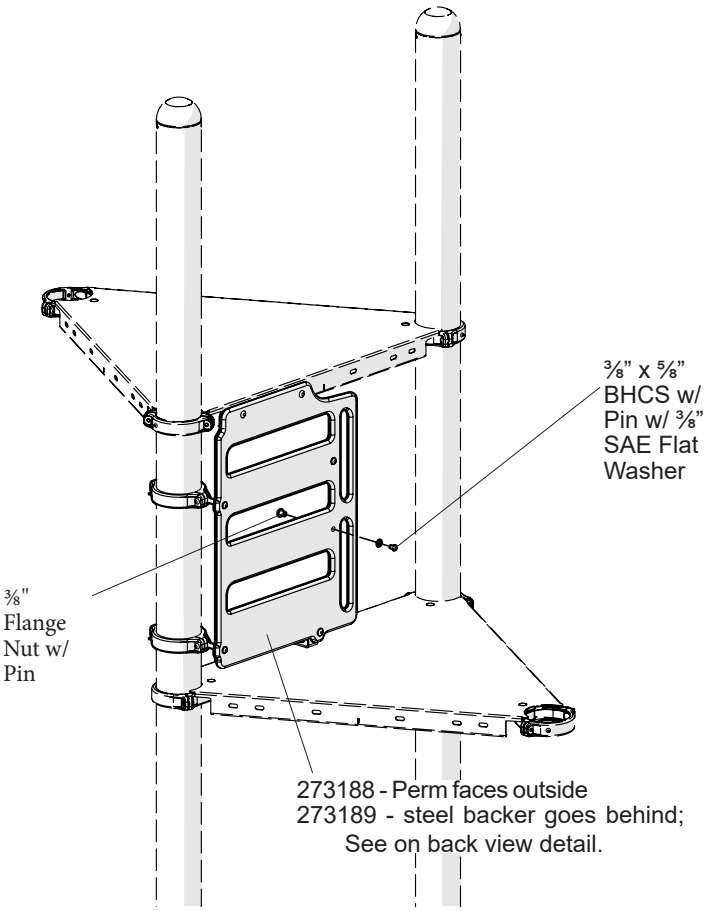
landscape structures®

ISO 14001 CERTIFIED

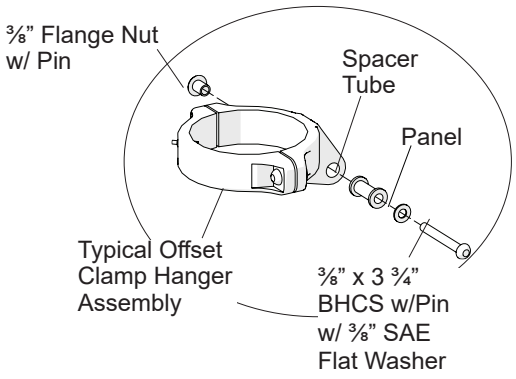
ISO 9001 Certified

SAFETY NOTE

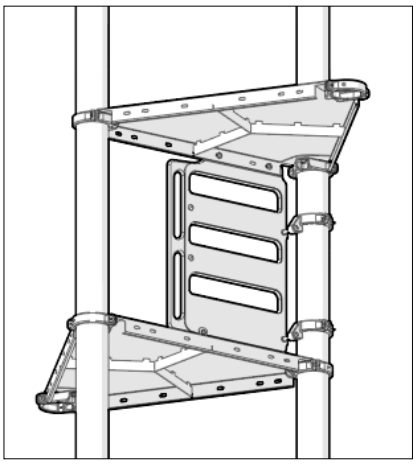
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



DETAIL
CLAMP ATTACHMENT



DETAIL
BACK VIEW



Parts List

PART NUMBER	DESCRIPTION	QTY.
273190	CUST 32i HALF CLIMBER BKT PNT	1
273189	CUST 32i HALF CLIMBER BKR PNT	1
273188	CUST 32i HALF CLIMBER PERM	1
273187	CUST 32i HALF CLIMBER INST	1
124460	BHCS 6LP 3/8x3-3/4i SST	2
113729	CLAMP OFFSET 5 RAIL HGR	2
113468	TUBE 7/8OD X 1-11/16 PNT	2
105327	CLMP HALF 5 AL	2
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	2

PART NUMBER	DESCRIPTION	QTY.
100365	WASHER FLAT SAE 3/8i SST	5
100362	WASHER FLAT 3/8i SST	4
100353	FLG NUT 6LP 3/8-16 SST	7
100351	MOD T-NUT 3/8-16 SST	4
100327	HEX NUT STD 3/8-16 SST	1
100198	BHCS 6LP 3/8x1-1/8i SST	7
100196	BHCS 6LP 3/8x7/8i SST	1
100195	BHCS 6LP 3/8x5/8i SST	2

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference.

2) Install protective surfacing before users are allowed to play on the structure.

Custom 32” Half Climber

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

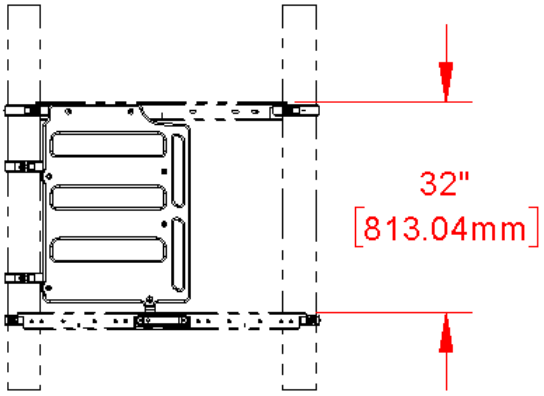
landscape structures®

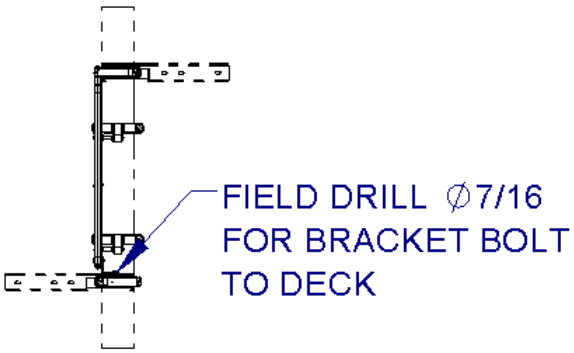
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)





Custom 32” Half Climber

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

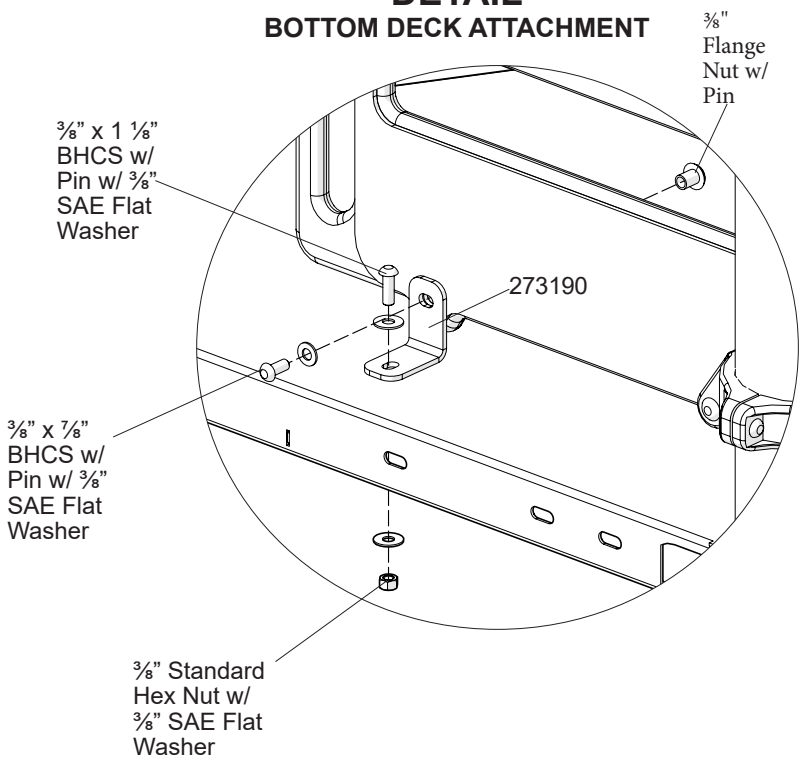
ISO 14001 CERTIFIED

ISO 9001 Certified

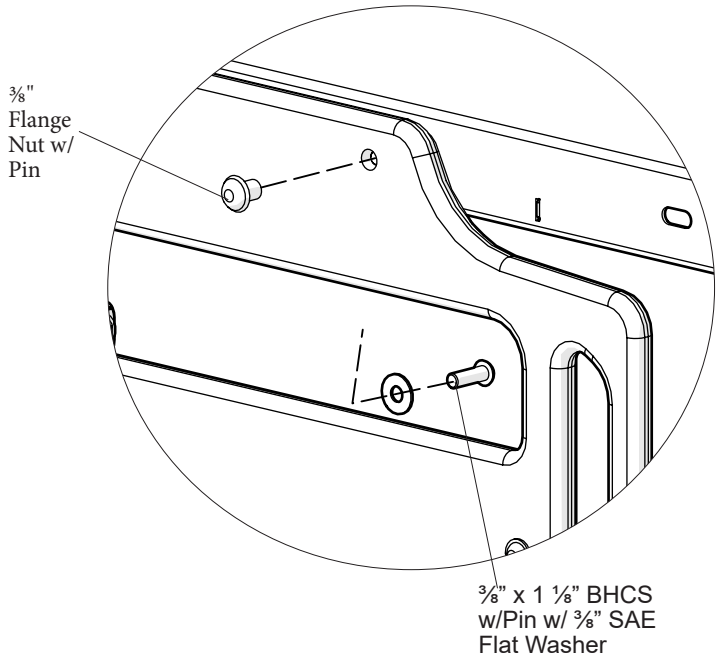
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
BOTTOM DECK ATTACHMENT



DETAIL
UPPER DECK ATTACHMENT



Custom 32” Half Climber

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

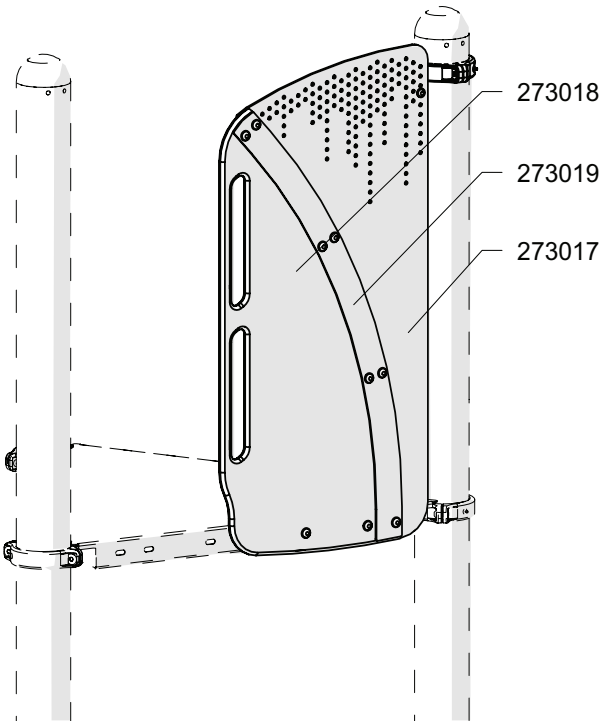
landscape structures®

ISO 14001 CERTIFIED

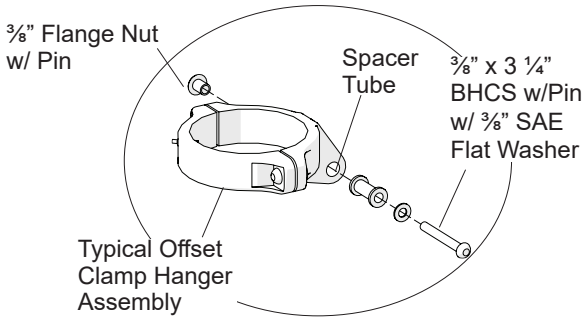
ISO 9001 Certified

SAFETY NOTE

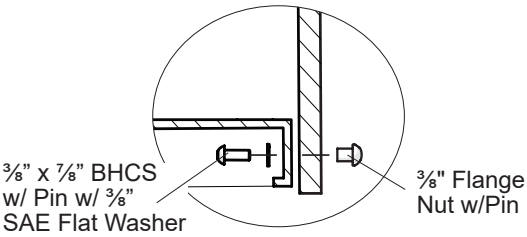
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



DETAIL
CLAMP ATTACHMENT



DETAIL
DECK ATTACHMENT



NOTE: Same hardware for multi-panel deck connection.

Custom Digifuse® Handhold Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

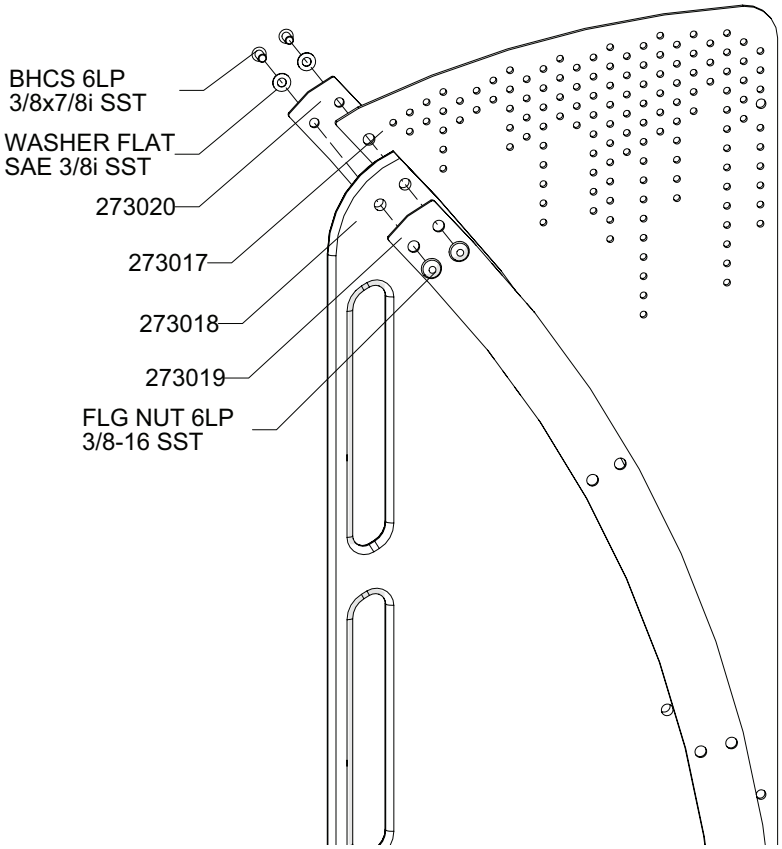
ISO 14001 CERTIFIED

ISO 9001 Certified

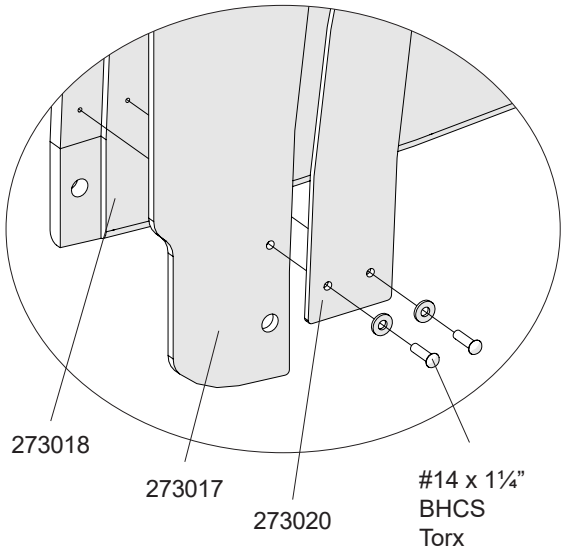
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
PANEL ATTACHMENT



DETAIL
LOWER PANEL BACK ATTACHMENT



Parts List

PART NUMBER	DESCRIPTION	QTY.
273020	CUST 3/4 HHOLD PNL ACCENT PLATE B PNT	1
273019	CUST 3/4 HHOLD PNL ACCENT PLATE A PNT	1
273018	CUST 3/4 HHOLD PNL PART B PERM	1
273017	CUST 3/4 HHOLD PNL PART A DGI	1
216761	#14 X 1 BHCS 6LP SST A THREAD	2
127463	BIT HEX TPP T-27 (TORX)	1
113729	CLAMP OFFSET 5 RAIL HGR	1
113468	TUBE 7/8OD X 1-11/16 PNT	1
105327	CLMP HALF 5 AL	1

PART NUMBER	DESCRIPTION	QTY.
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	1
100365	WASHER FLAT SAE 3/8i SST	10
100364	1/4 SAE WASHER	2
100353	FLG NUT 6LP 3/8-16 SST	10
100351	MOD T-NUT 3/8-16 SST	2
100198	BHCS 6LP 3/8x1-1/8i SST	2
100196	BHCS 6LP 3/8x7/8i SST	9
100168	BHCS 6LP 3/8X3-1/4iSSTPAT	1

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Permalene: ⅜" (.375) Bolt torque to 15ft/lbs.
Approx. Weight: 39 lbs

Custom Digifuse® Handhold Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

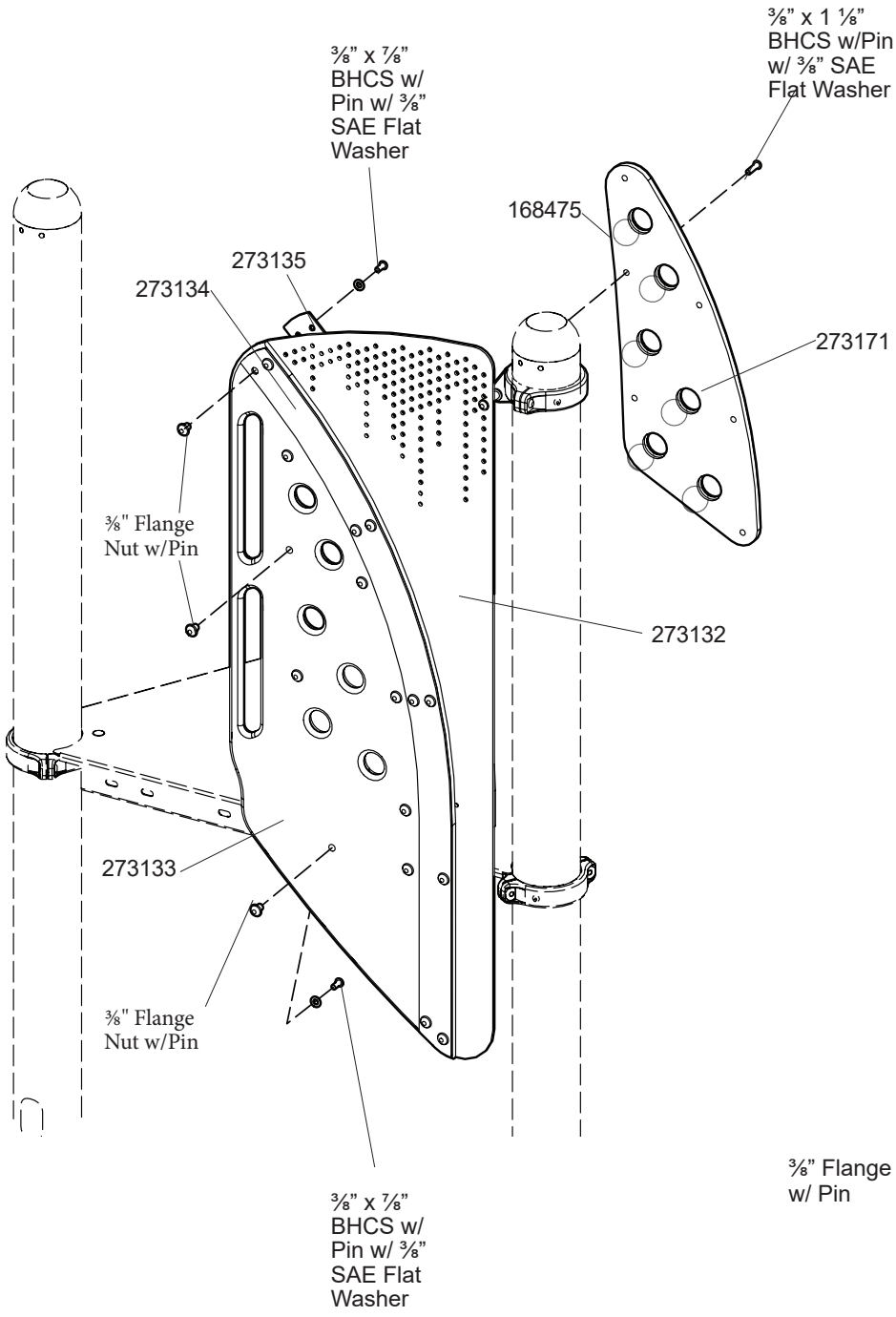
landscape structures®

ISO 14001 CERTIFIED

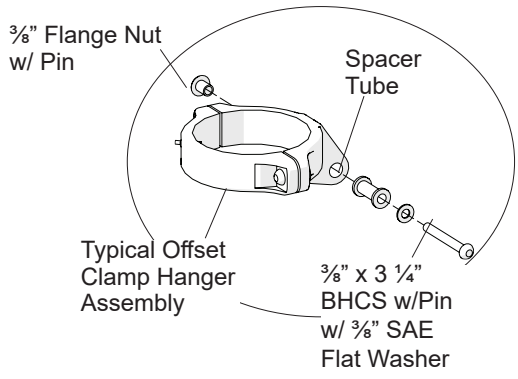
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



DETAIL
CLAMP ATTACHMENT



Custom 3/4 DGI/Perm Marble Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

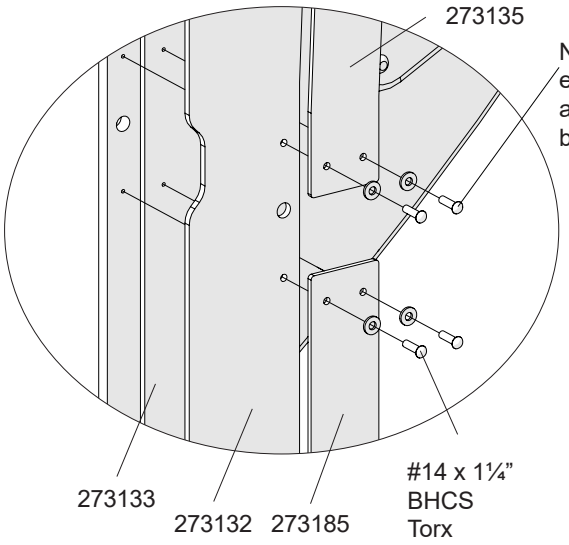
ISO 14001 CERTIFIED

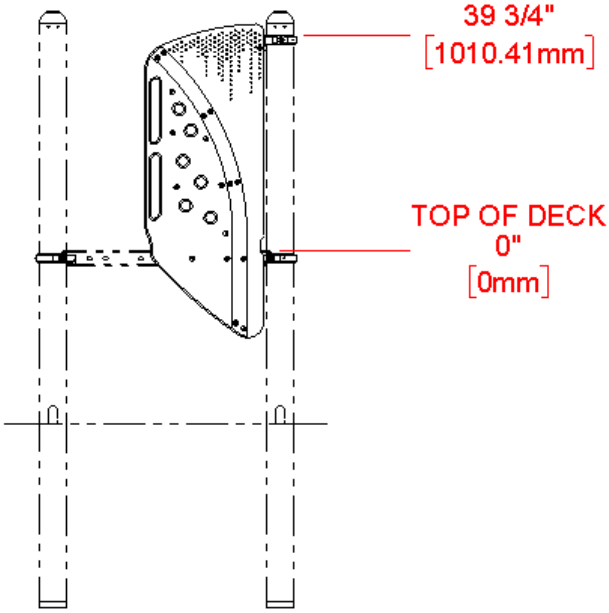
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
LOWER PANEL BACK ATTACHMENT





Parts List

PART NUMBER	DESCRIPTION	QTY.
273185	CUST 3/4 MARBLE HHOLD PNL ACC PLATE C PNT	1
273171	CUST 3/4 MARBLE PNL PART C PERM	1
273135	CUST 3/4 MARBLE HHOLD PNL ACC PLATE B PNT	1
273134	CUST 3/4 MARBLE HHOLD PNL ACC PLATE A PNT	1
273133	CUST 3/4 MARBLE PNL PART B PERM	1
273132	CUST 3/4 MARBLE PNL PART A DGI	1
168475	MARBLE 2i	6
127463	BIT HEX TPP T-27 (TORX)	1
113729	CLAMP OFFSET 5 RAIL HGR	1
113468	TUBE 7/8OD X 1-11/16 PNT	1

PART NUMBER	DESCRIPTION	QTY.
113027	BHCS 6LP 3/8x1-3/8i SST	6
105327	CLMP HALF 5 AL	1
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	1
100365	WASHER FLAT SAE 3/8i SST	12
100364	1/4 SAE WASHER	4
100353	FLG NUT 6LP 3/8-16 SST	18
100351	MOD T-NUT 3/8-16 SST	2
100198	BHCS 6LP 3/8x1-1/8i SST	2
100196	BHCS 6LP 3/8x7/8i SST	11
100168	BHCS 6LP 3/8X3-1/4iSSTPAT	1

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 54 lbs.

Custom 3/4 DGI/Perm Marble Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

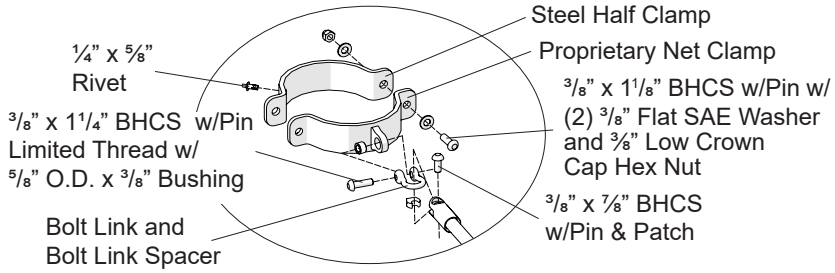
ISO 14001 CERTIFIED

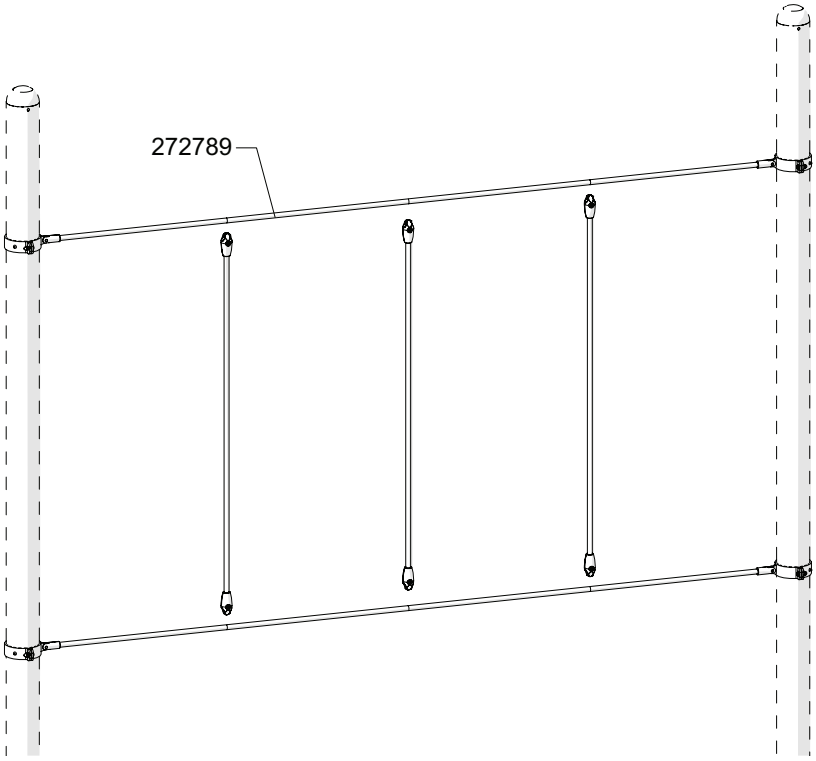
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
CLAMP ATTACHMENT





Parts List

PART NUMBER	DESCRIPTION	QTY.
272789	CUST HIGH WIRE NET CLIMB ACROSS 123i OC ROPE	1
196319	BOLT LINK SPACER	4
161898	PROPRIETARY NET CLMP	4
156962	BUSH 5/8 OD X 1/2 LG SST	4
138915	BOLT LINK SST	4
104731	CLMP HALF 1-3/4i STL	4

PART NUMBER	DESCRIPTION	QTY.
100611	RVT 1/4X3/8 AS (GRIP=.328/.422)	4
100365	WASHER FLAT SAE 3/8i SST	16
100349	3/8 HEX NUT L/C CAP	8
100292	BHCS 6LP LTHD 3/8X1-1/4i SST	4
100290	BHCS 6LP LTHD 3/8X7/8iSST	4
100198	BHCS 6LP 3/8x1-1/8i SST	8

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 23 lbs

Custom 123" High Wire Net Climb Across

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

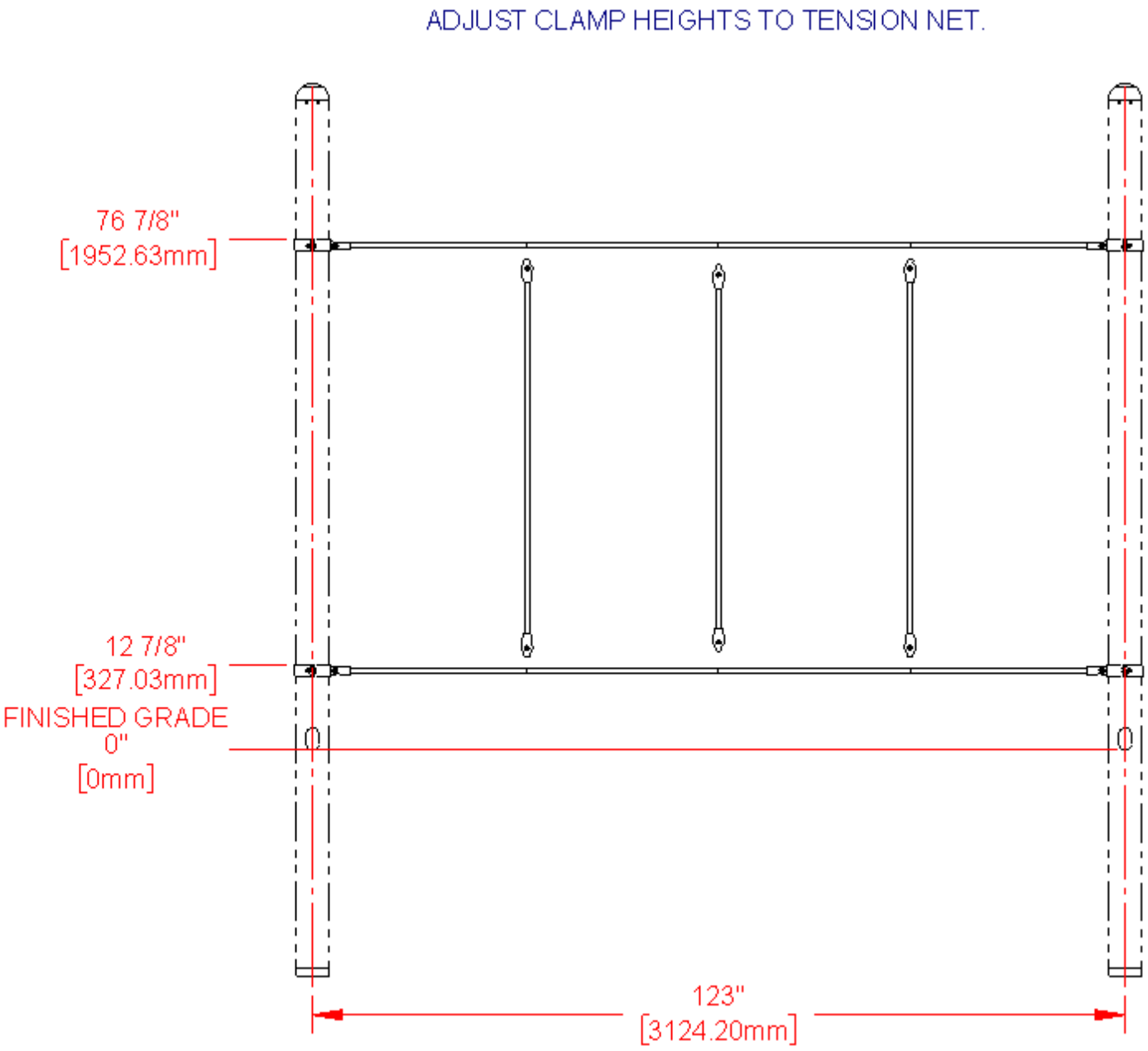
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom 123” High Wire Net Climb Across

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

ISO 14001 CERTIFIED

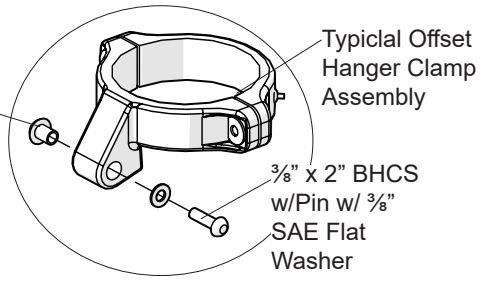
ISO 9001 Certified

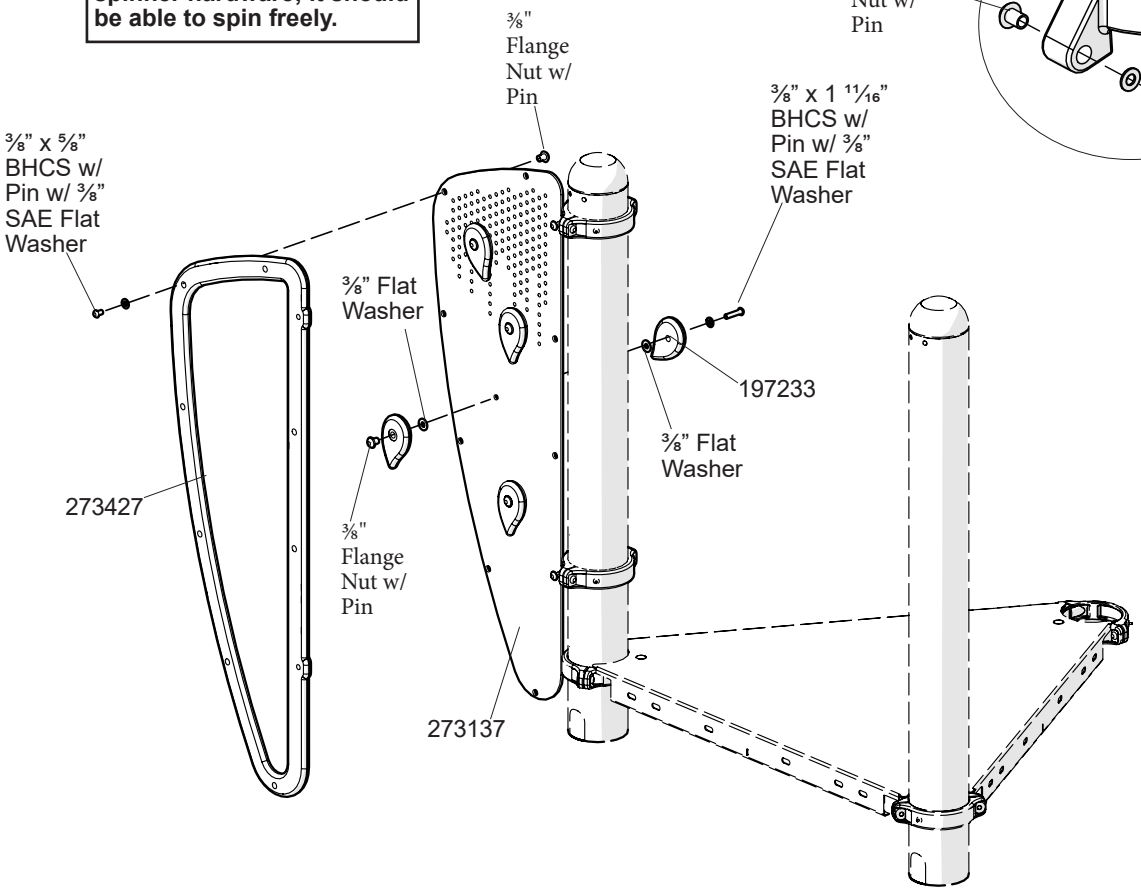
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

NOTE: Do not overtighten spinner hardware; it should be able to spin freely.

DETAIL
CLAMP ATTACHMENT





Parts List

PART NUMBER	DESCRIPTION	QTY.
273427	CUST DGI SPINNER PNL TRIM A PERM	1
273137	CUST LEAF SPINNER PNL DGI	1
197233	SMART STRUCTURE LEAF PERM	4
197233	SMART STRUCTURE LEAF PERM	4
123224	BHCS 6LP 3/8x1-11/16i SST	4
113729	CLAMP OFFSET 5 RAIL HGR	2
105327	CLMP HALF 5 AL	2
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	2

PART NUMBER	DESCRIPTION	QTY.
100365	WASHER FLAT SAE 3/8i SST	14
100362	WASHER FLAT 3/8i SST	8
100353	FLG NUT 6LP 3/8-16 SST	14
100351	MOD T-NUT 3/8-16 SST	4
100198	BHCS 6LP 3/8x1-1/8i SST	4
100195	BHCS 6LP 3/8x5/8i SST	8
100173	BHCS 6LP 3/8x2i SST PAT	2

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 25 lbs.

Custom DGI Leaf Spinner Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document # 27511203

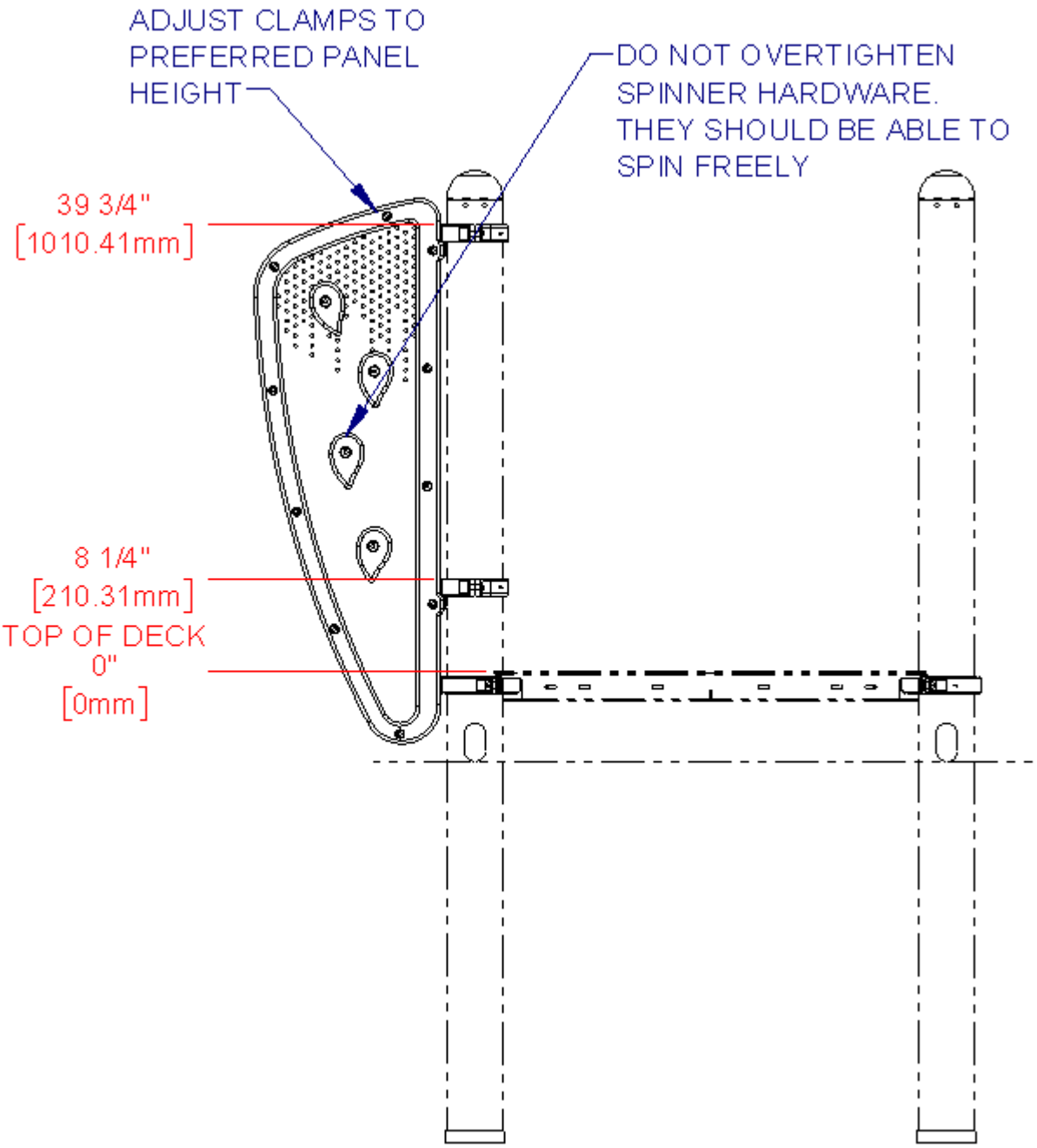
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom DGI Leaf Spinner Panel

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

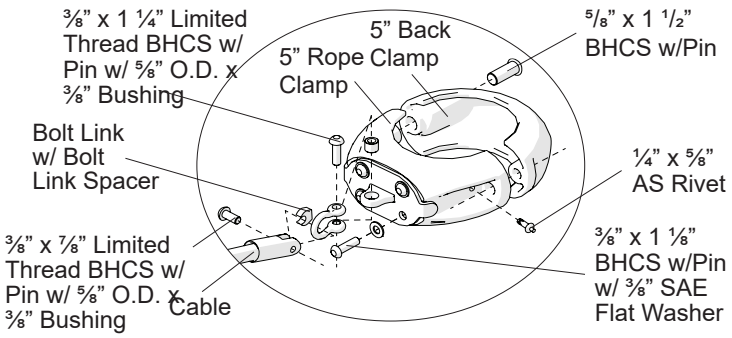
ISO 14001 CERTIFIED

ISO 9001 Certified

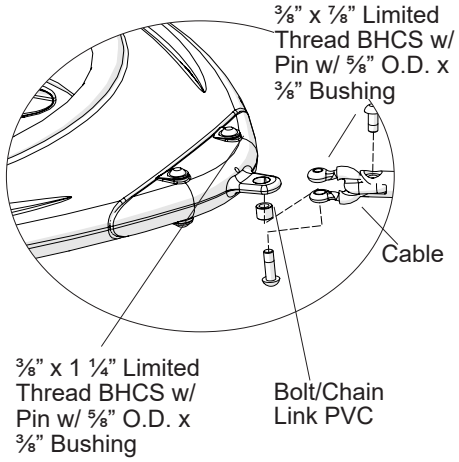
SAFETY NOTE

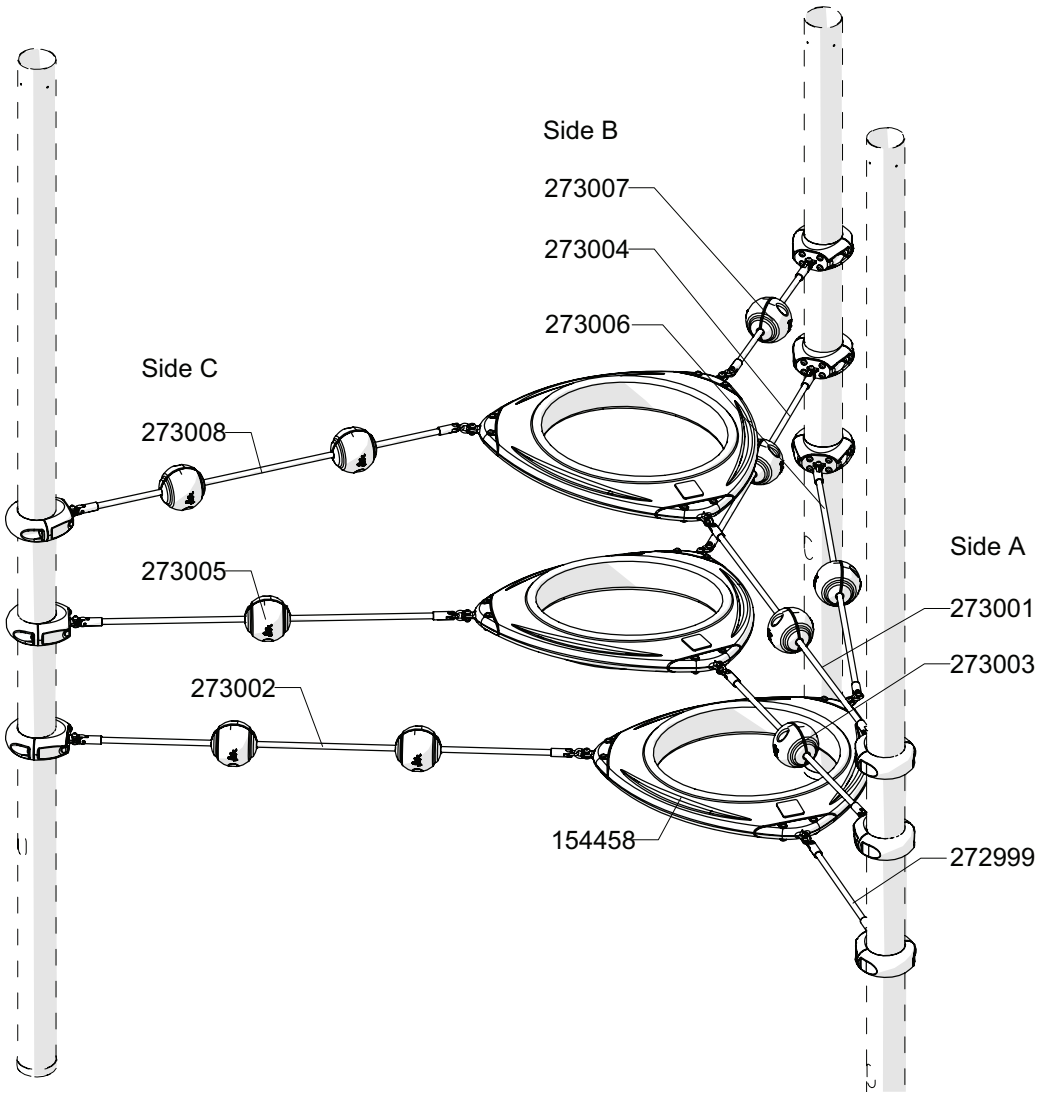
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
CLAMP ATTACHMENT



DETAIL
O-ZONE RING ATTACHMENT





Custom Three Vertical O-Zones

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

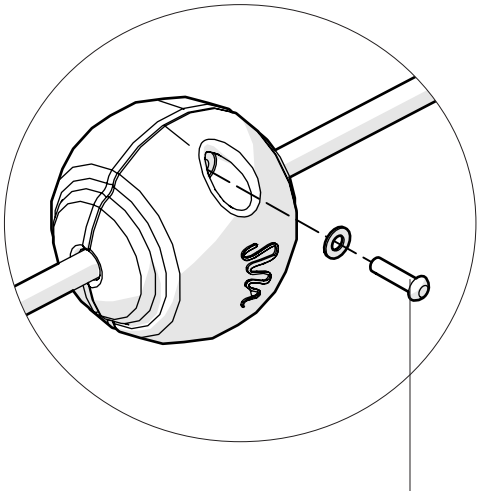
ISO 14001 CERTIFIED

ISO 9001 Certified

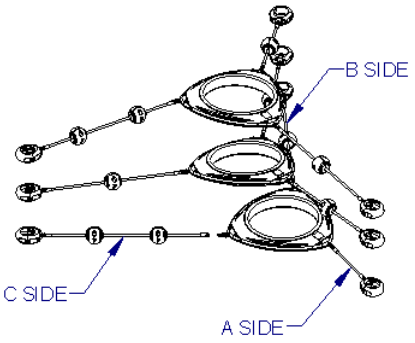
SAFETY NOTE

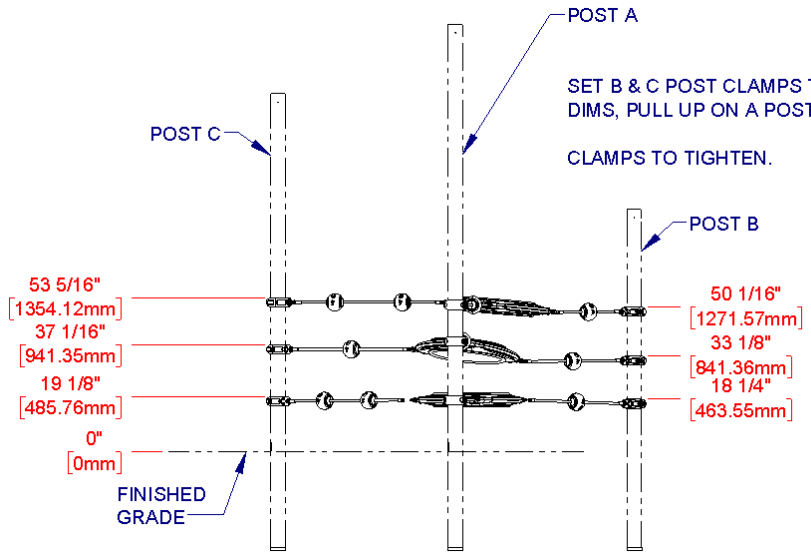
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DETAIL
SWIGGLEKNOT ATTACHMENT



⅜" x 1 ½" BHCS w/Pin w/ ⅜" SAE Flat Washer





Parts List

PART NUMBER	DESCRIPTION	QTY.
275061	CUST BOLT LINK AND CHAIN LINK PVC	9
273008	CUST O-ZONE CL UPR C ROPE	1
273007	CUST O-ZONE CL UPR B ROPE	1
273006	CUST O-ZONE CL UPR A ROPE	1
273005	CUST O-ZONE CL MID C ROPE	1
273004	CUST O-ZONE CL MID B ROPE	1
273003	CUST O-ZONE CL MID A ROPE	1
273002	CUST O-ZONE CL LWR C ROPE	1
273001	CUST O-ZONE CL LWR B ROPE	1
272999	CUST O-ZONE CL LWR A ROPE	1
196319	BOLT LINK SPACER	9
195943	5i BACK CLAMP PNT	9
195922	5i ROPE CLAMP PNT	9
194082	CASTING PLATE SINGLE TAB PNT	9

PART NUMBER	DESCRIPTION	QTY.
192748	CABLE BALL KNOT HALF	20
164009	O-ZONE RING CAP PNT	9
156962	BUSH 5/8 OD X 1/2 LG SST	18
154458	EVOS O-ZONE ROTO RING	3
138915	BOLT LINK SST	9
127551	5/8 X 1 1/2 BHCS 6LP SST W/AS	18
113027	BHCS 6LP 3/8x1-3/8i SST	36
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	9
100365	WASHER FLAT SAE 3/8i SST	92
100292	BHCS 6LP LTHD 3/8X1-1/4i SST	18
100290	BHCS 6LP LTHD 3/8X7/8iSST	18
100196	BHCS 6LP 3/8x7/8i SST	36
100171	BHCS 6LP 3/8x1-1/2iSSTPAT	20

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Approx. Weight: 125 lbs

Custom Three Vertical O-Zones

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

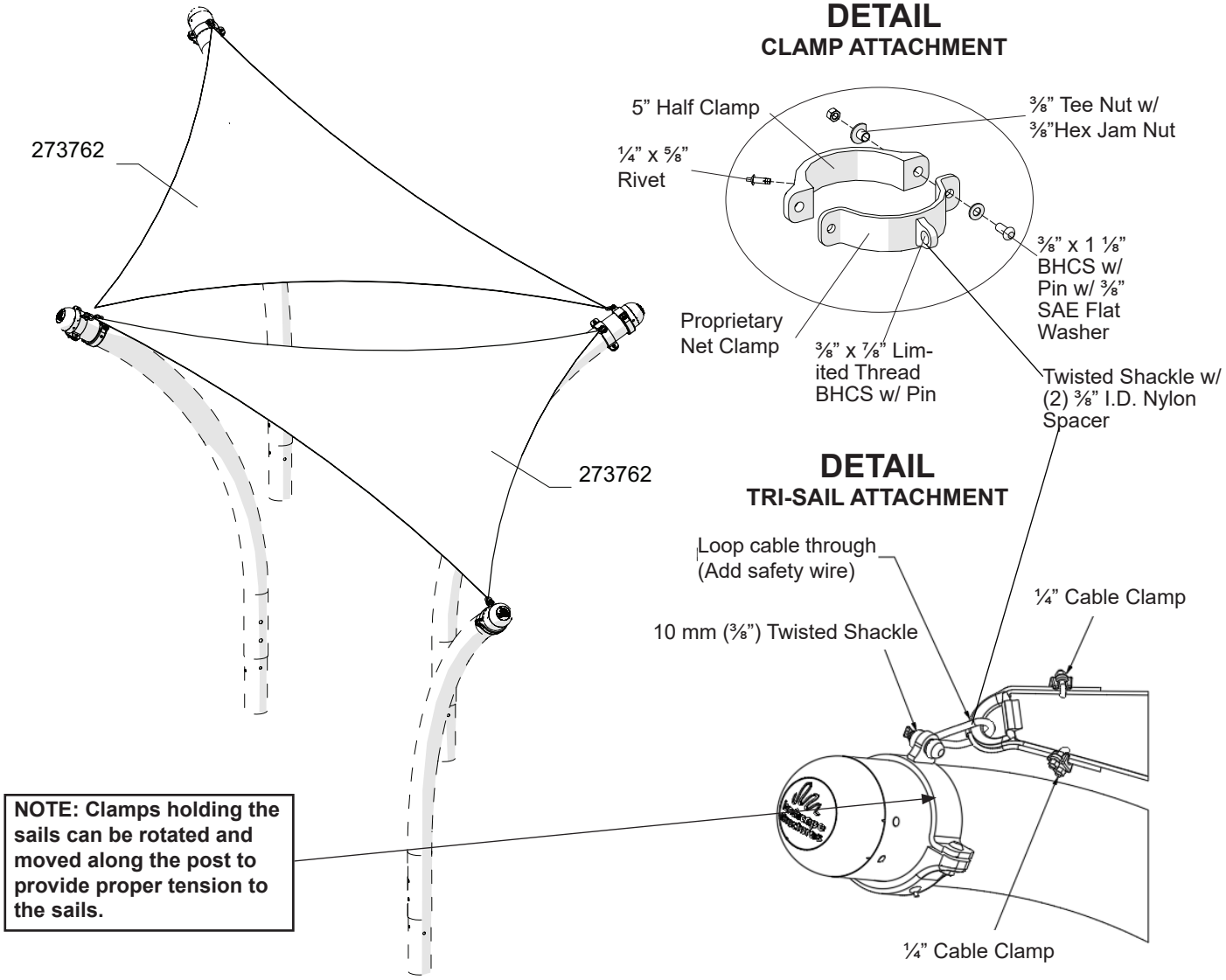
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



NOTE: Clamps holding the sails can be rotated and moved along the post to provide proper tension to the sails.

