Conimicut Point Park Shade Structure Project

Bid No. 2024-352

Honorable Frank J. Picozzi
Mayor

Bidding Requirements, Bond Forms, Contract Agreement, Conditions of the Contract and Technical Specifications

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Contents:

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Francis M. Gomez
Purchasing Agent

Frank J. Picozzi
Mayor

City of Warwick
Purchasing Division
(Mailing Address)
3275 Post Road
Warwick, Rhode Island 02886
Tel (401) 738-2013
Fax (401) 737-2364

The following notice is to appear on the City of Warwick's website Thursday, February 7, 2024. The website address is http://www.warwickri.gov/bids.

CITY OF WARWICK
BIDS REQUESTED FOR

Bid2024-352 Conimicut Point Park Shade Structure Project

Specifications
Specifications are available in the Purchasing Division, Warwick City Hall, Monday through Friday, 8:30 AM until 4:30 PM on or after Thursday, February 7, 2024. If you received this document from our homepage or from a source other than the City of Warwick Purchasing Division, please check with our office prior to submitting your bid to ensure that you have a complete package. The Purchasing Division cannot be responsible to provide addenda if we do not have you on record as a plan holder.

Submissions
All bids should be submitted with one (1) original and two (2) copies in a sealed envelope (total of three (3) copies), which should read: **YOUR COMPANY NAME** plainly marked on the exterior of the envelope as well as **"Bid2024-352 Conimicut Point Park Shade Structure Project"** No bids will be accepted via Facsimile or email. All bids must be sealed. Sealed bids will be received by the Purchasing Division no later than **11:00 AM, Thursday, February 22, 2024.** The bids will be opened publicly commencing at 11:00 AM on the same day at 65 Centerville Road, Meeting Room 2.

Delivery
If delivering in person or sent by delivery service (FedEx/UPS/DHL etc.) use physical address 65 Centerville Road, Warwick, RI 02886, Suite D. If sent via United States Postal Service use mailing address 3275 Post Road Warwick, Rhode Island 02886.

Awards
Awards will be made on the basis of the lowest evaluated or responsive bid price.

Questions

Please direct questions related to the bidding process, how to fill out forms, and how to submit a bid (Pages 1-8) to the Purchasing Division.

- Email: Bids@warwickri.gov
- Phone: 401-738-2013

Please direct all questions related to the specifications outlined (beginning on page 9) to the issuing department's subject matter expert:

- Name: David Kurowski
- Title: Field Construction Inspector
- Phone: 401-921-9605
- Email: david.a.kurowski@warwickri.gov

Individuals requesting interpreter services for the hearing impaired must notify the Purchasing Division at 401-738-2013 at least 48 hours in advance of the bid opening date.

Original Signature on file

Francis M. Gomez
Purchasing Agent

PLEASE COMPLETE THIS PAGE & SUBMIT WITH YOUR BID

Acknowledgement of Addendum (if applicable)

Addendum Number	**Signature of Bidder**
_____	_____
_____	_____

COMPANY NAME: _____

COMPANY ADDRESS: _____

COMPANY ADDRESS: _____

BIDDER'S SIGNATURE: _____

BIDDER'S NAME (PRINT): _____

TITLE: _____ TEL. NO.:_____

EMAIL ADDRESS: _____*

*Please include your email address. Future bids will be emailed, unless otherwise noted.

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II. AWARD AND CONTRACT:

The CITY OF WARWICK, acting as duly authorized through its Purchasing Agent/Finance Director/Mayor, accepts the above bid and hereby enters into a contract with the above party to pay the bid price upon completion of the project or receipt of the goods unless another payment schedule is contained in the specifications. All terms of the specifications, both substantive and procedural, are made terms of this contract.

DATE: _____ _____

Bid2024-352 Purchasing Agent

PLEASE COMPLETE THIS PAGE & SUBMIT WITH YOUR BID

CERTIFICATION & WARRANT FORM*

This form must be completed and submitted with sealed bid.
Failure to do so will result in automatic rejection.

Any and all bids shall contain a certification and warrant that they comply with all relevant and pertinent statues, laws, ordinances and regulations, in particular, but not limited to Chapter 16-Conflicts of Interest, of the Code of Ordinances of the City of Warwick. Any proven violation of this warranty and representation by a bidder at the time of the bid or during the course of the contract, included, but not limited to negligent acts, either directly or indirectly through agents and/or sub-contractors, shall render the bidder's contract terminated and the bidder shall be required to reimburse the City for any and all costs incurred by the City, including reasonable attorney fees, to prosecute and/or enforce this provision.