Parts List

PART NUMBER	DESCRIPTION	QTY.
273762	CUST LSI TREE TOPPER	1
273307	CUST CURVED POST TRI SAIL INST	1
209861	EVOS PROPRIETARY TAB SST	1
161898	PROPRIETARY NET CLMP	3
128296	3/8-16 HEX JAM NUT SST	6
127179	BUSH 5/8OD X 3/8 LG SST	3

PART NUMBER	DESCRIPTION	QTY.
105327	CLMP HALF 5 AL	3
104198	CLMP HALF 1-3/4i WD ST ZP	1
100610	RVT 1/4X5/8 AS (GRIP=.578/.672)	3
100351	MOD T-NUT 3/8-16 SST	6
100198	BHCS 6LP 3/8x1-1/8i SST	6

Installation Instructions

1) Assemble structure following steps and details shown. Use 2D layout as a reference; may include elevations and bury depths.

2) Install protective surfacing before users are allowed to play on the structure.

Custom Curved Post Tri-Sail

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

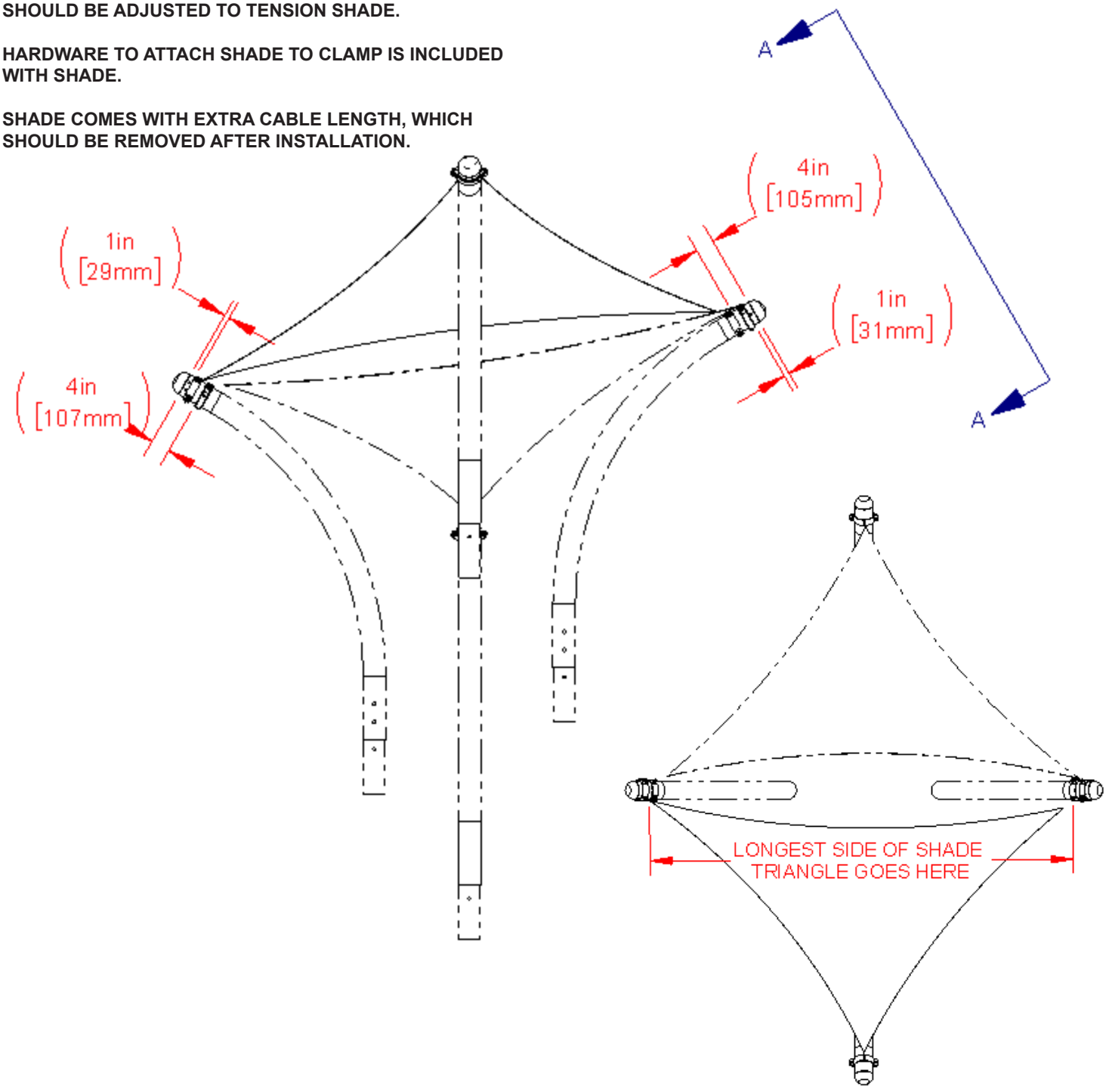
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

DO NOT INSTALL CLAMP RIVETS UNTIL SHADE IS COMPLETELY INSTALLED FOR SHADE ADJUSTMENT PURPOSES.

SHADE CLAMP LOCATIONS ARE APPROXIMATE AND SHOULD BE ADJUSTED TO TENSION SHADE.

HARDWARE TO ATTACH SHADE TO CLAMP IS INCLUDED WITH SHADE.

SHADE COMES WITH EXTRA CABLE LENGTH, WHICH SHOULD BE REMOVED AFTER INSTALLATION.



Custom Curved Post Tri-Sail

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27511203

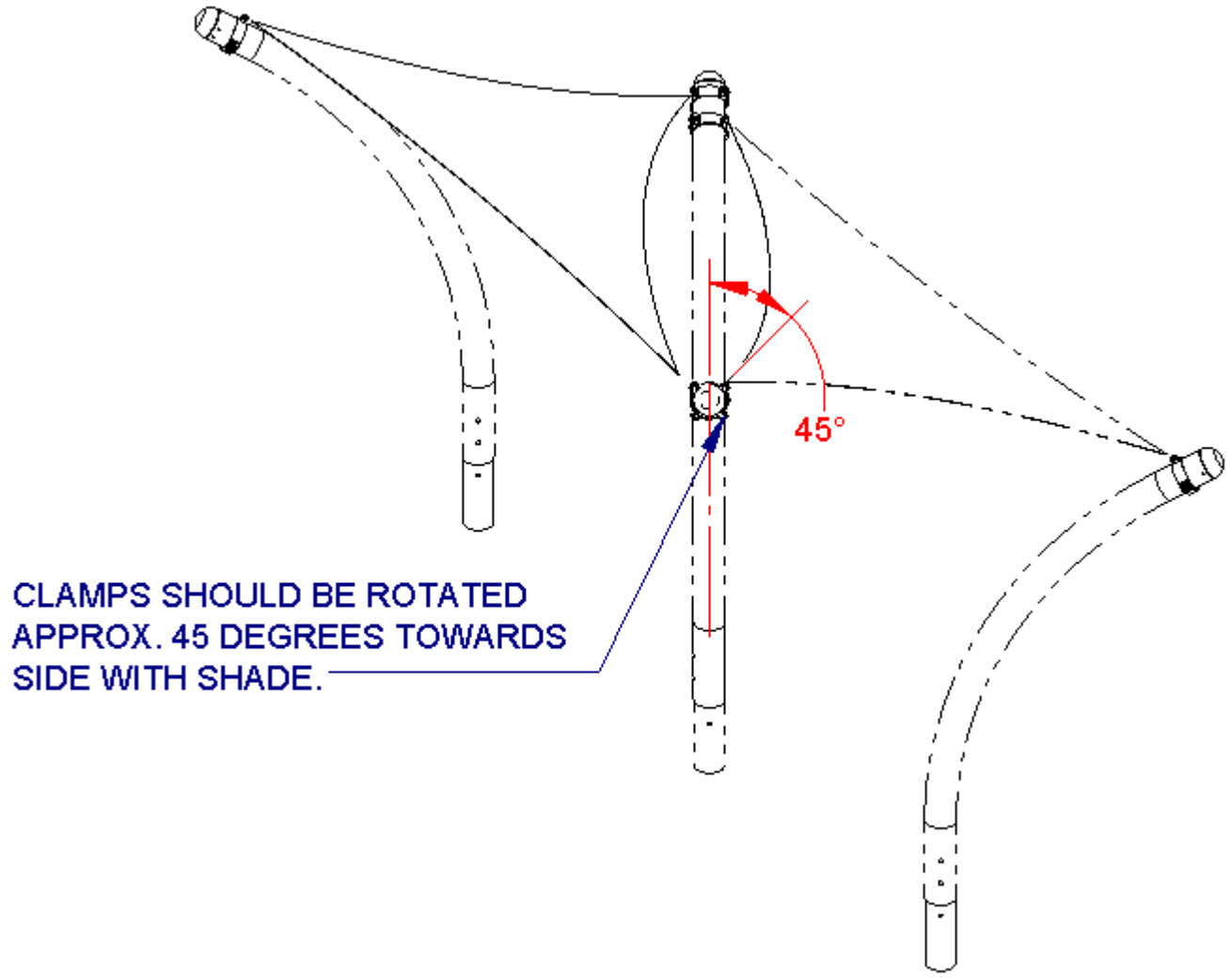
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



SECTION A-A

Custom Curved Post Tri-Sail

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

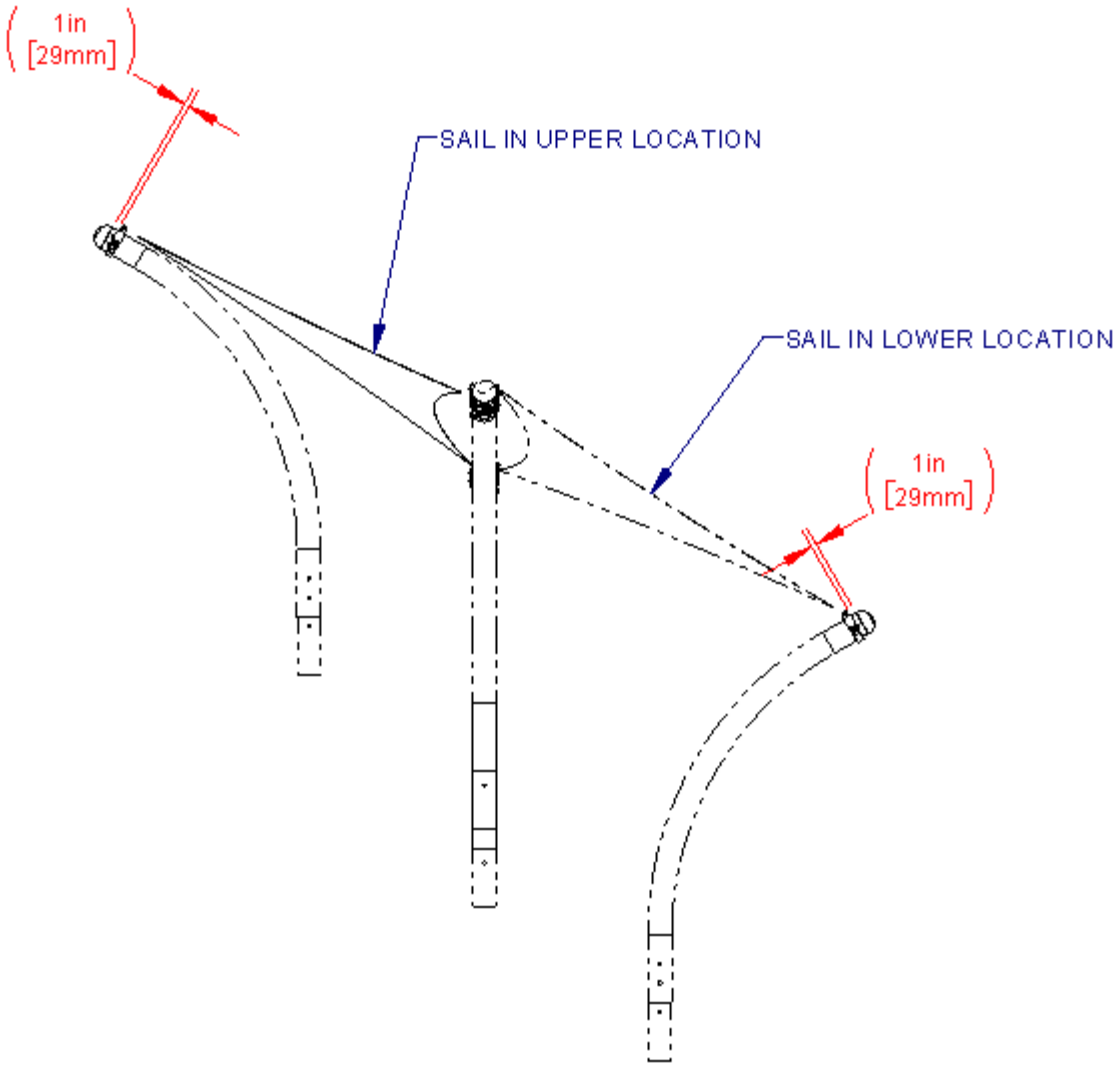
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)



Custom Curved Post Tri-Sail

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

Specifications

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Cable/Net Assemblies: (Cable) Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. (Cable Connectors) 6063-T6 aluminum.

Belting: .315" (8,00 mm) Thick mini rough top rubber belting with polyester fabric plys, black in color.

Net Clamps: Weldment comprised of 1 /4" (6,35 mm) x 1 3 /4" (44,45 mm) HRPO flat steel and .375" (9,53 mm) stainless steel sheet. Finish: ProShield, color specified.

5" Clamps: Cast aluminum. Finish: ProShield, color specified.

Steel Half Clamps: Fabricated from of 1 /4" (6,35 mm) HRPO flat steel. Finish: ProShield, color specified.

Slides/Slide Hoods/O-Zone Rings/Ball Knots/Pods: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Rail Spacer Tube: Fabricated from 1.312 (33,33 mm) O.D. x 16 Ga. (.065) (1,65 mm) steel tubing. Finish: ProShield, Color Specified.

Spacer Tube: Made from 6061-T6 aluminum 7 /8" O.D. x 1 11/16". Finish: ProShield, color specified.

Slide Hand Rails: Extruded from 1.125" (28,57 mm) O.D. x .312" (7,92 mm)W. 6005-T5 aluminum. Finish: ProShield, Color Specified.

Chain: Steel 1 /4" (6,35 mm) straight link chain, 3,150 lbs. (1428,82 kilograms) working load limit. Finish: ProGuard.

DigiFuse Barrier Panels: Assembled from 1/4" (6,35 mm) thick aluminum sheet. Dye sublimation printed digital artwork is fused onto the powdercoated substrate. Solid color Permalene®, color specified. SHT HRPO steel plate 0.1793" (7Ga)

Seeker Climber Supports: Weldment comprised of 2.375" (60,33 mm) O.D. RS40 (.130"-.140") (3,30 mm-3,56 mm) wall galvanized steel tube, and 1 /4" (6,35 mm) HRPO flat steel. Finish: ProShield®, color specified.

Cable Clamps: Weldment comprised of 2 3 /8" (60,32 mm) O.D. RS40 (.130"-.140")(3,30 mm-3,55 mm) wall galvanized steel tubing, 1 /4" (6,35 mm) HRPO steel plate and 3 /8" (9,52 mm) HRPO steel plate. Finish: ProShield®, color specified

Alpine Slide Exit Support: Weldment comprised of 2.375" (60,32 mm) O.D. x .120" (3,04 mm) black steel tubing and 1 /4" (6,35 mm) x 3" (76,2 mm)mounting plate. Finish: ProShield, Color Specified.

O-Zone Ring Caps: Fabricated from sand-cast alloy 356. Finish: ProShield, color specified.

Vertical Ladder Handhold Panel: Solid color Permalene®, color specified.

Vertical Ladder Backer Plate: HRPO steel plate 0.1793" thick (7Ga)

Pod Bolt Plate: Weldment consists of 3 /16" (4,75 mm) HRPO steel plate and 3 /8" (9,53 mm) thick SST plate. Finish: ProShield®, color specified.

Swiggle Knot Footers: Formed from hot dipped galvanized HRPO steel plate 0.250" thick.

Marble Panel Assy.: (Panels) Two color Permalene®, color specified. (Poly Panel) Fabricated from .236" thick clear polycarbonate. (Marbles) 2" Diameter glass.

Bell Striker: Two color Permalene, color specified.

Bells: Fabricated from 10 GA. (.135") HRPO low carbon steel. Finish: ProShield®, color specified.

LolliLadder: Weldment comprised of 1 /4" (6,35 mm) stainless flat steel, 2.375" (60,33 mm) O.D. RS40 (.130"-.140") (3,30 mm-3,55 mm) wall galvanized steel tubing, and 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,29 mm) wall galvanized tubing. Finish: ProShield®, color specified.. Finish: ProShield, color specified.

LolliLadder Rung Cap: EPDM, black in color.

E-Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Double Slide Support: Weldment comprised of 2.375" O.D. RS-20 (.095" - .105") galvanized steel tubing and 1 /4" x 3" mounting plate. Finish: ProShield®, color specified.

Ring Pull Beam: Weldment comprised of 1.660" O.D. RS-20 (.085" - .095") galvanized steel tubing and 1 /4" x 1 3 /4" HRS clamps. Housings for double clevis are 1 1 /4" O.D. x .312" wall steel tubing. SAE 841 dry bronze bushings are pressed into housings at factory. Finish: ProShield®, color specified.

Ring Pull "D" Rings: Cast from A356 aluminum alloy with a cast in place 841 bronze alloy bushing. Finish: TenderTuffTM, brown in color.

Ring Pull Chain Assembly: 5 /16" Low carbon steel straight link galvanized chain, with bolt link made from grade 316 stainless steel. Finish: TenderTuff, brown in color.

Ring Pull Double Clevis: Stainless Steel.

Tree Tops™ Structure

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

Specifications

Shade Sail: Heavy duty, fire resistive, 62.9 mils (1.6 mm) thick professional grade shade fabric for tensioned structures and other shade applications. Made from UV stabilized HDPE monofilament and tape yarns. Specialized lock stitch knit for more air movement and better channeling of cooling breezeways. Constructed to block up to 97.7% of harmful UV sun rays. Fade and tear resistant, will not crack, rot or fray. Tensile strength warp 142.75 lbs. weft 560.67 lbs. Tear strength warp 42.03 lb. and weft 80.70 lbs.. Burst pressure 507.63 PSI. Live loads 5 psf. Remove fabric when wind speed is expected to exceed 90 mph and snow load is expected to exceed 5 psf.

Steel Posts: Cut from 5” O.D. .120” wall (11GA) galvanized steel.

Aluminum Posts: Cut from 5” O.D. .125” wall aluminum.

Post Toppers: Formed from 5” O.D. .120” wall (11GA) galvanized steel. Post caps are Fabricated from sand-cast alloy 356. Finish: Pro- Shield, color specified. Sleeve is cut from 4.69” OD X 24i galvanized steel.

Belt Bridge Handrail: Weldment comprised of 1.9” O.D. .095” wall (RS20) and 1.029” O.D. .083 wall (RS20) galvanized steel.

Belt Bridge Brackets: Formed from 0.250” thick aluminum plate.

Vine Climber: Weldment comprised of: 2.375” O.D. .134” wall (RS40) and 1.315” O.D. .083” wall (RS20) galvanized steel, HRPO steel sheet 0.250” thick, 3/8” SST tab.

Wrinkle Climber Frame: formed from HRPO steel plate .250” thick.

Decks: Flange formed from 11 GA (.120”) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5 /16” diameter holes. Deck face has (4) slotted holes for face mounting components. Finish: TenderTuff, color specified.

Tree Tops™ Structure

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

MEO23810

landscape structures®

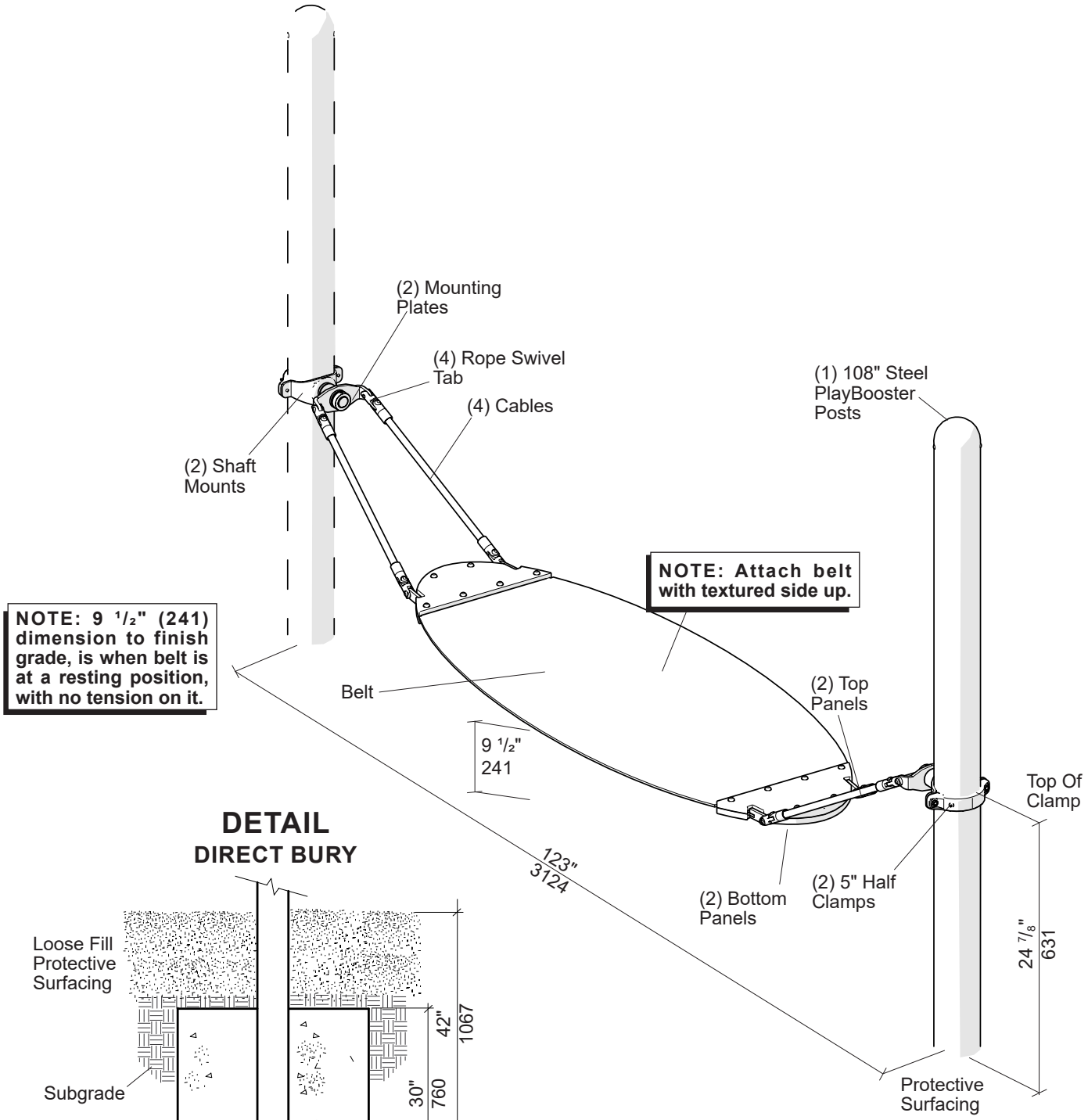
ISO 14001 CERTIFIED

ISO 9001 Certified

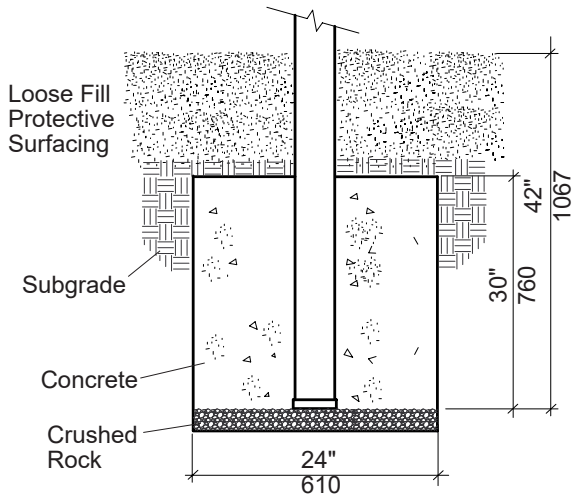
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

23206000



DETAIL
DIRECT BURY



PlayBooster® 193176 Boogie Board™

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

PlayBooster® Fun 193176 Boogie Board™

landscape structures®

Parts List

Part#	Description	Qty.
100610	1/4" x 5/8" Drive Rivet, AL/SST	2
105327	5" Half Clamp, Specify Color	2
140619	108" Steel Post w/Cap, 42" DB, Specify Color	1
228417	Belt, Specify Color	1
194377	Belt Plate, Specify Color	2
273374	Top Panel, Specify Color	2
194379	Bottom Panel, Specify Color	2
198514	Mounting Plate, Specify Color	2
194381	Shaft Mount, Specify Color	2
278154	22" Cable, Specify Color	4
196831	Presser Plate, Specify Color	2
218781	Rope Swivel Tab	4
267017	**Boogie Board Hardware Package**	1
100198	3/8" x 1 1/8" BHCS w/Pin, SST	4
113027	3/8" x 1 3/8" BHCS w/Pin, SST	12
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	12
100351	3/8" Tee Nut, SST	4
100353	3/8" Flange Nut w/Pin, SST	12
121135	1/4" O.D. x 2" Long Spring Pin, SST	2
127179	5/8" O.D. x 3/8" Bushing, SST	12
128296	3/8" Jam Nut, SST	4
120302	Collar, SST	2
149200	Thrust Bearing	2

Specifications

Post: See PlayBooster® (PB) General Specifications.

Mounting Plate: Weldment comprised of 3/8" (9,53 mm) thick SST, and 2" (50,8 mm) O.D. x 1.50 " (38,1 mm) I.D. stainless steel housing. Finish: ProShield®, color specified. (Oilite Bronze Bearing) 1.500" (38,1 mm) O.D. x 1.257" (31,92 mm) I.D.

Shaft Mount: Weldment comprised of 1/4" (6,35 mm) thick HRPO flat steel and 1" (25 mm) diameter stainless steel shaft. Finish: ProShield®, color specified.

Belt Plate: Weldment comprised of 3/8" (9,53 mm) thick HRPO sheet steel and 1/4" (6,35 mm) thick HRPO sheet steel. Finish: ProShield®, color specified.

Presser Plate: Fabricated from7 GA. (.179") (4,54 mm) thick HRPO sheet steel. Finish: ProShield®, color specified.

Cable Assembly: **(Cable)** Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. **(Cable Connectors)** 6063-T6 aluminum.

Panels: Permalene®, color specified.

Belt: .315" (8,00 mm) Thick mini rough top rubber belting with polyester fabric plys, black in color.

Clamps: Cast Aluminum. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 3 man hours
Weight: 110 lbs.
Concrete: Approx. 7.85 cu. ft.
Fall Height: 24" (0,61 m)

Specifications are subject to change without notice.

Installation Instructions

1) **(Direct Bury)** Dig footings to dimensions shown.
2) Attach shaft mounts to posts at height shown. Refer to the Shaft Mount Assembly Detail.
3) Slide mounting plate, thrust bearing, and collar onto shaft mount shaft. Line up hole in collar with hole in shaft. Tap 1/4" O.D. x 2" long spring pin through collar and shaft. Refer to the Shaft Mount Assembly Detail.
4) Attach belt plates, presser plates and panels to belt. Refer to the Belt Plate Attachment Detail.
5) Insert 5/8" O.D. x 3/8" long bushings into belt plate tabs. Attach cables to belt plate tabs. Refer to the Boogie Board Attachment Detail.
6) Insert 5/8" O.D. x 3/8" long bushings into mounting plate holes. Attach cables to mounting plates. Refer to the Cable Attachment Detail.
7) With post plumb, pour concrete footing. Allow concrete footings to cure for a minimum of 72 hours before users are allowed to play on the structure.
8) Install 1/4" x 5/8" drive rivets in 5" half clamps. Drill through hole in 5" half clamps and into 5" post with a 1/4" or "F" (only) drill bit, insert drive rivet in hole through clamp and into post. Hammer drive rivet pin in until flush with head. Refer to the Typical Offset Hanger Clamp Spec Sheet.
9) Install protective surfacing before users are allowed to play on the structure.

ECO # 0101990 Document 27815600 replaces 27337500. Update Cable to 22".
12/15/2020 Added specify color to cable parts.

landscape structures®

ISO 14001 CERTIFIED

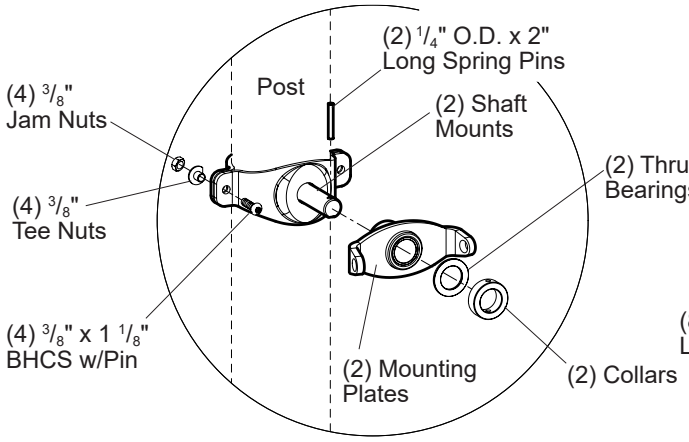
ISO 9001 Certified

SAFETY NOTE

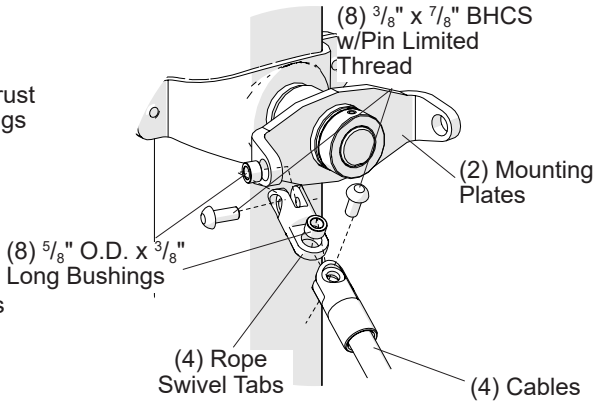
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

232060a

DETAIL
SHAFT MOUNT ASSEMBLY

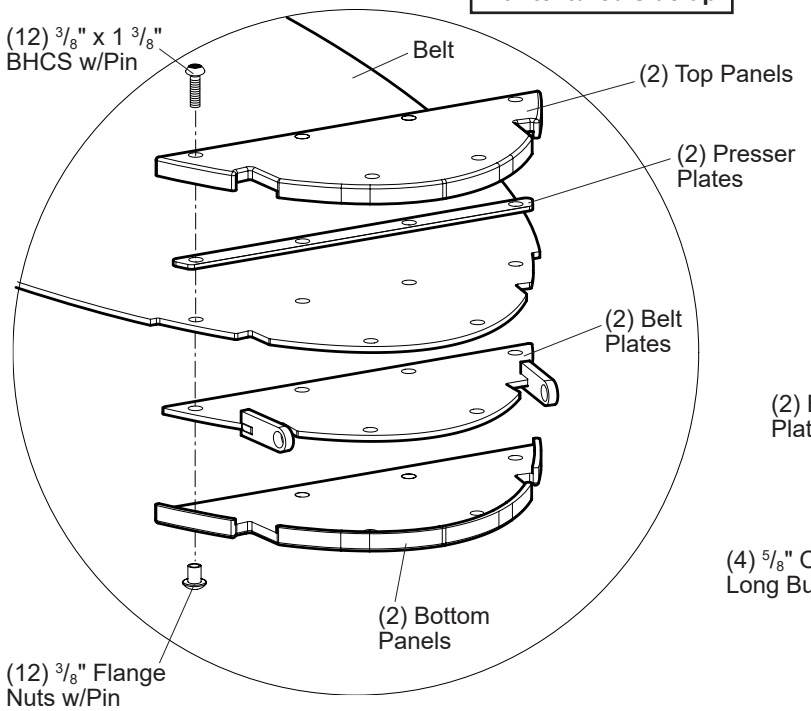


DETAIL
CABLE ATTACHMENT

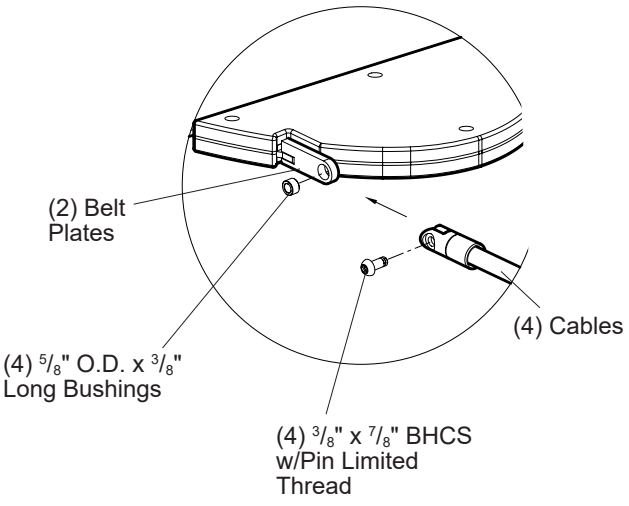


DETAIL
BELT PLATE ATTACHMENT

NOTE: Attach belt with textured side up.



DETAIL
BOOGIE BOARD ATTACHMENT



PlayBooster®

193176 Boogie Board™

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Document #27815600

landscape structures®

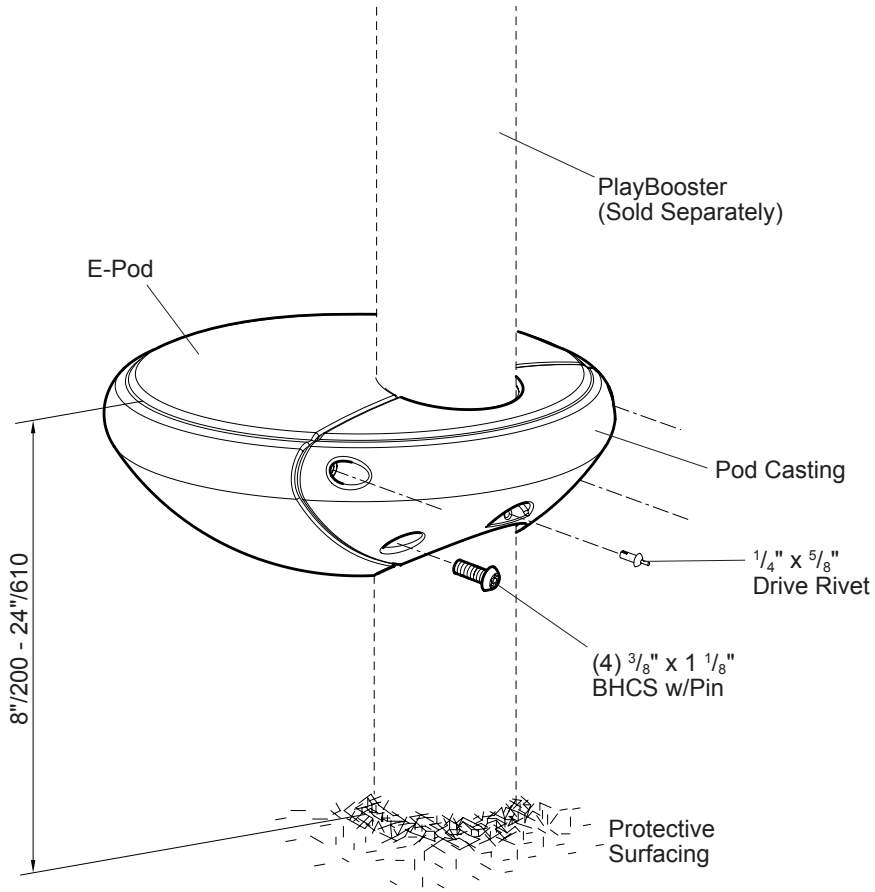
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

16681000



PlayBooster®

166809 E-Pod® Step

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2009 by Landscape Structures. All rights reserved.

landscape structures®

PlayBooster® 166809 E-pod® Step

Parts List

Part#	Description	Qty.
154461	E-Pod, Specify Color	1
156806	Pod Casting, Specify Color	1
156968	**Pod Hardware Package**	1
100198	$^3/_8$" x 1 $^1/_8$" BHCS w/Pin, SST	4
100610	$^1/_4$" x $^5/_8$" Drive Rivet, AL/SST	1

Specifications

E-Pod: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. $^1/_4$ man hour
Weight: 11 lbs.
Fall Height: Pod Height

Installation Instructions

1) Attach e-pod and pod casting to post as shown, using $^3/_8$" x 1 $^1/_8$" BHCS w/pin.

2) Drill through hole in pod casting and into post with a $^1/_4$" or "F" (only) drill bit. Insert $^1/_4$" x $^5/_8$" rivet in hole and hammer rivet pin in until it is flush with head.

3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

landscape structures

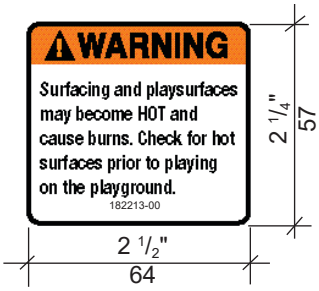
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

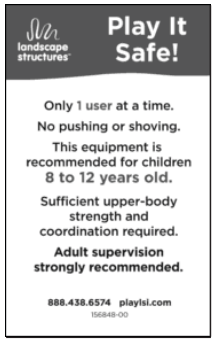
Part No. 156844-00-000



Part No. 182213-00-000

Part No. 115176-00-000

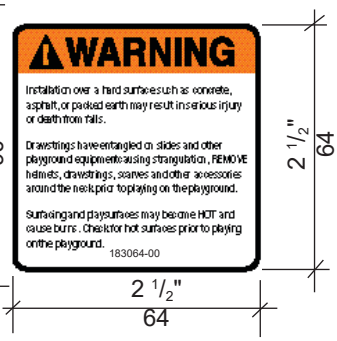
Part No. 156846-00-000



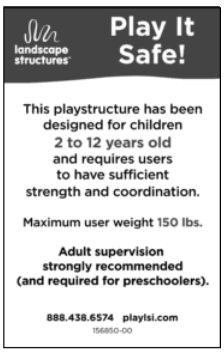
Part No. 156848-00-000

Part No. 166751-00-000

Part No. 182212-00-000

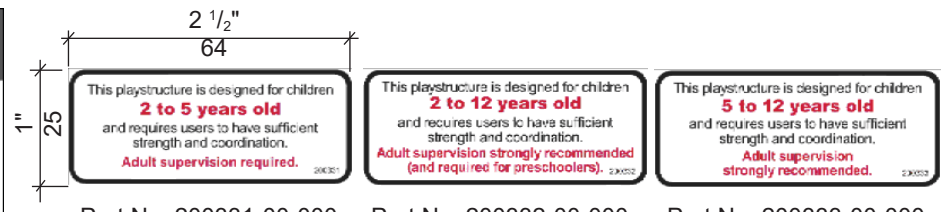


Part No. 183064-00-000



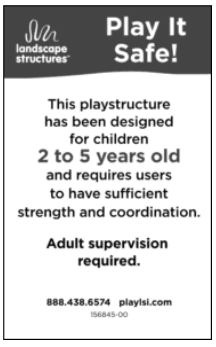
Part No. 156850-00-000

Part No. 166815-00-000



Part No. 200331-00-000 Part No. 200332-00-000 Part No. 200333-00-000

Part No. 156847-00-000



Part No. 156845-00-000

NOTE: The Playstructure design will determine which Play It Safe sticker will be supplied.

INSTRUCTIONS:

Surface must be clean and dry prior to applying sticker. Peel backing sheet away from back of sticker and place sticker in position. Using backing sheet, rub over face of sticker to burnish down into place. Choose a location visible to adults in a conspicuous location on product. Stickers work best on painted parts. Where possible, avoid placing on rotationally-molded plastic parts, TenderTuff-coated parts or where children may step and wear off sticker. This applies to both Freestanding Play items and Composite Playstructures. Apply sticker adjacent to or visible from the primary entrance to the structure. Apply 4'-5' above the surface. Apply at least (1) one to every structure and (2) two to large Composite Playstructures.

PB/PS/FP/Evos®/Weevos®

Warning Labels

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

Document #25780600

landscape structures

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

251714	5i Formed Play Safe Plate 6-23 Months w/Attaching HDW
251736	5i Formed Play Safe Plate 2-5 Years w/Attaching HDW
251712	5i Formed Play Safe Plate 2-12 Years w/Attaching HDW
251713	5i Formed Play Safe Plate 5-12 Years w/Attaching HDW
251715	5i Formed Play Safe Plate 1.5-5 Years w/Attaching HDW
251716	5i Formed Play Safe Plate 1.5-12 Years w/Attaching HDW
251720	3.5i Formed Play Safe Plate 6-23 Months w/Attaching HDW
251717	3.5i Formed Play Safe Plate 2-5 Years w/Attaching HDW
251718	3.5i Formed Play Safe Plate 2-12 Years w/Attaching HDW
251719	3.5i Formed Play Safe Plate 5-12 Years w/Attaching HDW
251721	3.5i Formed Play Safe Plate 1.5-5 Years w/Attaching HDW
251722	3.5i Formed Play Safe Plate 1.5-12 Years w/Attaching HDW
251726	Flat Large Play Safe Plate 6-23 Month w/Attaching HDW
251723	Flat Large Play Safe Plate 2-5 Years w/Attaching HDW
251724	Flat Large Play Safe Plate 2-12 Years w/Attaching HDW
251725	Flat Large Play Safe Plate 5-12 Years w/Attaching HDW
251727	Flat Large Play Safe Plate 1.5-5 Years w/Attaching HDW
251728	Flat Large Play Safe Plate 1.5-12 Years w/Attaching HDW

251731	Flat Small Play Safe Plate 6-23 Month w/Attaching HDW
251729	Flat Small Play Safe Plate 2-5 Years w/Attaching HDW
251730	Flat Small Play Safe Plate 2-12 Years w/Attaching HDW
251735	Flat Small Play Safe Plate 5-12 Years w/Attaching HDW
251732	Flat Small Play Safe Plate 1.5-5 Years w/Attaching HDW
251733	Flat Small Play Safe Plate 1.5-12 Years w/Attaching HDW

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

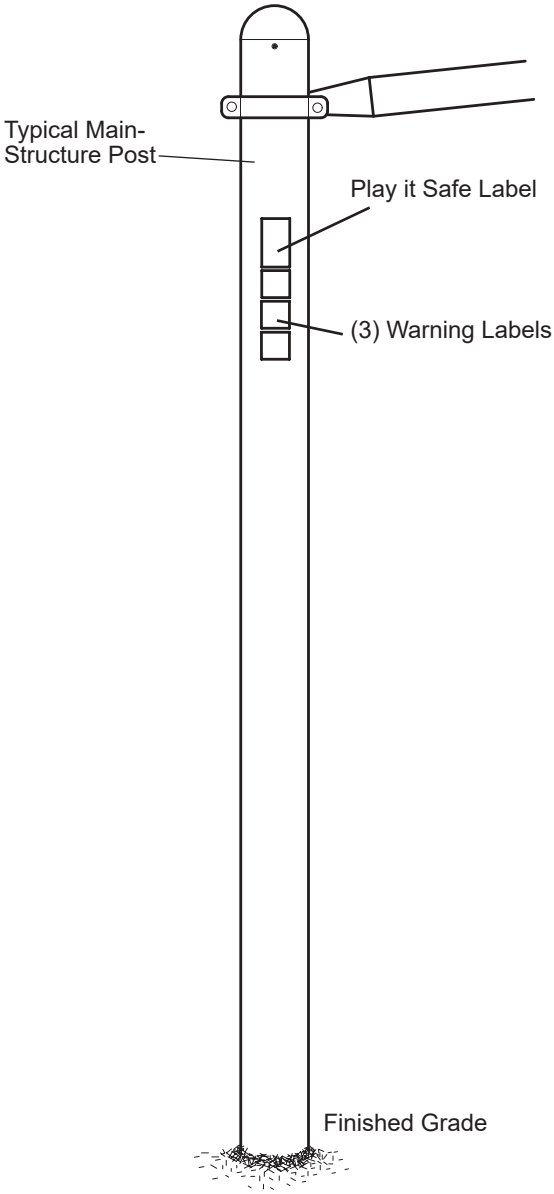
landscape structures

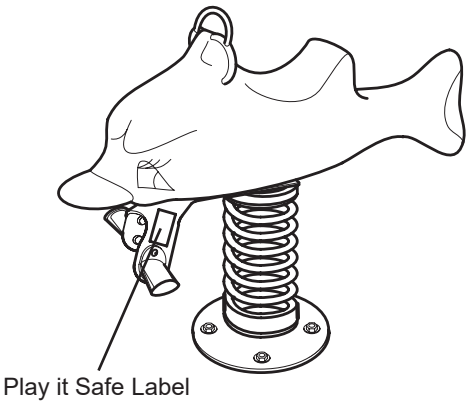
ISO 14001 CERTIFIED

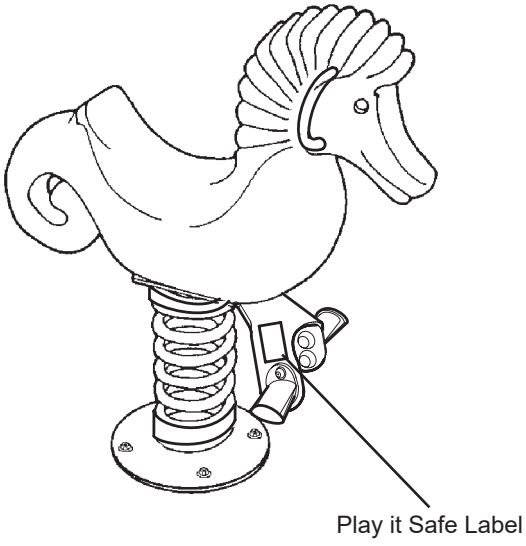
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)







Warning Labels

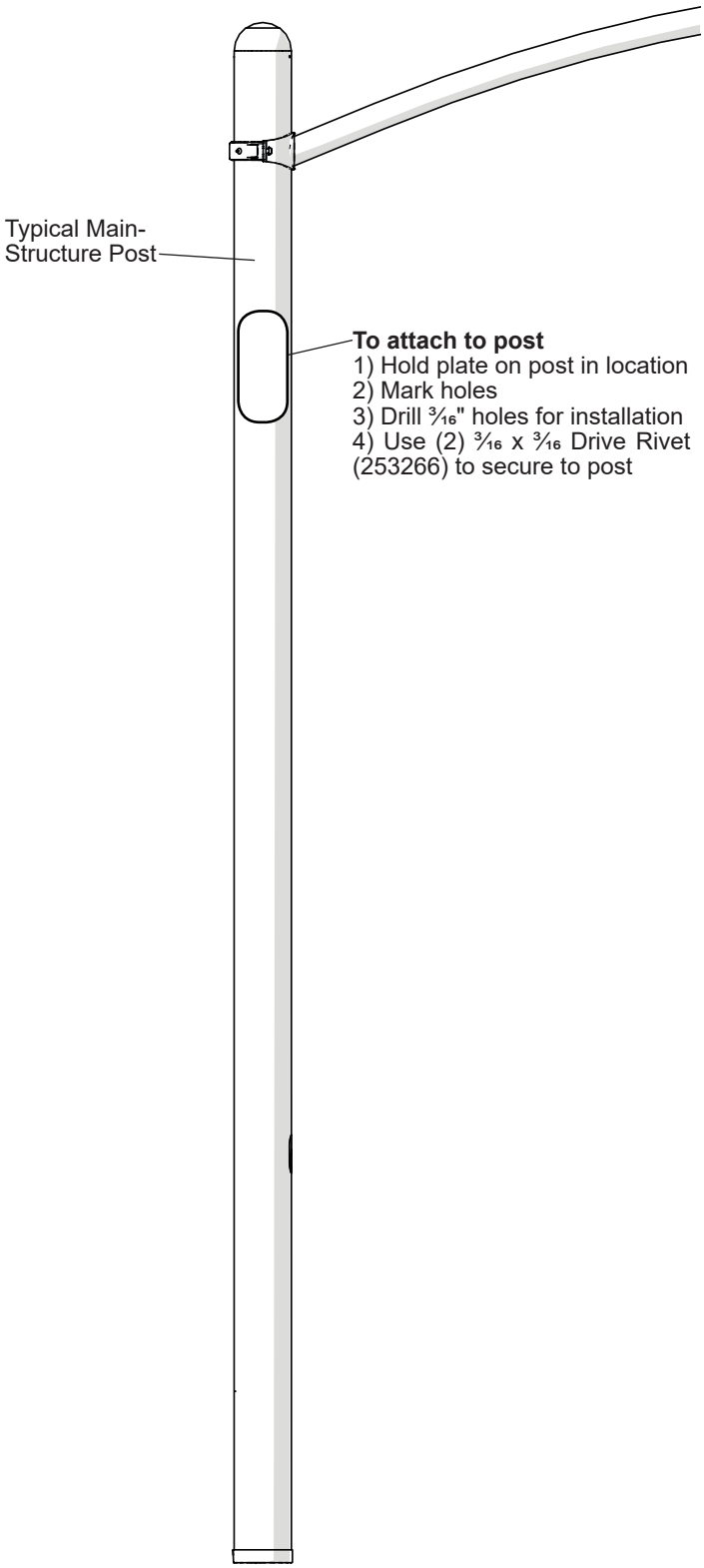
601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

Document #25780600

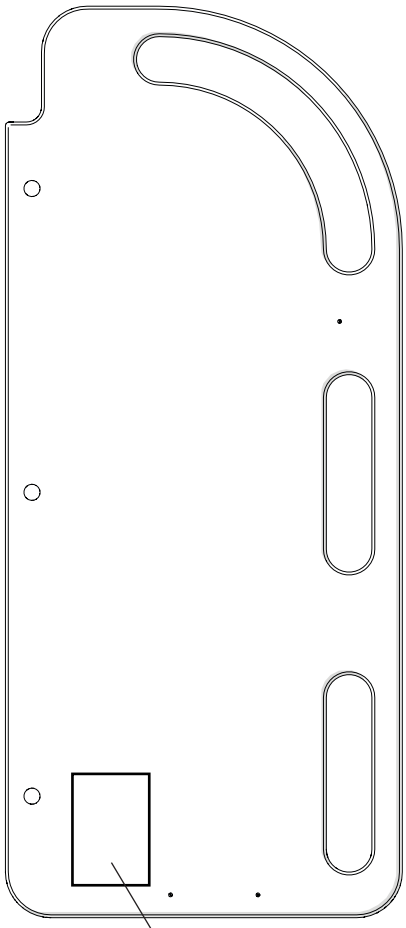
landscape structures

5" formed plate mounts to 5" posts.
3.5" formed plate mounts to 3.5" posts



To attach to post
1) Hold plate on post in location
2) Mark holes
3) Drill 3⁄16" holes for installation
4) Use (2) 3⁄16 x 3⁄16 Drive Rivet (253266) to secure to post

Large flat plate mounts to flat surfaces



To attach to permalene
1) Hold plate on surface in location
2) Mark holes
3) Drill ⅛" x $^1/_2$" deep holes for installation
4) Use (2) TorX #14 x ½ Cap Screw (129671) to attach to panel

PB/PS/FP/Evos®/Weevos®

Warning Labels

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

Eco 0101597 Document #25780600 replaces #20151300. Added warning signs to document

Document #25780600

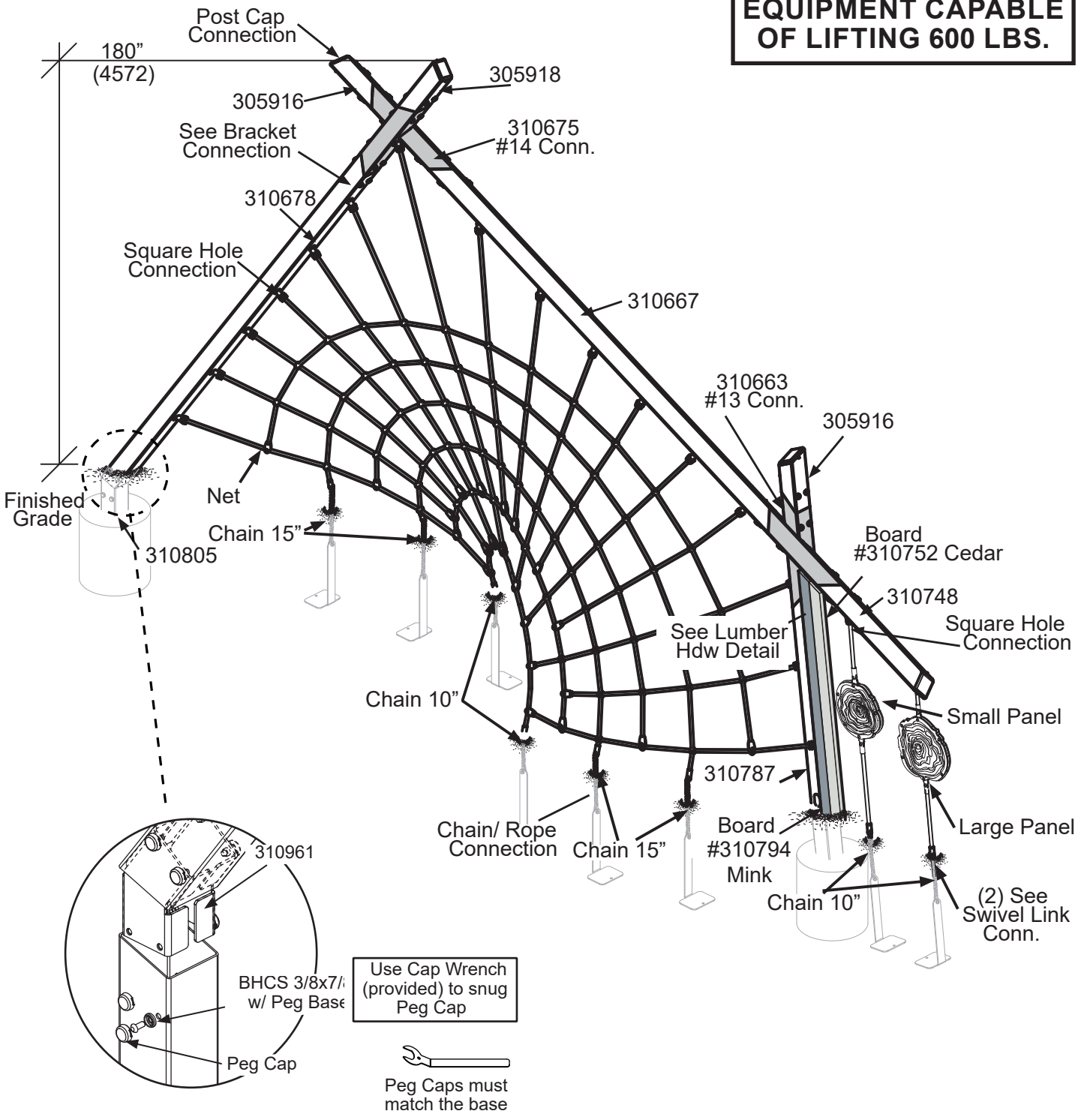
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

FOR EASE OF INSTALLATION, RECOMMEND LIFTING EQUIPMENT CAPABLE OF LIFTING 600 LBS.



307425 Forge® Climber

Forma™

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2024 by Landscape Structures. All rights reserved.

Document #31570500

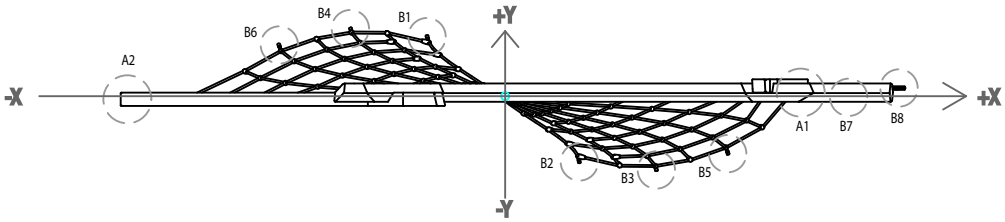
landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

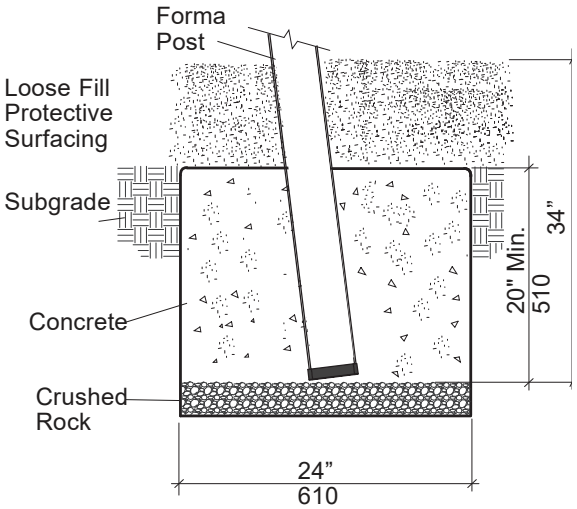
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

Note: For direct bury; the Cable might need to be propped up to achieve pCabler height.

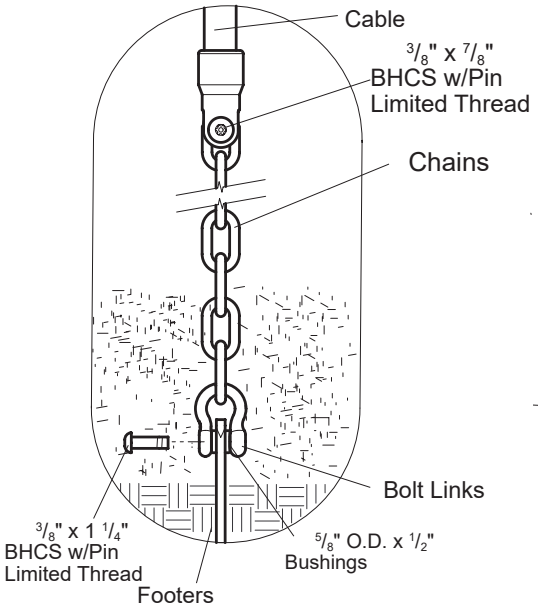


N.	I.D.	X (ft-in)	Y (ft-in)	Dist. to O	DIA (in)
1	A1	9'-3"	1 1/2"	9'-3"	24
2	A2	-11'-9 1/2"	-1"	11'-9 1/2"	24
3	B1	-2'-5 1/2"	1'-10 1/2"	3'-1"	14
4	B2	2'-4"	-2'-0 1/2"	3'-1"	14
5	B3	4'-8 1/2"	-2'-3 1/2"	5'-3"	14
6	B4	-4'-10"	2'-1 1/2"	5'-3 1/2"	14
7	B5	6'-11 1/2"	-1'-9 1/2"	7'-2"	14
8	B6	-7'-0 1/2"	1'-7"	7'-3"	14
9	B7	10'-9"	-1/2"	10'-9"	14
10	B8	12'-3 1/2"	3"	12'-3 1/2"	14

DETAIL
DIRECT BURY



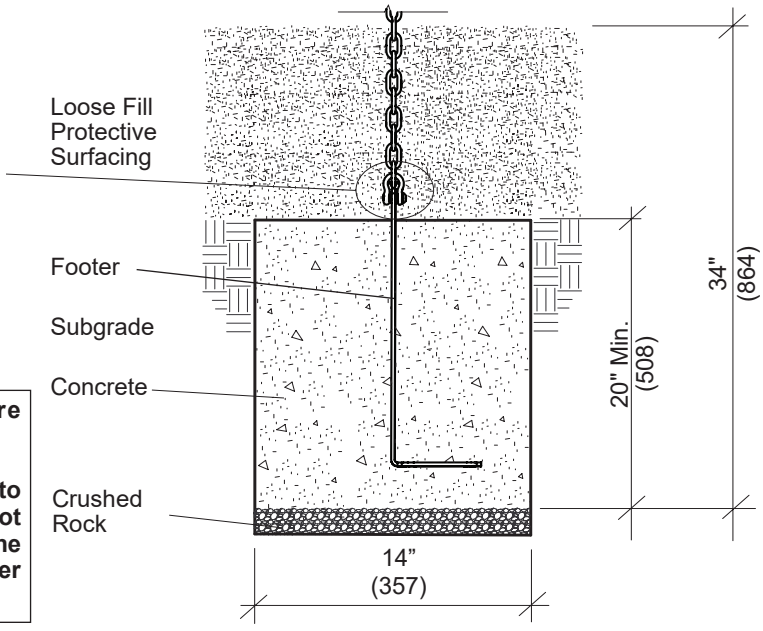
DETAIL
CHAIN/ CABLE CONN.



IMPORTANT! Tension Cables/nets before pouring concrete footings.

NOTE: The hole depth for the footer needs to be deep enough, so the footer plate does not contact the bottom of the hole. The weight of the concrete will force the footer plate down, further tightening the cable.

DETAIL
DIRECT BURY



601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2024 by Landscape Structures. All rights reserved.

Document #31570500

landscape structures®

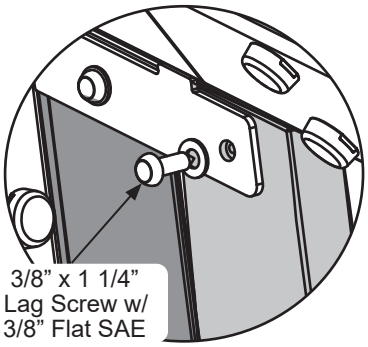
ISO 14001 CERTIFIED

ISO 9001 Certified

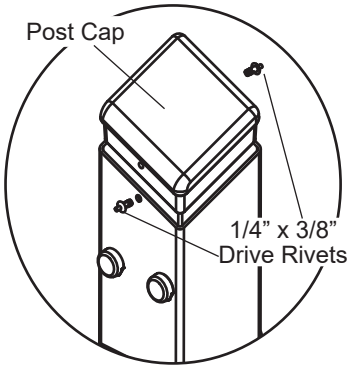
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

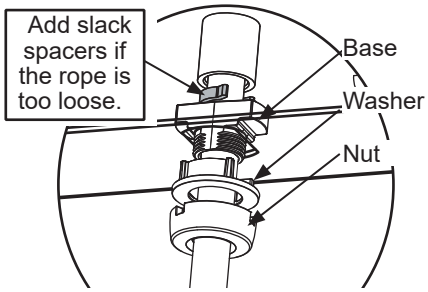
DETAIL LUMBER HDWR



DETAIL POST CAP

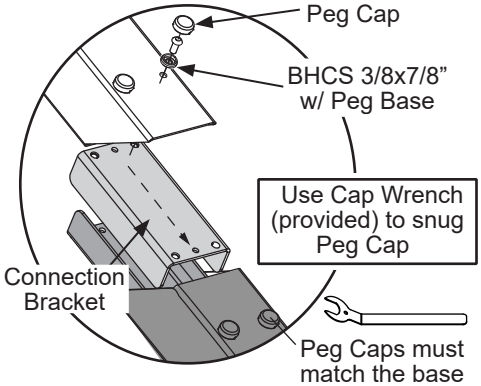


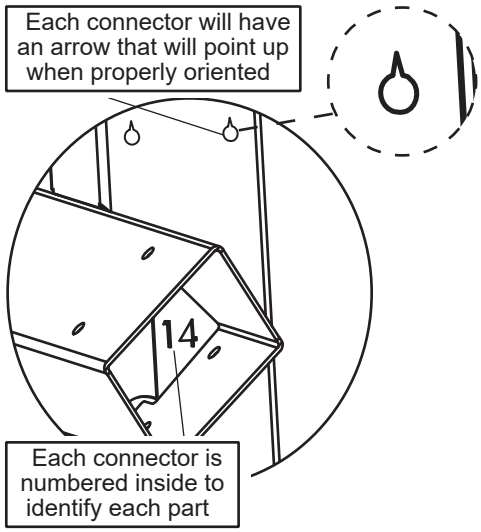
DETAIL SQUARE CABLE CONN.



Place base inside the pipe and rotate into place. Use washer to align rope into place. Pull the cable straight and tighten the nut hand tight. Use the Spanner tool and turn the nut a quarter rotation to reach 15 ft-lbs.

DETAIL BRACKET CONN.





601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2024 by Landscape Structures. All rights reserved.

Document #31570500

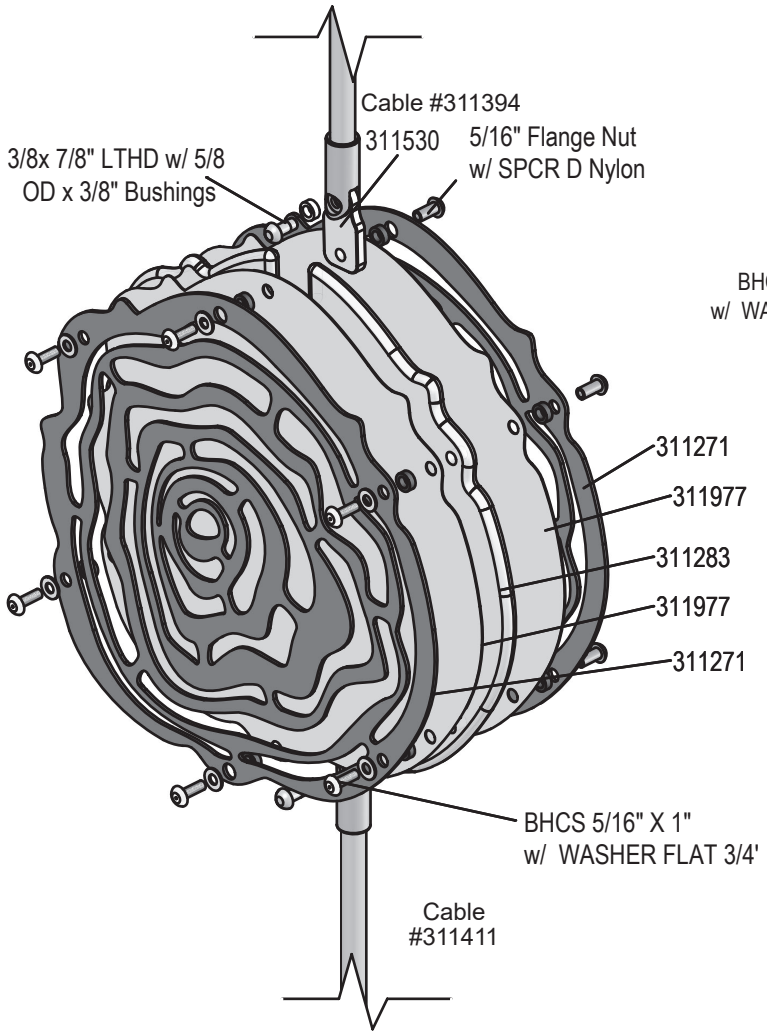
landscape structures®

ISO 14001 CERTIFIED

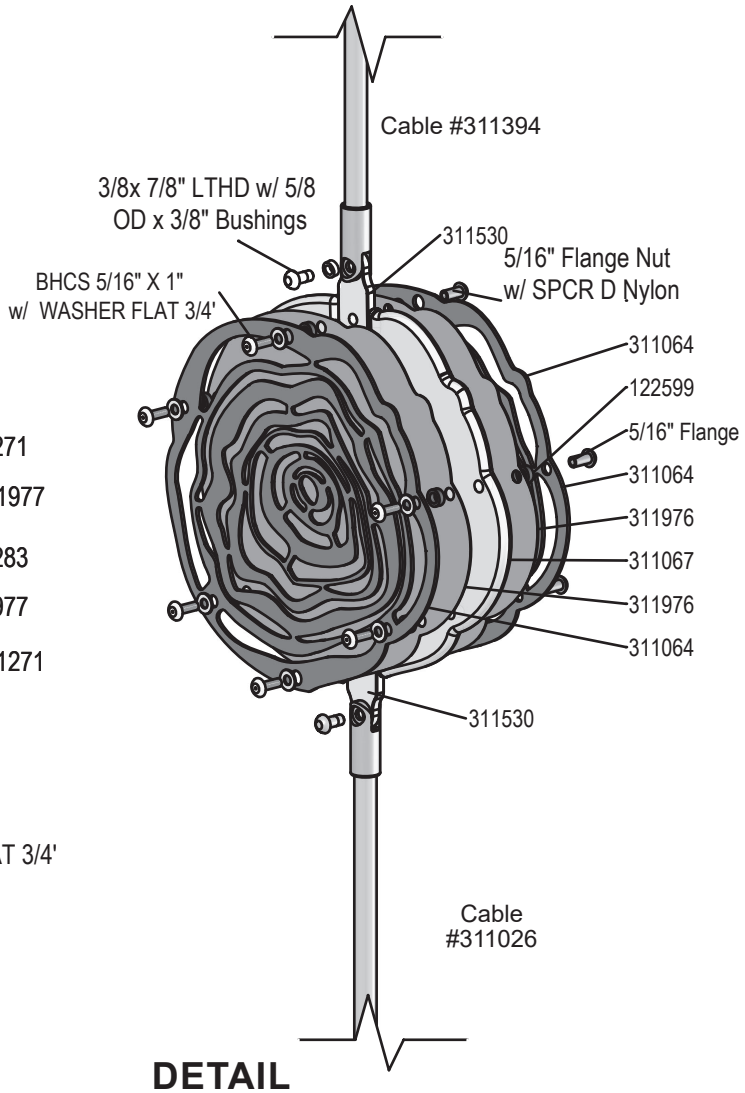
ISO 9001 Certified

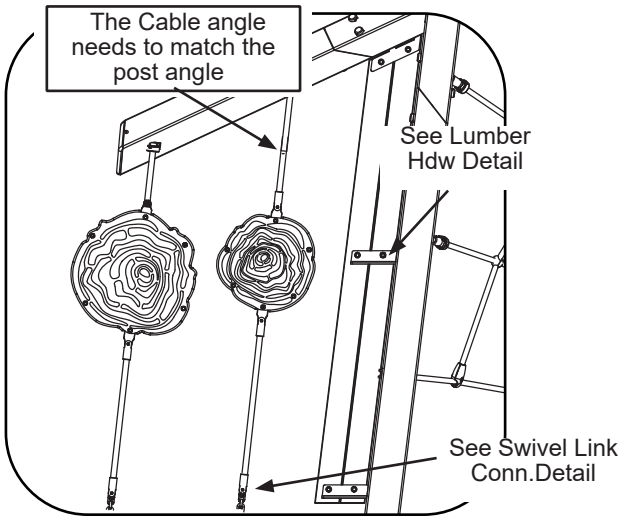
SAFETY NOTE
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL LARGE PANEL

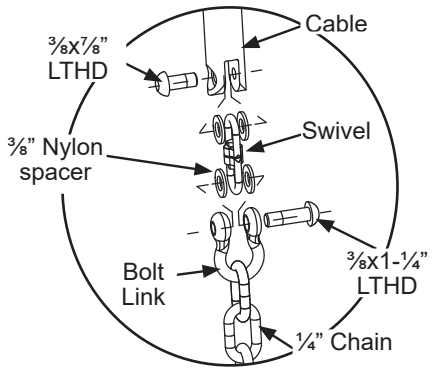


DETAIL SMALL PANEL





DETAIL SWIVEL LINK CONN.



601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2024 by Landscape Structures. All rights reserved.

Document #31570500

landscape structures®

Forma™ 307425 Forge® Climber

Parts List

Part#	Description	Qty.
310667	134i BEAM, Specify Color	1
310678	162i NET POST, Specify Color	1
305916	16i EXTENSION, Specify Color	2
305918	22i EXTENSION, Specify Color	1
311530	3i TAB 2 HOLE SST PNT, Specify Primary Color	2
311530	3i TAB 2 HOLE SST PNT, Specify Secondary Color	2
310748	40i EXTENSION, Specify Color	1
306022	5i SQ CAST END CAP PNT, Specify Color	4
310787	93.5i POST, Specify Color	1
200433	CHAIN 10i	4
200435	CHAIN 15i	4
305951	CONNECTION BRACKET, Specify Color	16
310961	CONNECTION BRACKET 2, Specify Color	2
311411	FORGE LARGE PANEL Cable 2, Specify Color	1
311026	FORGE SMALL PANEL Cable 2, Specify Color	1
310651	FORMA NET, Specify Color	1
311271	NET LARGE SENSORY PANEL AL, Specify Color	2
311283	NET LARGE SENSORY PANEL POLY	1
310805	NET POST FTR, Specify Color	1
311394	NET SENSORY PNL Cable 1, Specify Color	2
311064	NET SMALL SENSORY PANEL AL, Specify Color	2
311067	NET SMALL SENSORY PANEL POLY	1
315321	HN EN BRACKET, Specify Color	1
314455	PEG CAP CAST PNT, Specify Primary Color	36
314455	PEG CAP CAST PNT, Specify Secondary Color	36
317384	Cable SPANNER WRENCH PVC / 009 Red	1
310794	RPL 2X4 66.56i 7 DEG MITER / 288 Mink	1
310752	RPL 2X4 68.38i 7 DEG MITER / 172 Cedar	1
311977	SENSORY PANEL LARGE MIRROR	2
311976	SENSORY PANEL SMALL MIRROR	2
247871	SINGLE Cable FOOTER HDG	8
310663	SQUARE TUBE BEAM CONN 13, Specify Color	1
310675	SQUARE TUBE BEAM CONN 14, Specify Color	1
314701	HDW PKG FORGE® CLIMBER FRAME	1
100196	BHCS 6LP 3/8x7/8i SST	72
205152	LAG SCR BH 6LP 3/8x1-1/4i SST	6
307377	PEG BASE MACHINED	72
100611	RIVET 1/4X3/8i DRV AS	8
100365	WASHER FLAT SAE 3/8i SST	6
315883	HDW PKG FORGE® Cables And Panels	1
100290	BHCS 6LP LTHD 3/8x7/8iSST	12
100292	BHCS 6L LTHD 3/8x1-1/4SST	10
101000	BAG POLY 8 X 10 X 4 MIL	1
122599	SPCR .250 X .385 ID NYLON	24
127179	BUSHING 5/8OD X 3/8 LG SST	4
138915	BOLT LINK SST	10
156962	BUSHING 5/8 OD X 1/2 LG SST	8
175006	FLG NUT 6LP 5/16-18 SST	12
255617	WASHER FLAT 3/4 OD 5/16 ID SST RAW	12
264971	BHCS 6LP 5/16i -18 X 1i SST	12
317230	SWIVEL LINK	2
112501	SPACER NYLON 3/8i ID	8
182693	HDW PKG LABELS 5-12 YRS	1
115176	LABEL HD SRF WARNING ASTM	1
156847	LABEL PLAY SAFE 5-12 YRS	1
182212	LABEL ENTANGLEMENTWARNING	1
182213	LABEL HOT SURFACE WARNING	1

Specifications

Boards:	Recycled high-density polyethylene. Cedar and mink in color.
Cable Assembly:	Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable connectors) Die Cast 369.1 Alum.
Cable Nets:	(Cable) Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. Color Specific. (Cable Connectors) 6063-T6 Alum.
Chain Support:	Made from 1/4" (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.
Chain:	Steel 1/4" (6,35 mm) straight link chain, 3,150 lb (1428,82 kilograms). working load limit. Finish: ProGuard.
Fasteners:	Primary fasteners shall be socketed and pinned tamper-proof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/ specifications).
Forma Frame:	ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.
Panels:	5052 H32 Aluminum panels. Finish: Proshield, specify color.
Polycarbonate:	Made from 1/2" (12,7MM) clear polycarbonate.
Top Caps:	Cast aluminum. Finish: ProShield, color specified.
Installation Time:	DB - Approx. 8 person hours
Concrete Req.:	DB - Approx. 24.7 cu. ft.
Weight:	DB -678 lbs.
Fall Height:	DB -89" (2,26)

10/2/2023 - Added a cap wrench detail.

Installation Instructions

1) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Assemble the Frame and place it into holes.
3) Attach cables to upper beam. Be sure to match the pattern in the illustration.
4) Attach Lumber to the post.
5) Assemble the large and small panels.
6) Connect the panels to the frame.
7) Connect chains to the ends of the cables. Attach footers to the chains.
8) Pull footers into place.
9) (Direct Bury) Pour concrete footing . Allow concrete footing to cure for a minimum of 72 hours before users are allowed to play on the structure.
10) Apply Play Safe and Warning Labels, as shown.
11) Install protective surfacing before users are allowed to play on the structure.

landscape structures®

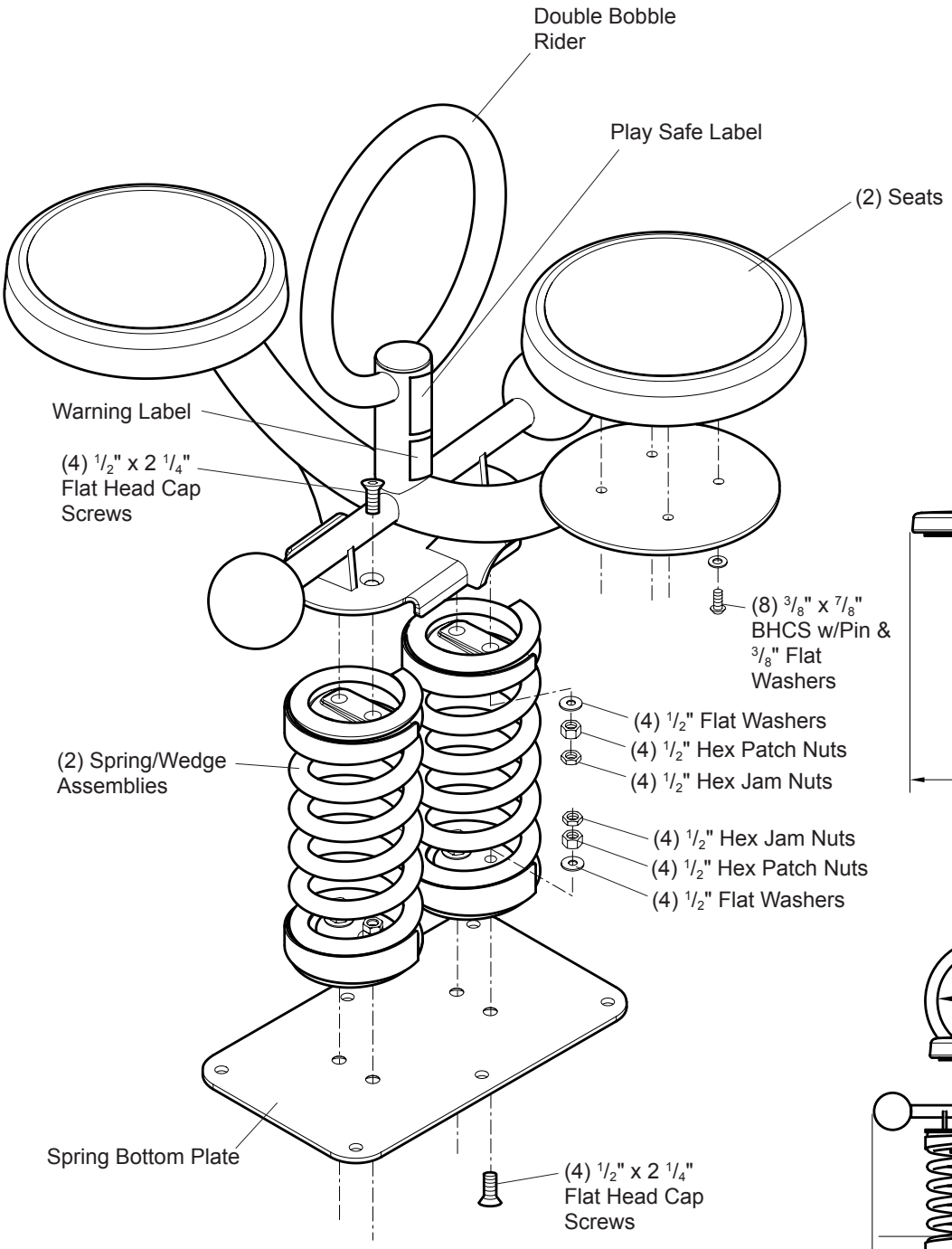
ISO 14001 CERTIFIED

ISO 9001 Certified

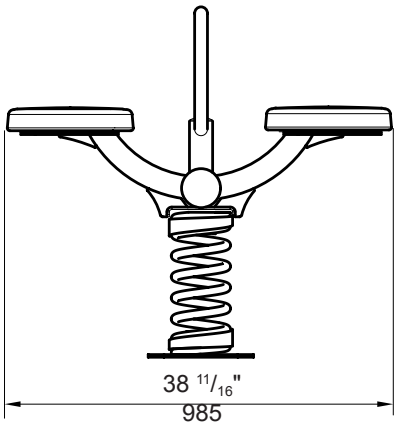
SAFETY NOTE

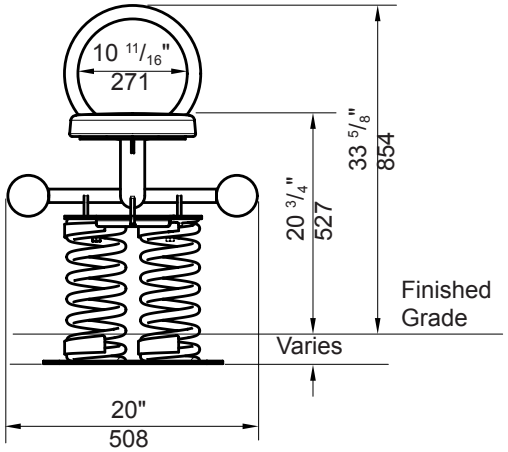
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

24927700



PLAN VIEW





Kids In Motion 164075 Bobble Rider™, Double

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2012 by Landscape Structures. All rights reserved.

Kids In Motion 164075 Bobble Rider™, Double

Parts List

Part#	Description	Qty.
132912	Spring/Wedge Assembly, Black	2
160586	Seat, Black	2
185341	Double Bobble Rider, Specify Color	1
164058	Footer (DB), Black	1
164318	Spring Bottom Plate (SM), Black	1
183887	**Double Bobble Rider Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	8
100362	3/8" Flat Washer, SST	8
100363	1/2" Flat Washer, SST	8
129692	1/2" Hex Patch Nut, SST	8
129693	1/2" Hex Jam Nut, SST	8
130824	1/2" x 2 1/4" Flat Head Cap Screw, SST	8
156846	Play Safe Label 2-12 Years	1
183064	Warning Label	1
121868	**Spring Animal Anchor Hardware Package (SM)**	1
100262	1/2" x 6" Anchor Bolt	6
100322	1/2" Standard Hex Nut, SST	6
100363	1/2" Flat Washer, SST	6

DB = Direct Bury
SM = Surface Mount

Specifications

Double Bobble Rider: Weldment comprised of 1.315" O.D. RS20 (.080"-.090" wall) galvanized steel tubing, 2.375" O.D. RS20 (.095"-.105" wall) galvanized steel tubing, 3/8" HRPO steel plate, 1/4" HRPO steel plate, and 4" diameter 10 GA. (.135") low carbon steel ball. Finish: ProShield®, color specified.

Spring: Weldment comprised of 5 5/8" diameter 13/16" tempered alloy steel coil. Finish: ProShield, black in color.

Seat: Rotationally molded from U.V. stabilized linear low density polyethylene, black in color.

Spring Bottom Plate: Fabricated from 3/8" x 10" x 17" sheet HRPO steel. Finish: ProShield, black in color.

Footer: Weldment comprised of 3 1/2" O.D. RS20 (.120" - .130" wall) galvanized steel tubing and 1/4" x 10" x 17" sheet HRPO steel. Finish: ProShield, black in color.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: **SM** - Approx. 2 man hours
DB - Approx. 2 1/4 man hours
Concrete Req.: **DB** - Approx. 5.25 cu. ft.
Area Req.: 15'-3" x 13'-8" (4,64 m x 4,17 m) Minimum Use Zone
Weight: **(SM)** 113 lbs
(DB) 137 lbs
Seat Height: 20 3/4" (527 mm)

Installation Instructions

(Direct Bury)

1) Dig footing hole as shown.
2) Attach Bobble Rider to spring/wedge assemblies using 1/2" x 2 1/4" flat head cap screws, 1/2" flat washers, 1/2" hex patch nuts and 1/2" hex jam nuts, as shown.
3) Attach spring/wedge assemblies to footer using 1/2" x 2 1/4" flat head cap screws, 1/2" flat washers, 1/2" hex patch nuts and 1/2" hex jam nuts.
4) Attach seats to Bobble Rider using 3/8" x 7/8" BHCS w/pin and 3/8" flat washers.
5) With footer plumb and Bobble Rider propped up, pour concrete footing and let cure for a minimum of 72 hours before using.
6) Apply labels as shown.
7) Install protective surfacing before users are allowed to play on the component.

(Surface Mounting On A Concrete Slab)

1) Using the spring bottom plate as a pattern, make a plywood template for anchor bolt placement. Attach 1/2" x 6" anchor bolts with 1/2" standard hex nuts and 1/2" flat washers to holes in template.
2) Pour concrete slab and lay template on surface in level position. Push 1/2" x 6" anchor bolts into concrete and allow 3/4" to 7/8" of thread to protrude from concrete. Allow 72 hours before template removal.
3) Attach spring/wedge assemblies to spring bottom plate using 1/2" x 2 1/4" flat head cap screws, 1/2" flat washers, 1/2" hex patch nuts and 1/2" hex jam nuts.
4) Attach spring bottom plate to anchor bolts in concrete with 1/2" standard hex nuts and 1/2" flat washers.
5) Attach Bobble Rider to spring/wedge assemblies using 1/2" x 2 1/4" flat head cap screws, 1/2" flat washers, 1/2" hex patch nuts and 1/2" hex jam nuts, as shown.
6) Attach seats to Bobble Rider using 3/8" x 7/8" BHCS w/pin and 3/8" flat washers.
7) Apply labels as shown.
8) Suficient protective surfacing for a 2' fall height should cover bottom plate and anchor bolts. (See ASTM F1487, Section 9.)

Specifications are subject to change without notice.

Eco #0101409 Document #24927700 replaces #18563400. Correct dimensions on install for area required minimum use zone.

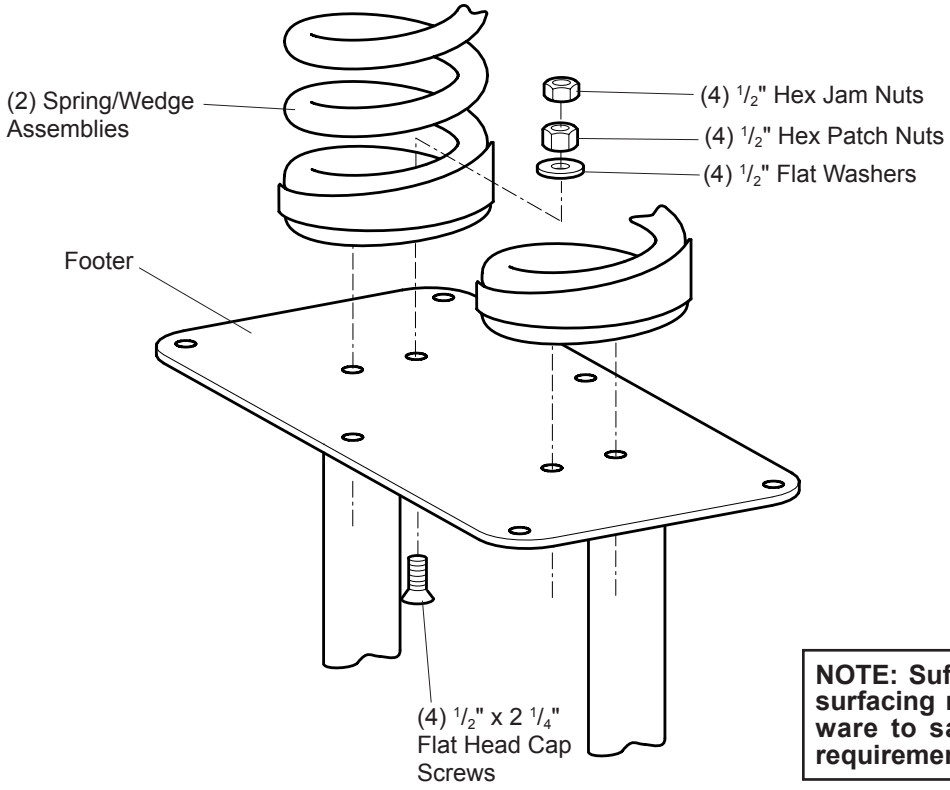
landscape structures®

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

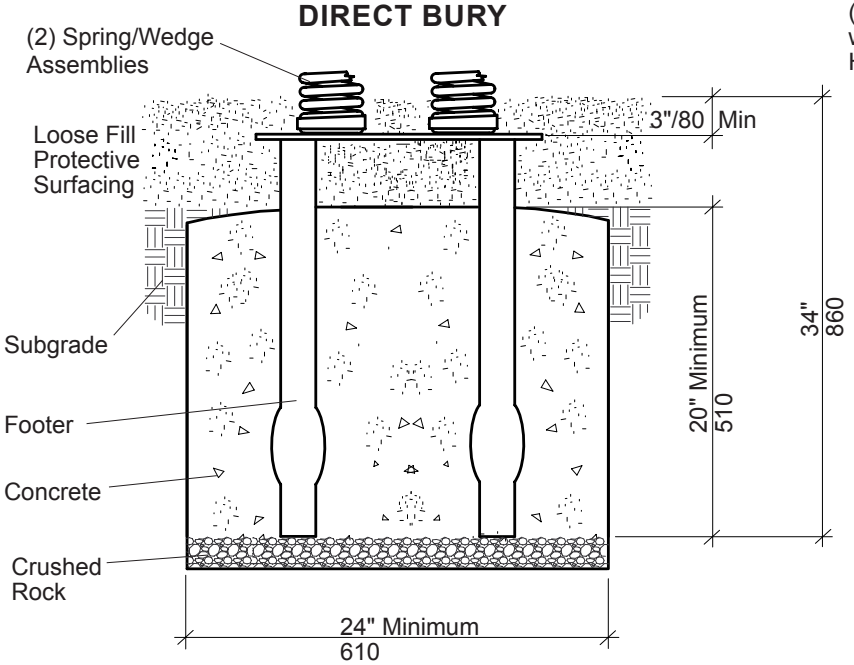
164077a

DETAIL
DIRECT BURY
BASE LEG ATTACHMENT

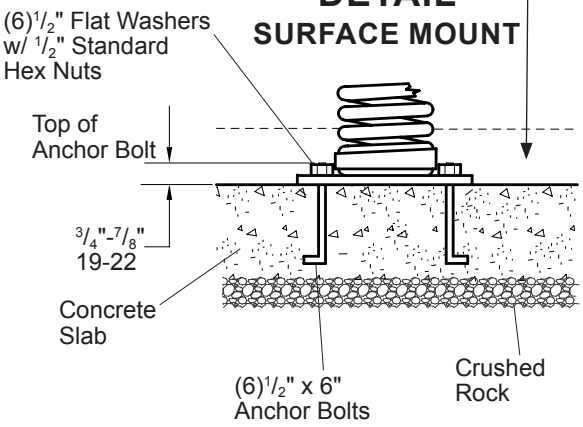


NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

DETAIL
DIRECT BURY



DETAIL
SURFACE MOUNT



Kids In Motion **164075 Bobble Rider™, Double**

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2012 by Landscape Structures. All rights reserved.