_____ _____
Signature Date

_____
Company Name

_____
Address

_____
Address

This form cannot be altered

CITY OF WARWICK
NOTICE TO BIDDERS

Bid2024-352 Conimicut Point Park Shade Structure Project

The IRS Form W-9 is available on www.warwickri.gov should be completed and submitted with the bid if the bidder falls under IRS requirements to file this form.

All bids should be written in ink or typed. If there is a correction with whiteout, the bidder should initial the change.

Any deviation from the specifications must be noted in writing and attached as part of the bid proposal. The bidder should indicate the item or part with the deviation and indicate how the bid will deviate from specifications.

Bids received prior to the time of the opening will be securely kept, unopened. No responsibility will be attached to an officer or person for the premature opening of a bid not properly addressed and identified.

The opening of bids will be in the order established by the posted agenda and the agenda will continue uninterrupted until completion.

Once an item has been reached and any bids on that item has been opened, no other bids on that item will be accepted and any such bid will be deemed late.

Negligence on the part of the bidder in preparing the proposal confers no rights for the withdrawal of the proposal after it is open.

The contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap for any position for which the employee or applicant is qualified and that in the event of non-compliance the City may declare the contractor in breach and take any necessary legal recourse including termination or cancellation of the contract.

A bidder filing a bid thereby certifies that no officer, agent, or employee of the City has a pecuniary interest in the bid or has participated in contract negotiations on the part of the City, that the bid is made in good faith without fraud, collusion, or connection of any kind with any other bidder for the same call for bids, and that the bidder is competing solely in his own behalf without connection with, or obligation to, any undisclosed person or firm.

All proposals submitted become the property of the City and will not be returned. If the company intends to submit **confidential or proprietary information** as part of the proposal, **any limits on the use or distribution of that material should be clearly delineated in writing**. **This information should be submitted in a sealed envelope, clearly labeled confidential** and where it should be submitted in the response. Please be advised of the Freedom of Information Act as it may pertain to your submittal.

Bid surety in the form of a bank check, original bid bond or certified check in the amount of ten (10) percent of the total bid price must be submitted with each bid. If a bid bond is submitted, it must be duly executed by the bidder as principal and having as surety thereon a surety company licensed to do business in the State of Rhode Island and approved by the owner.

The successful bidder must furnish a performance and payment bond in the amount of 100 percent of the total bid price.

The contractor must carry sufficient liability insurance and agree to indemnify the City against all claims of any nature, which might arise as a result of his operations or conduct of work.

Failure to provide adequate insurance coverage within the specified duration of time as set forth is a material breach of contract and grounds for termination of the contract.

The successful bidder must provide the City of Warwick with an original **Certificate of Insurance** for General, Automotive and Professional Liability in a minimum amount of $1 million, naming the **City of Warwick as the additional insured** and so stated on the certificate with the bid name and bid number. It is the vendor's responsibility to provide the City of Warwick with an updated Certificate of Insurance upon expiration of the original certificate.

For a bid to be awarded to a corporation, limited liability company or other legal entity, prior to commencing work under the awarded bid, that corporation, company or legal entity may be required to provide to the Purchasing Agent a **Certificate of Good Standing** dated no more than thirty (30) days prior to the date upon which the bid approval was made.

If required, the successful bidder will provide **Certificate of Good Standing** within ten (10) calendar days after notification or the City reserves the right to rescind said award.

This is a one-time purchase. Term contracts may be extended for one (1) additional term upon mutual agreement unless otherwise stated.

The City is exempt from the payment of the Rhode Island Sales Tax under the 1956 General Laws of the State of Rhode Island, 44-18-30, Paragraph I, as amended.

The Purchasing Agent reserves the right to reject any and all bids, to waive any minor deviations or informalities in the bids received, and to accept the bid deemed most favorable to the interest of the City.

The City reserves the right to terminate the contract or any part of the contract in the best interests of the City, upon 30-day notice to the contractor. The City will incur no liability for materials or services not yet ordered if it terminates in the best interests of the City. If the City terminates in the interests of the City after an order for materials or services has been placed, the contractor will be entitled to compensation upon submission of invoices and proper proof of claim, in that proportion which its services and products were satisfactorily rendered or provided, as well as expenses necessarily

incurred in the performance of work up to time of termination.

No extra charges for delivery, handling or other services will be honored. All claims for damage in transit will be the responsibility of the successful bidder. Deliveries must be made during normal working hours unless otherwise agreed upon.

All costs directly or indirectly related to the preparation of a response to this solicitation, or any presentation or communication to supplement and/or clarify any response to this solicitation which may be required or requested by the City of Warwick will be the sole responsibility of and will be borne by the respondent.