Document #24927700

landscape structures®

ISO 14001 CERTIFIED

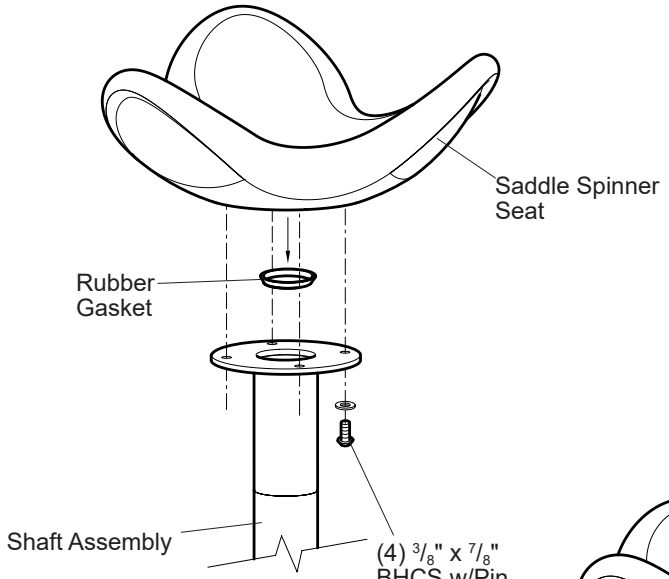
ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

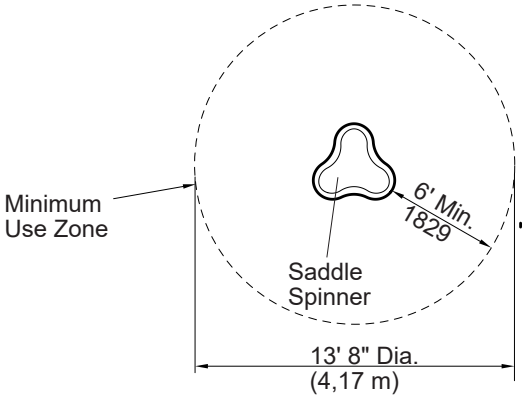
20076700

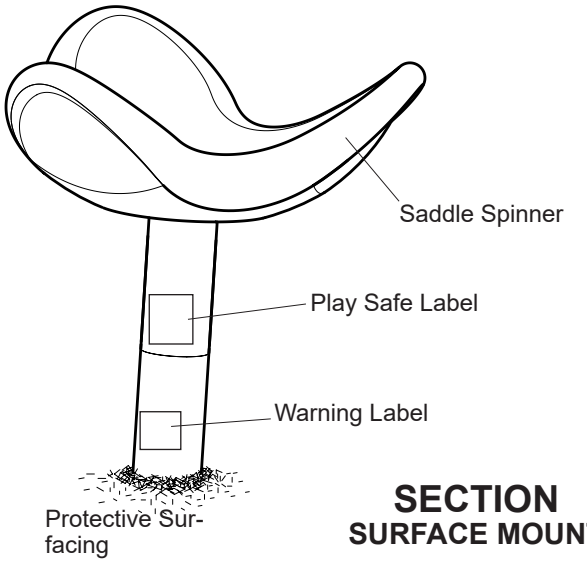
DETAIL
SADDLE SPINNER SEAT ASSEMBLY



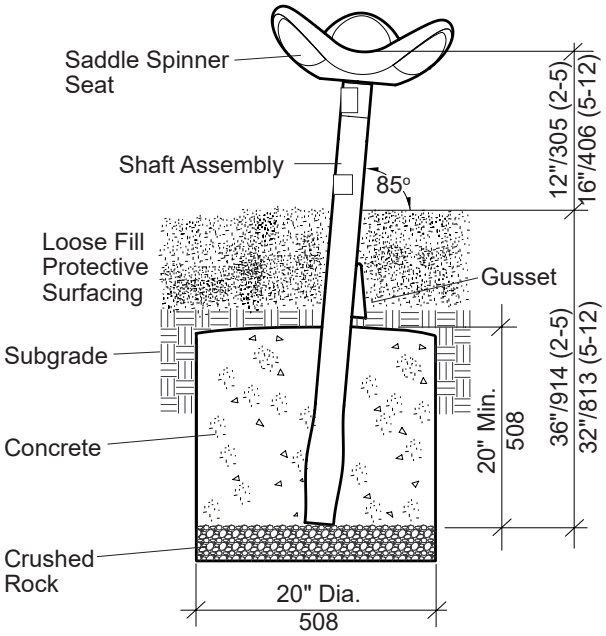
NOTE: Install Rubber Gasket with small diameter down.

DETAIL
MINIMUM USE ZONE

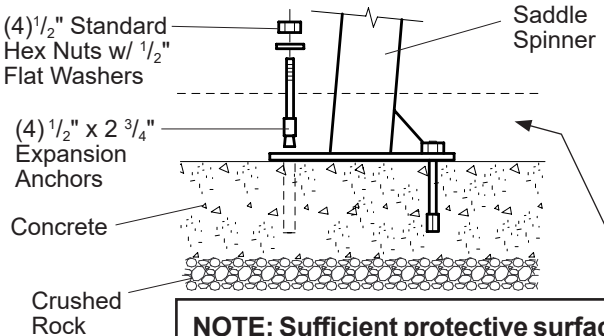




DETAIL
DIRECT BURY



SECTION
SURFACE MOUNT



NOTE: Sufficient protective surfacing must cover hardware to satisfy fall height requirements.

Kids In Motion 152179 Saddle Spinner

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2020 by Landscape Structures. All rights reserved.

Kids In Motion 152179 Saddle Spinner

Parts List

Part #	Description	Qty.
151539	Saddle Spinner Seat, Specify Color	1
197017	Shaft Assy., DB, Specify Color	*
274018	Shaft Assy. 12" Seat Height, SM, Specify Color	*
197011	Shaft Assy. 16" Seat Height, SM, Specify Color	*
211418	**Spinner Seat Hardware Package**	1
100196	$^{3}/_{8}$" x $^{7}/_{8}$" BHCS w/Pin, SST	4
100365	$^{3}/_{8}$" SAE Flat Washer, SST	4
156845	Play Safe Label, 2-5 Yrs.	1
156847	Play Safe Label, 5-12 Yrs.	1
127935	$^{5}/_{16}$" x 2 $^{15}/_{32}$" Rubber Gasket	1
183064	Warning label	1
121348	**4-Hole (SM) Hardware Package**	1
100266	$^{1}/_{2}$" x 2 $^{3}/_{4}$" Expansion Anchor	4
100322	$^{1}/_{2}$" Standard Hex Nut, SST	4
100363	$^{1}/_{2}$" Flat Washer, SST	4

*** = Quantity Determined By Your Order**
DB = Direct Bury
SM = Surface Mount

Specifications

Shaft Assembly: **(Saddle Spinner Seat Post)** Weldment comprised of 2.875" O.D. RS40 (.160"-.170" Wall) galvanized steel tubing, 1.250" O.D. steel shaft, 12 Ga. (.105") HR flat steel, and 1144 steel collar. Finish: Pro-Shield®, color specified. **(Sleeve/Plate)** Weldment comprised of $^{1}/_{4}$" sheet HRPO steel and 2.875" O.D. schedule 80 steel tubing. Finish: ProShield, color specified.

Rubber Gasket: Made from 50 durometer neoprene.

Saddle Spinner Seat: Rotationally molded from U.V. stabilized linear low density polyethylene measuring 18 $^{1}/_{4}$" wide x 7" high, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 1 man hour **(DB)**
$^{3}/_{4}$ man hour **(SM)**
Weight: 36 lbs. **(DB)**
30 lbs. 12" Seat Height **(SM)**
32 lbs. 16" Seat Height **(SM)**
Area Req.: 13' 8" (4,17 m) diameter
Min. Use Zone.: 6' (1,83 m)
Concrete: Approx. 3 $^{1}/_{2}$ cu. ft. **(DB)**
Fall Height: 12" (300 mm) 2-5 Years
16" (410 mm) 5-12 Years

Installation

1) **(Direct Bury)** Dig footing as shown. Refer to the Direct Bury Detail.

2) Attach saddle spinner seat and rubber gasket to shaft assembly using $^{3}/_{8}$" x $^{7}/_{8}$" BHCS w/pin and $^{3}/_{8}$" SAE flat washers. Refer to the Saddle Spinner Seat Attachment Detail. **NOTE:** *Install Rubber Gasket with small diameter down.*

3) **(Direct Bury)** Place the shaft assembly in footing hole. Place a level on the shaft assembly gusset, when gusset is plumb pour concrete footing. Allow concrete footing to cure a minimum of 72 hours before users are allowed to play on structure. **NOTE**: *Saddle spinner will have to be propped in position, until concrete has cured.*

   (Surface Mount) Drill $^{1}/_{2}$" x 3" deep holes through base plate using hammer drill and $^{1}/_{2}$" masonry bit. Tap expansion anchors into drilled holes. Attach shaft assembly base plate to expansion anchors using $^{1}/_{2}$" standard hex nuts with $^{1}/_{2}$" flat washers.

4) If required to meet Canadian Standard (CSA Z614) requirement for water ponding, drill (3) $^{1}/_{8}$" diameter drain holes on top side of seat, and (3) $^{1}/_{8}$" diameter holes on bottom side of seat. **NOTE:** *Positions are prelocated on both sides of seat with an indent marking. Use caution to drill through one wall of plastic only.*

5) Apply labels as shown.

6) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Eco #0101909 Document #27401700 replaces #21141900. Part number change for shaft assembly 12"..

landscape structures®

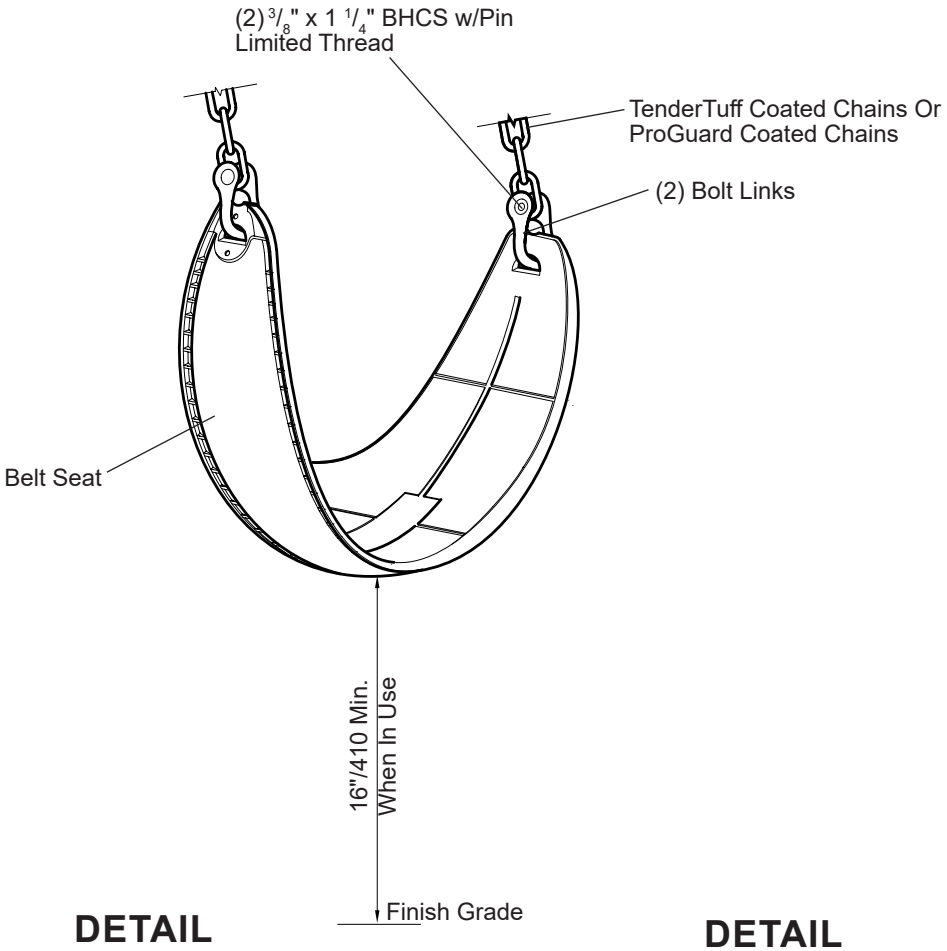
ISO 14001 CERTIFIED

ISO 9001 Certified

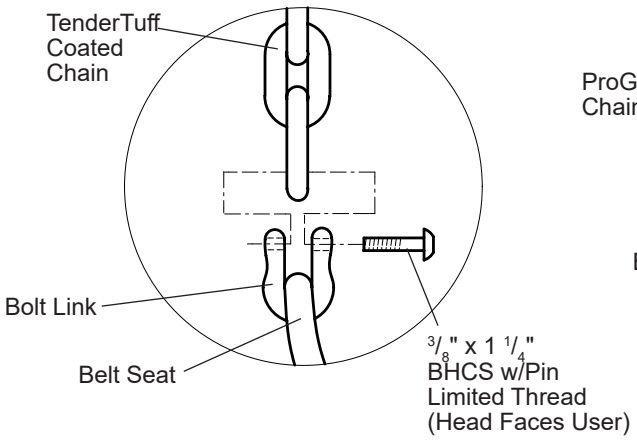
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

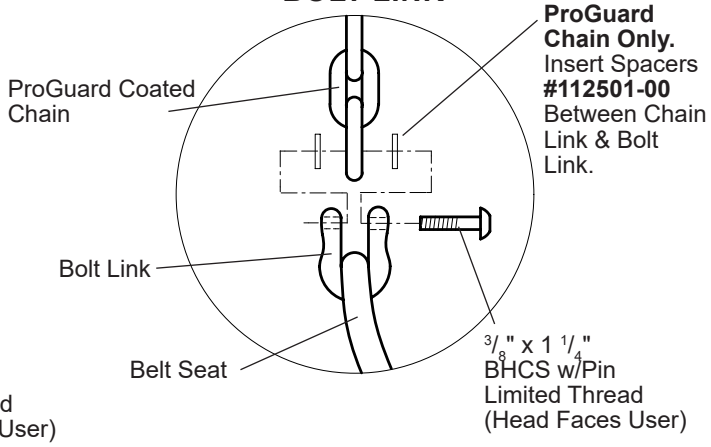
17745700



DETAIL
BOLT LINK



DETAIL
BOLT LINK



Swings

174018 Belt Seat

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2015 by Landscape Structures. All rights reserved.

Swings 174018 Belt Seat

Parts List

Part #	Description	Qty.
	7 Ft. High Beam	
128842	Belt Swing Seat, Black	1
178679	57 7/16" Chain, TenderTuff, Specify Color	2
175251	57 7/16" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292-00	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
	8 Ft. High Beam	
128842	Belt Swing Seat, Black	1
152050	67 7/8" Chain, TenderTuff, Specify Color	2
174404	67 7/8" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
	10 Ft. High Beam	
128842	Belt Swing Seat, Black	1
152052	90 11/16" Chain, TenderTuff, Specify Color	2
174884	90 11/16" Chain, ProGuard	2
132672	**Bolt Link w/Bolt & Spacers**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2
112501	Chain Spacer	4
132635	**Bolt Link w/Bolt Hardware Package**	1
100292	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread, SST	2
138915	Bolt Link, SST	2

Specifications

Chain Spacer: Made from white nylon measuring .080" x .785" O.D.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff®, color specified.

Belt Seats: Molded from U.V. stabilized black EPDM rubber encapsulating a weldment comprised of a 22 GA (.029") spring stainless steel sheet, and (4) .105" thick stainless steel washers. The belt seat elliptical shape measures 7" wide x 26" long x .700" thick.

Bolt Link: Stainless Steel.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 1/4 man hour per seat

Weight: 8 lbs. (7 Ft. Beam w/ProGuard Chains)
9 lbs. (7 Ft. Beam w/TenderTuff Chains
8 lbs. (8 Ft. Beam w/ProGuard Chains)
9 lbs. (8 Ft. Beam w/TenderTuff Chains)
10 lbs. (10 Ft. Beam w/ProGuard Chains)
11 lbs. (10 Ft. Beam w/TenderTuff Chains)

Installation

NOTE: *Refer to Swing Frame assembly for swing hanger type.*

Swing Hangers With Double Clevis

1) Attach chains to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread, as shown.
2) Attach chains to belt seat using bolt links with 3/8" x 1 1/4" BHCS w/ pin limited thread. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Anti-wrap Swing Hangers

1) Attach chains to aluminum clevis using 3/8" x 7/8" BHCS w/pin limited thread, as shown.
2) Attach chains to belt seat using bolt links with 3/8" x 1 1/4" BHCS w/ pin limited thread. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

5/14/25 - Clarification and note added for swing hanger components being part of swing frame assembly.

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

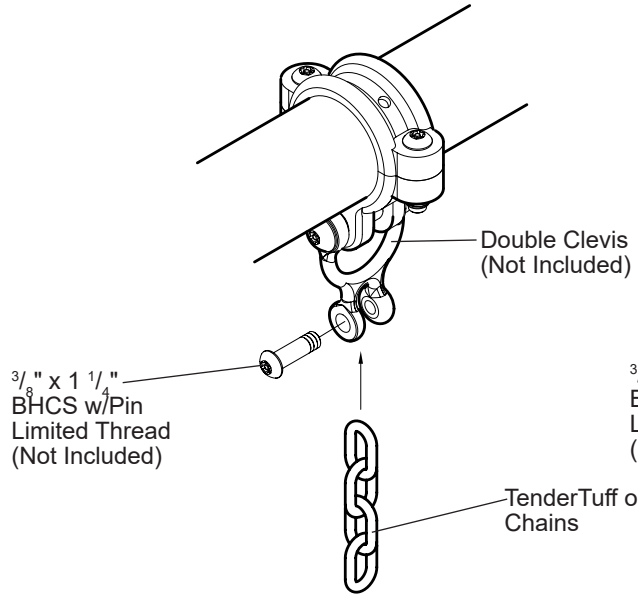
SAFETY NOTE

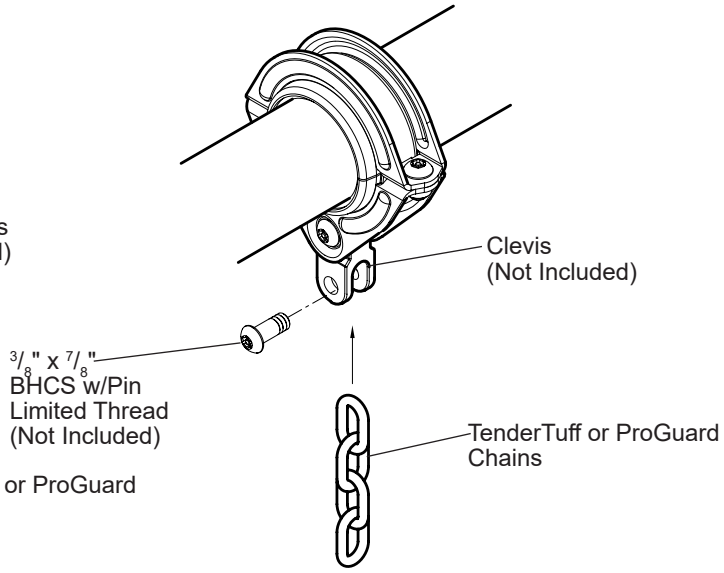
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

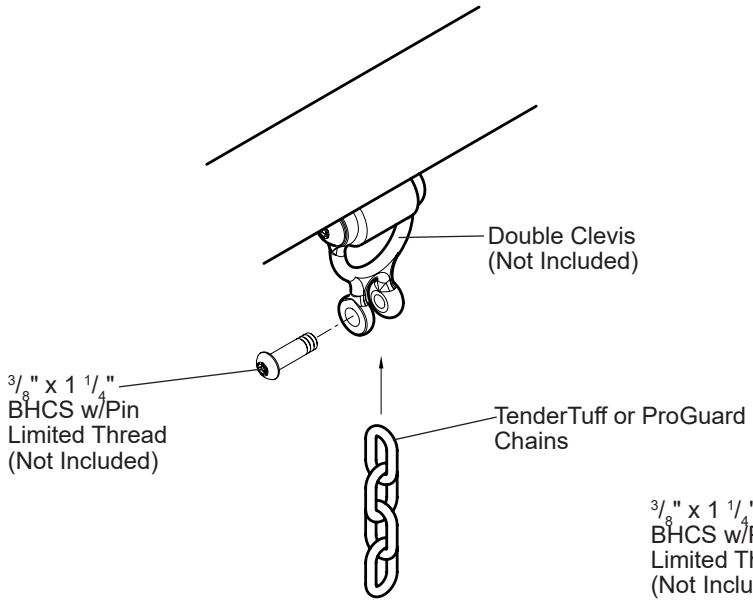
177460b

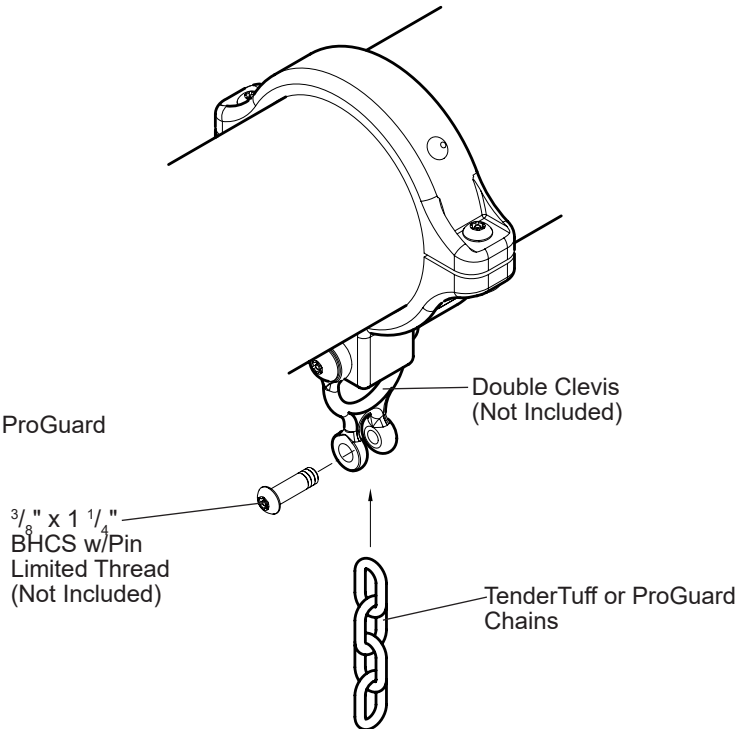
SWING HANGER OPTIONS

Swing Hanger Components included with Swing Frame.









601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2015 by Landscape Structures. All rights reserved.

landscape structures®

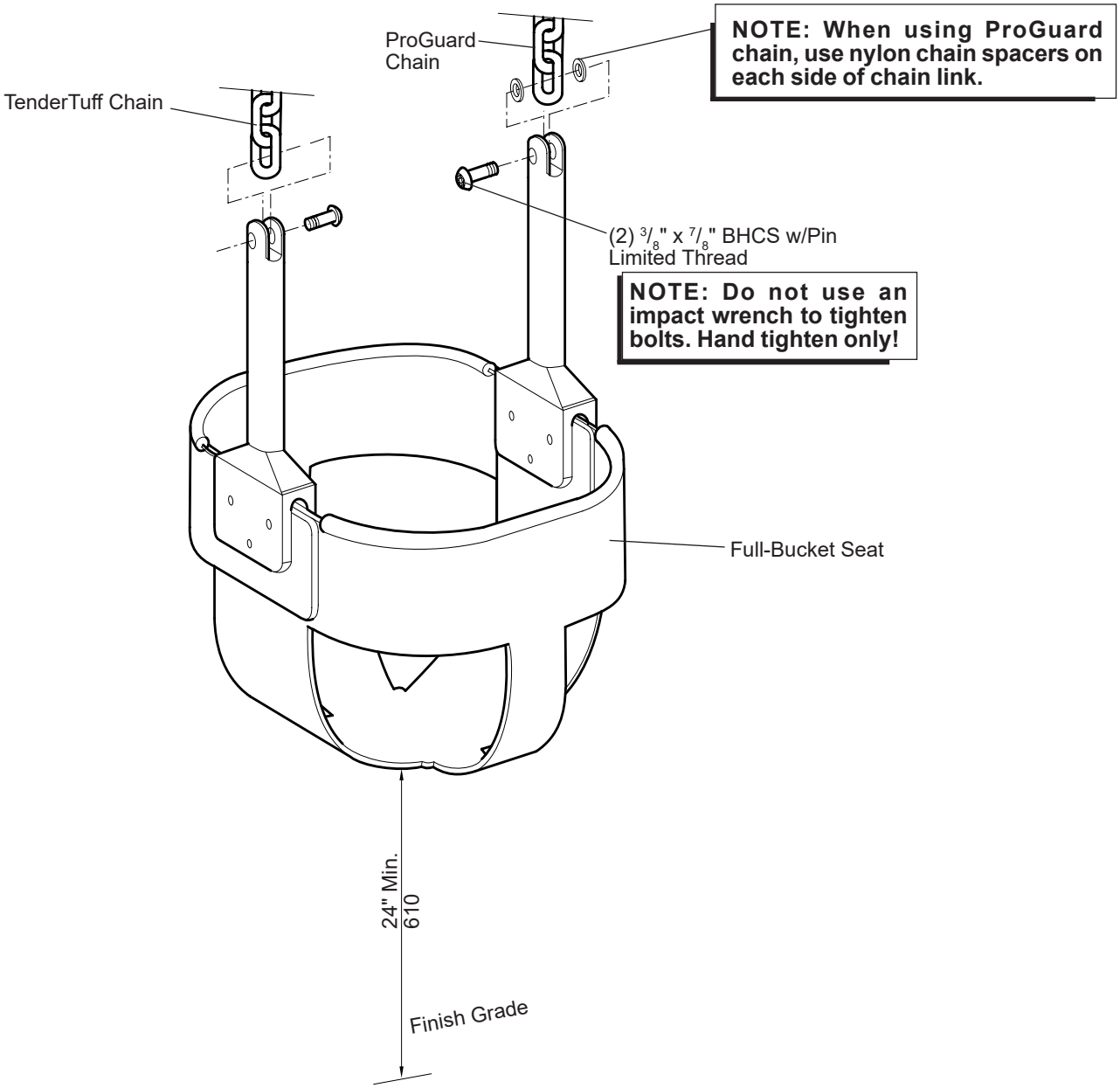
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

18985400



Swings

176038 Full-Bucket Seat, w/Chains

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2015 by Landscape Structures. All rights reserved.

Document #21059200

Swings 176038 Full-Bucket Seat, w/Chains

Parts List

Part#	Description	Qty.
	7 Ft. High Beam (5" Dia. Beam)	
186276	Full-Bucket Swing Seat, Black	1
141739	43 3/16" Chain, TenderTuff, Specify Color	2
175248	43 3/16" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	8 Ft. High Beam	
186276	Full-Bucket Swing Seat, Black	1
160110	52 9/16" Chain, TenderTuff, Specify Color	2
174882	52 9/16" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	10 Ft. High Beam	
186276	Full-Bucket Swing Seat, Black	1
152051	76 7/16" Chain, TenderTuff, Specify Color	2
174883	76 7/16" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	7 Ft. High Beam (Tot)	
186276	Full-Bucket Swing Seat, Black	1
152053	37 1/2" Chain, TenderTuff, Specify Color	2
175247	37 1/2" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4
	75" High Beam (Toddler)	
186276	Full-Bucket Swing Seat, Black	1
152016	29 7/8" Chain, TenderTuff, Specify Color	2
174881	29 7/8" Chain, ProGuard	2
138414	**Bucket Seat Hardware Package**	1
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	2
112501	Chain Spacer (For ProGuard Chains Only)	4

Specifications

Full-Bucket Seat: Seat shall be molded of U.V. stabilized, high quality, black rubber, encapsulating a 24 gauge stainless steel reinforcement plate. Handle cast from 356-T6 aluminum alloy with black polyarmor paint finish. Handle attaches to seat with (3) 1/4" x 1 5/16" long stainless steel rivets. The finished size of the full bucket shall be 9" deep x 10 1/2" wide.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: 1/4 man hour per seat

Weight:
14 lbs. (7 FT. Beam 5" Dia. w/TenderTuff Chain)
13 lbs. (7 FT. Beam 5" Dia. w/ProGuard Chain)
14 lbs. (8 FT. Beam w/TenderTuff Chain)
14 lbs. (8 FT. Beam w/ProGuard Chain)
17 lbs. (10 FT. Beam w/TenderTuff Chain)
16 lbs. (10 FT. Beam w/ProGuard Chain)
12 lbs. (7 FT. Beam w/TenderTuff Chain)
12 lbs. (7 FT. Beam w/ProGuard Chain)
11 lbs. (75" Beam w/TenderTuff Chain)
11 lbs. (75" Beam w/ProGuard Chain)

Installation Instructions

NOTE: *Refer to Swing Frame assembly for swing hanger type.*

Swing Hangers with Double Clevis

1) Attach chains to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread bolts, as shown.
2) Attach chains to full-bucket seat using 3/8" x 7/8" BHCS w/pin limited thread bolts. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

Anti-wrap Swing Hangers

1) Attach chains to aluminum clevis using 3/8" x 7/8" BHCS w/pin limited thread bolts, as shown.
2) Attach chains to full-bucket seat using 3/8" x 7/8" BHCS w/pin limited thread bolts. Be sure bolt heads face user. **NOTE:** *Use chain spacers as shown when installing ProGuard chains.*
3) Install protective surfacing before users are allowed to play on the structure.

5/14/2025 Clarification and note added to swing hanger components being part of swing frame assembly.
2/10/2016 Added Hand Tighten Only Note.

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

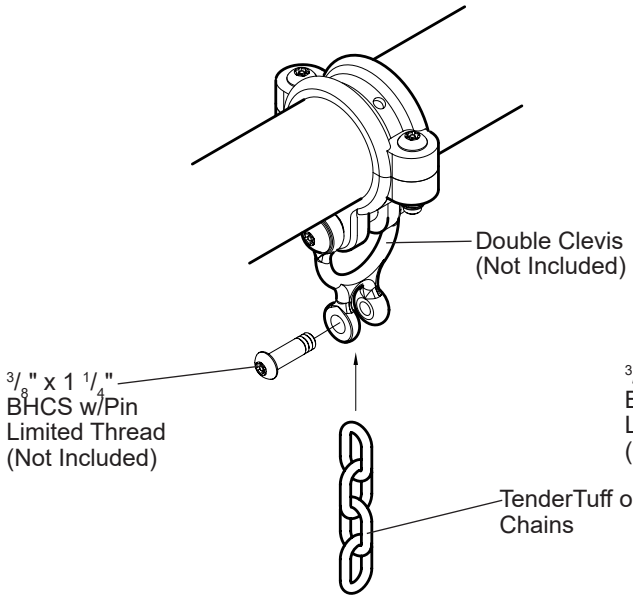
SAFETY NOTE

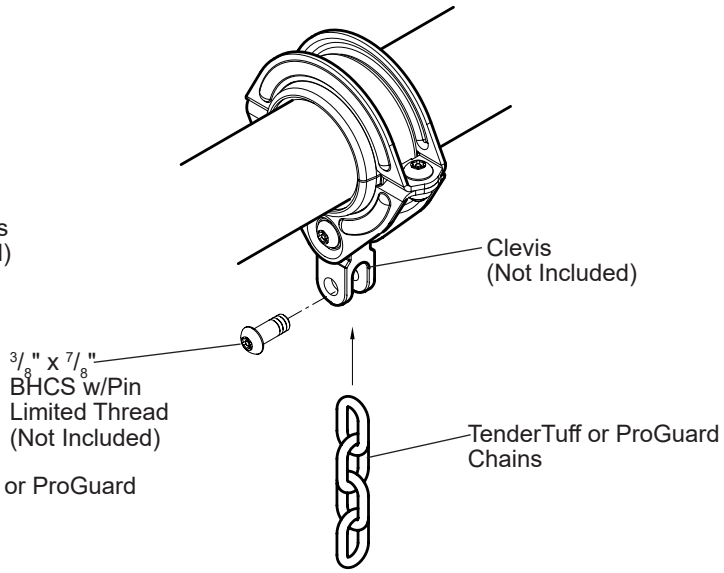
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

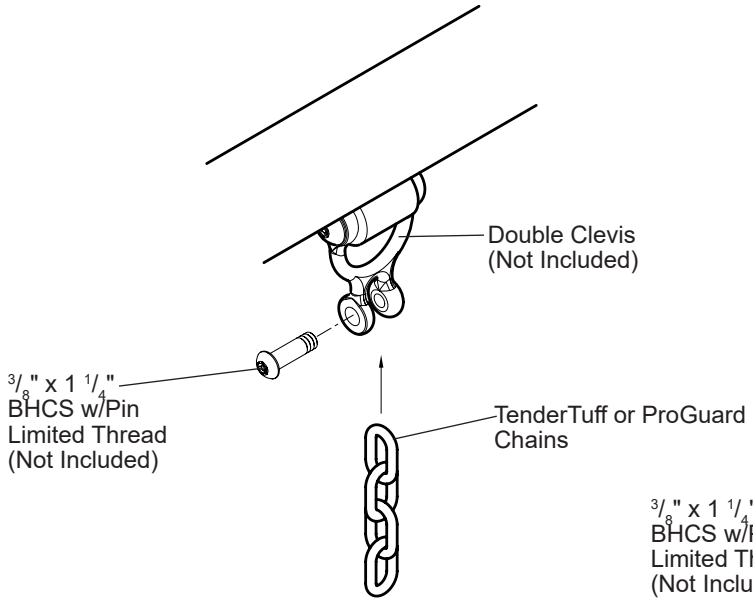
177460b

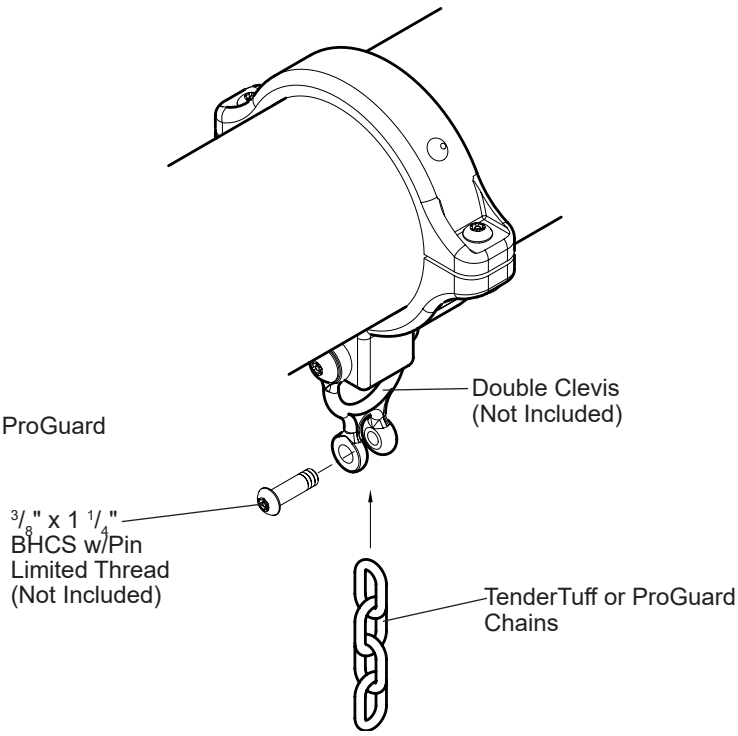
SWING HANGER OPTIONS

Swing Hanger Components included with Swing Frame.









601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2015 by Landscape Structures. All rights reserved.

landscape structures®

ISO 14001 CERTIFIED

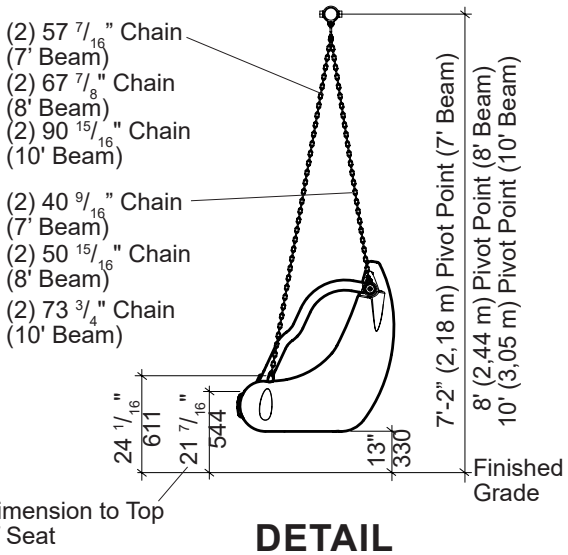
ISO 9001 Certified

SAFETY NOTE

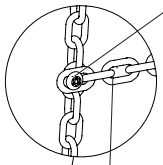
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

225544

ELEVATION

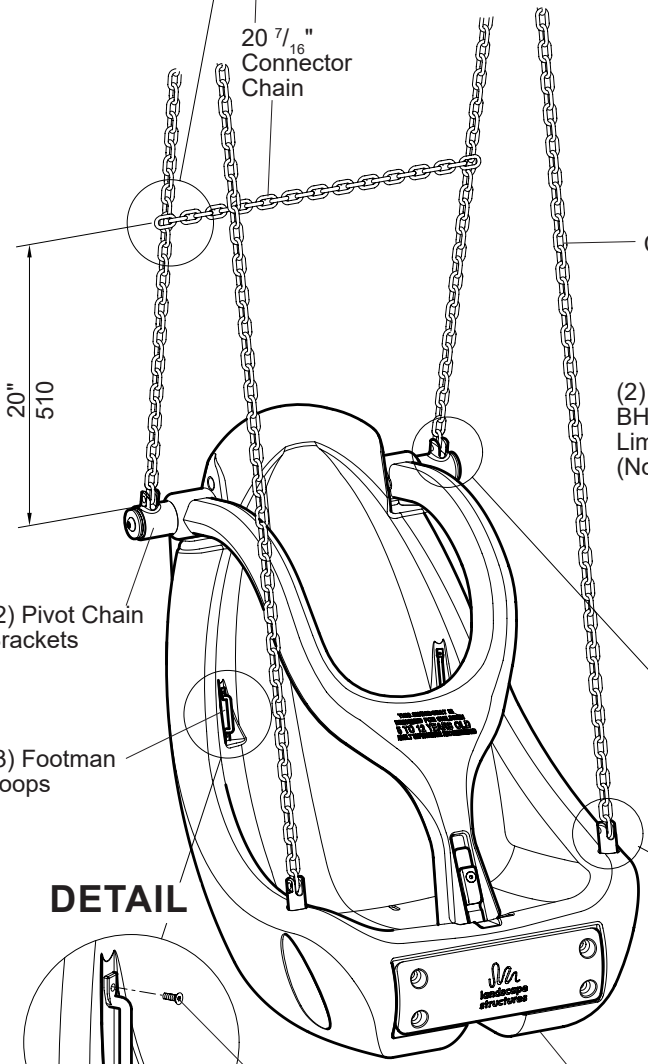


DETAIL

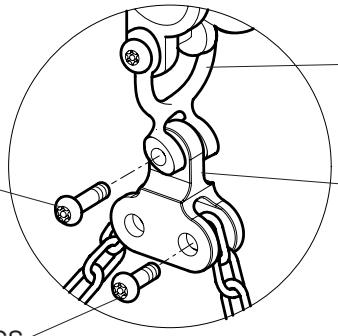


(ProGuard Chain)
(2) 3/8" x 7/8" BHCS w/Pin & 3/8" Hex Jam Nuts

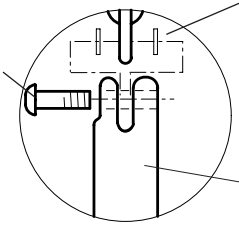
(TenderTuff Chain)
(2) 3/8" x 1 1/8" BHCS w/Pin & 3/8" Standard Hex Nuts w/ 3/8" SAE Flat Washers



DETAIL
HANGER ASSEMBLY

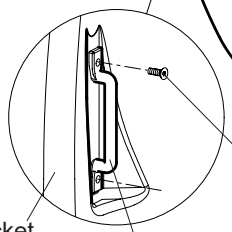


DETAIL
BRACKET

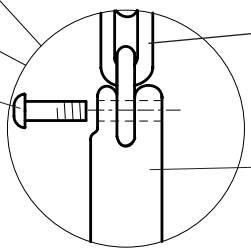


NOTE: For ProGuard chain, insert (8) nylon spacers between chain links & brackets

DETAIL



DETAIL
BRACKET



Swings

177351 Molded Bucket Seat, w/Harness

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

Document #25974300

landscape structures®

Swings 177351 Molded Bucket Seat, w/Harness

Parts List

Part#	Description	Qty.
259433	Molded Bucket Seat Assembly, Specify Color	1
	7 Ft. High Beam - ProGuard Finished Chains	
175251	57 7/16" Long, (Front)	2
193869	40 9/16" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	8 Ft. High Beam - ProGuard Finished Chains	
174404	67 7/8" Long, (Front)	2
175619	50 15/16" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	10 Ft. High Beam - ProGuard Finished Chains	
174884	90 11/16" Long, (Front)	2
175623	73 3/4" Long, (Back)	2
175653	20 7/16" Long, (Connector)	1
	7 Ft. High Beam - TenderTuff Chains	
178679	57 7/16" Long, (Front), Specify Color	2
179286	40 9/16" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
	8 Ft. High Beam - TenderTuff Chains	
152050	67 7/8" Long, (Front), Specify Color	2
174572	50 15/16" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
	10 Ft. High Beam -TenderTuff Chains	
152052	90 11/16" Long, (Front), Specify Color	2
175621	73 3/4" Long, (Back), Specify Color	2
174571	20 7/16" Long, (Connector), Specify Color	1
225662	**Molded Seat w/Yoke Hardware Package**	1
100196	3/8" x 7/8" BHCS w/Pin, SST	2
100198	3/8" x 1 1/8" BHCS w/Pin, SST	2
100290	3/8" x 7/8" BHCS w/Pin Limited Thread, SST	8
100327	3/8" Standard Hex Nut, SST	2
100365	3/8" SAE Flat Washer, SST	6
106035	Seat Mounting Bracket	2
112501	Nylon Spacer	8
128296	3/8" Hex Jam Nut, SST	2
207709	Footman Loop, SST	3
160307	Double Pivot Block Assy.	2
162462	#10-24 x 1/2" Flat Head Screw, SST	6

Specifications

Bucket Seat Assy.: **(Bucket Seat & Yoke)** Rotationally molded from U.V. stabilized linear low density polyethylene, color specified. **(Pipebolt)** Made from 1.125" O.D. 6005-T5 threaded annodized aluminum tube. **(Bearings)** UHMW PE lubricated. **(Brackets)** Made from 356-T6 aluminum.

Chain/ProGuard: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: ProGuard.

Chain/Coated: Steel 3/16" straight link chain, 800 lb. working load limit. Finish: TenderTuff, color specified.

Seat Mounting Bracket: Cast from 535 aluminum magnesium.

Bumper: Molded from U.V. stabilized black EPDM rubber encapsulating 11 GA (.120") HRPO steel sheet.

Dbl. Pivot Block: Fabricated from 6061-T6 Aluminum with bronze oil impregnated bearing.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1 man hour

Weight: 50 lbs. (7 Ft. Beam w/ProGuard Chains)
53 lbs. (7 Ft. Beam w/TenderTuff Chains)
48 lbs. (8 Ft. Beam w/ProGuard Chains)
51 lbs. (8 Ft. Beam w/TenderTuff Chains)
51 lbs. (10 Ft. Beam w/ProGuard Chains)
55 lbs. (10 Ft. Beam w/TenderTuff Chains)

Installation Instructions

1) Insert seat mounting brackets into molded-in holes in front of bucket seat and attach ends of chain, using 3/8" x 7/8" BHCS w/pin limited thread. See Bracket Detail. **NOTE:** *For ProGuard coated chain, insert (4) nylon spacers between chain links and brackets.*

2) Attach ends of chain to pivot chain brackets, using 3/8" x 7/8" BHCS w/pin limited thread. See Bracket Detail. **NOTE:** *For ProGuard coated chain, insert (4) nylon spacers between chain links and brackets.*

3) Attach chains to double pivot blocks, using 3/8" x 7/8" BHCS w/pin limited thread.

4) **NOTE**: *Refer to Swing Frame assembly for swing hanger type.*

   (Swing Hangers with Double Clevis) Attach chains to swing hanger double clevis, using 3/8" x 1 1/4" BHCS w/pin limited thread.

   (Anti-wrap Swing Hangers) Attach chains to anti-wrap swing hanger clevis, using 3/8" x 7/8" BHCS w/pin limited thread.

5) **(ProGuard Chain)** Attach connector chain to back swing chains at dimension shown, using 3/8" x 7/8" BHCS w/pin & 3/8" jam nuts. Refer to Detail.

   (TenderTuff Chain) Attach connector chain to back swing chains at dimension shown, using 3/8" x 1 1/8" BHCS w/pin & 3/8" standard hex nuts with 3/8" SAE Flat Washers. Refer to Detail.

6) Attach footman loops, using #10-24 x 1/2" flat head screws, as shown. Footman loops are used for seat belts (not included).

7) Attach bumper to front of swing seat, using 3/8" x 7/8" BHCS w/pin with 3/8" SAE Flat Washers.

8) Install protective surfacing before users are allowed to play on the structure.

5/14/25 - Clarification and note added for swing hanger components being part of swing frame assembly.
ECO 0101646. Document 25974300 replaces 22554400. Added age appropriate message to swing yoke.

Specifications are subject to change without notice.