If the respondent is awarded a contract in accordance with this solicitation and fails or refuses to satisfy fully all of the respondents' obligations thereunder, the City of Warwick will be entitled to recover from the respondent any losses, damages or costs incurred by the City as a result of such failure or refusal.

The City reserves the right to award in part or full and to increase or decrease quantities in the best interest of the City.

Any quantity reference in the bid specifications are estimates only, and do not represent a commitment on the part of the City of Warwick to any level of billing activity. It is understood and agreed that the agreement will cover the actual quantities ordered during the contract period.

The City reserves the right to rescind award for non-compliance to bid specifications.

The successful bidder must adhere to all City, State and Federal Laws, where applicable.

PLEASE COMPLETE THIS PAGE AND SUBMIT WITH YOUR BID

PRICING MAY NOT BE CONFIDENTIAL

CITY OF WARWICK

BID AND CONTRACT FORM

TITLE OF SPECIFICATION: Bid2024-352 Conimicut Point Park Shade Structure Project

I. BID:

WHEREAS, the CITY OF WARWICK has duly asked for bids for performance of services and/or supply of goods in accordance with the above-indicated specifications.

The person or entity does irrevocably offer to perform the services and/or furnish the goods in accordance with the specifications, which are hereby incorporated by reference in exchange for the bid price.

This offer will remain open and irrevocable until the CITY OF WARWICK has accepted this bid or another bid on the specifications or abandoned the project.

The bidder agrees that acceptance by the CITY OF WARWICK will transform the bid into a contract. This bid and contract will be secured by Bonds, if required by the specifications.

SECTION 00200

INFORMATION FOR BIDDERS

1.01 RECEIPT AND OPENING OF BIDS

A. The City of Warwick, Rhode Island, herein called the Owner, invites sealed bids for "CONIMICUT POINT PARK SHADE STRUCTURE PROJECT, Bid# 2024-352", in accordance with the Contract Documents prepared by Owner.

B. Such Bids, submitted in sealed envelopes plainly marked in the upper left-hand corner with the Bidder's name and address, plainly marked in the lower left-hand corner with the date and time of opening;

Addressed to: City of Warwick, Rhode Island
Purchasing Division
65 Centerville Road, Suite D, Warwick, Rhode Island 02886

Endorsed: Bid# 2024-352
CONIMICUT POINT PARK SHADE STRUCTURE PROJECT

Delivered by: 11:00 AM, Thursday, February 22, 2024

Said Bids will be publicly opened and read aloud at that time.

C. The Owner may consider informal, any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all Bids. Conditional or qualified Bids will not be accepted. Any Bid received after the time and date specified shall not be considered. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

D. All bids shall comply with the provisions of RIGL §37-2-18 which provides as follows:

§ 37-2-18. Competitive sealed bidding

(a) Contracts exceeding the amount provided by § 37-2-22 shall be awarded by competitive sealed bidding unless it is determined in writing that this method is not practicable or that the best value for the state may be obtained by using an electronic reverse auction as set forth in § 37-2-18.1. Factors to be considered in determining whether competitive sealed bidding is practicable shall include whether:

(1) Specifications can be prepared that permit award on the basis of either the lowest bid price or the lowest evaluated bid price; and

(2) The available sources, the time and place of performance, and other relevant circumstances as are appropriate for the use of competitive sealed bidding.

(b) The invitation for bids shall state whether the award shall be made on the basis of the lowest bid price or the lowest evaluated or responsive bid price. If the latter basis is used, the objective measurable criteria to be utilized shall be set forth in the invitation for bids, if available. All documents submitted in response to the bid proposal are public pursuant to chapter 38-2 upon opening of the bids. The invitation for bids shall state that each bidder must submit a copy of their bid proposal to be available for public inspection upon the opening of the bids. The burden to identify and withhold from the public copy that is released at the bid opening any trade secrets, commercial or financial information, or other information the bidder deems not subject to public disclosure pursuant to chapter 38-2, the Access to Public Records Act, shall rest with the bidder submitting the bid proposal.

(c) Unless the invitations for bid are accessible under the provisions as provided in § 37-2-17.1, public notice of the invitation for bids shall be given a sufficient time prior to the date set forth therein for the opening of bids. Public notice may include publication in a newspaper of general circulation in the state as determined by the purchasing agent not less than seven (7) days nor more than twenty-eight (28) days before the date set for the opening of the bids. The purchasing agent may make a written determination that the twenty-eight (28) day limitation needs to be waived. The written determination shall state the reason why the twenty-eight (28) day limitation is being waived and shall state the number of days, giving a minimum and maximum, before the date set for the opening of bids when public notice is to be given.

(d) Bids shall be opened and read aloud publicly at the time and place designated in the invitation for bids. Each bid, together with the name of the bidder, shall be recorded and an abstract made available for public inspection.

(e) The chief purchasing officer shall adopt and file regulations governing the bidding of highway and bridge construction projects in the state not later than December 31, 2011.

(f) Immediately subsequent to the opening of the bids, the copies of bid documents submitted pursuant to subsection 37-2-18(b) shall be made available for inspection by the public. Any objection to any bid on the grounds that it is nonresponsive to the invitation for bids must be filed with the purchasing agent within five (5) business days of the opening of the bids. The purchasing agent shall issue a written determination as to whether the subject bid is nonresponsive addressing each assertion in the objection and shall provide a copy of the determination to the objector and all those who submitted bids at least seven (7) business days prior to the award of the contract. If a bid is nonresponsive to the requirements in the invitation to bid, the bid is invalid, and the purchasing agent shall reject the bid. The purchasing agent shall have no discretion to waive any requirements in the invitation to bid which are identified as mandatory. Nothing in this section shall be construed to interfere with or invalidate the results of the due diligence conducted by the division of purchasing to determine whether bids are responsive and responsible.

(g) Subsequent to the awarding of the bid, all documents pertinent to the awarding of the bid that were not made public pursuant to subsection 37-2-18(e) shall be made available and open to public inspection, pursuant to chapter 38-2, the Access to Public Records Act, and retained in the bid file. The copy of the bid proposal provided pursuant to subsection 37-2-18(b) shall be retained until the bid is awarded.

(h) The contract shall be awarded with reasonable promptness by written notice to the responsive and responsible bidder whose bid is either the lowest bid price, lowest evaluated, or responsive bid price.

(i) Correction or withdrawal of bids may be allowed only to the extent permitted by regulations issued by the chief purchasing officer.

(j) As of January 1, 2011, this section shall apply to contracts greater than one million dollars ($1,000,000); on January 1, 2012 for all contracts greater than seven hundred fifty thousand dollars ($750,000); on January 1, 2013 for all contracts greater than five hundred thousand dollars ($500,000); and on January 1, 2014 for all contracts awarded pursuant to this section.

1.02 LOCATION AND WORK TO BE DONE

A. The location, general characteristics, and principal details of the Work are indicated in a set of drawings, entitled “CONIMICUT POINT PARK SHADE STRUCTURE PROJECT, Bid# 2024-352".

B. Details and Schedules found in the Appendices, and the Drawings listed above are the Contract Drawings, sometimes referred to herein as the "Drawings".

C. Additional drawings showing details in accordance with which the Work is to be done will be furnished from time to time by the Owner, if found necessary, and shall then become part of the Drawings.

D. The Contractor shall furnish all labor, services, materials, equipment, plant machinery, apparatus, appliances, tools, supplies and all other things necessary to perform all work required for the completion of each item of the Work and as herein specified.

E. The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described but shall include all incidental work necessary or customarily done for the completion of that item.

1.03 CONTRACT DOCUMENTS

A. The Contract Documents, INFORMATION FOR BIDDERS, SPECIFICATIONS, and forms for BID, AGREEMENT, and BONDS, may be examined and obtained at the locations designated in the “Notice to Bidders”.

1.04 QUESTIONS REGARDING DRAWINGS AND DOCUMENTS

A. In general, no answer will be given to prospective bidders in reply to an oral question of the intent or meaning of the Drawings or other Contract Documents, or the equality or use of products or methods other than those designated or described on the Drawings or in the Specifications. Any information given to bidders other than by means of the Drawings and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the bidder only and is not guaranteed. The bidder agrees that such information shall not be used as the basis of nor shall the giving of any such information entitle the bidder to assert any claim or demand against the Owner or the Owner on account thereof.

B. To receive consideration, such questions shall be submitted in writing to David A. Kurowski, Field Construction Inspector, Department of Public Works – Engineering, david.a.kurowski@warwickri.gov at least seven calendar days before the established date for receipt of Bids. If the question involves the equality or use of products or methods, it must be accompanied by drawings, specifications, or other data in sufficient detail to determine the equality or suitability of the product or method. In general, the

Owner will neither approve nor disapprove particular products prior to the opening of Bids; such products will be considered when offered by the Contractor for incorporation into the Work.

C. The Owner will set forth as Addenda, which shall become a part of the Contract Documents, such questions received as above provided as in his sole judgement are appropriate or necessary and his decision regarding each. At least five days prior to the receipt of Bids, he will send a copy of these Addenda to those prospective bidders known to have taken out sets of the Drawings and other Contract Documents.