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

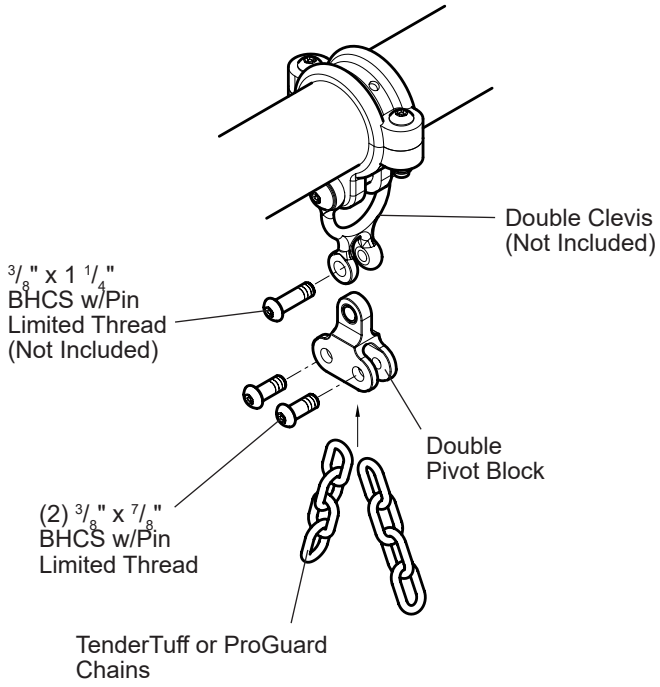
SAFETY NOTE

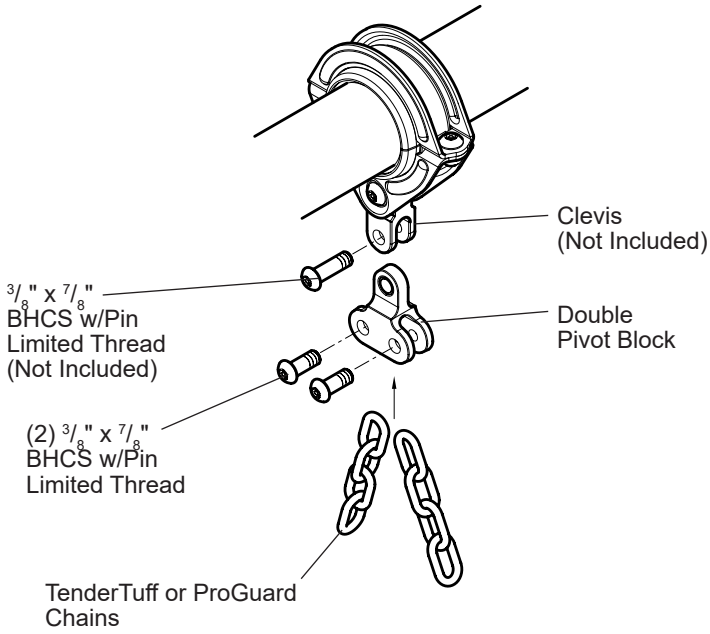
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

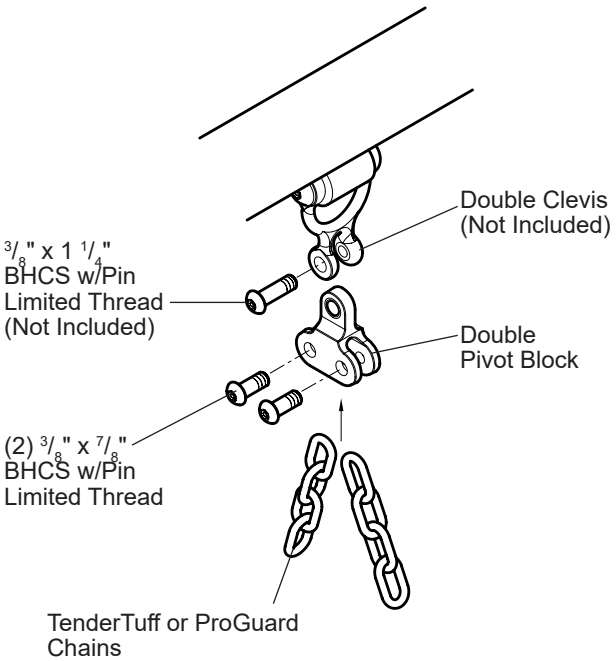
177462a

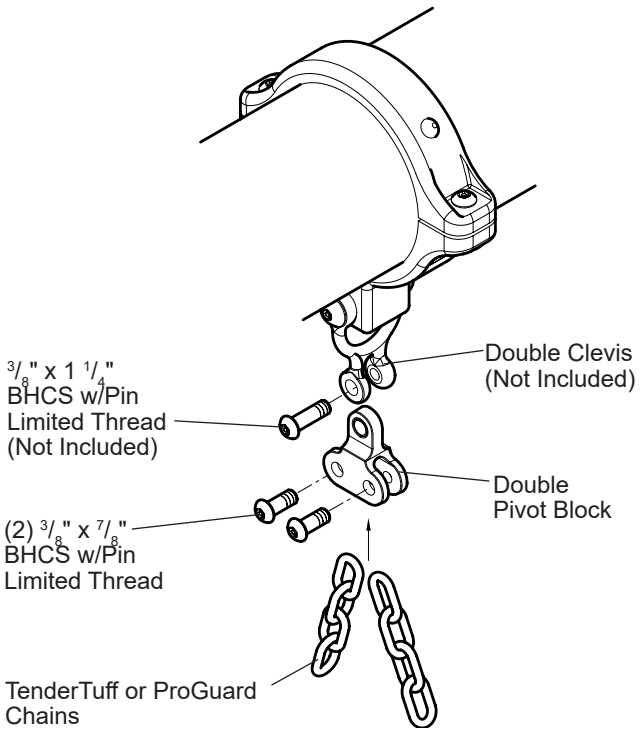
SWING HANGER OPTIONS

Swing Hanger Components included with Swing Frame.









601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2019 by Landscape Structures. All rights reserved.

landscape structures®

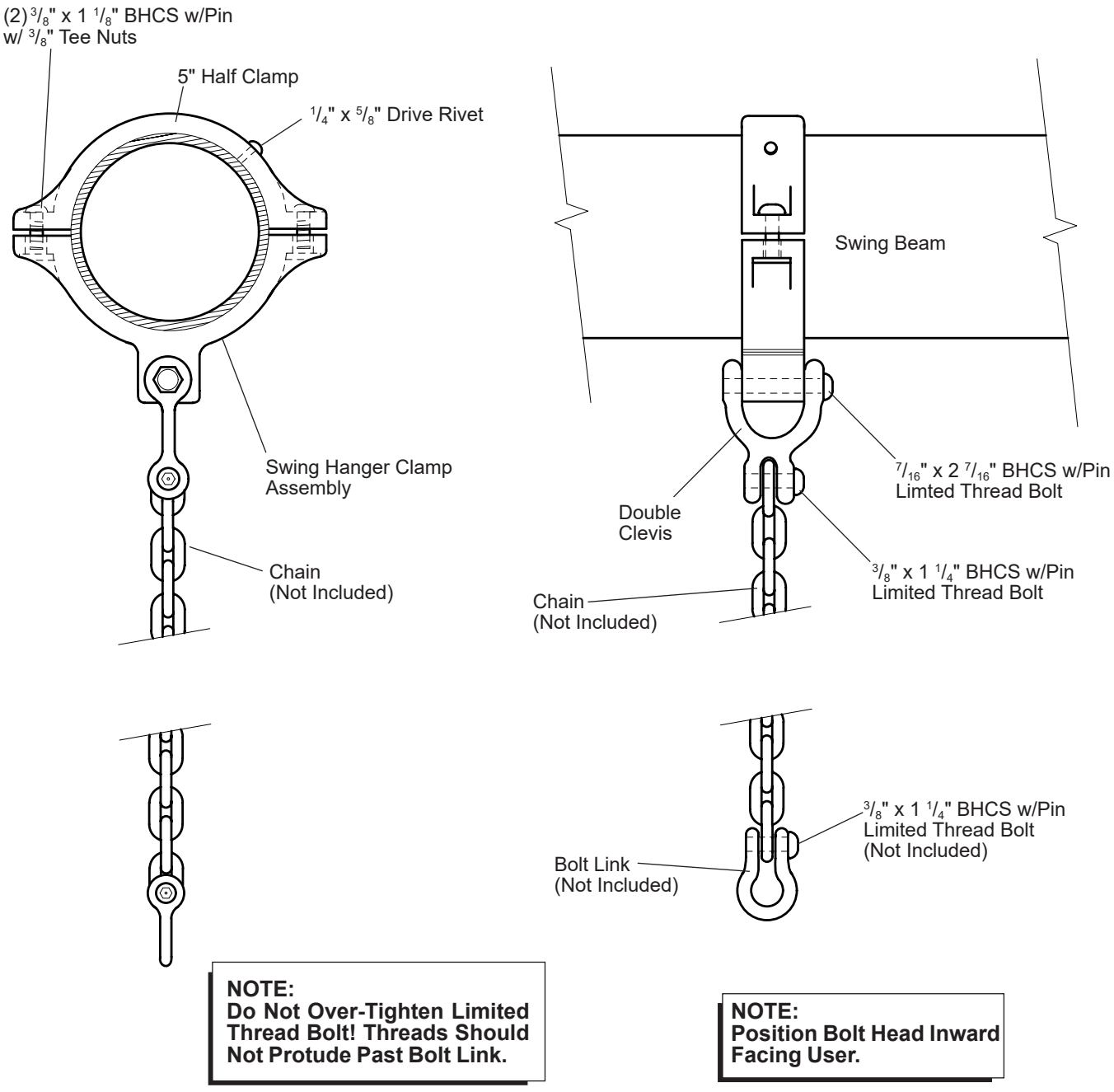
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

13616300



NOTE:
Do Not Over-Tighten Limited Thread Bolt! Threads Should Not Protude Past Bolt Link.

NOTE:
Position Bolt Head Inward Facing User.

Swings

111418 Swing Hanger, Belt Swing

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2012 by Landscape Structures. All rights reserved.

Swings 111418 Swing Hanger, Belt Swing

Parts List

Part#	Description	Qty.
105327-01	5" Half Clamp, Specify Color	1
100198-00	3/8" x 1 1/8" BHCS w/Pin, SST	2
100351-00	3/8" Tee Nut, SST	2
100610-00	1/4" x 5/8" Drive Rivet, AL/SST	1
100292-00	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread Bolt, SST	1
121291-00	**Swing Hanger Clamp Assy. Specify Color**	1
121289-00	Swing Hanger Clamp, Specify Color	1
127068-00	7/16" x 2 7/16" BHCS w/Pin Ltd. Thread Bolt, SST	1
138917-00	Swing Hanger Double Clevis SST	1
100667-00	Oilite Bushing	1

Specifications

Hanger Clamp Assembly: Cast aluminum. Finish: ProShield®, color specified.

Double Clevis: Stainless Steel.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1/2 man hour

Weight: 6 lbs.

Installation Instructions

1) Locate and mark location of clamp on beam.

2) Attach 5" half clamp and swing hanger clamp to beam using 3/8" x 1 1/8" BHCS w/pin and 3/8" tee nuts. *Tighten evenly.*

3) ***IMPORTANT:*** *Drill through holes in 5" half clamps and into 5" pipe with a 1/4" or "F" (only) drill bit, tap 1/4" x 5/8" drive rivets through 5" half clamps and into pipe, to ensure that clamps remain secure.*

4) Attach swing chain to double clevis using 3/8" x 1 1/4" BHCS w/pin limited thread bolts.

5) Attach swing seat to chains using bolt links with 3/8" x 1 1/4" BHCS w/pin limited thread bolts. **NOTE:** *Do not over-tighten limited thread bolt. Threads should not protrude past bolt link. Position bolt head inward facing user.*

Specifications are subject to change without notice.

ECO #54506 Document #18379700 replaces #13616300. Changed Double Clevis material to Stainless Steel.

landscape structures®

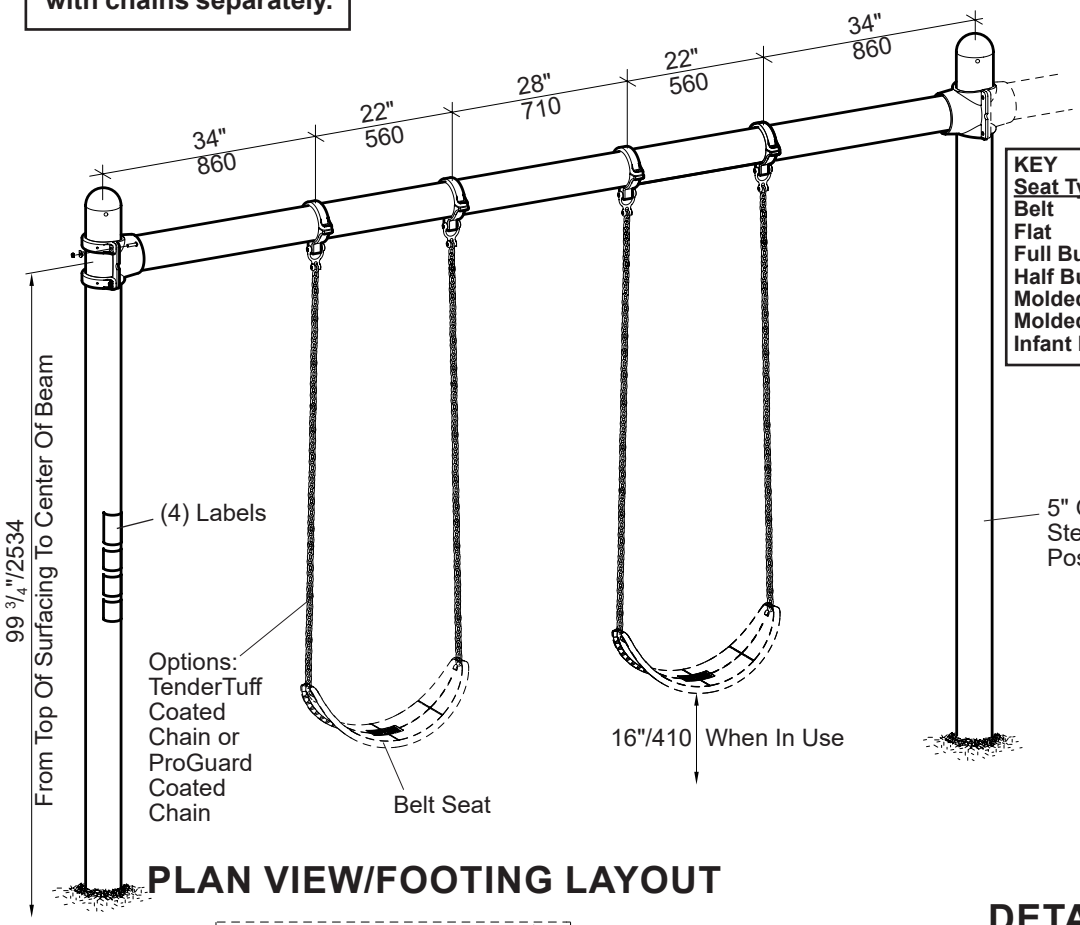
ISO 14001 CERTIFIED

ISO 9001 Certified

SAFETY NOTE

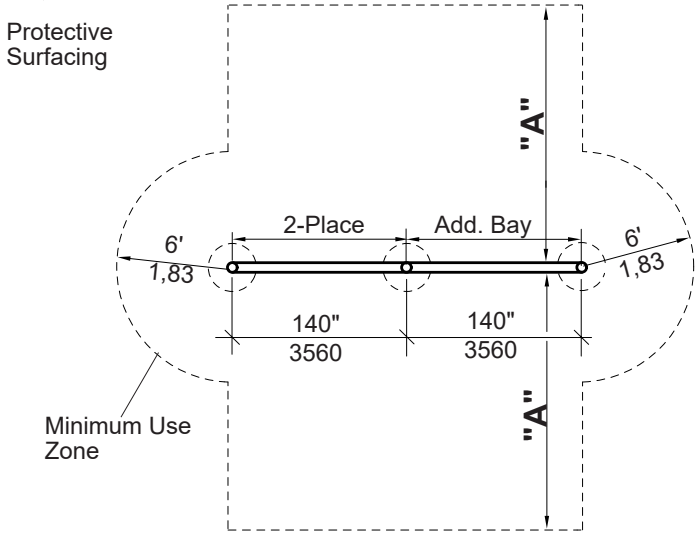
Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

NOTE: Model numbers are for swing frames only, order swing seats with chains separately.

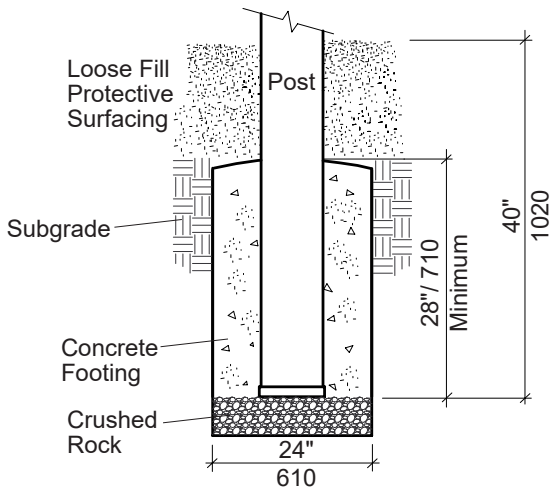


KEY	
Seat Type	**Dimension "A"**
Belt	16'-0" (4,88 m)
Flat	16'-0" (4,88 m)
Full Bucket	12'-0" (3,66 m)
Half Bucket	16'-0" (4,88 m)
Molded Bucket	16'-0" (4,88 m)
Molded Bucket/Harness	16'-0" (4,88 m)
Infant Full Bucket	N/A

PLAN VIEW/FOOTING LAYOUT



DETAIL
CONCRETE FOOTING



Model #177333 Additional Bay

Swings

177332/177333 Single Post Swing Frame

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2021 by Landscape Structures. All rights reserved.

Document #30164000

Swings 177332/177333 Single Post Swing Frame

landscape structures®

Parts List

Part#	Description	Qty. 2 Pl	Qty. Add Bay
216492	Swing Beam, Specify Color	1	1
220966	148" Steel Post Assy., Specify Color	2	1
105327	5" Half Clamp, Specify Color	8	4*
100610	1/4X5/8i DRV, Rivet, AS	8	8
121291	**Swing Hanger Clamp Assy. Specify Color**	4	4
121289	Swing Hanger Clamp, Specify Color	4	4
127068	$^{7}/_{16}$" x 2 $^{7}/_{16}$" BHCS w/Pin Ltd. Thread, SST	4	4
138917	Swing Hanger Double Clevis	4	4
100667	Oilite Bushing	4	4
243802	**Hdw Pkg 5iOD Swing Beam.**	1	1
100198	$^{3}/_{8}$" x 1 $^{1}/_{8}$" BHCS w/Pin, SST	8	8
234397	BHCS 6LP LTHD 7/16 x 1 11/16i, SSTST	8	8
100292	$^{3}/_{8}$" x 1 $^{1}/_{4}$"BHCS w/Pin Ltd. Thread, SST	4	4
100351	$^{3}/_{8}$" Tee Nut, SST	8	8
156846	Play Safe Label, 2-12 Yrs.	1	1
234937	$^{7}/_{16}$" D Cut Washer, SST	16	16
182213	Hot Surface Warning Label	1	1
182212	Entanglement Warning Label	1	1
115176	Hard Surface Warning Label	1	1
100330	$^{7}/_{16}$" Nylok Hex Nut	8	8

*** = 5" Half Clamps From 2 PL. End Of Beam Need To Be Used.**

Specifications

Post: See PlayBooster® (PB) General Specifications.

Swing Beam: Weldment comprised of tee clamps and 5" O.D. extruded 6005-T5 aluminum alloy tube with a .125" wall. Finish: ProShield®, color specified.

Clamp: Cast aluminum. Finish: ProShield,, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/ specifications).

Installation Time: **2-Place** - Approx. 6 man hours
Additional Bay - Approx. 3 man hours

Concrete Req.: **2-Place** - Approx. 14 cu. ft.
Additional Bay - Approx. 7 cu. ft.

Area Req: **2-Place** - 24'-1" x 24' (7,3 m x 7,31 m) Full bucket seats.
2-Place - 24'-1" x 32' (7,3 m x 9,75 m) For all other seats.
Additional Bay - 11'-8" x 24' (3,56 m x 7,31 m) Full bucket seats.
Additional Bay - 11'-8" x 32' (3,56 m x 9,75 m) For all other seats.

Weight: **2-Place** - 206 lbs.
Additional Bay - 122 lbs.

Installation Instructions

1) Dig footings spaced as shown. Refer to Concrete Footing Detail.
2) Set posts in footing holes and attach swing beam using 5" half clamps with $^{7}/_{16}$" BHCS w/Pin, $^{7}/_{16}$" D-Cut Washers, and $^{7}/_{16}$" Nylok nuts. Refer to the Swing Beam Attachment Detail. Center of beam should be 99 $^{3}/_{4}$" above finished grade. When installing back to back swing beams refer to the Back To Back Tee Clamps Detail. **NOTE:** *Tighten all BHCS w/ pin equally.*
3) Level beam and plumb posts and temporarily prop in position. Pour concrete footings and let cure for 72 hours before proceeding.
4) Locate, mark and attach swing hanger clamps to beam in locations shown. Refer to the Swing Hanger Clamp Attachment Detail.
5) **NOTE:** *Refer to specific swing seat installation document for attaching chains and seats.*
6) Install $^{1}/_{4}$" x $^{5}/_{8}$" drive rivets in all 5" half clamps. Refer to the Typical Offset Hanger Clamp Spec Sheet. Refer to the Back To Back Tee Clamps Detail.
7) Apply Play Safe and Warning Labels, as shown.
8) Install protective surfacing before users are allowed to play on the swing.

ECO# 0102179 Document 30164000 replaces 24382000 Change to molded seat w/harness use zone

Specifications are subject to change without notice.

landscape structures®

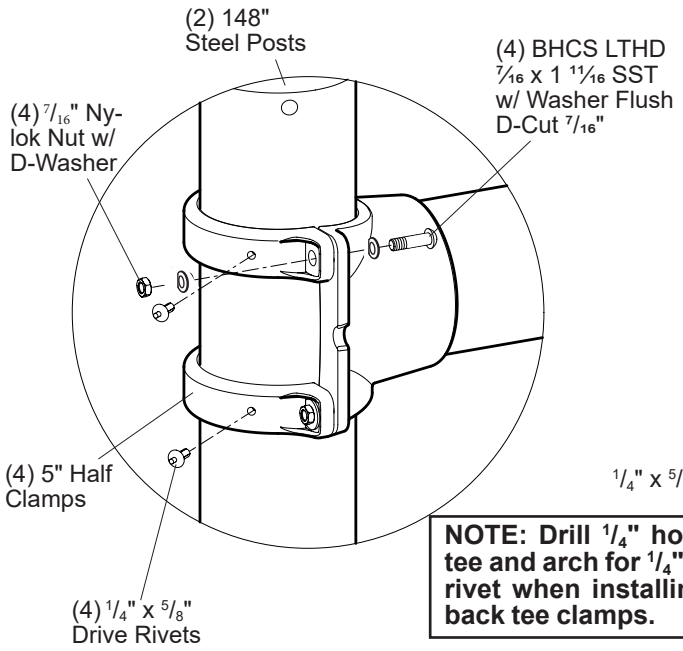
ISO 14001 CERTIFIED

ISO 9001 Certified

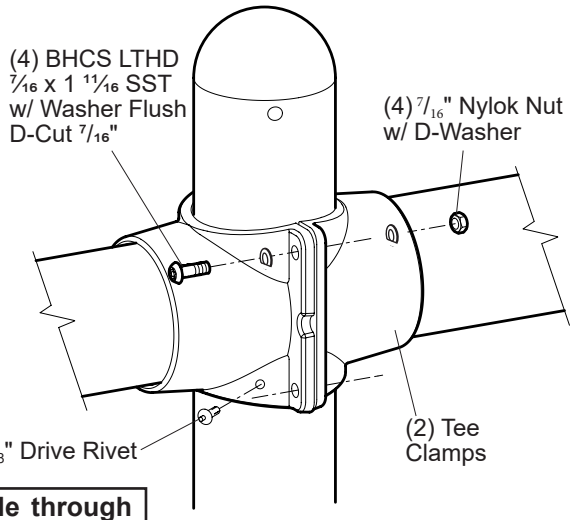
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. ASTM F1487.)

DETAIL
BEAM ATTACHMENT



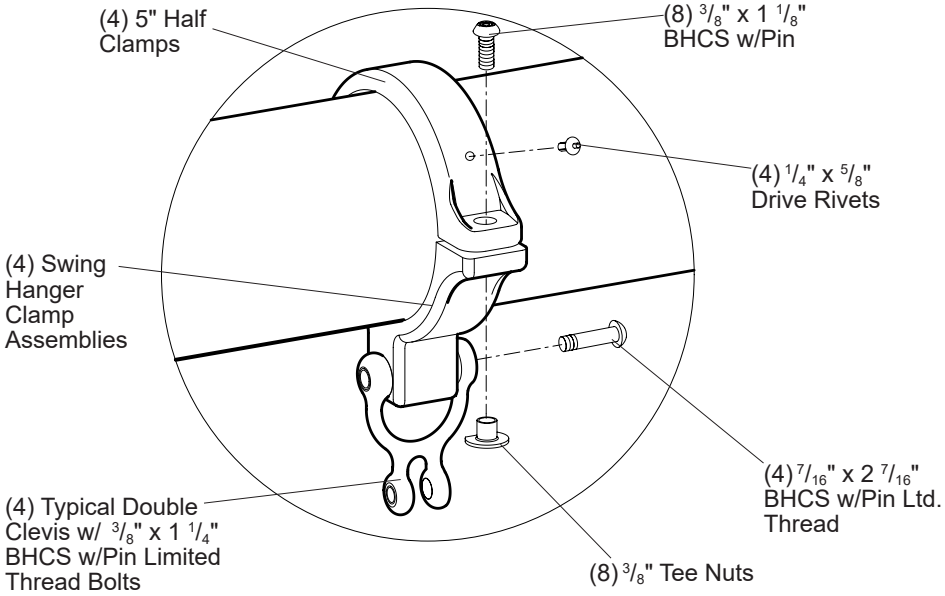
DETAIL
BACK TO BACK TEE CLAMPS



NOTE: Drill 1/4" hole through tee and arch for 1/4" x 5/8" drive rivet when installing back to back tee clamps.

NOTE: Tighten all BHCS w/Pin equally.

DETAIL
SWING HANGER ATTACHMENT



Swings **177332/177333 Single Post Swing Frame**

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2021 by Landscape Structures. All rights reserved.

Document #30164000

landscape structures®

ISO 14001 CERTIFIED

ISO 9001 Certified

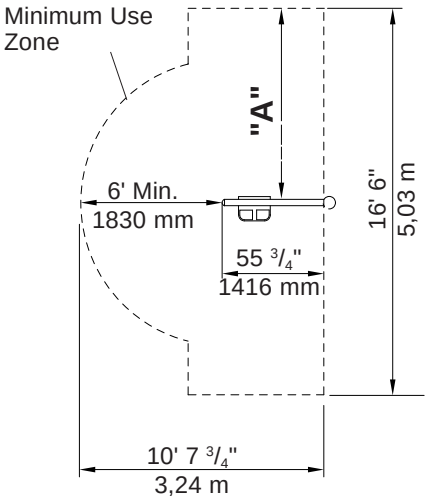
SAFETY NOTE

Choose a protective surfacing material that has a Critical Height Value of at least the height of the Highest Accessible Part/Fall Height of the adjacent equipment. (Ref. *ASTM F1487*.)

17745000

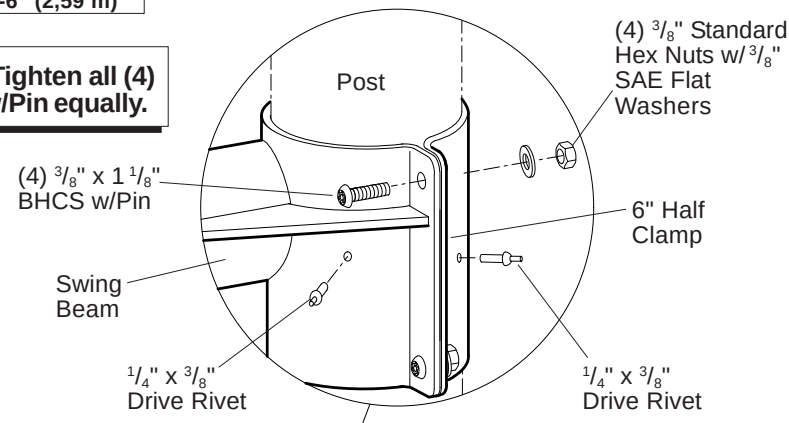
KEY	
Seat Type	**Dimension "A"**
Belt	**N/A**
Flat	**N/A**
Full Bucket	**8'-6" (2,59 m)**
Half Bucket	**12'-6" (3,81 m)**
Molded Bucket	**N/A**
Molded Bucket/Harness	**N/A**
Infant Full Bucket	**8'-6" (2,59 m)**

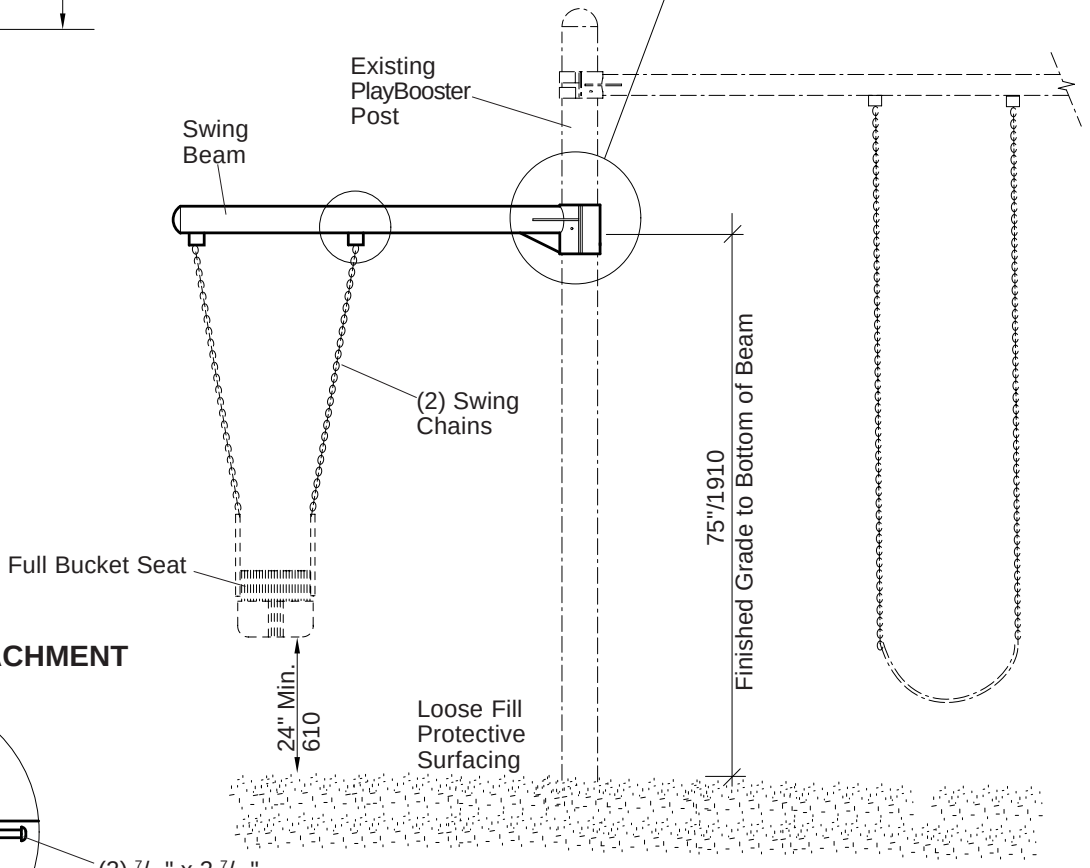
MINIMUM USE ZONE



NOTE: Tighten all (4) BHCS w/Pin equally.

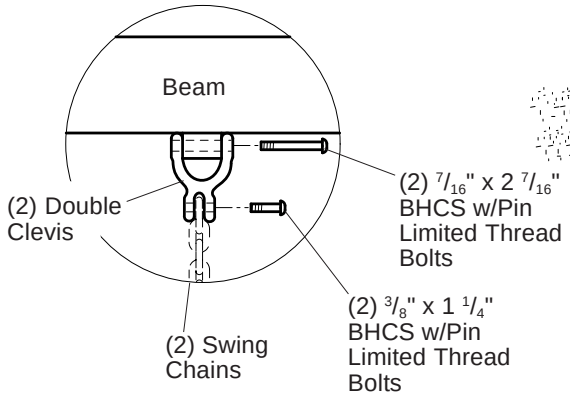
DETAIL
SWING BEAM ATTACHMENT





NOTE:
This Swing is designed for users up to 5 years of age.

DETAIL
DOUBLE CLEVIS ATTACHMENT



NOTE: Model number is for swing beam only, order swing seat with chains separately.

Swings 177337 Toddler Swing Add-On Beam, No Post

601 7TH STREET SOUTH, DELANO, MINNESOTA 55328-8605 888-574-4678 LSI Install Help 888-438-6574 LSI Direct 763-972-5200 Int. FAX (763) 972-3185

© 2011 by Landscape Structures. All rights reserved.

Swings 177337 Toddler Swing Add-On Beam, No Post

Parts List

Part#	Description	Qty.
135548-00	Swing Beam, Specify Color	1
154322-00	6" Half Clamp, Specify Color	1
116882-00	**Beam Hardware Package**	1
100198-00	3/8" x 1 1/8" BHCS w/Pin, SST	4
100327-00	3/8" Standard Hex Nut, SST	4
100365-00	3/8" SAE Flat Washer, SST	4
100611-00	1/4" x 3/8" Drive Rivet, AL/SST	2
132634-00	**Double Clevis Hardware Package**	1
127068-00	7/16" x 2 7/16" BHCS w/Pin Ltd. Thread Bolt, SST	2
100292-00	3/8" x 1 1/4" BHCS w/Pin Ltd. Thread Bolt, SST	2
138917-00	Double Clevis	2

Specifications

Swing Beam: Weldment comprised of 3.500" O.D. RS-20 (.120" - .130") galvanized steel tubing, 6" wide zinc plated steel clamp, 3.500" pipe cap, and 1 1/4" housings with bronze bushings. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Installation Time: Approx. 1 man hour
Area Req.: 10' 7 3/4" x 17' (3,24 m x 5,18 m)
Weight: 31 lbs.

Installation Instructions

1) Attach swing beam to post using 6" half clamp, 3/8" x 1 1/8"BHCS w/pin and 3/8" standard hex nuts with 3/8" SAE flat washers. Refer to the Swing Beam Attachment Detail. **NOTE:** *Tighten all (4) BHCS w/pin equally.*

2) Attach double clevises to beam using 7/16" x 2 7/16" BHCS w/pin limited thread bolts, and attach swing chains to double clevises using 3/8" x 1 1/4" BHCS w/pin limited thread bolts. Refer to the Double Clevis Attachment Detail.

3) Install Swing Seat per the installation sheet.

4) Drill through hole in 6" half clamp and into post with a 1/4" or "F" (only) drill bit. Install 1/4" x 3/8" drive rivet. Refer to the Swing Beam Attachment Detail.

5) Drill through hole in swing beam and into post with a 1/4" or "F" (only) drill bit. Install 1/4" x 3/8" drive rivet. Refer to the Swing Beam Attachment Detail.

6) Install protective surfacing before users are allowed to play on the structure.

Specifications are subject to change without notice.

Material Specifications
Quote: MEO23810 MEO23810
12/9/2025

Material Specifications:

193176A

Boogie Board DB Only

Panels: Permalene, color specified.

Belt Plate: Weldment comprised or 3/8" (9,53 mm) thick HRPO sheet steel and 1/4" (6,35 mm) thick HRPO sheet steel. Finish: ProShield®, color specified.

Post: See PlayBooster (PB) General Specifications.

Belt:.315" (8,00 mm) Thick mini rough top rubber belting with polyester fabric plys, black in color.

Mounting Plate: Comprised of 3/8" (9,53 mm) thick HRPO sheet steel and 2" (50,8 mm) O.D. x 1.50 " (38,1 mm) I.D. stainless steel housing. Finish: ProShield®, color specified.

Shaft Mount: Weldment comprised of 1/4" (6,35 mm) thick HRPO flat steel and 1" (25 mm) diameter stainless steel shaft. Finish: ProShield®, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Presser Plate: Fabricated from7 GA. (.179") (4,54 mm) thick HRPO sheet steel. Finish: ProShield®, color specified.

Leg Cap: Aluminum.

Clamps: Cast aluminum. Finish: ProShield, color specified.

166809A

E-Pod Seat

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated

(see specific product installation/specifications).

E-Pod: Rotationally molded from U.V. stabilized linear low-density polyethylene, color specified.

Pod Casting: Fabricated from sand cast alloy 356 in accordance with ASTM B26. Finish: ProShield, color specified.

111404R

108"Steel Post DB

Post: See PlayBooster (PB) General Specifications.

No Material Spec for 016776A

307425A

Forge Climber DB Only

Chain Support: Made from 1/4" (6,35 mm) HRPO steel plate. Finish: Hot dip galvanized per ASTM A123.

Polycarbonate: Made from 1/2" (12,7MM) clear polycarbonate.

Panels: 5052 H32 Aluminum panels. Finish: Proshield, specify color.

Forma Frame: ASTM A53, 5"SQ x .120 wall tubing. Shall be galvanized after rolling and shall have both I.D. and the cut ends sprayed with a corrosion resistant coating Finish: Proshield, Color Specific.

Cable Assembly: Made of tightly woven, polyester-wrapped, six stranded galvanized-steel cable with a polypropylene core. (Cable connectors) Die Cast 369.1 Alum. FInish: ProShield Specify Color

Boards: Recycled high-density polyethylene. Cedar and mink in color.

Cable Nets: (Cable) Made of tightly woven polyester-wrapped, six-stranded galvanized-steel cable with a polypropylene core. (Cable Connectors) 6063-T6 aluminum.

Top Caps: Cast aluminum. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in

design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Chain: Steel 1/4" (6,35 mm) straight link chain, 3,150 lb (1428,82 kilograms). working load limit. Finish: ProGuard.

No Material Spec for 001299A

164075B

Double Bobble Rider DB

Seat: Rotationally molded from U.V. stabilized linear low-density polyethylene, black in color.

Footer: Weldment comprised of 3.500" (88,9 mm) O.D. RS20 (.120"-.130") (3,04 mm-3,30 mm) wall galvanized steel tubing and 1/4" x 10" x 17" (6,35 mm x 254 mm x 431 mm) sheet HRPO steel. Finish: ProShield, black in color.

Spring: Weldment comprised of 5 5/8" (142,87 mm) diameter 13/16" (20,63 mm) tempered alloy steel coil. Finish: ProShield, black in color.

Bobble Rider: Weldment comprised of 1.315" (33,40 mm) O.D. RS20 (.080"-.090") (2,03 mm-2,28 mm) wall galvanized steel tubing, 2.375" (60,32 mm) O.D. RS20 (.095"-.105") (2,41 mm-2,66 mm) wall galvanized steel tubing, 3/8" (9,52 mm) HRPO steel plate, 1/4" (6,35 mm) HRPO steel plate, and 4" (101 mm) diameter 10 GA. (.135") (3,42 mm) low carbon steel ball. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

152179A

Saddle Spinner DB 16"Height

Rubber Gasket: Made from 50 durometer neoprene.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Spinner Seat: Rotationally molded from U.V. stabilized linear low-density polyethylene measuring 18 1/4" (463,55 mm) wide x 7" (178 mm) high, color specified.

Shaft Assembly: (Spinner Seat Post) Weldment comprised of 2.875" (73,03 mm) O.D. RS40 (.160"-.170") (4,06 mm-4,32 mm) Wall galvanized steel tubing, 1.250" (31,75 mm) O.D. steel shaft, 12 Ga. (.105") (2,66 mm) HR flat steel and 1144 steel collar. Finish: ProShield, color specified. (Sleeve/Plate) Weldment comprised of 1/4" (6,35 mm) sheet HRPO steel and 2.875" (73,03 mm) O.D. schedule 80 steel tubing. Finish: ProShield, color specified.

174018A

Belt Seat ProGuard Chains for 8' Beam Height

Chain/ProGuard: Steel 3/16" (4,75 mm) straight link chain, 800 lb. (362,87 kilograms) working load limit. Finish: ProGuard.

Bolt Link: Stainless Steel

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Belt Seat: Molded from UV stabilized black EPDM rubber encapsulating a weldment comprised of a 22 GA (.029") (0,74 mm) spring stainless steel sheet and (4) .105" (2,67 mm) thick stainless steel washers. The belt seat elliptical shape measures 7" (178 mm) wide x 26" (660 mm) long x .700" (17,78 mm) thick.

176038G

Full Bucket Seat ProGuard Chains for Toddler Swing

Chain/ProGuard: Steel 3/16" (4,75 mm) straight link chain, 800 lb. (362,87 kilograms) working load limit. Finish: ProGuard.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Full Bucket Seat: Made of U.V. stabilized high-quality black rubber encapsulating a 24 GA (.024") (0,61 mm) stainless steel reinforcement plate. Handles cast from 356-T6 aluminum alloy with black polyarmor paint finish. Handles attach to seat with (3) 1/4" (6,35 mm) x 1 5/16"

(33,32 mm) long stainless steel rivets. The full bucket measures 9" (229 mm) deep x 10 1/2" (266,7 mm) wide.

177351A

Molded Bucket Seat (5-12 yrs) w/Harness ProGuard Chains for 8' Beam Height

Chain/ProGuard: Steel 3/16" (4,75 mm) straight link chain, 800 lb. (362,87 kilograms) working load limit. Finish: ProGuard.

Dbl. Pivot Block: Fabricated from 6061-T6 Aluminum with bronze oil impregnated bearing.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Bucket Seat Assy: (Bucket Seat & Yoke) Rotationally molded from U.V. stabilized linear low-density polyethylene, color specified. (Pipebolt) Made from 1.125" (28,58 mm) O.D. 6005-T5 threaded annodized aluminum tube. (Bearings) UHMW PE lubricated. (Brackets) Made from 356-T6 aluminum.

Bumper: Molded from U.V. stabilized black EPDM rubber.

Mounting Bracket: Cast from 535 aluminum magnesium.

177332A

Single Post Swing Frame 8' Beam Height Only DB Only

Half Clamp: Cast aluminum. Finish: ProShield, color specified.

Post: See PlayBooster (PB) General Specifications.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Beam: Weldment comprised of 2.375" (60,33 mm) O.D. RS-40 (.130" - .140") (3,30 mm-3,56 mm) galvanized steel tubing, 3" (76 mm) wide zinc-plated steel clamps and 1 1/4" (31,75 mm) housings w/bronze bushings. Finish: ProShield, color specified.

177337A

Toddler Swing Add-On Beam

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Swing Beam: Weldment comprised of 3.500" (88,9 mm) O.D. RS-20 (.120" - .130") (3,04 mm-3,30 mm) galvanized steel tubing, 6" (152 mm) wide zinc plated steel clamp, 3.500" (88,9 mm) pipe cap, and 1 1/4" (31,75 mm) housings with bronze bushings. Finish: ProShield, color specified.

Landscape Structures Inc. ("Manufacturer") warrants that all playstructures and/ or equipment sold will conform in kind and in quality to the specifications manual for the products identified in the Acknowledgment of Order and will be free of defects in manufacturing and material. Manufacturer further warrants: 100-YEAR LIMITED WARRANTY On all PlayBooster® and PlayShaper® aluminum posts, stainless steel fasteners, clamps, beams and caps against structural failure due to corrosion/natural deterioration or manufacturing defects, and on PlayBooster steel posts against structural failure due to material or manufacturing defects. 15-YEAR LIMITED WARRANTY On all Evos® and Weevos® steel arches, all plastic components (including TuffTimbers™ edging), all aluminum and steel components not covered above, Mobius® climbers, Rhapsody® Outdoor Musical Instruments, decks and TenderTuff™ coatings (except Wiggle Ladders, Chain Ladders and Swing Chain) against structural failure due to material or manufacturing defects. 10-YEAR LIMITED WARRANTY On concrete products against structural failure due to natural deterioration or manufacturing defects. Does not cover minor chips, hairline cracks or efflorescence. 8-YEAR LIMITED WARRANTY On Aeronet® climbers and climbing cables against defects in materials or manufacturing defects. 5-YEAR LIMITED WARRANTY On Rhapsody® cables and mallets against defects in materials or manufacturing defects, on polycarbonate panels against defects in materials or manufacturing defects, and on bamboo panels against delamination due to defects in materials or manufacturing defects. Does not cover damage which may be associated with the natural characteristics of bamboo aging, including but not limited to discoloration, splitting, cracking, warping or twisting, nor the formation of algae, mold and other forms of fungal-type bodies on bamboo. 3-YEAR LIMITED WARRANTY On all other parts, i.e.: Pulse® products, all swing seats and hangers, Mobius climber handholds, Wiggle Ladders, Chain Ladders and ProGuard™ Swing Chain, Track Ride trolleys and bumpers, all rocking equipment including Sway Fun® gliders, belting material, HealthBeat® resistance mechanism, Seesaws, etc., against failure due to corrosion/ natural deterioration or manufacturing defects. The environment near a saltwater coast can be

extremely corrosive. Some corrosion and/or deterioration is considered "normal wear" in this environment. Product installed within 500 yards (457 meters) of a saltwater shoreline will only be covered for half the period of the standard product warranty, up to a maximum of five years, for defects caused by corrosion. Products installed in direct contact with saltwater or that are subjected to salt spray are not covered by the standard warranty for any defects caused by corrosion. This warranty does not include any cosmetic issues or wear and tear from normal use of the product, or misuse or abuse of the product. It is valid only if the playstructures and/or equipment are erected to conform with Landscape Structures' installation instructions and maintained according to the maintenance procedures furnished by Landscape Structures Inc.