D. The Contractor agrees to use the products and methods designated or described in the Specifications as amended by the Addenda.

1.05 BIDDERS TO INVESTIGATE

A. Bidders are required to submit their Bids upon the following express conditions, which shall apply to and be deemed a part of every Bid received, viz.:

Bidders must satisfy themselves by personal examination of the Work and by such other means as they may wish, as to the actual conditions there existing, the character and requirements of the Work and difficulties attendant upon its execution, and the accuracy of all estimated quantities stated in the Bid.

1.06 INFORMATION NOT GUARANTEED

A. All information given on the Drawings or in the other Contract Drawings relating to subsurface and other conditions, natural phenomena, existing pipes and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

B. It is agreed and understood that the Owner does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes or other structures encountered during construction will be the same as those indicated on the Drawings or in the other Contract Documents.

C. It is agreed further and understood that no bidder or Contractor shall use or be entitled to use any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the Owner, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes of other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

1.07 CONDITIONS OF WORK

A. Each bidder must inform himself fully of the conditions relating to the construction and labor under which the work is now or will be performed; failure to do so will not relieve the successful bidder of his obligation to furnish all materials and all labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in his bid. Insofar as possible, the Contractor, in the carrying out of his work, shall employ such methods or means as will not cause any interruption of or interference with: the operation of the existing sewer; traffic; use of existing facilities and utilities; locations of existing utilities and structures affecting the work or other similar conditions at the site; character of equipment and facilities needed preliminary to and during prosecution of the work; requirements of owners and controlling authorities, having jurisdiction over the various lands, existing structures, facilities, and utilities; and all other conditions affecting the work to be done, and the labor and materials needed; and he shall make his bid in sole reliance thereon; and shall not, at any time after submission of a bid, assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

1.08 BLANK FORM FOR BID

A. Each bid must be submitted on the prescribed form and any other requested information. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and numerical figures, and be signed by the bidder with his business address and place of residence. Where both written words and numerical figures are given, the written words shall apply in the event of conflict. All bids shall be prepared in conformity with, and based upon and submitted subject to, all requirements of the Specifications and Drawings, together with all addenda thereto.

B. Bidders shall remove and submit the Bid pages (section 00200 and 00300) and Bid Bond pages (Section 00400). All pages shall be correctly assembled, and submitted in accordance with Section 00100. All erasures or other changes in the Bid must be properly initialed by an authorized representative of the Bidder.

1.10 WITHDRAWAL OF BIDS

A. Except as hereinafter in this subsection otherwise expressly provided, once his Bid is submitted and received by the Owner for consideration and comparison with other bids

similarly submitted, the bidder agrees that he may not and will not withdraw it within Ninety (90) consecutive calendar days after the actual date of the opening of Bids.

B. Upon proper written request and identification, Bids may be withdrawn only as follows:

1. At any time prior to the designated time for the opening of Bids.
2. Provided the Bid has not theretofore been accepted by the Owner, at any time subsequent to the expiration of the period during which the bidder has agreed not to withdraw his Bid.

C. Unless a Bid is withdrawn as provided above, the bidder agrees that it shall be deemed open for acceptance until the AGREEMENT has been executed by both parties thereto or until the Owner notifies a bidder in writing that his Bid is rejected or that the Owner does not intend to accept it, or returns his Bid deposit. Notice of acceptance of a Bid shall not constitute rejection of any other Bid.

1.11 INTERESTED PARTIES TO CONTRACT

A. The undersigned declares; that the only person interested this Bid as principals are named herein as such; that no official of the Owner and no person acting for or employed by the Owner is interested directly or indirectly in this Bid, or in any contract which may be made under it, or in any expected profits to arise therefrom; that this Bid is made in good faith, without fraud, collusion or connection with any other person bidding or refraining from bidding for the same work; that he has examined carefully the said instructions and all other documents bound herewith and the Contract Drawings relating to the Contract covered by this Bid and hereby makes them part of this Bid; that he has informed himself fully in regard to all conditions pertaining to the work and place where it is to be done; and that he has made his own examination and carefully checked his estimates for cost and from them makes this Bid.

1.12 ABILITY AND EXPERIENCE OF BIDDER

A. No award will be made to any bidder who cannot satisfy the Owner that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the Work successfully within the time named. The Owner and the Owner may make such investigation as they deem necessary to determine the ability of the bidder to perform the work; and the bidder shall furnish to the Owner and the Owner all such information and data for this purpose as the Owner and the Owner may request.

B. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein within the time stated. The Owner's decision or judgement on these matters shall be final, conclusive, and binding for all parties involved.

1.13 BIDS

A. The Owner reserves the right to waive any informalities in, or to reject any or all Bids which in its sole judgement are either incomplete, conditional, obscure, or not responsive or which contain additions not called for, erasures not properly initialed, alternative, or similar irregularities, or the Owner may waive such omissions, conditions, or irregularities as he may feel appropriate.

B. Conditional bids will not be accepted. Bidder(s) will be disqualified if more than one proposal is received from an individual, firm, partnership, corporation or association, under the same or different names and such proposals will not be considered.

C. The Owner reserves the right to reject any or all Bids, should the Owner deem it to be in the public interest to do so.

1.14 COMPARISON OF BIDS

A. Bids will be compared on the basis of the experience and competence of the bidders and on the basis of the totals of the quantities listed in the proposal under the enumerated items at the unit prices or lump sums bid for these items. The Contract will be awarded to the lowest responsive, responsible and eligible bidder as determined by the Owner and/or its authorized representatives or agents. However, the Owner may reject any and all bids if it is in the public interest to do so.

B. The term, "Lowest responsive, responsible and eligible bidder," shall mean the bidder whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the Work; who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work.

C. Bids should be made on each separate item of work shown in the bid (proposal) with reasonable relation to the probable cost of doing the work included in such items. The Owner reserves the right to reject, wholly, any bid on which an item or items thereof are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interests of the Owner. The attention of the bidder is called to the fact that unbalancing of bids may adversely affect the Contractor if certain portions for the Work are increased or decreased as provided in the Contract Documents.

D. A bidder shall state the proposed price for the work by which the bids will be compared. This price is to cover all the expenses incidental to the completion of the work in full conformity with the Contract, Specifications, and Drawings. In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the lump-sum or unit prices written in words and numerical figures, the prices written in words shall govern. No bid will be accepted which does not contain a unit price or lump sum as indicated for each of the applicable items enumerated in the proposal form.

1.15 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work in order to bring the cost within available funds. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the Contract or at any time during the progress of the Work. The Owner further reserves the right, at any time during the progress of the Work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

1.16 CONTRACT BONDS

A. The Bidder whose Bid is accepted agrees to furnish the Contract Bonds in the forms which follow in Section 00400, titled CONTRACT BONDS, each in the sum of the full amount of the Bid and/or Contract Price as determined by the Owner, and duly executed and acknowledged by the said bidder as Principal and by a surety company qualified to do business under the laws of Rhode Island and satisfactory to the Owner, as Surety, for the faithful performance of the contract and payment for labor and materials. The premiums for such Bonds shall be paid by the Contractor.

B. Surety Companies executing the Contract Bonds must also appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (Amended) by the Audit Staff Bureau of Accounts.

1.17 POWER OF ATTORNEY

A. Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each Bond a certified and effectively dated copy of their power of attorney.

1.18 EXECUTION OF AGREEMENT

A. The Bidder whose Bid is accepted will be required and agrees to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID after notification that the AGREEMENT is ready for signature.

B. The Bidder whose Bid is accepted upon his failure or refusal to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID, shall forfeit to the Owner as liquidated damages for such failure or refusal, the surety deposited with his BID.

1.19 INSURANCE CERTIFICATES

A. The Contractor will not be permitted to start any construction work until he has submitted certificates covering all insurances called for under that subsection of the AGREEMENT,

titled "Insurance." The Contractor shall submit said certificates to Owner under said subsection.

1.20 LAWS AND REGULATIONS

A. The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal ordinances, and rules and regulations or authorities having jurisdiction over construction of the project, shall apply to the Contract throughout, and shall be deemed to be included in the Contract the same as though herein written out in full.

1.21 WORK ON STATE, MUNICIPAL, AND PRIVATE PROPERTY

A. Particular attention is hereby directed to the fact that portions of the Work included under this Contract will be done within the limits of properties that are State-owned, municipal-owned, or privately owned. The Contractor shall be responsible for coordinating the prosecution of the Work of this Contract with the property owner and for providing work in accordance with any additional requirements as specified herein.

1.22 DATUM OR LEVELS

A. The figures given in the Contract and Specifications or upon the Drawings after the word elevation, shall mean the distance in feet above mean sea level, the base of the State of Rhode Island and the United States Geodetic Survey (U.S.G.S.).

1.23 STATE SALES AND USE TAX

A. Materials and equipment purchased for installation under this Contract are exempt from the Rhode Island Sales Tax. The Contractor shall file for exemption on behalf of the Owner with the State of Rhode Island Department of Taxation as required by law. The exemption from the Sales Tax shall be taken into account by the Contractor during bidding.