Account Name:	M.E. O'Brien & Sons	Created Date:	2/26/2024 12:55 PM
Project Name:	41005-Fuller St. Park Splashpad, MA	Quote Number:	QUO-23351-Q4Y6J9
Project ID:	41005	Quote Name:	Version A 2024

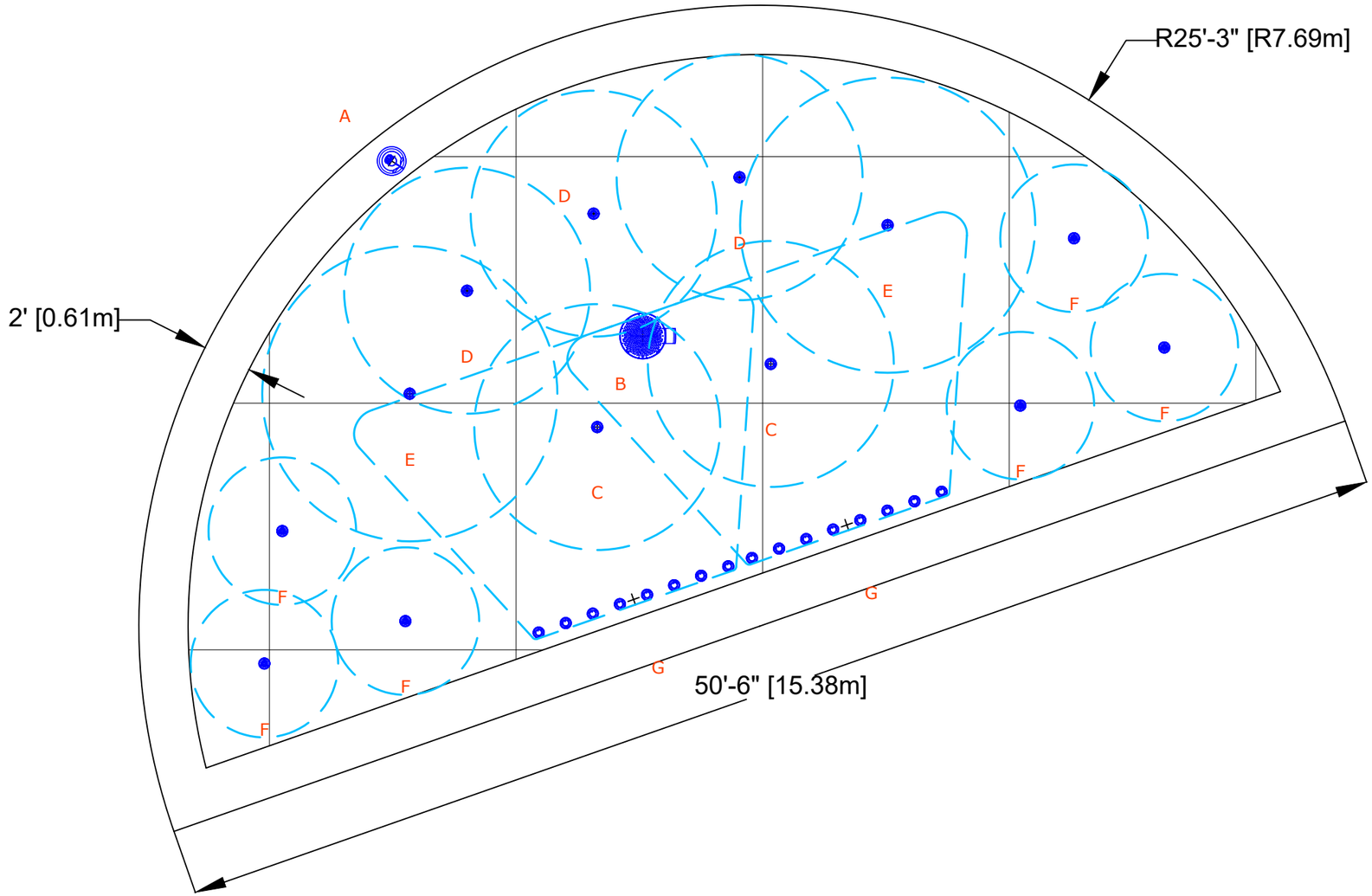
VOR	Product No.	Product Name	Description	QTY
1- Play Products				
		ACTIVATOR N° 4		1
3000	108168-304L	SPRAYLINK JET NO.1		2
3005	109921-304L	SPRAYLINK GEYSER		3
3007	109944-304L	SPRAYLINK FOUNTAIN		2
3009	109949-304L	SPRAYLINK PODSPRAY		6
3055	108384-304L	SPRAYLINK TUNNEL NO.2		2
2- Water Management System and Controls				
	2- Water Distribution System 'WDS'			
		Smartflow Command Center-Cabinet	WDS ECCC 2.0 BFP PR 10V 1X2" FT MaestroPro 120V BLV	1
	4- Drains			
1004	103080-304L	Playsafe Drain N°4	Playsafe Drain N°4	1
7- Installation Kits				
	101143-304L	INSTALLATION KIT #SAFESWAP NO1		1
	103335	M12 CONNECTION WIRE, 5-PIN, STRAIGHT CONNECTOR_75M LG_22AWG		1
	110184	SPRAYLINK BOX AND TRAY FOR SHIPPING		8
	102313	TOOL KIT #0 :		1
	102314	TOOL KIT #1 :SECURITY BITS (ALL)		1
	110258	TOOL KIT #129: SPRAYLINK SECURITY KEY		1

SPLASHPAD DIMENSION

TOTAL AREA :	1000 ft²	93 m²
SPRAY AREA :	755 ft²	70 m²
GRID SIZE :	10 x 10 ft	3 x 3 m

PRODUCT LEGEND

REF	PRODUCT	QTY	GPM	LPM
A	Activator N°4	1	0.0	0.0
B	Playsafe Drain N°4 VOR 1004	1		
C	Spraylink Jet N°1 VOR 3000	2	5.0	18.9
D	Spraylink Geyser VOR 3005	3	15.0	56.7
E	Spraylink Fountain VOR 3007	2	12.0	45.4
F	Spraylink Podspray VOR 3009	6	24.0	90.7
G	Spraylink Tunnel N°2 VOR 3055	2	16.0	60.5
	TOTAL	QTY	GPM	LPM
		17	72	272.2



5'[1.5m] SPRAY FREE CONCRETE AREA ALL AROUND THE SPLASHPAD

NOTE: QUANTITY AND LOCATION OF DRAINS BASED ON VORTEX RECOMMENDATIONS.
MODIFICATIONS MAY BE REQUIRED DUE TO SPECIFIC SITE CONDITIONS AND/OR LOCAL CODE.

Fuller St. Park Splashpad, MA

41005 - Version B

October 31, 2023

SPLASHPAD LAYOUT DRAWING

SCALE :6/32":1'

11" X 17" sheet size

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL 2006-THIS DOCUMENTS AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

All 3D renders shown are for illustration purposes only. Actual colors, textures and finishes may differ from renders.

**The product shown in the image may differ from the actual product sold.*

Ideal age group: For all ages

VOR 622
ACTIVATOR Nº4

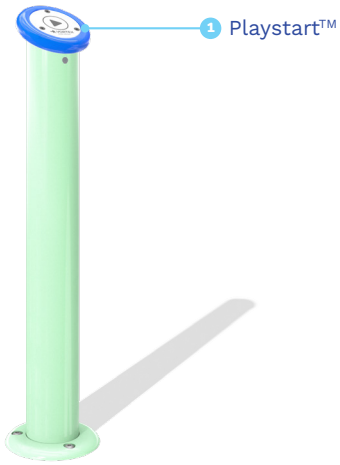
PRODUCT HIGHLIGHTS

- Inclusive and innovative activator features an ADA-compliant sound alert that activates when pressed.
- Sustainable bollard design reduces the use of excess material.
- Sleek design that fits all Vortex solutions ranging from a vibrant Splashpad® to an urban CoolHub™.
- Easy two-wire installation process ensures a smooth and effortless setup.

VORTEX

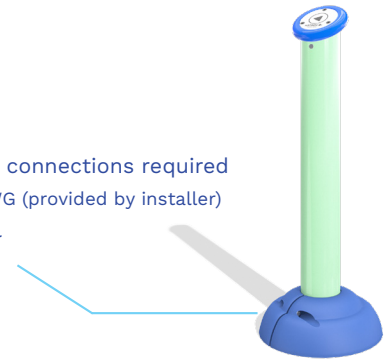
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS



H./W./L.
37/14/14 in
94/35.5/35.5 cm

Color choices
Vortex colors for post



Notes
- Additional electrical connections required
  Cable 2 wires 22-26AWG (provided by installer)
- Toeguard is optional

PRODUCT INNOVATIONS

This product features the following technologies that are unique to Vortex.

PLAYSTART™
- On-demand activation saves water
- Inclusive sound signal alerts activation
- Easy operation for kids of all ages & abilities

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 0622

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. **Play Product Structure:** The Activator Nº4 VOR-622 shall be constructed of 304/304L stainless steel structural tubing with an outside diameter of 4½" (11.4cm) and a wall thickness of 0.120" (3mm). The upper part housing of the feature is constructed with a soft touch polyurethane that is durable polymer, engineered for impact resistance, UV protection, and anti-fungus properties. This housing will hold the Playstart activator. The Playstart™ activator shall have no moving parts and run on a low voltage electrical supply. An electrical switch sensor to be used as an interface for processing user input activation. The activation cap shall of 304/304L stainless steel with powder coating and laser engraving. It shall be secured in place using tamper-resistant fasteners. This post activator shall be surface mounted only with the provided anchors secured in concrete with epoxy following installation instructions.

1.2. **Overall play product dimensions:** The Activator shall have an overall height of 37” (94cm) above the final grade.

1.3. **Play Product Interactivity:** The Activator shall be the direct interface between the users of the aquatic play area and the aquatic Play Products. The pre-programmed sequences of the aquatic Play Products shall be activated only when the touch-activated button on the Bollard Activator is touched by the user. The Activator has a inclusive sound activation signal.

1.4. **Hydraulic Activity/Components:** not applicable

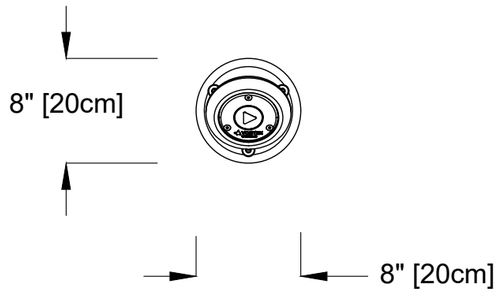
1.5. **Electric Specifications**

CONNECTION: CABLE 2 WIRES, 22-26AWG
SWITCHING VOLTAGE: 24V AC/DC
SWITCHING CURRENT: 0.200 A
SWITCH RESISTANCE "ON": <220 Ohm
IMPULSE TIME: 125-300 mSEC
OPERATING TEMP: -30 C TO +75 C
STORAGE TEMP: -40 C TO +85 C

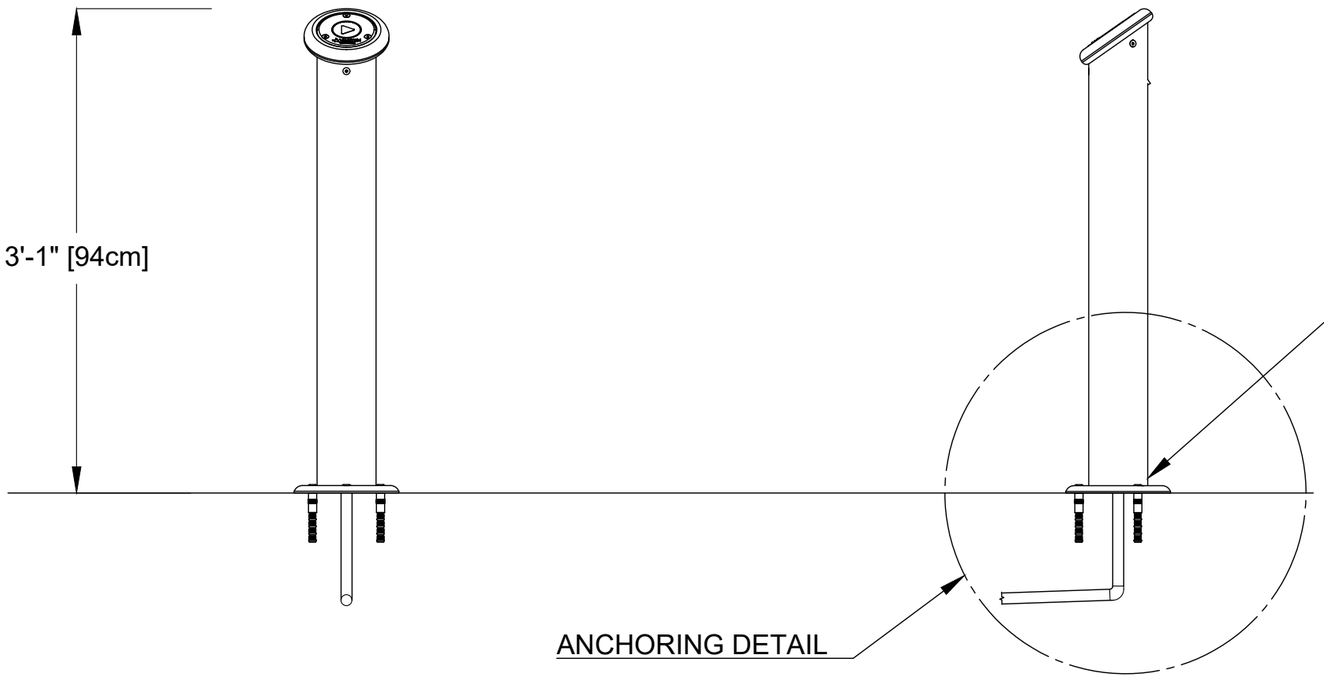
This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.

THESE DRAWINGS PROVIDE A GENERIC OVERVIEW OF THE INSTALLATION. THEY ARE NOT PROJECT SPECIFIC OR REFLECT ANYCUSTOMIZATION UNLESS NOTED. PLEASE CONTACT VORTEX AQUATIC STRUCTURES INTERNATIONAL FOR MORE DETAILS.

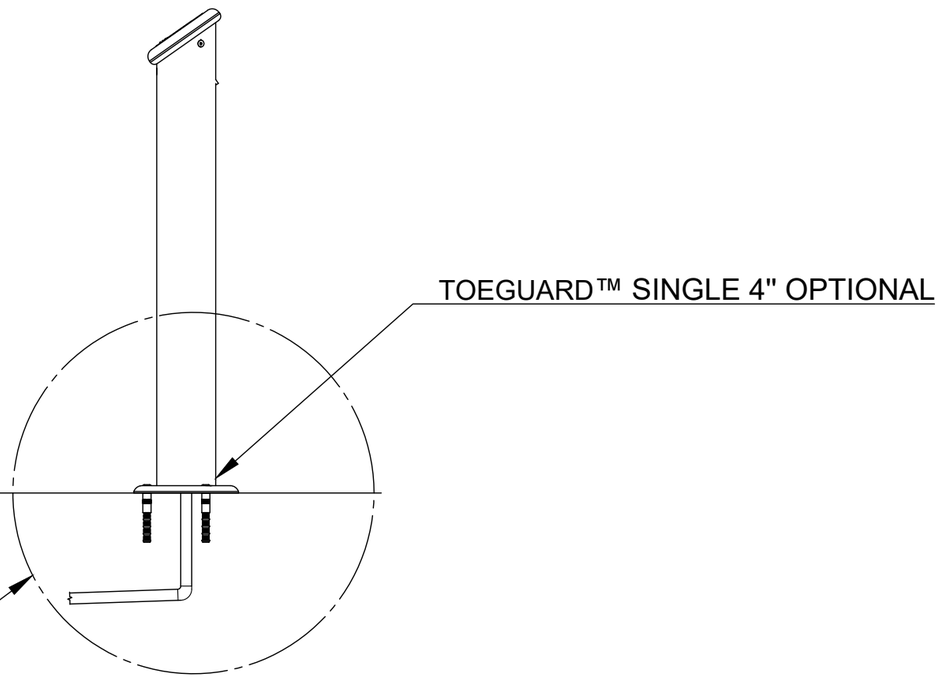
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



PRODUCT NAME: ACTIVATOR No4			
PRODUCT NUMBER: VOR-0622	DATE: 02-2024	SHEET NO: 1/2	11"x17" SHEET SIZE

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

NOTES:

1) "BY INSTALLER/BY CONTRACTOR" MAY REFER TO SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER. PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

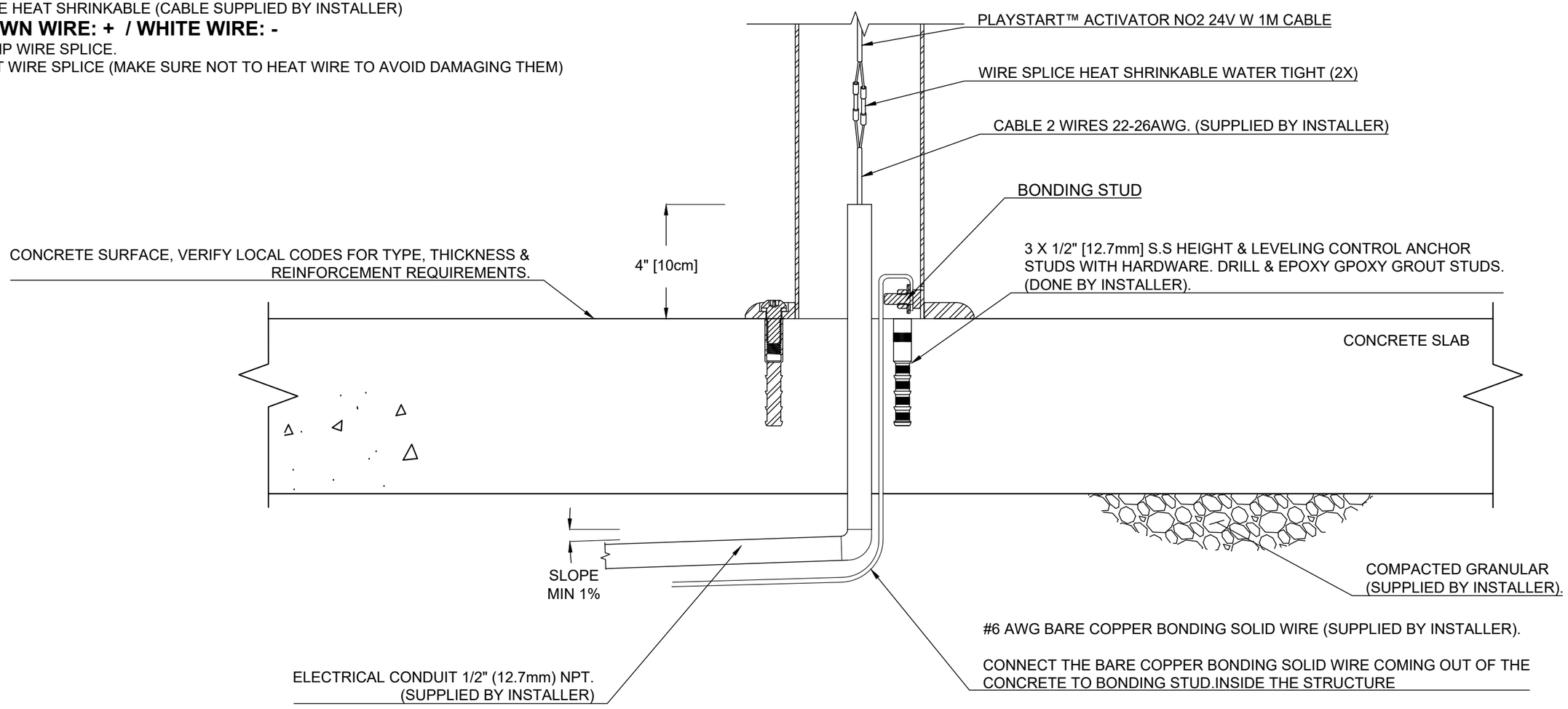
2) ANCHOR FOR CONCRETE INSTALLATION INSTRUCTIONS:

- DRILL $\frac{5}{8}$" (15.875mm) HOLE, MIN. HOLE DEPTH 4 $\frac{1}{8}$" (104.8mm).
- CLEAN THE HOLE.
- FILL EPOXY ADHESIVE INTO HOLE TO APPROXIMATELY $\frac{1}{3}$ TO HALF FULL.
- INSERT ANCHOR INTO HOLE.
- ALLOW EPOXY TO CURE PRIOR TO APPLYING MAXIMUM LOAD.

3) CONNECT THE ACTIVATOR CABLE TO THE CABLE THAT CONNECTS TO THE ELECTRICAL BOX USING WIRE SPLICE HEAT SHRINKABLE (CABLE SUPPLIED BY INSTALLER)

BROWN WIRE: + / WHITE WIRE: -

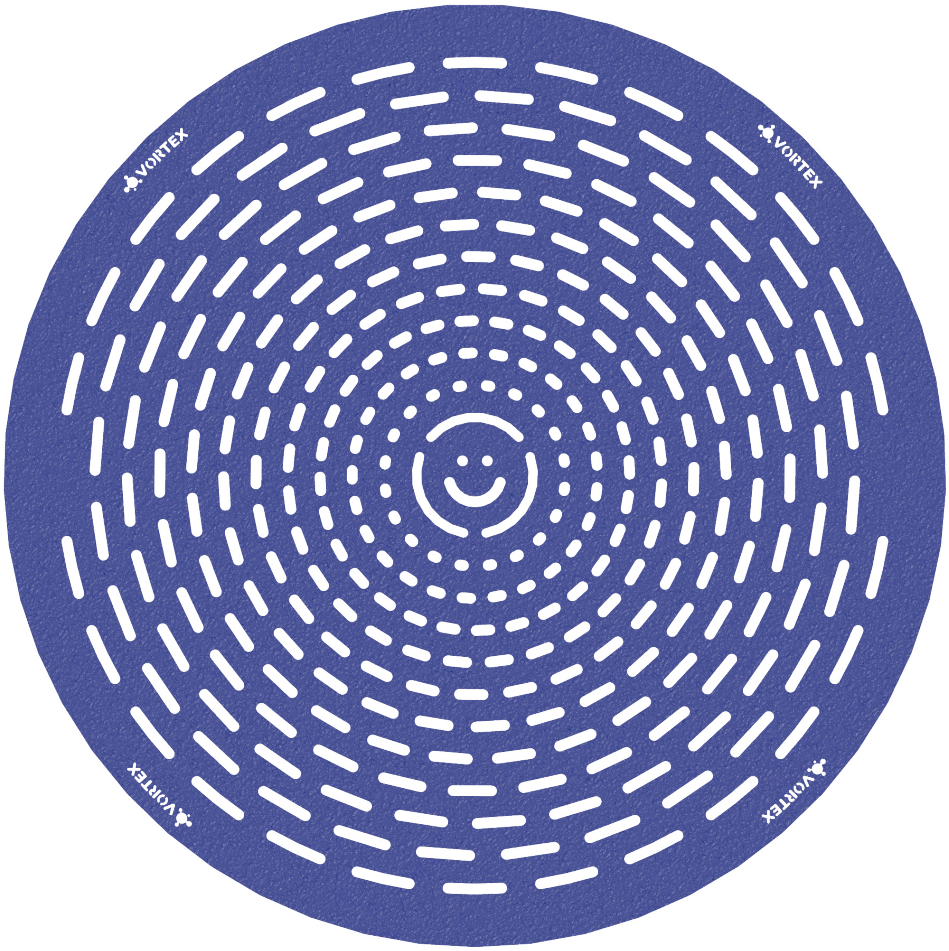
- CRIMP WIRE SPLICE.
- HEAT WIRE SPLICE (MAKE SURE NOT TO HEAT WIRE TO AVOID DAMAGING THEM)



PRODUCT NAME: ACTIVATOR No4		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR-0622	DATE: 02-2024	SHEET NO: 2/2	11"x17" SHEET SIZE

VORTEX

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL



**The product shown in the image may differ from the actual product sold.*

VOR 1004
PLAYSAFE™ DRAIN Nº4

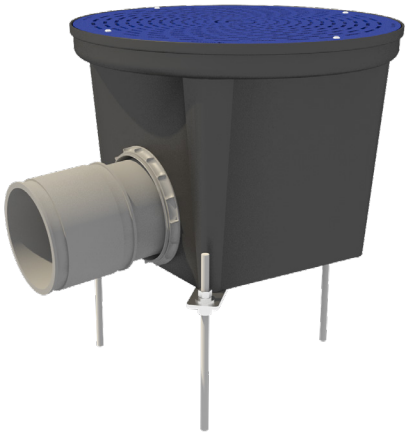
PRODUCT HIGHLIGHTS

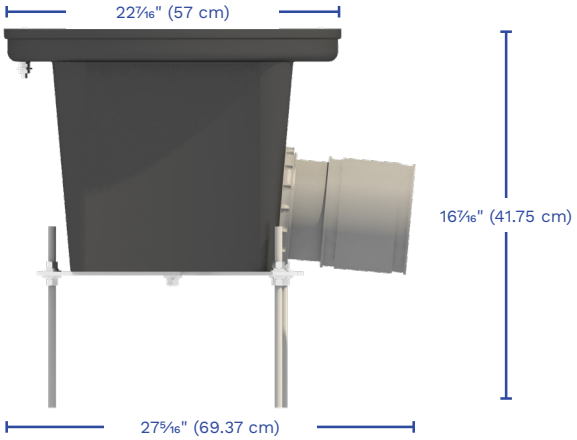
- 22” diameter cover with new design
- 6” diameter drainage pipe
- 240 GPM drainage capacity
- 3 adjustable levelling anchors
- Optional strainer available (33400.2100)

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS





H./W./L.
16 7/16 / 27 5/16 / 22 7/16 in
41.75/69.37/57 cm

Color choices
Vortex blue RAL 5017

Flow
Recommanded 240 GPM (300 GPM max)
Recommanded 908 LPM (1135 LPM max)

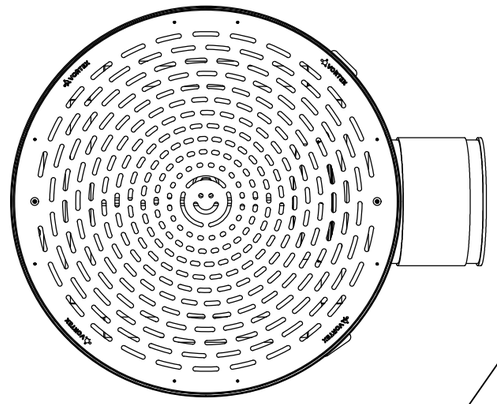
Dia. Cover plate
22 in
55.88 cm

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

PLAN VIEW

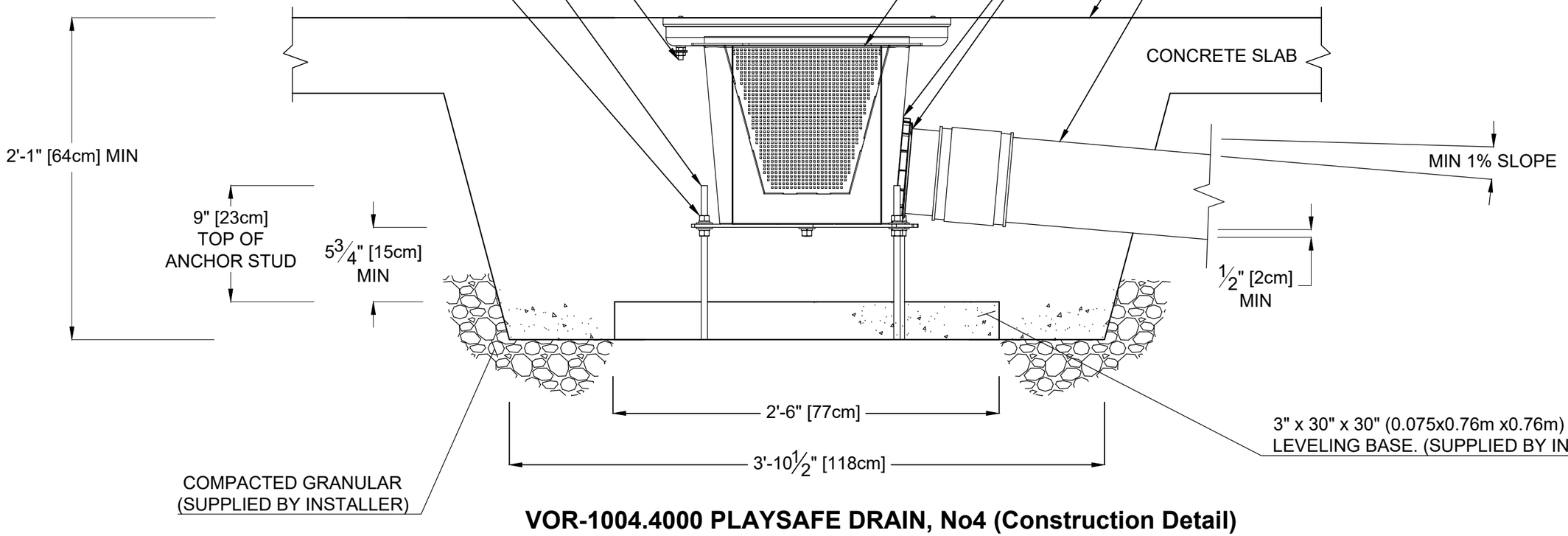
Note:
1- Cover plate must be install during concrete pouring.



STRAINER BASKET
PART #: 33400.2100
STAINLESS STEEL 304 | THICKNESS: 14 GA
SQUARE OPENINGS: 0.15" (3.8mm)
(SOLD SEPARATELY)

ADD SIKAFLEX MARINE GRADE SILICONE SEALANT
ON THE OUTSIDE AND ON THE INSIDE:
- BETWEEN DRAINAGE BOX & SEAL
- BETWEEN SEAL & SUPPLIED 6" PIPE
  (LEAVE THE 6 " PIPE EXTENDED BY 1/2" FROM THE SEAL INSIDE THE DRAINAGE BOX)

FRONT ELEVATION VIEW



VOR-1004.4000 PLAYSAFE DRAIN, No4 (Construction Detail)

PRODUCT NAME: PLAYSAFE DRAIN, No4	PRODUCT INFORMATION		VORTEX
PRODUCT NUMBER: VOR-1004.4000	DATE: 11/17/20	SHEET NO: 1/1	11"x17" SHEET SIZE

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPETY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 1004.4000

PLAYSAFE™ DRAIN Nº4

Please refer to PART 1 : VORTEX GENERAL CLAUSES
for all Play Product construction and installation information.

1.0 PLAY PRODUCT SPECIFICATIONS :

1.1. Play Product Structure :

The Playsafe™ Drain Nº4, VOR-1004.4000 consists of a basin and a removable cover. The basin shall be constructed in Polyethylene (PE) 22.5" (57 cm) outside diameter X 10" (25.4cm) height. The deck grating cover shall be stainless steel and constructed with 22" (56 cm) diameter and 1/4" (0.63cm) thickness. The gaps of the openings are 1/4 in (0.6 cm). This removable cover has an anti-kid surface. The Playsafe™ Drain Nº4 has also an optional strainer basket. A concrete levelling base (supplied by installer) with the Playsafe™ drain which has the capabilities to be levelled shall be inserted in the hole to create a concrete drain box pit. The Water line outlet connected to the drain basin shall be a maximum of 6" in diameter at a minimum slope of 1%. The drainage recommanded capacity is 240 GPM, 300 GPM max (recommanded 908 LPM, 1135 LPM max).

1.2. Overall play product dimensions :

The overall height of the Play Product shall be 0" (0 cm) above ground. The diameter of this feature shall be not less than 22.5” (57 cm).

1.3. Play Product Interactivity :

N.A.

1.4. Hydraulic Activity/Components :

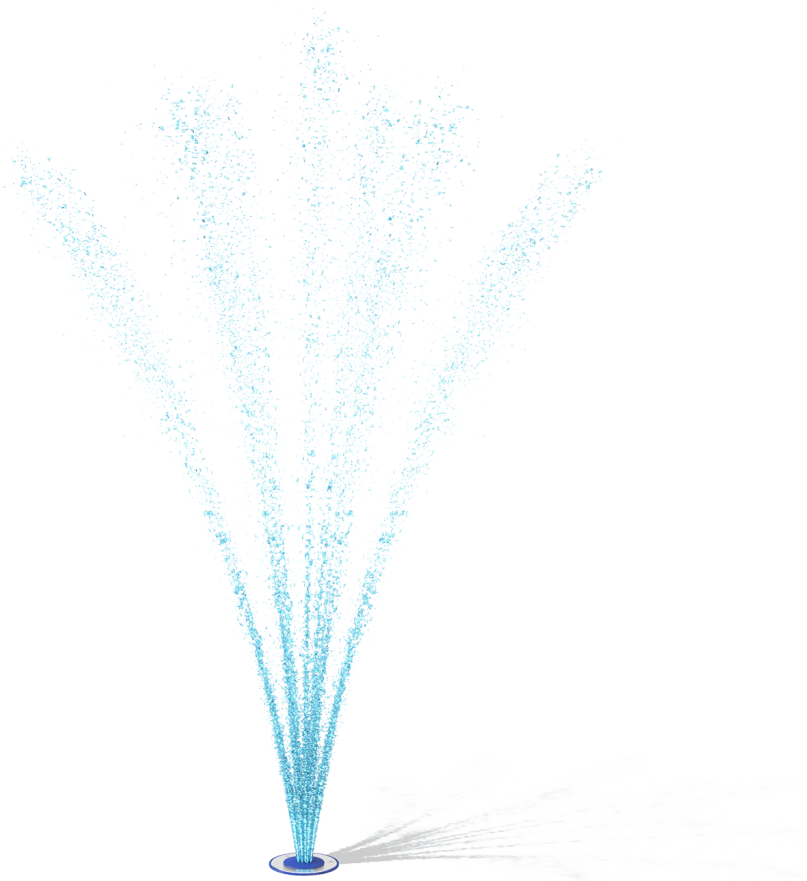
N.A.

1.5. Hydraulic Requirements :

N.A.

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited

18/08/2020, Version 1.00



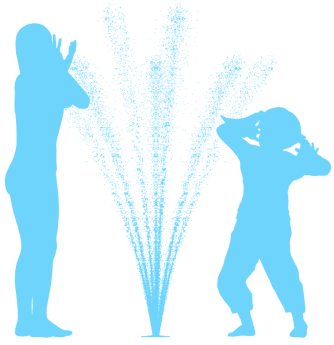
**The product shown in the image may differ from the actual product sold.*
**Water jet heights may not always be equals depending on water flow.*

Ideal age group: For all ages

VOR 3007
SPRAYLINK™ FOUNTAIN

PRODUCT HIGHLIGHTS

Spraylink™ is a cutting-edge ground spray collection. With a wide variety of water effects and designs to choose from, these ground sprays are a sustainable solution perfect for any sized Splashpad®.

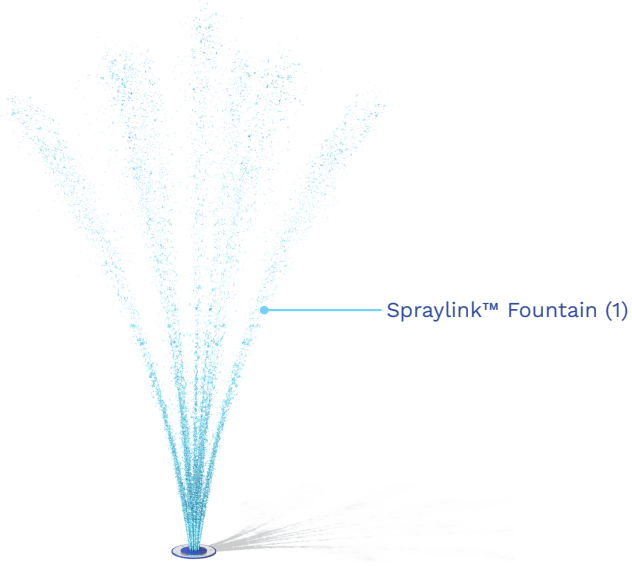


- Enjoy running your feet and hands through soft water jets
- Provides high interactivity with low water consumption
- Offers many imaginative play opportunities
- Designed and manufactured with sustainability at the forefront
- One-size interchangeable nozzles for all Spraylink™ items

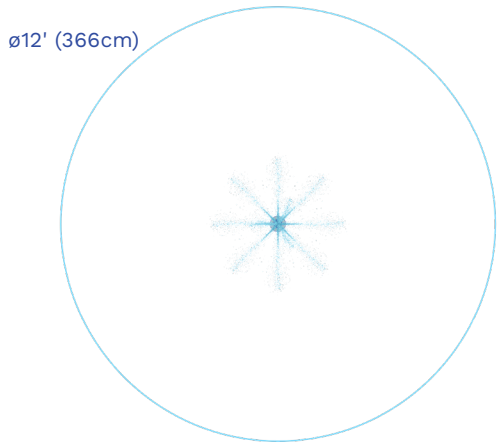
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS



SprayZone



Recommended jet height: 6' (183cm)

H./W./L.
0/5.3/5.3 in
0/13.5/13.5 cm

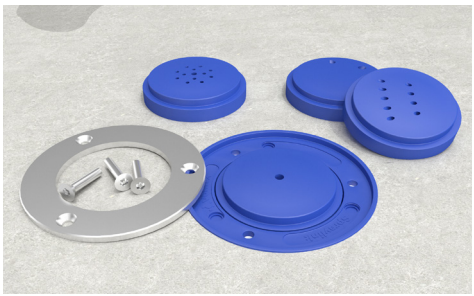
Color choices
Colors as shown

Flow
5-7 GPM
19-26.5 LPM

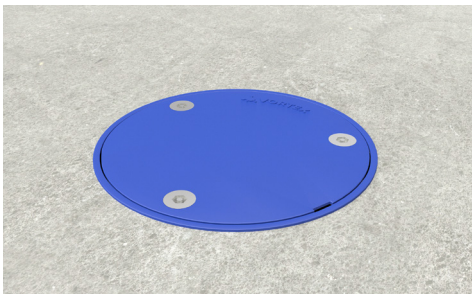
Pressure
3-5 PSI
0.2-0.3 BAR

ADVANTAGES

Easy on-site assembly and installation



One-size interchangeable nozzle
(sufficient flow and sprayzone required)



Easy maintenance and winterization

VORTEX

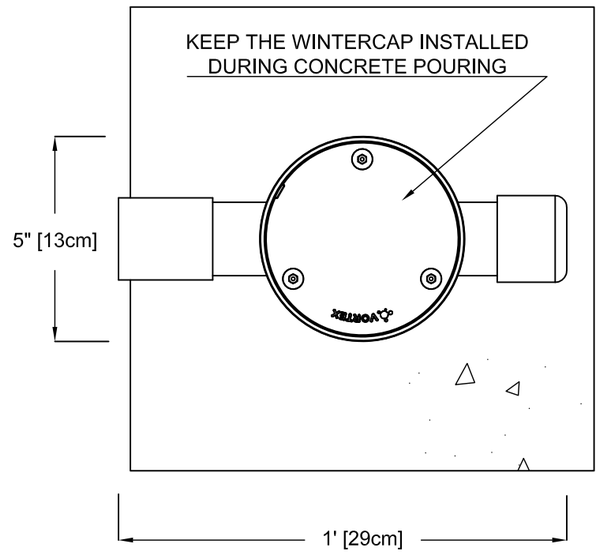
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

NOTES:

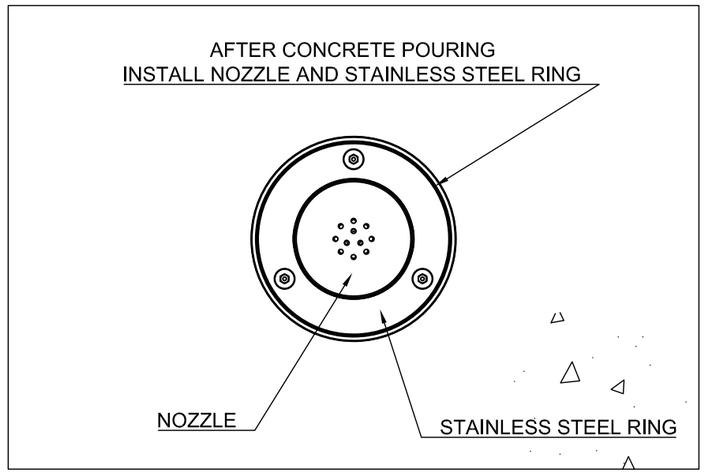
1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO
SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER.
PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

2) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

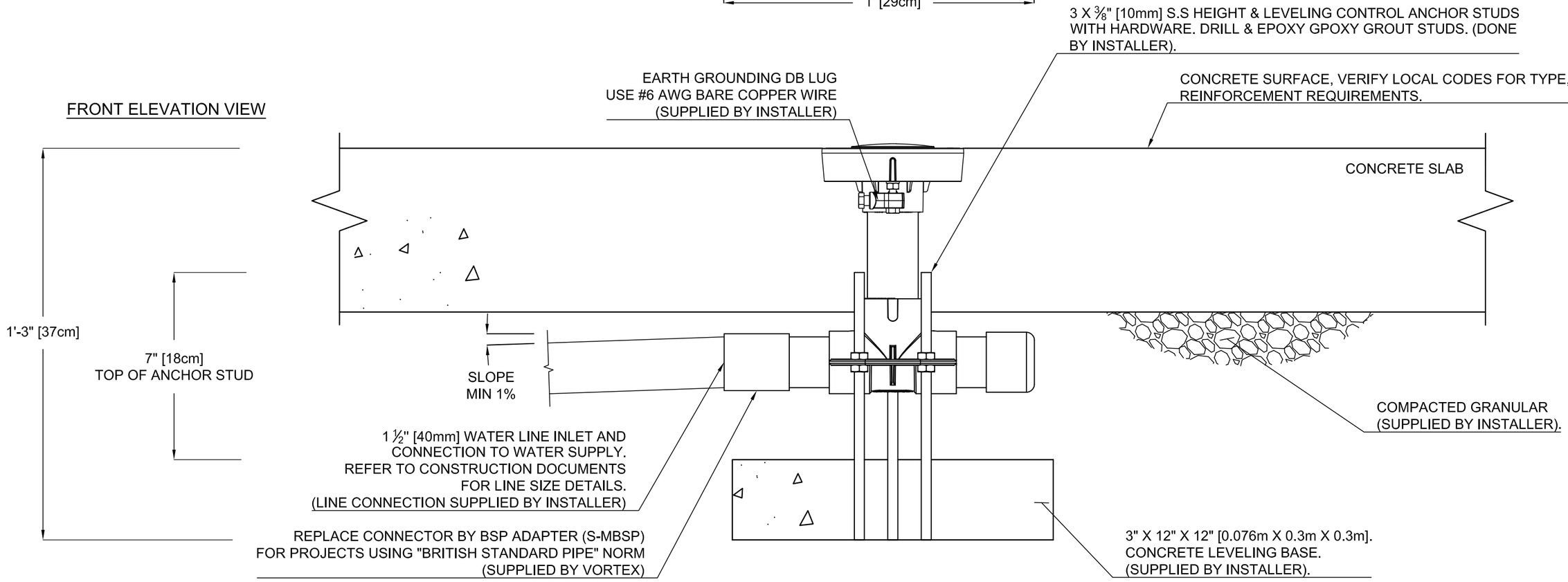
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



PRODUCT NAME: SPRAYLINK FOUNTAIN		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR 3007	DATE: 06/10/25	SHEET NO: 1/1	11"x17" SHEET SIZE

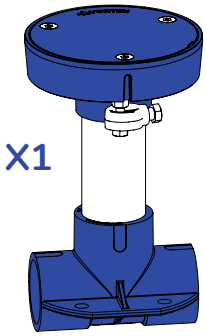
VORTEX

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 3007
SPRAYLINK™ FOUNTAIN
SPRAYLINK[MC] FONTAINE

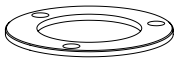
109945

INSTALLATION GUIDE EN
GUIDE D'INSTALLATION FR
GUÍA DE INSTALACIÓN ES

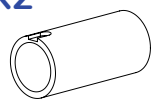


X1 108159 Spraylink Housing

X1 108124 Spraylink Fountain

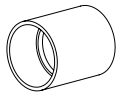


X1 108152 Spraylink Ring

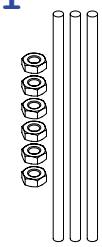


X2 108069 PVC Pipe 4"

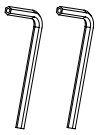
X1 108165 PVC Cap



X1 105818 PVC Coupling



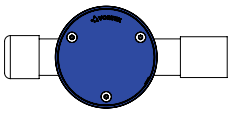
X1 108167 Levelling Rod Kit



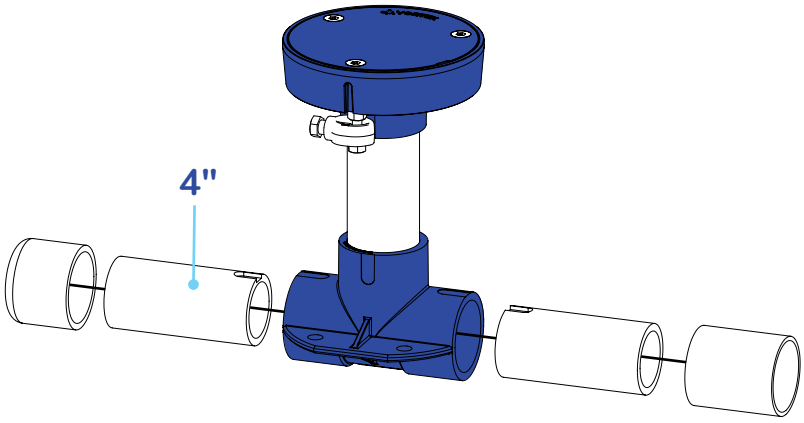
110258 Tool kit #129 Security Key (1 kit per project)

1

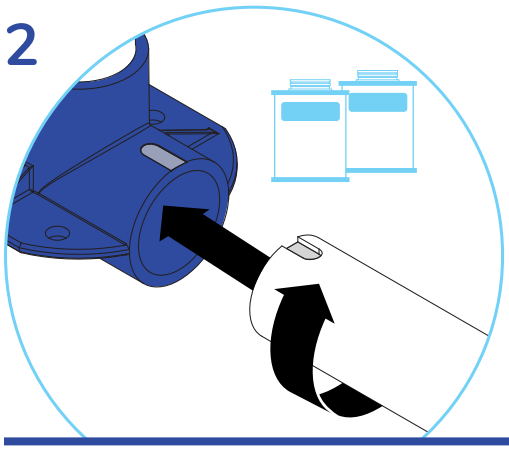
By installer: Dry fit assembly before gluing
Par installateur: Assembler à sec avant collage
Por Instalador: Montaje en seco antes del pegado



9.2 / 5.3 / 11.6"
23 / 13 / 29.5 cm



2



FOR ALL CONNECTIONS
- Apply PVC primer and PVC cement on both parts
- Slighty turn pipe at entry and align with notch
- Push pipe all the way in and let solvent bond

POUR TOUTES LES CONNEXIONS
- Appliquer de l'apprêt PVC et du ciment à PVC sur les deux bouts
- Tourner légèrement le tuyau à l'entrée et s'aligner avec l'encoche
- Poussez le tuyau jusqu'au fond et laissez le solvant se lier

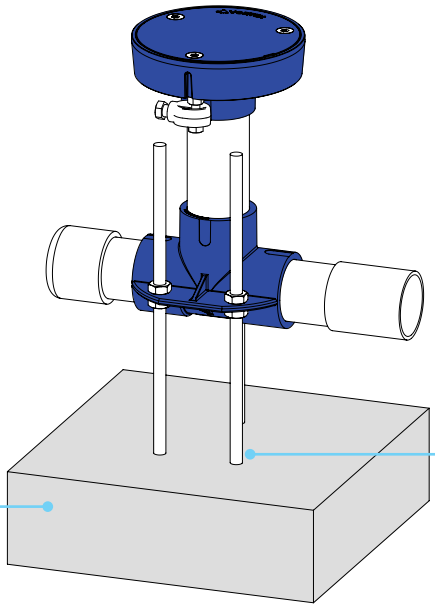
PARA TODAS LAS CONEXIONES
- Aplique imprimación de PVC y cemento de PVC en ambas partes
- Atornille ligeramente el tubo en la entrada alineando con la muesca
- Empuje la tubería hasta el final y deje que el disolvente se adhiera

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3

By installer: Concrete leveling bases
Par installateur: Bases de mise à niveau en béton
Por Instalador: Bases niveladora de hormigón



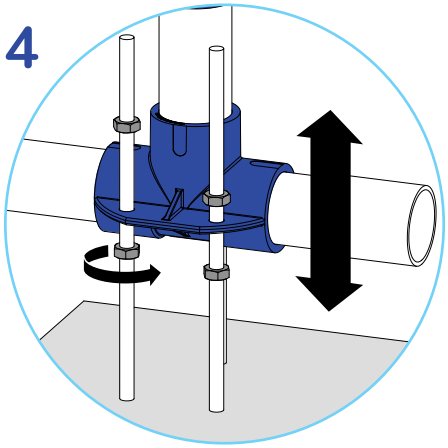
3 / 12 / 12"
(7.6 / 30.5 / 30.5 cm)

Drill & fix rods with anchoring epoxy

Percer & fixer les tiges avec de l'époxy d'ancrage

Taladrar & fijar varillas con anclaje epoxi

4



Levelled with nuts and rods to lock at proper height

Niveler avec les écrous et les tiges pour verrouiller à la bonne hauteur

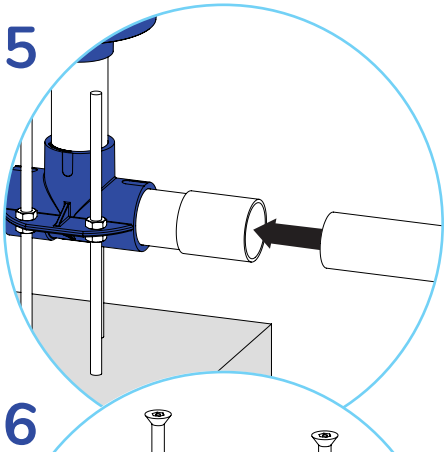
Nivelado con tuercas y varillas para bloquear a la altura adecuada

Connect water line inlet 1 1/2" (40mm)

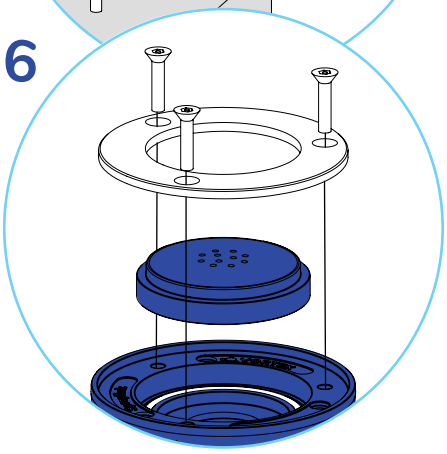
Connecter le tuyau d'entrée d'eau 1 1/2" (40mm)

Conecte la entrada de la línea de agua 1 1/2" (40mm)

5



6

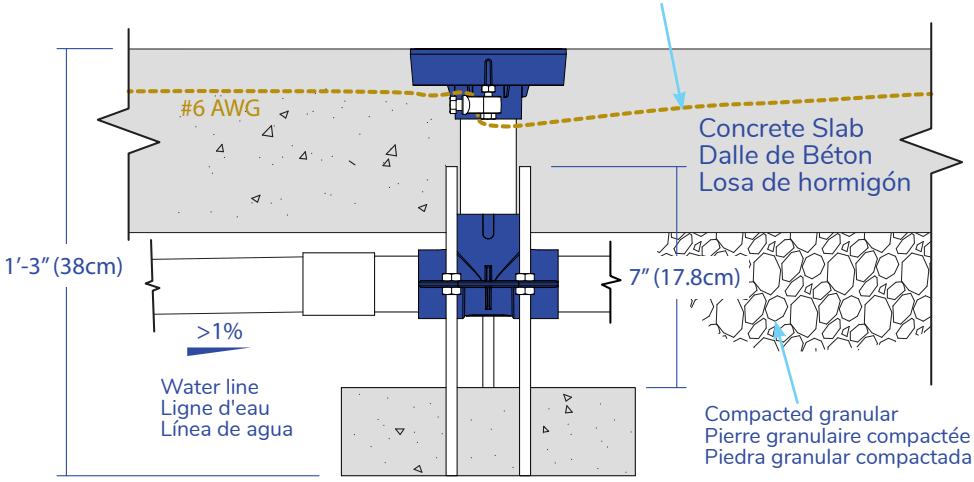


After concrete pouring; remove cap, install nozzle & ring (always leave O-ring in place)

Après la coulée de béton; retirer le capuchon, installer la buse et l'anneau (laissez toujours le O-ring en place)

Después del vertido de hormigón; quitar tapa, instalar boquilla y anillo (siempre deje la junta tórica en su lugar)

Concrete surface: verify local codes for type, thickness & reinforcement requirements
Surface de béton: vérifier les normes locales pour le type, épaisseur et armatures nécessaire
Superficie de concreto: verifique los códigos locales para el tipo,requisitos de espesor y refuerzo



VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 3007

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. **Play Product Structure:** The Spraylink Fountain VOR 3007 shall be constructed of polymer spray housing (1), fittings and pipings in Rigid Polyvinyl Chloride (PVC) without plasticizer according to industry standards. Each spray head housing shall be fitted with a 304-304L passivated Stainless steel ring thickness of 0.1875" (4.75mm), a UHMWPE polymer spray cap and a rubber O-ring assembled with tamper-resistant fasteners. The spray cap shall be free of finger entrapment hazards. Installer must follow installation guide provided to assemble the components. The embedded anchoring and leveling system shall be used.