1.24 MANUFACTURER'S EXPERIENCE

A. Wherever it may be written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period may be considered by the Owner if the equipment supplier or manufacturer is willing to provide a sufficient bond or cash deposit as determined by the Owner for the duration of the specified time period which will guarantee full replacement of that equipment in the event of failure at no additional cost to the Owner.

1.25 PROTECTION OF LIVES AND HEALTH

A. The project is subject to all of the Safety and Health Regulations as promulgated by the United States Department of Labor (Title 29, Part 1926/1910 CFR, 1985 revisions); the Contract Work Hours and Safety Standards Act (40 U.S.C. 327 et seq.) as supplemented by the Department of Labor Regulations (Title 29 CFR Part 5); and OSHA 2207, 1983 revisions; and all subsequent amendments thereto. Contractors are urged to make themselves familiar with the requirements of these regulations.

1.26 NONDISCRIMINATION IN EMPLOYMENT

A. Contracts for work under this bid (proposal) will obligate the Contractors and subcontractors not to discriminate in employment practices.

B. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and the employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading; demotions, or transfers; recruitment or recruitment advertising, layoffs, or terminations; rates of pay or other forms of compensation; selection for training including apprenticeship; and participation in recreational and education activities. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notice to be provided setting forth the provisions of this non-discrimination clause. The Contractor will in all solicitations or advertisements for employees placed by or on behalf on the Contractor state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin. The Contractor will cause the foregoing provisions to be inserted in all sub-contracts for any work covered by this Contract so that such provisions will be binding upon each sub-contractor and upon sub- contracts for standard commercial supplies or raw materials.

C. The Contractor shall keep such records and submit such reports concerning the racial and ethnic origin of applicants for employment and employees as the Owner may require as consistent with Federal and State law. The Contractor agrees to comply with such rules, regulations, or guidelines as the State of Rhode Island may implement these requirements. The Contractor further warrants that he will comply with the President's Executive Order No. 11246 or any preceding similar Executive Order relating thereto.

D. Bidders and Contractors must, if required, submit a compliance report (EPA Form 5720-4) concerning their employment practices and policies in order to maintain their eligibility to receive award of the Contract.

E. Successful bidders and Contractors must, if required, submit a list of all Subcontractors who will perform work on the project, and written signed statements from authorized agents of labor pools with which they will or may deal with for employees on the work, together with any information to the effect that such labor pools' practices or policies are in conformity with said Executive Order that they will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under this Contract; or a certification as to when such agents or labor pools have failed or refused to furnish them, prior to award of the Contract.

F. The successful bidder will be required to comply with Equal Opportunity Requirements for Public Work Projects for all employees on the job. It is the responsibility of Bidders to inform themselves as to the local labor conditions, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustment of wage rates. Information is available at the Department of Labor.

G. The successful bidder must be prepared to comply with the provisions of the General Laws of Rhode Island and attention is called to Title 37, Chapter 13, Section 1-16, relative to the payment of wages, obligations and charges by Contractors on public works projects. Non-resident Contractors are subject to Section 44-1-6 of the RI General Laws, as amended, regarding OUT-OF-STATE CONTRACTORS.

1.27 SEQUENCE OF OPERATIONS

A. The Contractor must submit to the Owner within fourteen (14) calendar days after execution of the Contractor Documents, a sequence of operations, giving detailed plans and schedules of his operation including any elements for by-pass pumping and/or flow diversion during the Work. Said sequence of operations shall be reviewed and must be approved by the Owner prior to the start of the Work. The Owner reserves the right to limit or, if found necessary and/or required, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest to do so.

B. The Contractor shall have no claim for additional compensation or damage on account of any such delays and/or required sequence of operations.

C. The Contractor shall maintain uninterrupted utility services at all times, and plan his work accordingly.

D. The Contractor shall coordinate his activities with any other contract and/or contractor to complete the Work as detailed on the Plans and Specifications.

END OF SECTION

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SECTION 00300

BID

To the City of Warwick, Rhode Island, herein called the "Owner", for "Bid# 2024-352 CONIMICUT POINT PARK SHADE STRUCTURE PROJECT"

The Undersigned, as a bidder herein referred to as singular and masculine, declares as follows:

(1) The only parties interested in this BID as Principals are named herein;

(2) this BID is made without collusion with any other person, firm, or corporation;

(3) no officer, agent, or employee of the Owner is directly or indirectly interested in this BID;

(4) 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, the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;

(5) he understands that information 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 Owner 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 (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in this BID;

(6) and 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 Owner; and he agrees that, if this BID is accepted he will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Owner, this BID form being part of said Contract Documents, and that he will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Owner as therein set forth, and that he will take in full compensation therefore the total dollar amount tabulated from the actual measured quantities of said work and each unit or lump sum price stated in this BID as hereinafter set forth.