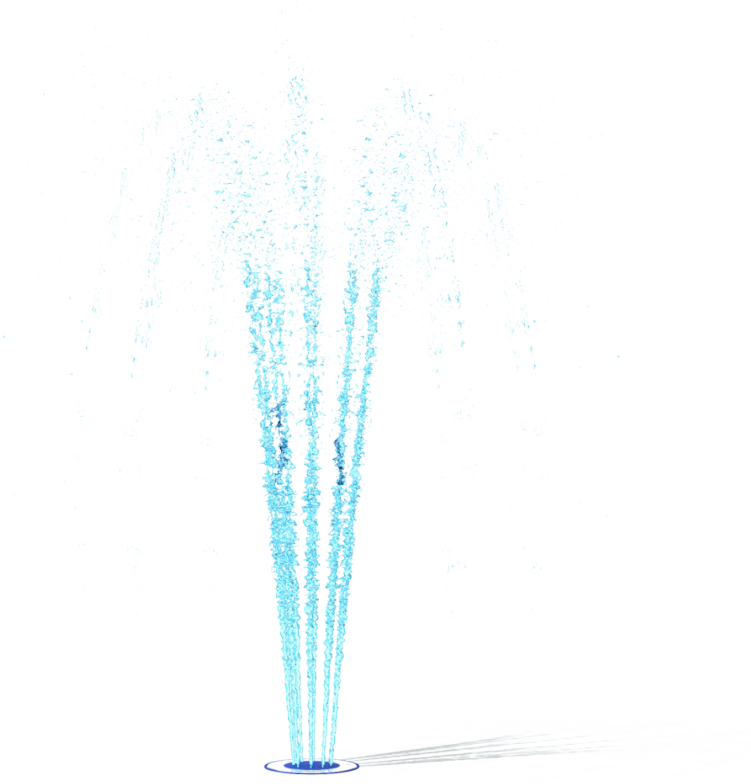
1.2. **Overall play product dimensions:** The overall height of the Play Product shall be 0" (0 cm) above ground.

1.3. **Play Product Interactivity:** The high or low stream of water produced by jet creates visual interest.

1.4. **Hydraulic Activity/Components:** The water effect from the spray head shall produce soft streams.

1.5. **Hydraulic Requirements:** The hydraulic requirements shall be 5-7 gpm (19-26.5 lpm) @ 3-5 psi (0.2-0.3 bar).

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.



**The product shown in the image may differ from the actual product sold.*
**Water jet heights may not always be equals depending on water flow.*

Ideal age group: For all ages

VOR 3005
SPRAYLINK™ GEYSER

PRODUCT HIGHLIGHTS

Spraylink™ is a cutting-edge ground spray collection. With a wide variety of water effects and designs to choose from, these ground sprays are a sustainable solution perfect for any sized Splashpad®.

- Enjoy running your feet and hands through soft water jets
- Provides high interactivity with low water consumption
- Offers many imaginative play opportunities
- Designed and manufactured with sustainability at the forefront
- One-size interchangeable nozzles for all Spraylink™ items

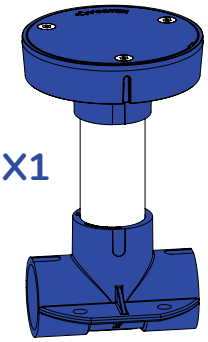
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 3005
SPRAYLINK™ GEYSER

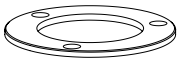
109924

INSTALLATION GUIDE EN
GUIDE D'INSTALLATION FR
GUÍA DE INSTALACIÓN ES

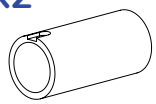


X1
108159
Spraylink Housing

X1
108127
Spraylink Geyser

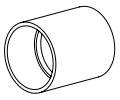


X1
108152
Spraylink Ring

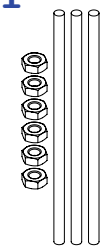


X2
108069
PVC Pipe 4"

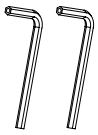
X1
108165
PVC Cap



X1
105818
PVC Coupling



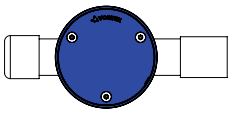
X1
108167
Levelling Rod Kit



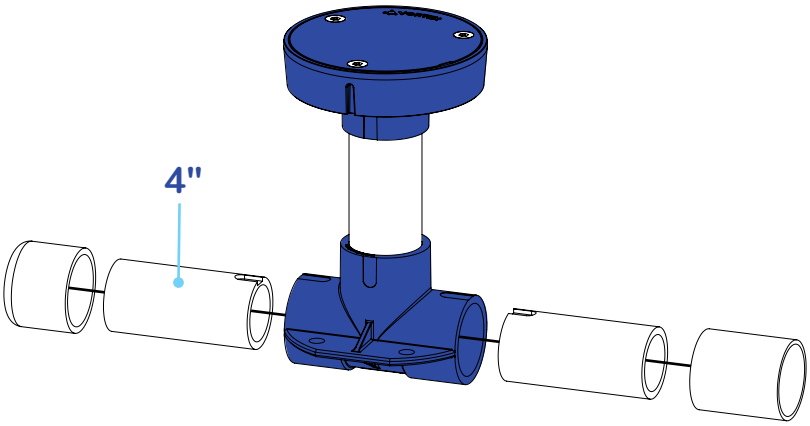
110258
Tool kit #129
Security Key
(1 kit per project)

1

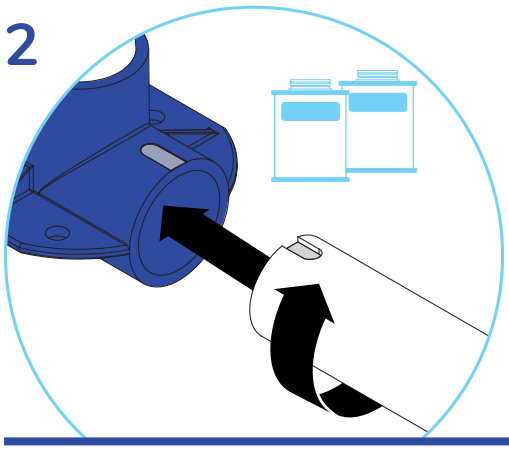
By installer: Dry fit assembly before gluing
Par installateur: Assembler à sec avant collage
Por Instalador: Montaje en seco antes del pegado



9.2 / 5.3 / 11.6"
23 / 13 / 29.5 cm



2



FOR ALL CONNECTIONS
- Apply PVC primer and PVC cement on both parts
- Slighty turn pipe at entry and align with notch
- Push pipe all the way in and let solvent bond

POUR TOUTES LES CONNEXIONS
- Appliquer de l'apprêt PVC et du ciment à PVC sur les deux bouts
- Tourner légèrement le tuyau à l'entrée et s'aligner avec l'encoche
- Poussez le tuyau jusqu'au fond et laissez le solvant se lier

PARA TODAS LAS CONEXIONES
- Aplique imprimación de PVC y cemento de PVC en ambas partes
- Atornille ligeramente el tubo en la entrada alineando con la muesca
- Empuje la tubería hasta el final y deje que el disolvente se adhiera

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3

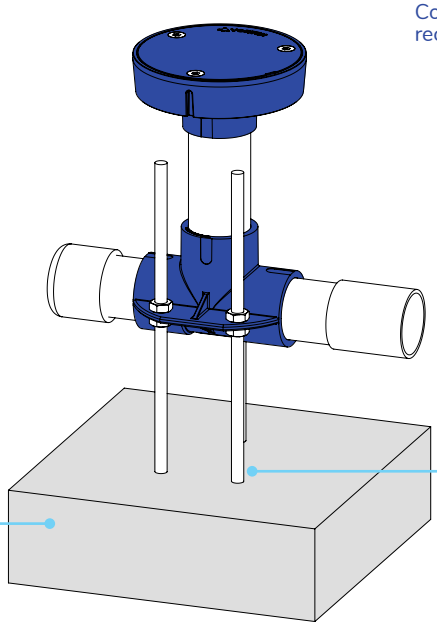
By installer:
Par installateur:
Por Instalador:

Concrete leveling bases
Bases de mise à niveau en béton
Bases niveladora de hormigón

Polymer encapsulated assembly, no earth grounding and bonding recommended for Spraylink™ system. Follow local code.

Assemblage encapsulé en polymère, aucune mise à la terre recommandée pour le système Spraylink™. Suivez le code local.

Conjunto encapsulado de polímero, sin conexión a tierra recomendado para el sistema Spraylink™. Siga el código local.



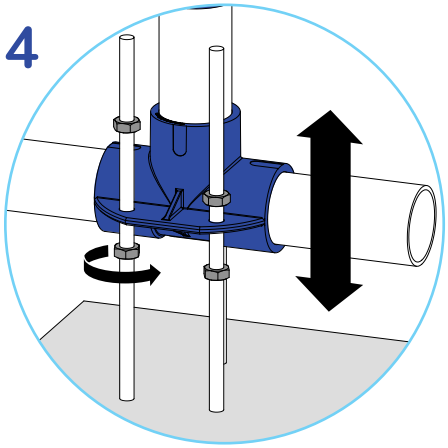
3 / 12 / 12"
(7.6 / 30.5 / 30.5 cm)

Drill & fix rods with anchoring epoxy

Percer & fixer les tiges avec de l'époxy d'ancrage

Taladrar & fijar varillas con anclaje epoxi

4



Levelled with nuts and rods to lock at proper height

Niveler avec les écrous et les tiges pour verrouiller à la bonne hauteur

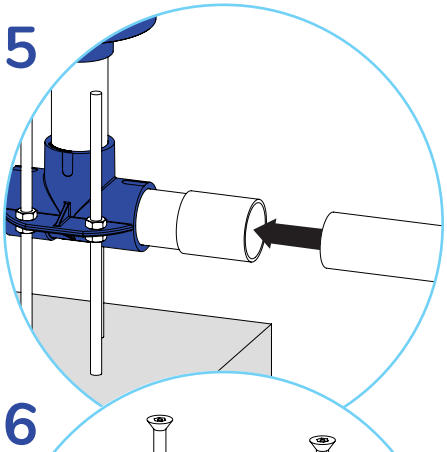
Nivelado con tuercas y varillas para bloquear a la altura adecuada

Connect water line inlet 1 1/2" (40mm)

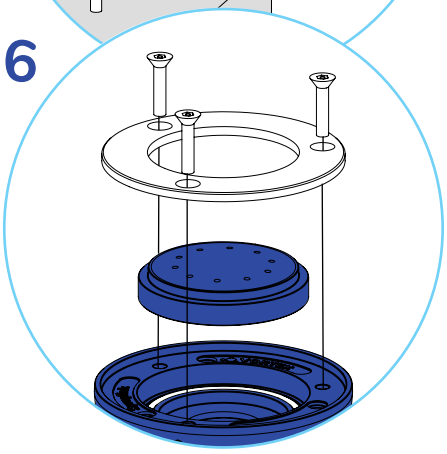
Connecter le tuyau d'entrée d'eau 1 1/2" (40mm)

Conecte la entrada de la línea de agua 1 1/2" (40mm)

5



6

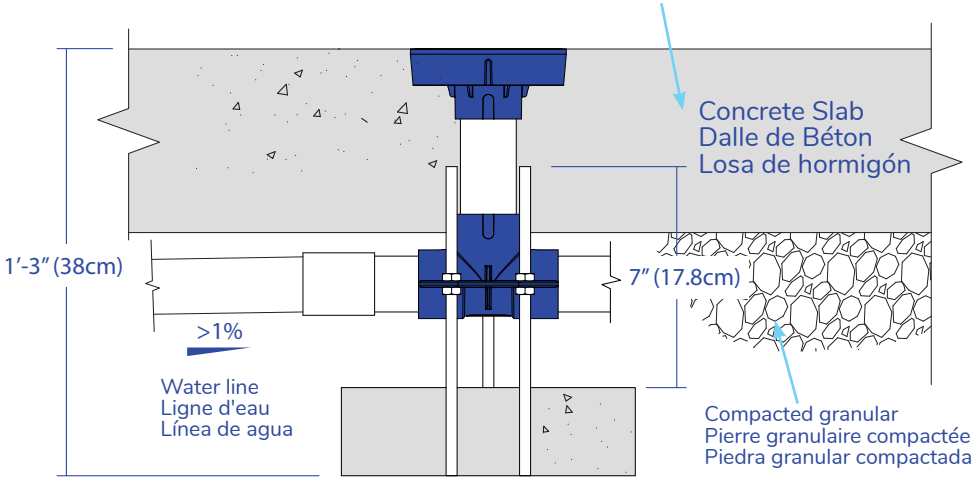


After concrete pouring; remove cap, install nozzle & ring (always leave O-ring in place)

Après la coulée de béton; retirer le capuchon, installer la buse et l'anneau (laissez toujours le O-ring en place)

Después del vertido de hormigón; quitar tapa, instalar boquilla y anillo (siempre deje la junta tórica en su lugar)

Concrete surface: verify local codes for type, thickness & reinforcement requirements
Surface de béton: vérifier les normes locales pour le type, épaisseur et armatures nécessaire
Superficie de concreto: verifique los códigos locales para el tipo,requisitos de espesor y refuerzo



VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

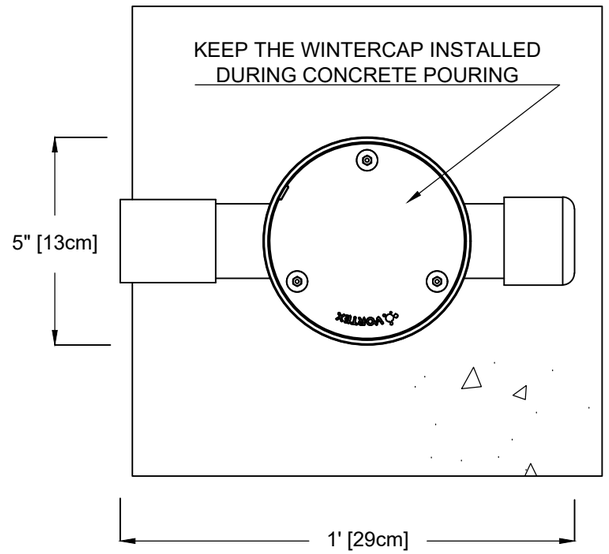
NOTES:

1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO
SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER.
PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

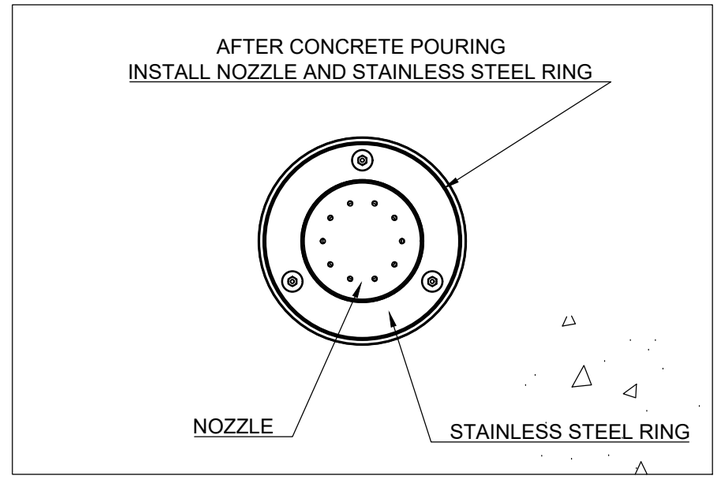
2) POLYMER ENCAPSULATED ASSEMBLY
NO EARTH GROUNDING AND NO BONDING RECOMMENDED FOR SPRAYLINK™ SYSTEM
FOLLOW LOCAL CODE

3) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

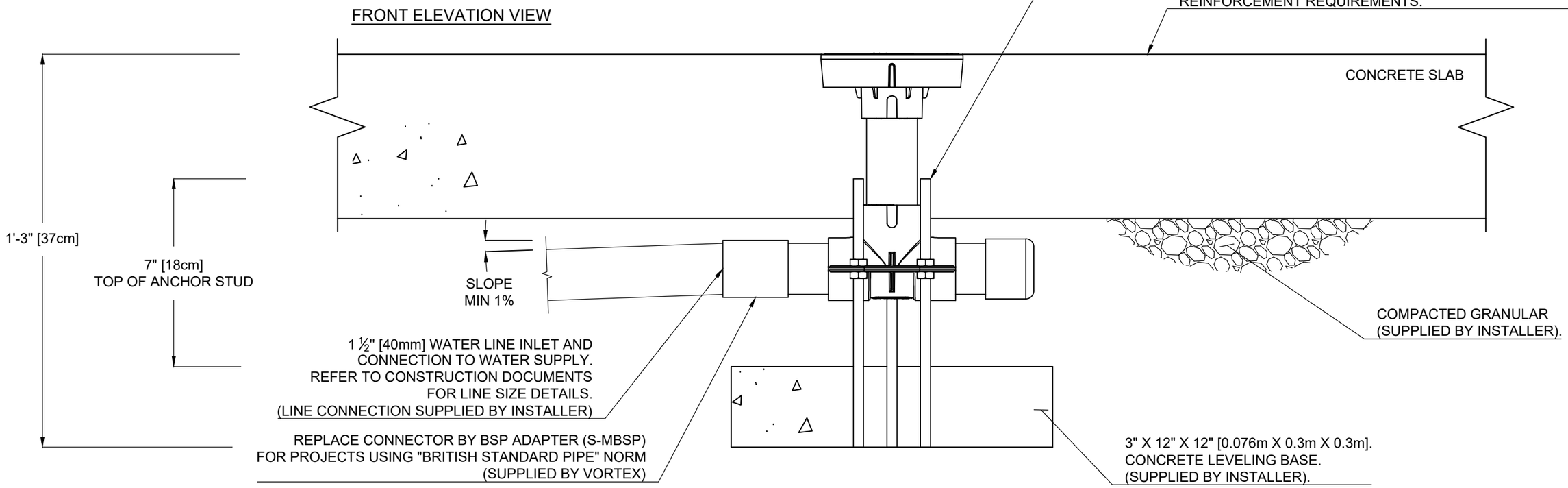
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



PRODUCT NAME: SPRAYLINK GEYSER		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR 3005	DATE: 01/06/23	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 3005

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. **Play Product Structure:** The Spraylink Geyser VOR 3005 shall be constructed of polymer spray housing (1), fittings and pipings in Rigid Polyvinyl Chloride (PVC) without plasticizer according to industry standards. Each spray head housing shall be fitted with a 304-304L passivated Stainless steel ring thickness of 0.1875" (4.75mm), a UHMWPE polymer spray cap and a rubber O-ring assembled with tamper-resistant fasteners. The spray cap shall be free of finger entrapment hazards. Installer must follow installation guide provided to assemble the components. The embedded anchoring and leveling system shall be used.

1.2. **Overall play product dimensions:** The overall height of the Play Product shall be 0" (0 cm) above ground.

1.3. **Play Product Interactivity:** The high or low stream of water produced by jet creates visual interest.

1.4. **Hydraulic Activity/Components:** The water effect from the spray head shall produce soft streams.

1.5. **Hydraulic Requirements:** The hydraulic requirements shall be 4-6 gpm (15-23 lpm) @ 2-4 psi (0.1-0.3 bar).

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.

**The product shown in the image may differ from the actual product sold.*
**Water jet heights may not always be equals depending on water flow.*

Ideal age group: For all ages

VOR 3000
SPRAYLINK™ JET N°1

PRODUCT HIGHLIGHTS

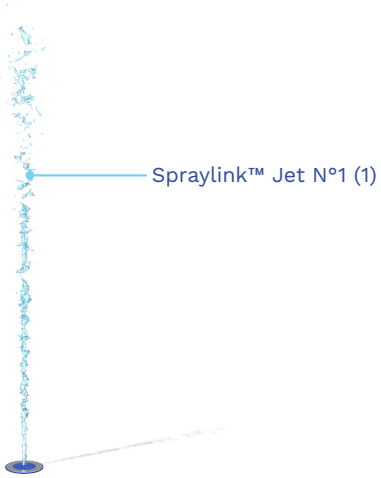
Spraylink™ is a cutting-edge ground spray collection. With a wide variety of water effects and designs to choose from, these ground sprays are a sustainable solution perfect for any sized Splashpad®.

- Enjoy running your feet and hands through soft water jets
- Provides high interactivity with low water consumption
- Offers many imaginative play opportunities
- Designed and manufactured with sustainability at the forefront
- One-size interchangeable nozzles for all Spraylink™ items

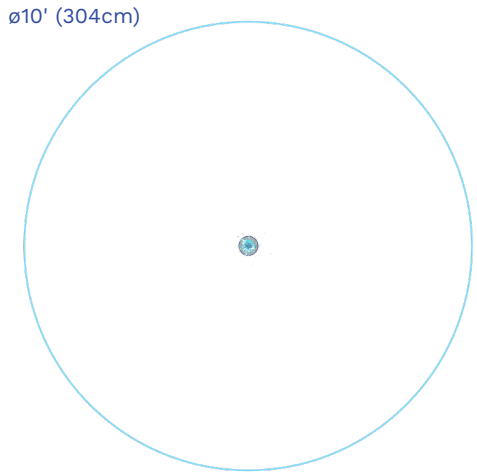
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS



SprayZone



Recommended jet height: 5' (152cm)

H./W./L.
0/5.3/5.3 in
0/13.5/13.5 cm

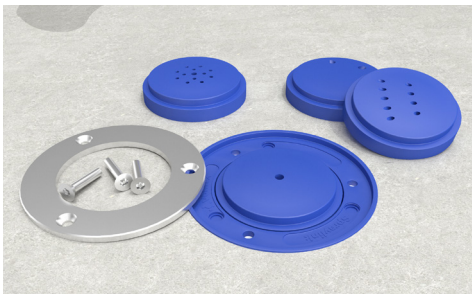
Color choices
Colors as shown

Flow
2-3 GPM
7.5-11 LPM

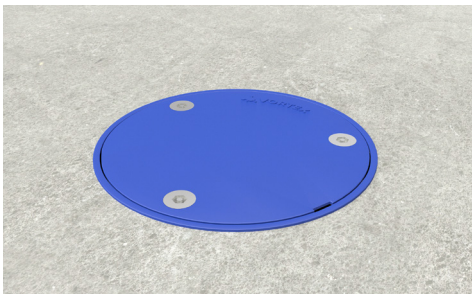
Pressure
2-4 PSI
0.1-0.3 BAR

ADVANTAGES

Easy on-site assembly and installation



One-size interchangeable nozzle
(sufficient flow and sprayzone required)



Easy maintenance and winterization

INSTALLATION

- Follow Installation guide provided.
- Polymer encapsulated assembly, no earth grounding and bonding recommended for Spraylink™ system. Follow local code.
- Replace nozzle and ring with provided cap for winterization.

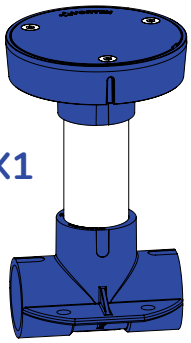
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 3000
SPRAYLINK™ JET N°1

109475

INSTALLATION GUIDE EN
GUIDE D'INSTALLATION FR
GUÍA DE INSTALACIÓN ES



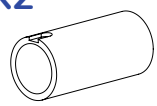
X1
108159
Spraylink Housing

X1

108079
Spraylink Jet N1

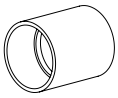
X1

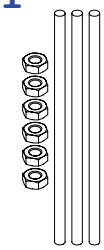
108152
Spraylink Ring

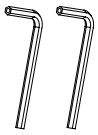
X2

108069
PVC Pipe 4"

X1

108165
PVC Cap

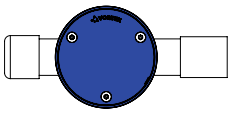
X1

105818
PVC Coupling

X1

108167
Levelling Rod Kit

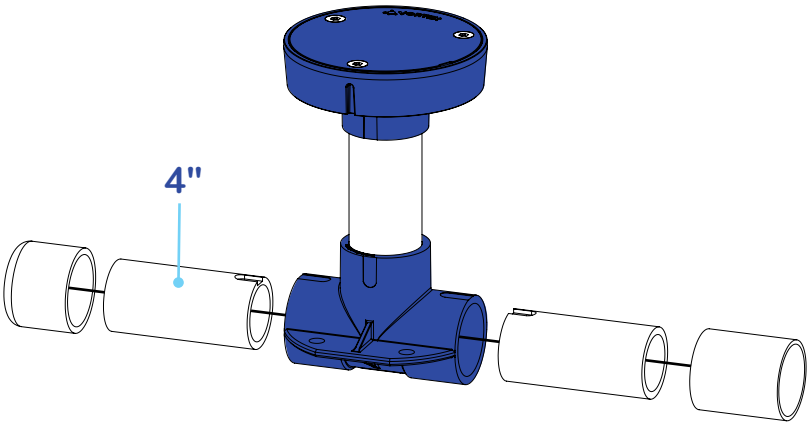

110258
Tool kit #129
Security Key
(1 kit per project)

1

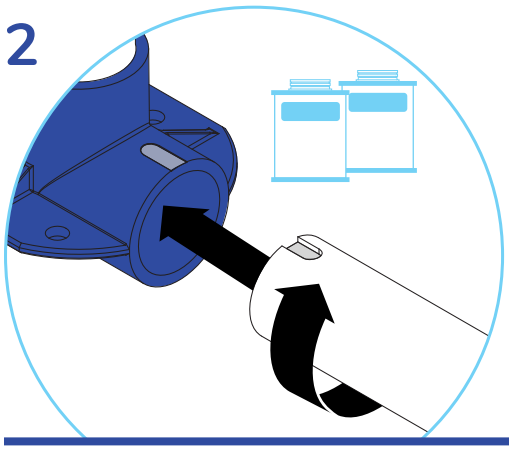
By installer: Dry fit assembly before gluing
Par installateur: Assembler à sec avant collage
Por Instalador: Montaje en seco antes del pegado



9.2 / 5.3 / 11.6"
23 / 13 / 29.5 cm



2



FOR ALL CONNECTIONS
- Apply PVC primer and PVC cement on both parts
- Slighty turn pipe at entry and align with notch
- Push pipe all the way in and let solvent bond

POUR TOUTES LES CONNEXIONS
- Appliquer de l'apprêt PVC et du ciment à PVC sur les deux bouts
- Tourner légèrement le tuyau à l'entrée et s'aligner avec l'encoche
- Poussez le tuyau jusqu'au fond et laissez le solvant se lier

PARA TODAS LAS CONEXIONES
- Aplique imprimación de PVC y cemento de PVC en ambas partes
- Atornille ligeramente el tubo en la entrada alineando con la muesca
- Empuje la tubería hasta el final y deje que el disolvente se adhiera

VORTEX
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3

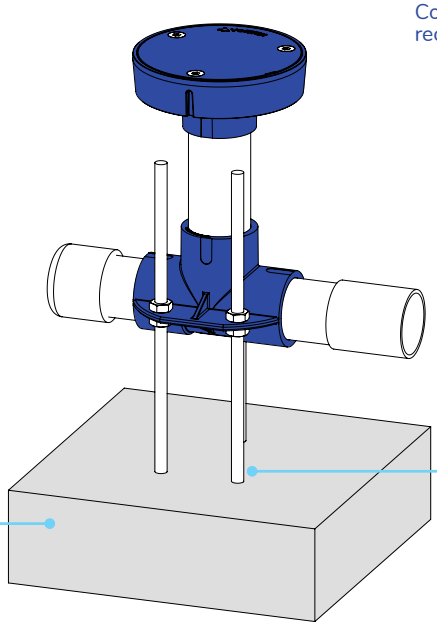
By installer:
Par installateur:
Por Instalador:

Concrete leveling bases
Bases de mise à niveau en béton
Bases niveladora de hormigón

Polymer encapsulated assembly, no earth grounding and bonding recommended for Spraylink™ system. Follow local code.

Assemblage encapsulé en polymère, aucune mise à la terre recommandée pour le système Spraylink™. Suivez le code local.

Conjunto encapsulado de polímero, sin conexión a tierra recomendado para el sistema Spraylink™. Siga el código local.



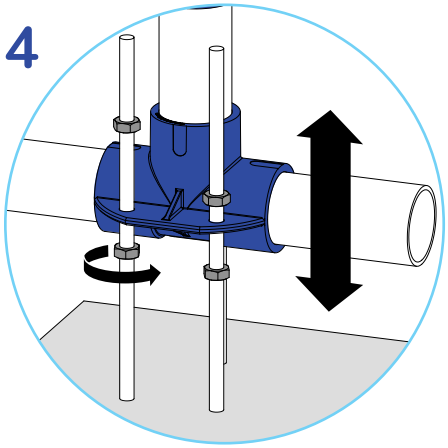
3 / 12 / 12"
(7.6 / 30.5 / 30.5 cm)

Drill & fix rods with anchoring epoxy

Percer & fixer les tiges avec de l'époxy d'ancrage

Taladrar & fijar varillas con anclaje epoxi

4



Levelled with nuts and rods to lock at proper height

Niveler avec les écrous et les tiges pour verrouiller à la bonne hauteur

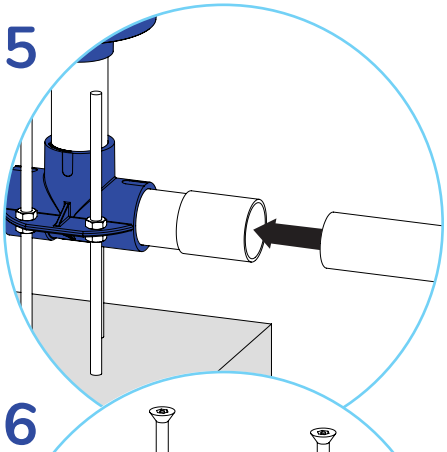
Nivelado con tuercas y varillas para bloquear a la altura adecuada

Connect water line inlet 1 1/2" (40mm)

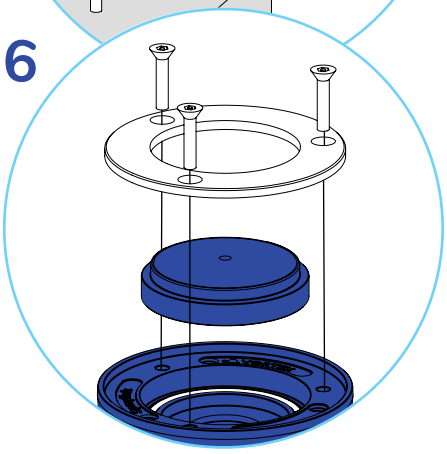
Connecter le tuyau d'entrée d'eau 1 1/2" (40mm)

Conecte la entrada de la línea de agua 1 1/2" (40mm)

5



6

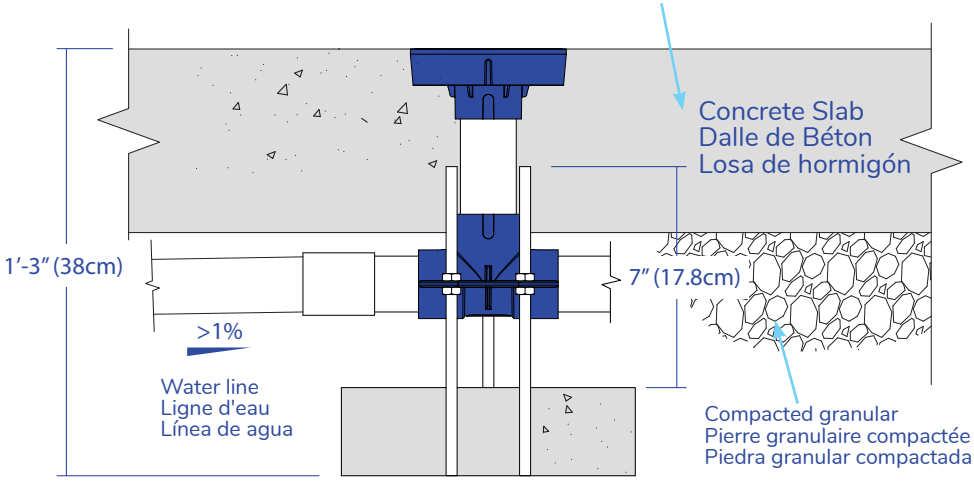


After concrete pouring; remove cap, install nozzle & ring (always leave O-ring in place)

Après la coulée de béton; retirer le capuchon, installer la buse et l'anneau (laissez toujours le O-ring en place)

Después del vertido de hormigón; quitar tapa, instalar boquilla y anillo (siempre deje la junta tórica en su lugar)

Concrete surface: verify local codes for type, thickness & reinforcement requirements
Surface de béton: vérifier les normes locales pour le type, épaisseur et armatures nécessaire
Superficie de concreto: verifique los códigos locales para el tipo,requisitos de espesor y refuerzo



VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

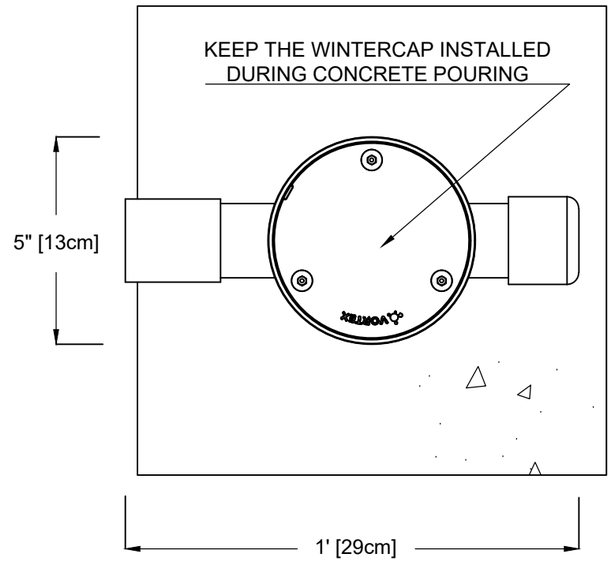
NOTES:

1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO
SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER.
PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

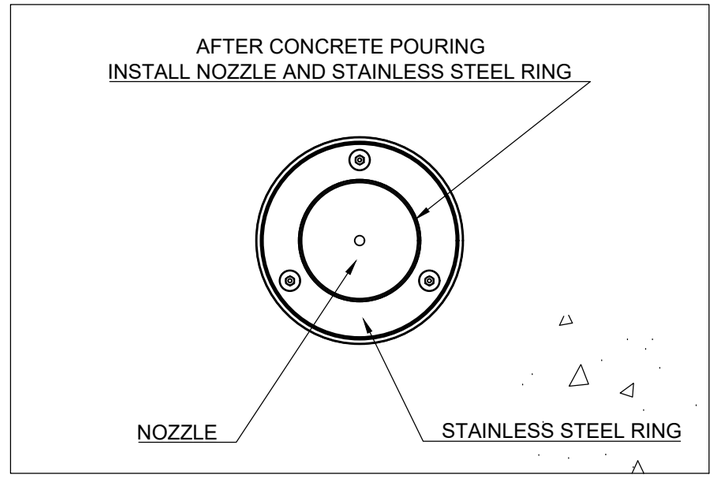
2) POLYMER ENCAPSULATED ASSEMBLY
NO EARTH GROUNDING AND NO BONDING RECOMMENDED FOR SPRAYLINK™ SYSTEM
FOLLOW LOCAL CODE

3) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

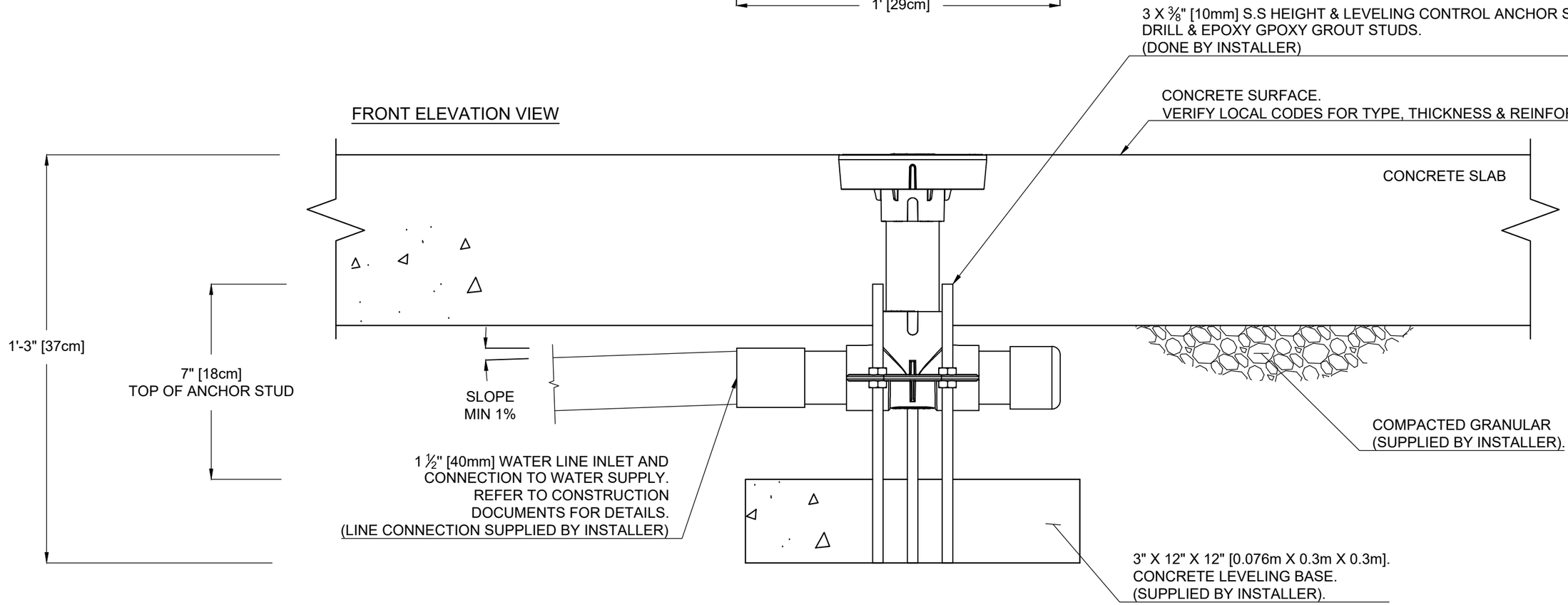
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



PRODUCT NAME: SPRAYLINK JET NO.1		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR 3000	DATE: 02/11/22	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 3000

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. Play Product Structure: The Spraylink Jet No.1 VOR 3000 shall be constructed of polymer spray housing (1), fittings and pipings in Rigid Polyvinyl Chloride (PVC) without plasticizer according to industry standards. Each spray head housing shall be fitted with a 304-304L passivated Stainless steel ring thickness of 0.1875" (4.75mm), a UHMWPE polymer spray cap and a rubber O-ring assembled with tamper-resistant fasteners. The spray cap shall be free of finger entrapment hazards. Installer must follow installation guide provided to assemble the components. The embedded anchoring and leveling system shall be used.

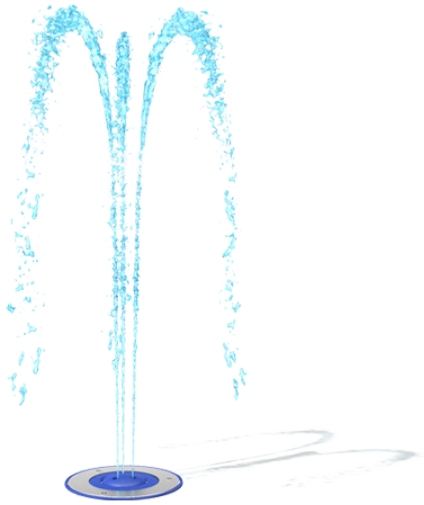
1.2. Overall play product dimensions**:** The overall height of the Play Product shall be 0" (0 cm) above ground.

1.3. Play Product Interactivity: The high or low stream of water produced by jet creates visual interest.

1.4. Hydraulic Activity/Components: The water effect from the spray head shall produce soft streams.

1.5. Hydraulic Requirements: The hydraulic requirements shall be 2-3 gpm (7.5-11 lpm) @ 2-4 psi (0.1-0.3 bar).

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.



**The product shown in the image may differ from the actual product sold.*
**Water jet heights may not always be equals depending on water flow.*

Ideal age group: For all ages

VOR 3009
SPRAYLINK™ PODSPRAY™

PRODUCT HIGHLIGHTS

Spraylink™ is a cutting-edge ground spray collection. With a wide variety of water effects and designs to choose from, these ground sprays are a sustainable solution perfect for any sized Splashpad®.

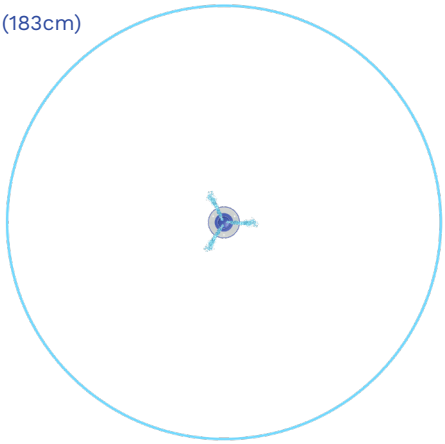
- Enjoy running your feet and hands through soft water jets
- Simply step on the Podspray™ to stop the stream
- Provides high interactivity with low water consumption
- Designed and manufactured with sustainability at the forefront
- One-size interchangeable nozzles for all Spraylink™ items

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS

SprayZone



Recommended jet height: 3' (91cm)

H./W./L.
0/5.3/5.3 in
0/13.5/13.5 cm

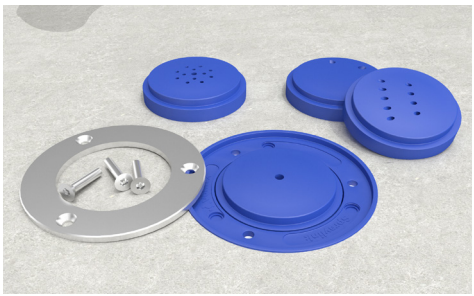
Color choices
Colors as shown

Flow
3-5 GPM
11-19 LPM

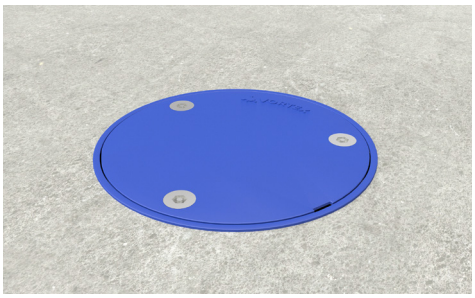
Pressure
4-10 PSI
0.3-0.7 BAR

ADVANTAGES

Easy on-site assembly and installation



One-size interchangeable nozzle
(sufficient flow and sprayzone required)



Easy maintenance and winterization

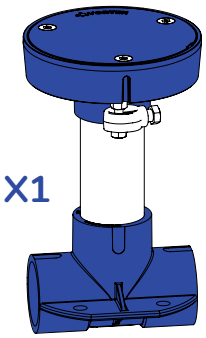
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 3009
SPRAYLINK™ PODSPRAY™

109950

INSTALLATION GUIDE EN
GUIDE D'INSTALLATION FR
GUÍA DE INSTALACIÓN ES



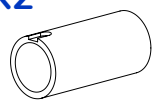
X1
108159
Spraylink Housing

X1
107500
Spraylink PodSpray

X1
107504
Spraylink PodSpray Adapter

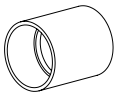
X1
108152
Spraylink Ring

X1
107506
Spraylink Reducer

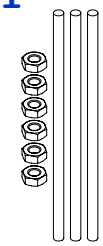


X2
108069
PVC Pipe 4"

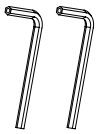
X1
108165
PVC Cap



X1
105818
PVC Coupling



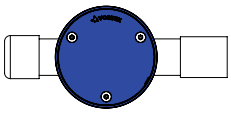
X1
108167
Levelling Rod Kit



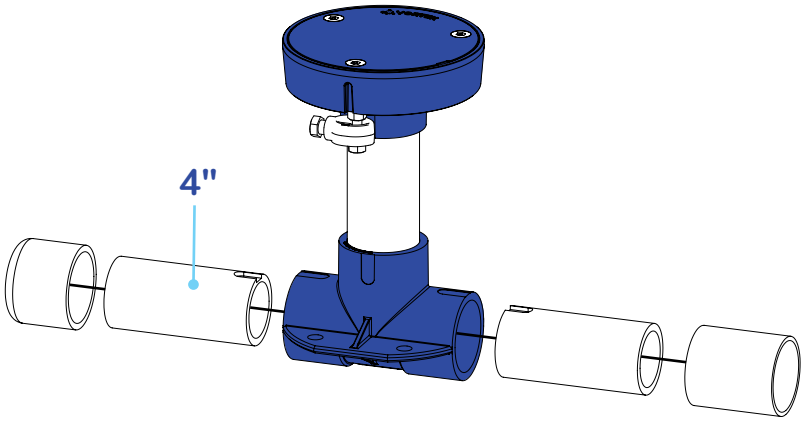
110258
Tool kit #129
Security Key
(1 kit per project)

1

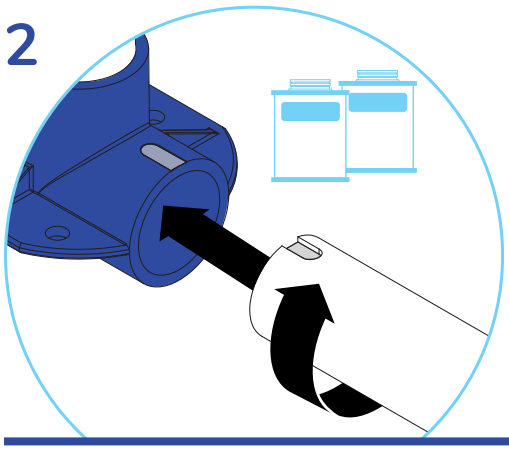
By installer: Dry fit assembly before gluing
Par installateur: Assembler à sec avant collage
Por Instalador: Montaje en seco antes del pegado



9.2 / 5.3 / 11.6"
23 / 13 / 29.5 cm



2



FOR ALL CONNECTIONS
- Apply PVC primer and PVC cement on both parts
- Slighty turn pipe at entry and align with notch
- Push pipe all the way in and let solvent bond

POUR TOUTES LES CONNEXIONS
- Appliquer de l'apprêt PVC et du ciment à PVC sur les deux bouts
- Tourner légèrement le tuyau à l'entrée et s'aligner avec l'encoche
- Poussez le tuyau jusqu'au fond et laissez le solvant se lier

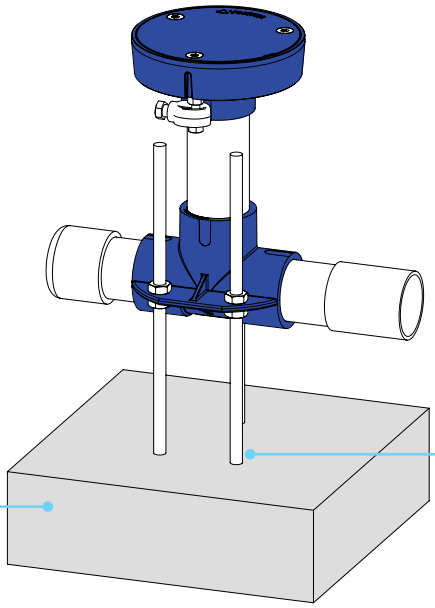
PARA TODAS LAS CONEXIONES
- Aplique imprimación de PVC y cemento de PVC en ambas partes
- Atornille ligeramente el tubo en la entrada alineando con la muesca
- Empuje la tubería hasta el final y deje que el disolvente se adhiera

VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3

By installer: Concrete leveling bases
Par installateur: Bases de mise à niveau en béton
Por Instalador: Bases niveladora de hormigón



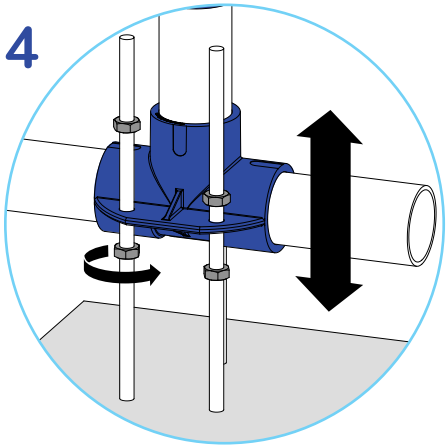
3 / 12 / 12"
(7.6 / 30.5 / 30.5 cm)

Drill & fix rods with anchoring epoxy

Percer & fixer les tiges avec de l'époxy d'ancrage

Taladrar & fijar varillas con anclaje epoxi

4



Levelled with nuts and rods to lock at proper height

Niveler avec les écrous et les tiges pour verrouiller à la bonne hauteur

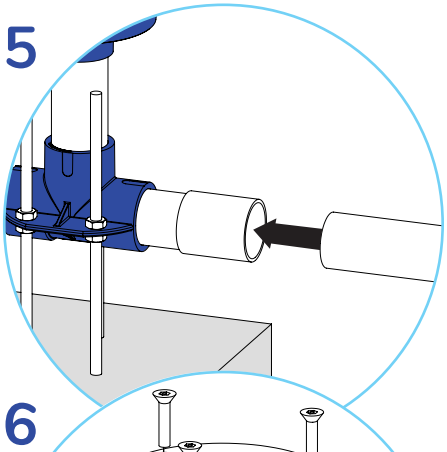
Nivelado con tuercas y varillas para bloquear a la altura adecuada

Connect water line inlet 1 1/2" (40mm)

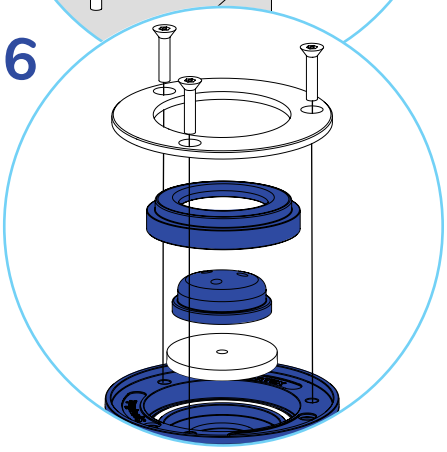
Connecter le tuyau d'entrée d'eau 1 1/2" (40mm)

Conecte la entrada de la línea de agua 1 1/2" (40mm)

5



6

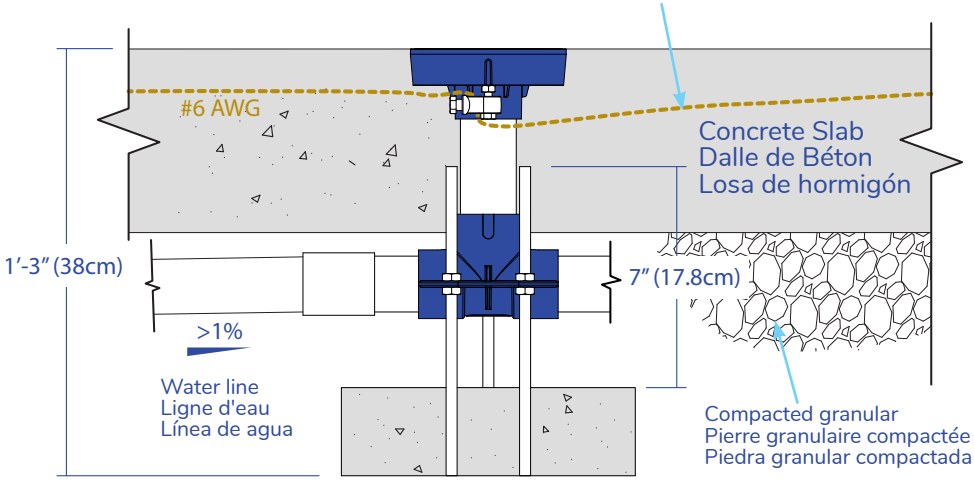


After concrete pouring; remove cap, install nozzle & ring (always leave O-ring in place)

Après la coulée de béton; retirer le capuchon, installer la buse et l'anneau (laissez toujours le O-ring en place)

Después del vertido de hormigón; quitar tapa, instalar boquilla y anillo (siempre deje la junta tórica en su lugar)

Concrete surface: verify local codes for type, thickness & reinforcement requirements
Surface de béton: vérifier les normes locales pour le type, épaisseur et armatures nécessaire
Superficie de concreto: verifique los códigos locales para el tipo,requisitos de espesor y refuerzo



VORTEX

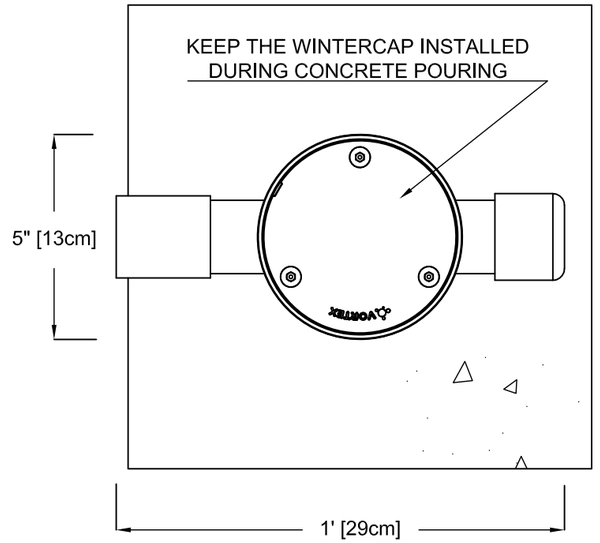
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

NOTES:

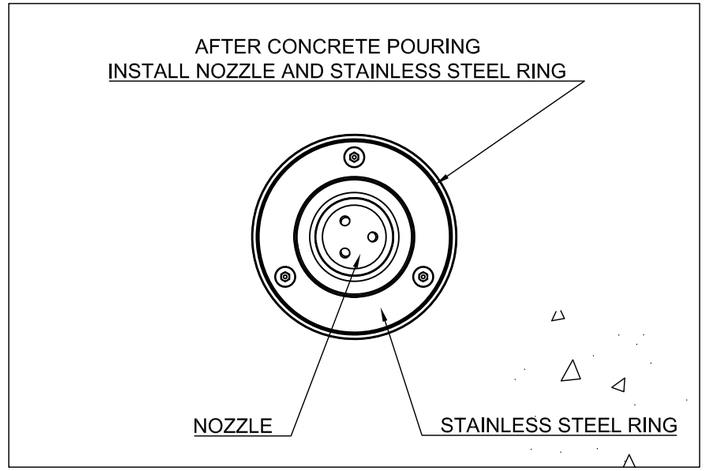
1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO
SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER.
PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

2) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

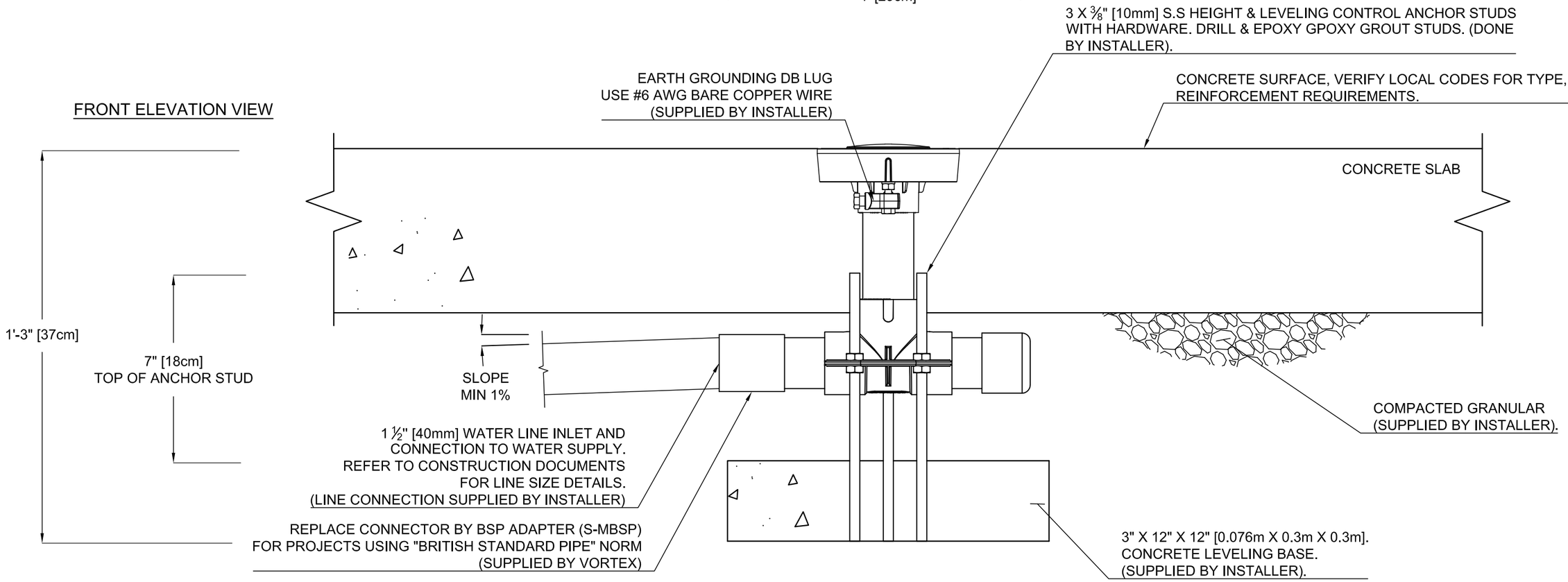
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



PRODUCT NAME: SPRAYLINK PODSPRAY		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR 3009	DATE: 06/10/25	SHEET NO: 1/1	11"x17" SHEET SIZE

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 3009

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. Play Product Structure: The Spraylink Podspray VOR 3009 shall be constructed of polymer spray housing (1), fittings and pipings in Rigid Polyvinyl Chloride (PVC) without plasticizer according to industry standards. Each spray head housing shall be fitted with a 304-304L passivated Stainless steel ring thickness of 0.1875" (4.75mm), a UHMWPE polymer spray cap and a rubber O-ring assembled with tamper-resistant fasteners. The spray cap shall be free of finger entrapment hazards. Installer must follow installation guide provided to assemble the components. The embedded anchoring and leveling system shall be used.

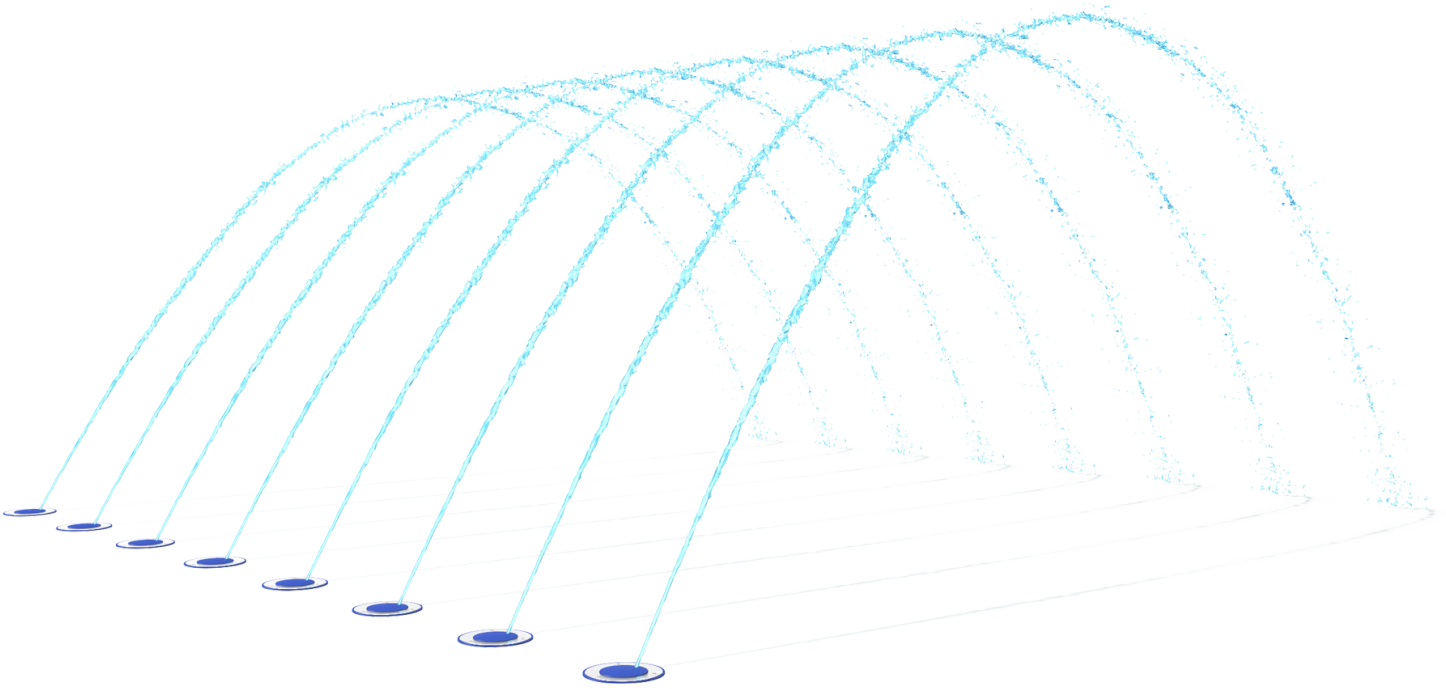
1.2. Overall play product dimensions**:** The overall height of the Play Product shall be 0" (0 cm) above ground.

1.3. Play Product Interactivity: The high or low stream of water produced by jet creates visual interest.

1.4. Hydraulic Activity/Components: The water effect from the spray head shall produce soft streams.

1.5. Hydraulic Requirements: The hydraulic requirements shall be 3-5 gpm (11-19 lpm) @ 4-10 psi (0.3-0.7 bar).

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.



**The product shown in the image may differ from the actual product sold.*
**Water jet heights may not always be equals depending on water flow.*

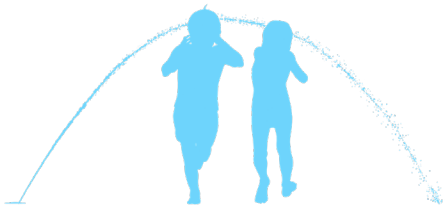
Ideal age group: For all ages

VOR 3055
SPRAYLINK™ TUNNEL N°2

PRODUCT HIGHLIGHTS

Spraylink™ is a cutting-edge ground spray collection. With a wide variety of water effects and designs to choose from, these ground sprays are a sustainable solution perfect for any sized Splashpad®.

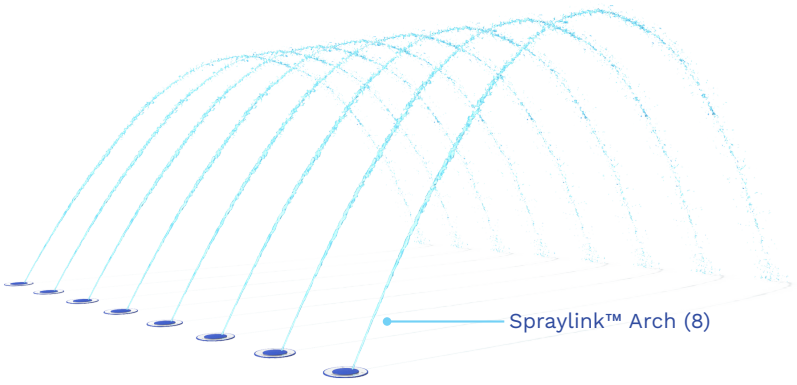
- Enjoy running your feet and hands through soft water jets
- Creates a tunnel effect where kids can cross under
- Provides high interactivity with low water consumption
- Designed and manufactured with sustainability at the forefront
- One-size interchangeable nozzles for all Spraylink™ items



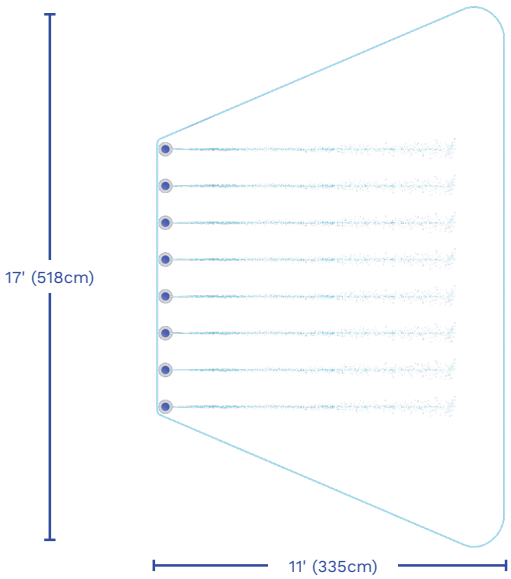
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

SPECIFICATIONS



SprayZone



Recommended jet height: 4' (123cm)
Recommended jet lenght: 7' (213cm)

H./W./L.
0/5.3/103 in
0/13.5/262 cm

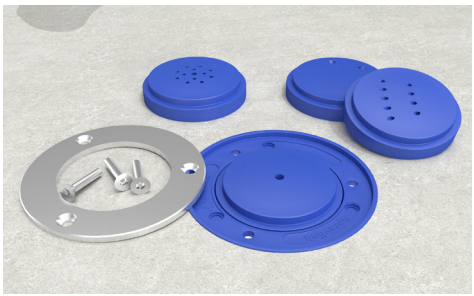
Color choices
Colors as shown

Flow
6-10 GPM
23-38 LPM

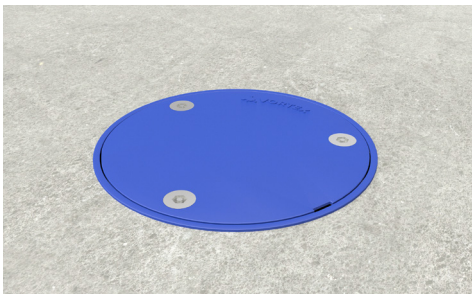
Pressure
5-7 PSI
0.3-0.5 BAR

ADVANTAGES

Easy on-site assembly and installation



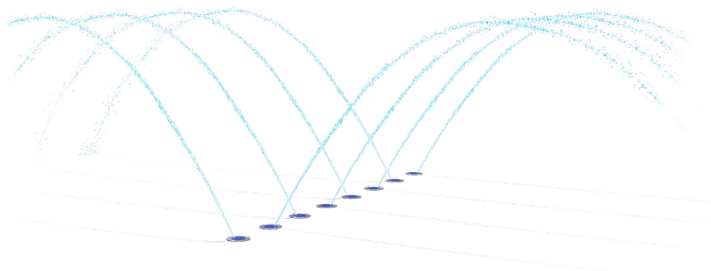
One-size interchangeable nozzle
(sufficient flow and sprayzone required)



Easy maintenance and winterization

INSTALLATION

- Follow Installation guide provided.
- Polymer encapsulated assembly, no earth grounding and bonding recommended for Spraylink™ system. Follow local code.
- Replace nozzle and ring with provided cap for winterization.



Alternative configuration, Sprayzone width 22'

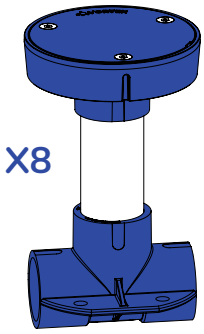
VORTEX

VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

VOR 3055
SPRAYLINK™ TUNNEL N°2

109585

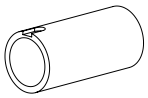
INSTALLATION GUIDE EN
GUIDE D'INSTALLATION FR
GUÍA DE INSTALACIÓN ES



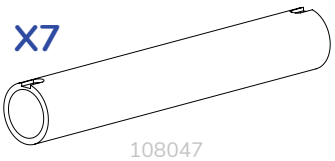
X8
108159
Spraylink Housing

X8
108260
Spraylink Arch

X8
108152
Spraylink Ring

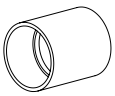


X2
108069
PVC Pipe 4"

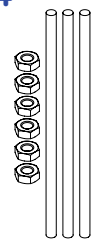


X7
108047
PVC Pipe 12"

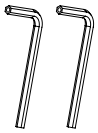
X1
108165
PVC Cap



X1
105818
PVC Coupling



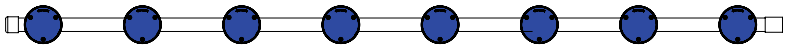
X4
108167
Levelling Rod Kit



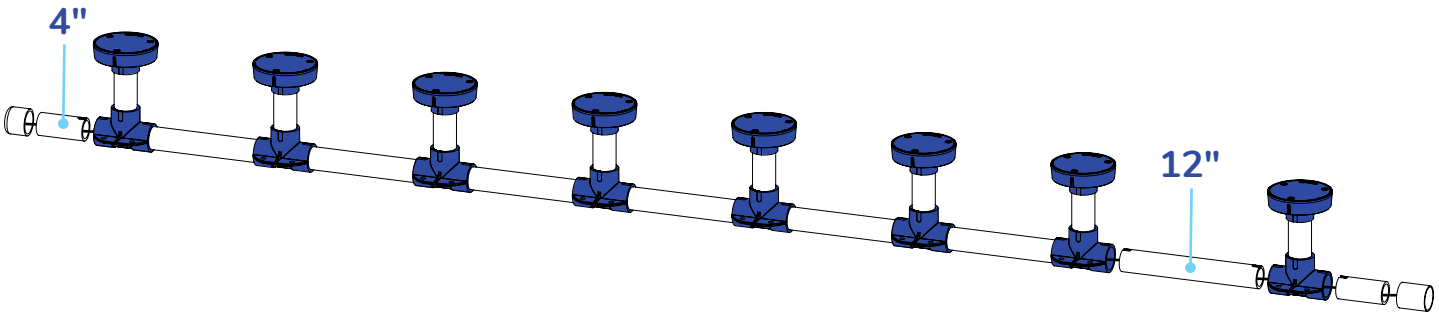
110258
Tool kit #129
Security Key
(1 kit per project)

1

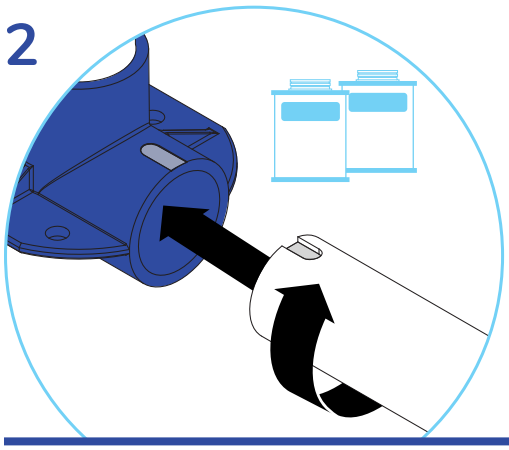
By installer: Dry fit assembly before gluing
Par installateur: Assembler à sec avant collage
Por Instalador: Montaje en seco antes del pegado



9.2 / 5.3 / 109.6"
23 / 102 / 278 cm



2



FOR ALL CONNECTIONS
- Apply PVC primer and PVC cement on both parts
- Slighty turn pipe at entry and align with notch
- Push pipe all the way in and let solvent bond

POUR TOUTES LES CONNEXIONS
- Appliquer de l'apprêt PVC et du ciment à PVC sur les deux bouts
- Tourner légèrement le tuyau à l'entrée et s'aligner avec l'encoche
- Poussez le tuyau jusqu'au fond et laissez le solvant se lier

PARA TODAS LAS CONEXIONES
- Aplique imprimación de PVC y cemento de PVC en ambas partes
- Atornille ligeramente el tubo en la entrada alineando con la muesca
- Empuje la tubería hasta el final y deje que el disolvente se adhiera

VORTEX
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3

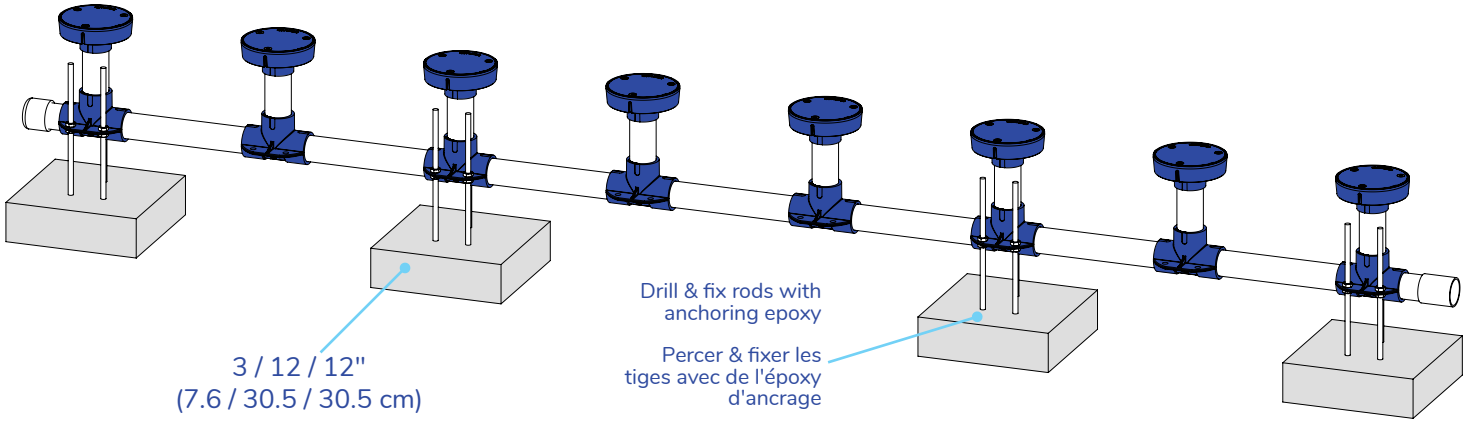
By installer:
Par installateur:
Por Instalador:

Concrete leveling bases
Bases de mise à niveau en béton
Bases niveladora de hormigón

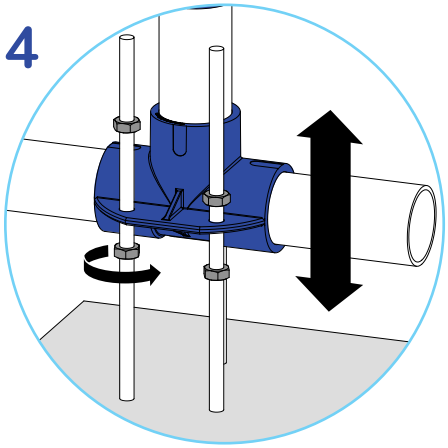
Polymer encapsulated assembly, no earth grounding and bonding recommended for Spraylink™ system. Follow local code.

Assemblage encapsulé en polymère, aucune mise à la terre recommandée pour le système Spraylink™. Suivez le code local.

Conjunto encapsulado de polímero, sin conexión a tierra recomendado para el sistema Spraylink™. Siga el código local.



4



Levelled with nuts and rods to lock at proper height

Niveler avec les écrous et les tiges pour verrouiller à la bonne hauteur

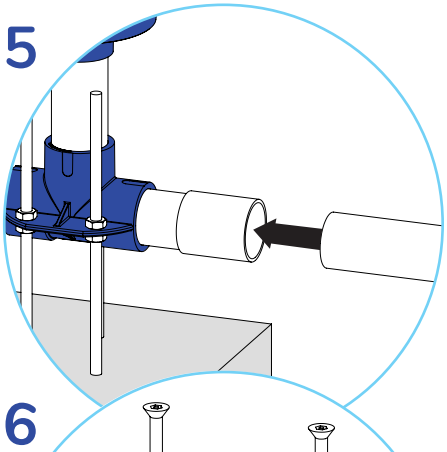
Nivelado con tuercas y varillas para bloquear a la altura adecuada

Connect water line inlet 1 1/2" (40mm)

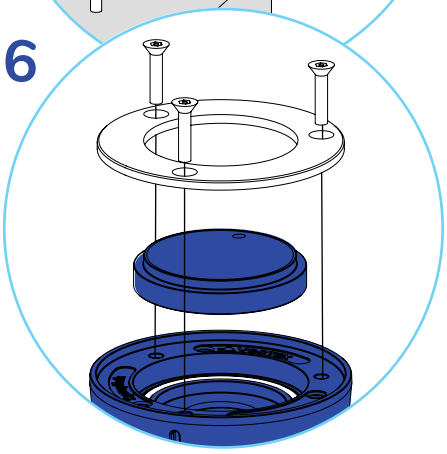
Connecter le tuyau d'entrée d'eau 1 1/2" (40mm)

Conecte la entrada de la línea de agua 1 1/2" (40mm)

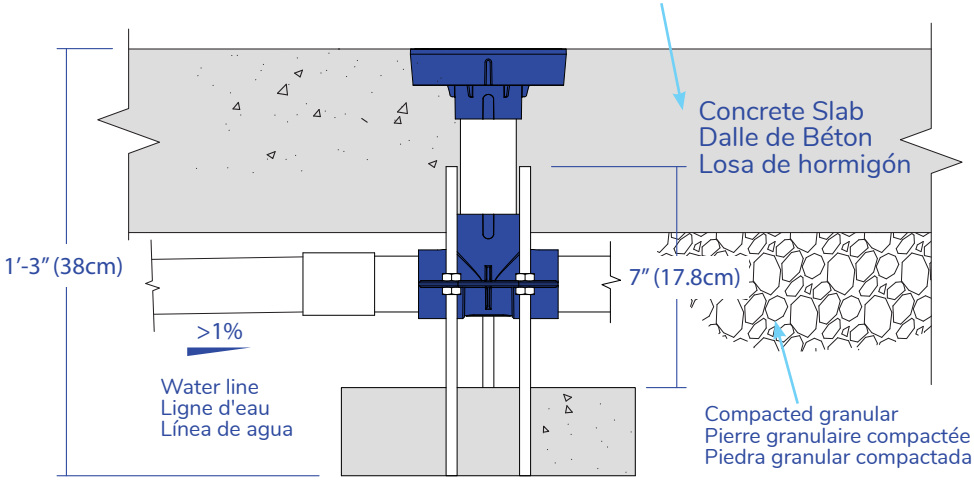
5



6



Concrete surface: verify local codes for type, thickness & reinforcement requirements
Surface de béton: vérifier les normes locales pour le type, épaisseur et armatures nécessaire
Superficie de concreto: verifique los códigos locales para el tipo,requisitos de espesor y refuerzo



After concrete pouring; remove cap, install nozzle & ring (always leave O-ring in place)

Après la coulée de béton; retirer le capuchon, installer la buse et l'anneau (laissez toujours le O-ring en place)

Después del vertido de hormigón; quitar tapa, instalar boquilla y anillo (siempre deje la junta tórica en su lugar)

VORTEX

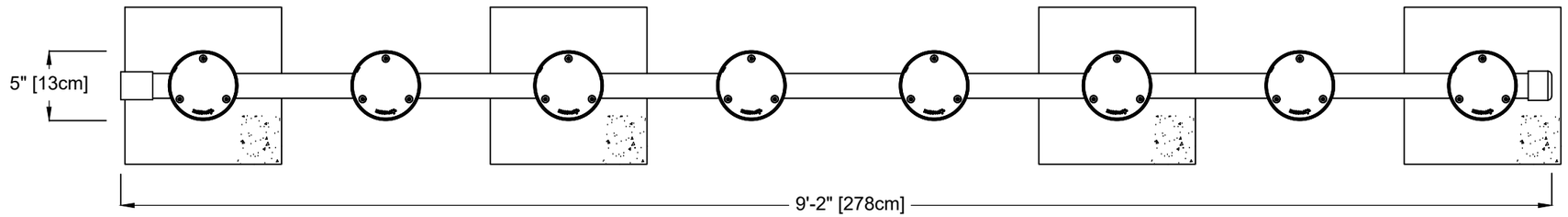
VORTEX-INTL.COM • INFO@VORTEX-INTL.COM
1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

NOTES:

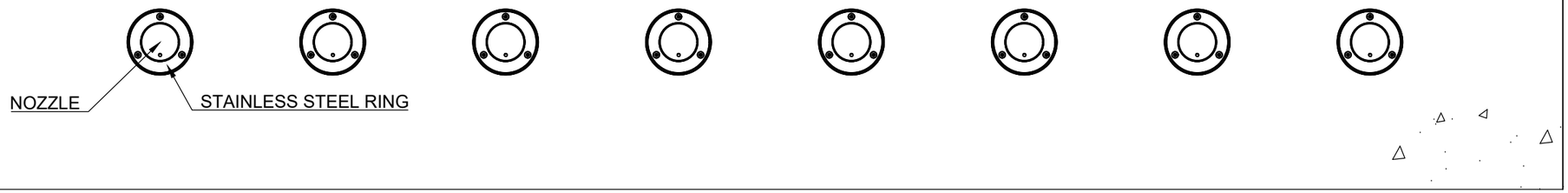
1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER. PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.
2) POLYMER ENCAPSULATED ASSEMBLY NO EARTH GROUNDING AND NO BONDING RECOMMENDED FOR SPRAYLINK™ SYSTEM. FOLLOW LOCAL CODE
3) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

PLAN VIEW

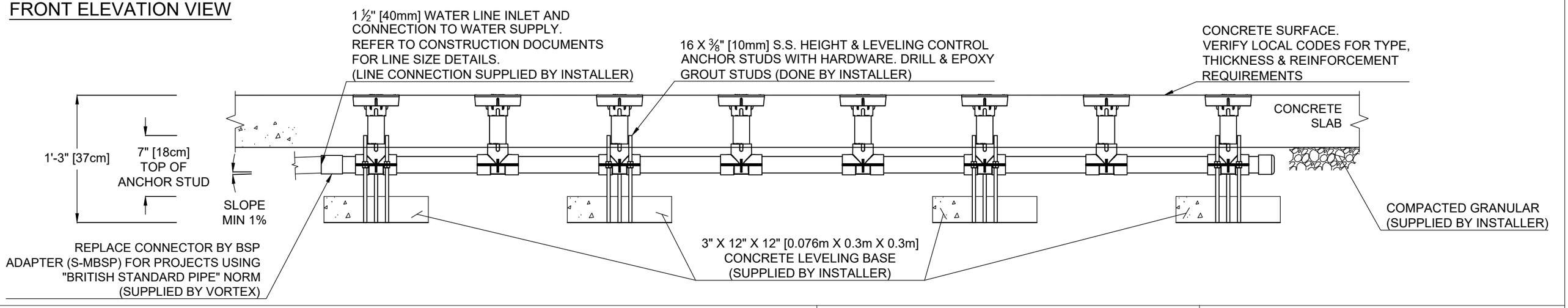
KEEP THE WINTERCAPS INSTALLED DURING THE CONCRETE POURING



AFTER CONCRETE POURING INSTALL NOZZLES AND STAINLESS STEEL RINGS



FRONT ELEVATION VIEW



PRODUCT NAME: SPRAYLINK TUNNEL NO.2		PRODUCT INFORMATION	
PRODUCT NUMBER: VOR 3055	DATE: 03/07/23	SHEET NO: 1/1	11"x17" SHEET SIZE

VORTEX

COPYRIGHT VORTEX AQUATIC STRUCTURES INTERNATIONAL-THIS DOCUMENT AND THE IDEAS, RENDERINGS AND OTHER CONTENTS CONTAINED THEREIN ARE THE SOLE PROPERTY OF VORTEX AQUATIC STRUCTURES INTERNATIONAL AND MAY NOT BE DISSEMINATED, COPIED, REPRODUCED OR OTHERWISE USED WITHOUT PRIOR WRITTEN CONSENT OF VORTEX AQUATIC STRUCTURES INTERNATIONAL

VOR 3055

Please refer to PART 1: VORTEX GENERAL CLAUSES for all Play Product construction and installation information.

1.0 Play Product Specifications:

1.1. Play Product Structure: The Spraylink Tunnel No.2 VOR 3055 shall be constructed of polymer spray housing (8), fittings and pipings in Rigid Polyvinyl Chloride (PVC) without plasticizer according to industry standards. Each spray head housing shall be fitted with a 304-304L passivated Stainless steel ring thickness of 0.1875" (4.75mm), a UHMWPE polymer spray cap and a rubber O-ring assembled with tamper-resistant fasteners. The spray cap shall be free of finger entrapment hazards. Installer must follow installation guide provided to assemble the components. The embedded anchoring and leveling system shall be used.

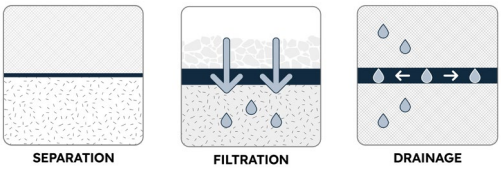
1.2. Overall play product dimensions**:** The overall height of the Play Product shall be 0" (0 cm) above ground.

1.3. Play Product Interactivity: The high or low stream of water produced by jet creates visual interest.

1.4. Hydraulic Activity/Components: The water effect from the spray head shall produce soft streams.

1.5. Hydraulic Requirements: The hydraulic requirements shall be 6-10 gpm (23-38 lpm) @ 5-7 psi (0.3-0.5 bar).

This document is the sole property of Vortex Aquatic Structures Intl Inc. Reproduction or redistribution in whole or in part without the express written consent of Vortex Aquatic Structures Intl is prohibited.



MIRAFI 140N

MIRAFI® 140N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. MIRAFI 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. MIRAFI 140N meets AASHTO M288 Class 3 for Elongation > 50%.
TenCate Geosynthetics Americas (A Solmax Company) is accredited by Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).
MIRAFI 140N meets Build America, Buy America Act, Pub. L. No. 117-58, div. G §§ 70901-52.

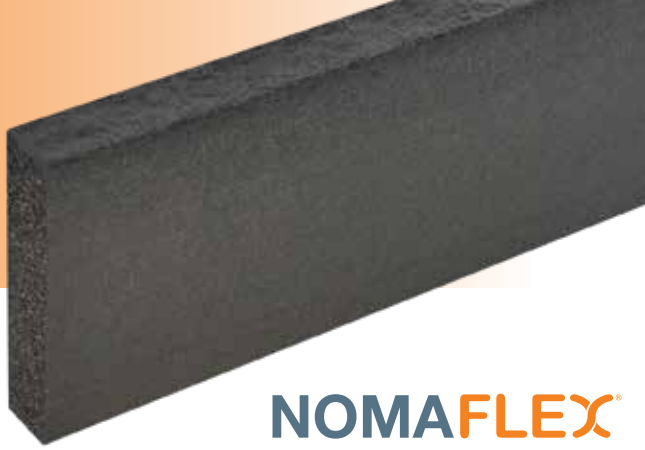
MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120(534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
			MAXIMUM OPENING SIZE	
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
			MINIMUM ROLL VALUE	
Permittivity	ASTM D4491	sec^{-1}	1.7	
Flow Rate	ASTM D4491	gal/min/ft² (l/min/m²)	135 (5500)	
			MINIMUM TEST VALUE	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	
PHYSICAL PROPERTIES	**TEST METHOD**	**UNIT**	**MINIMUM AVERAGE ROLL VALUE**	
Weight	ASTM D5261	oz/yd² (g/m²)	4.0 (136)	
			ROLL SIZE	
Roll Dimensions (width x length)		ft (m)	12.5 x 360 (3.8 x 110)	15 x 360 (4.5 x 110)
Roll Area		yd² (m²)	500 (418)	600 (502)
Roll Weight		lbs (kg)	151 (69)	177 (80)

365 South Holland Drive Pendergrass, GA 30567
Tel +1 706 693 2226 www.tencategeo.us

Solmax is not a design or engineering professional and has not performed any such design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation, or specification.

NOMAFLEX®

Polypropylene Joint Filler Plank and Sheet



NOMAFLEX®

Nomaflex® is a performance engineered foam that sets a new standard for concrete expansion joint fillers. It is a semi-rigid, closed-cell polypropylene foam that simply performs better and installs faster. Plus, the innovative **Nomaflex Cutter tool** enables concrete installers to easily trim Nomaflex on the job site or pre-score a removable 1/2" void for use with sealants. This **saves labor and money** by eliminating the need of an additional void cap system.

PERFORMANCE

Nomaflex is a closed-cell polypropylene foam that can be used in residential, commercial, civil, municipal and industrial applications. It will not absorb water, swell and disintegrate and it extends the service life of concrete by reducing the amount of imcompressible materials entering the joint. Nomaflex does not impede sealant cure time and can be used without a bond breaker with no impact on the long term performance of the sealant.

Nomaflex resists oils, gas, salts, acetone and other chemicals. It does not leach like other products and is not sticky. Nomaflex fully complies with ASTM standard specification D 8139, and ASTM standard specification D 1751 for extrusion, compression recovery and water absorption as tested per ASTM test method D 545.

Features

- No waste due to breakage
- Ultra lightweight
- Flexible, bends around circular structures
- Moisture resistant
- Can be stored outside
- Traditional methods used for installation
- Can be used with hot-pour and cold-applied sealants
- Clean product
- Inert
- Odor-free
- Recyclable
- Reusable
- Made in USA

INSTALLATION

Nomaflex is a flexible yet semi-rigid foam that can be passed across wet pours without breaking. It transports easily and is light enough that one person can easily carry multiple bundles.

Nomaflex can be used with all hot-pour or cold-applied sealants and prevents 3-sided sealant adhesion. The Nomaflex Cutter is a tool that creates a 1/2" tear-off strip that once removed, creates a void for sealants. The tear-off strip remains attached until the installer removes it. Nomaflex is also compatible with plastic edge caps and should be installed 1/2" below the concrete surface prior to pouring concrete. Nomaflex can be used as a form and should be installed against any edge where concrete is poured and an expansion joint is required. Spray adhesives can also be used with Nomaflex.

The Nomaflex Cutter eliminates the need for additional void cap systems.

VALUE

Nomaflex is waterproof and can be stored outside. It will not break or flake due to weather elements. Nomaflex lasts longer and is 100% recyclable. Installers have the added benefit of a lower installed cost when using Nomaflex.

NOMACO®

NOMAFLEX®

PHYSICAL PROPERTIES

Property	Value	ASTM Test Methods
Water Absorption	<1%	D 8139, D 545, D 1751
Compression Strength	>30 psi and <60 psi	D 8139, D 545, D 1751, D 1752
Compression Recovery	>80%	D 8139, D 545, D 1751, D 1752
Freeze Thaw Resistance	No Change	D 8139, C 666 (300 cycles)
Heat Resistance	392°F +/- 5°F	D 8139, D 5249
UV Weathering	No Change	D 8139, D 4329 (1000 hrs. Cycle A)
Extrusion	<0.1 in.	D 8139, D 545, D 1751, D 1752
Density	>3.5 lbs./cu.ft.	D 8139, D 545, D 1751, D 1752
Boiling in Hydrochloric Acid	No disintegration	D 545, D 1752
Expansion in Boiling Water	<1% expansion	D 545, D 1752
100% Recyclable	N/A	N/A
R-Value	3.5	C 518
Out-Gassing (no. of bubble)	0	C 1253

PRODUCT INFORMATION

Product	Linear Ft/ Unit	Feet per Pack	# of 10 Packs per Skid	Linear Ft / Pallet 5’	Linear Ft / Pallet 10’
3/8” Plank - Bundles of 10					
3/8” x 3”	5’ / 10’	50 / 100	160	8,000	16,000
3/8” x 3-1/2”	5’ / 10’	50 / 100	130	6,500	13,000
3/8” x 4”	5’ / 10’	50 / 100	120	6,000	12,000
3/8” x 6”	5’ / 10’	50 / 100	80	4,000	8,000
1/2” Plank - Bundles of 10					
1/2” x 2”	5’ / 10’	50 / 100	192	9,600	19,200
1/2” x 3”	5’ / 10’	50 / 100	128	6,400	12,800
1/2” x 3-1/2”	5’ / 10’	50 / 100	104	5,200	10,400
1/2” x 4”	5’ / 10’	50 / 100	96	4,800	9,600
1/2” x 5”	5’ / 10’	50 / 100	72	3,600	7,200
1/2” x 6”	5’ / 10’	50 / 100	64	3,200	6,400
1/2" x 7"	5’ / 10’	50 / 100	48	2,400	4,800
1/2" x 8"	5’ / 10’	50 / 100	48	2,400	4,800
1/2" x 12"	5’ / 10’	25 / 50	68 (5 pk)	1,700	3,400
3/4” Plank - Bundles of 10					
3/4” x 3-1/2”	5’ / 10’	50 / 100	78	3,900	7,800
3/4” x 4”	5’ / 10’	50 / 100	72	3,600	7,200
3/4” x 5”	5’ / 10’	50 / 100	54	2,700	5,400
3/4” x 6”	5’ / 10’	50 / 100	48	2,400	4,800
3/4" x 8"	5’ / 10’	50 / 100	36	1,800	3,600

Product	Linear Ft/ Unit	Feet per Pack	# of 10 Packs per Skid	Linear Ft / Pallet 5’	Linear Ft / Pallet 10’
1” Plank - Bundles of 10					
1" x 3-1/2”	5’ / 10’	50 / 100	52	2,600	5,200
1” x 4”	5’ / 10’	50 / 100	48	2,400	4,800
1” x 5”	5’ / 10’	50 / 100	36	1,800	3,600
1” x 6”	5’ / 10’	50 / 100	32	1,600	3,200
1" x 8"	5’ / 10’	50 / 100	24	1,200	2,400

Product	Linear Ft/ Unit	Sheets per Pallet	Feet / Pallet 5’	Feet / Pallet 10’
		Sheet		
3/8” x 48”	5’ / 10’	100	500	1,000
1/2” x 36”	10’	80	N/A	800
1/2” x 48”	5’ / 10’	80	400	800
3/4” x 48”	5’ / 10’	60	300	600
1” x 48”	5’ / 10’	40	200	400

Nomaflex Cutter Sizes

1/2”

3/4”

1”

©2022 Nomaco

CONTRACTORS SHALL ADHERE TO MASSDOT STANDARD SPECIFICATIONS LINKED BELOW.

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS

for Highways and Bridges

2025 Edition

DIVISION I-III & APPENDIX A

https://www.mass.gov/lists/construction-specifications

massDOT
Massachusetts Department of Transportation
Highway Division