(Note: All entries in the entire BID must be made clearly and in ink; price bid must be written in both words and figures.)

Item Number	Brief Description:	Lump Sum Prices

1.

A. Construct all site improvements as shown on the Construction Drawings and indicated in the technical specifications labeled "CONIMICUT POINT PARK SHADE STRUCTURE PROJECT" (including $10,000 owner's allowance).

_____Dollars and _____cents
(Word amount)

$_____
(Figure amount)

2. ALLOWANCE NO. 1 – Owner's Allowance

An Allowance of Ten Thousand Dollars ($10,000.00) shall be provided to address items which will include, but will not be limited to: removal of unsuitable material, additional material & equipment, police details, other work not contained in the scope of work, etc. If the allowance is not used, it will be deducted from the project cost and returned to OWNER.

$10,000.00	Ten Thousand Dollars
Lump Sum	In Words

The bidder will specify the bid price in both words and figures. All words and figures shall be in ink or typed. In case of discrepancy between the prices in written words and those in figures, the written word shall govern.

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the annexed form of AGREEMENT, he will accept compensation as stipulated therein as full payment for such extra work.

Please note that line item prices for items 1A shall be inclusive of the allowance. The Owner reserves the right to alter the line item prices with respect to the allowance, to increase or decrease allowances.

ALLOWANCES

As part of the Base Bid (Total Bid), the Bidder Agrees to carry the allowances listed above in the base bid of the contract. The Owner reserves the right to remove these items from the contract totally or in part and to adjust the contract sum to reflect the actual costs of the construction authorized by the Owner.

If the Bid is accepted by the OWNER, the undersigned agrees to commence work under this Contract on a date to be specified in a written "Notice to Proceed" by the Owner and complete the entire work provided to be done under this Contract within the time stipulated in Table "A" of the AGREEMENT.

As provided in the INFORMATION FOR BIDDERS, the bidder hereby agrees that he will not withdraw this BID, within 90 consecutive calendar days after the actual date of the opening of Bids, and that, if the Owner shall accept this BID, the bidder will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledged, the required CONTRACT BONDS within ten (10) calendar days after notification that the AGREEMENT and other Contract Documents are ready for signature.

(SEAL) _____ L.S.
(Name of Bidder)

By _____
(Signature and title of authorized representative)

_____
(Business address)

_____
(City and State)

Date _____

The bidder is a corporation incorporated in the State (or Commonwealth) of _____ - a partnership - an individual. (Bidder must add and delete as necessary to make this sentence read correctly.)

(Note: If the bidder is a corporation, affix corporate seal and give below the names of its president treasurer, and general manager, if any; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address, if different from business address.)

The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

_____

_____

_____

_____

(Add supplementary page if necessary)

CERTIFICATE OF AUTHORIZATION
FOR
BIDDING REPRESENTATIVE

(Note: Bidder must complete for certification of authorized representative signing Bid.)

At a duly authorized meeting of the Board of Directors of the

_____ held on _____, (Name
of Corporation) (Date)

at which all the Directors were present or waived notice, it was voted that

_____ _____
(Name of Authorized Representative) (Title)

of this company shall be, and hereby is, authorized to execute bidding documents, contracts and bonds in the name and on behalf of said company, and to affix the corporate seal thereto, and such execution of any contract obligation in this company's name on its behalf of such

_____under seal of the company shall be valid and binding upon this company. (Title)

A true copy

ATTEST_____
(Clerk)

Place of Business_____

_____

I hereby certify that I am the clerk of the _____
(Name of Corporation)

_____, that _____
(Name of Authorized Representative)

is the duly elected _____of said company, and that the
(Title)

above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

Corporate
_____Seal
(Clerk)

STATEMENT OF BIDDERS' QUALIFICATIONS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work, as bid upon, in accordance with the contract drawings and specifications. This statement must be notarized. All questions must be answered. Additional data may be submitted on separate attached sheets.

1. Name of Bidder _____

2. Permanent Main Office Address _____

3. Official Mailing Address For This Contract _____

4. When Organized? _____

5. Where Incorporated, If a Corporation _____

6. Years Contracting under Present Name _____

7. List contracts on hand, and those completed similar in nature to this kind of project.

Owner	Owner	Contract	Description	Contract Amount	Completion Date

8. List any work the firm/company has failed to complete, state where and why.

_____

9. If you have ever defaulted on any contract, state where and why.

_____

10. List full names and residences of all principals (i.e.: Officers, Directors, Partners, Owners) interested in this bid.

Name	Residence	Title	Firm/Company

11. State name(s) and qualifications of resident supervisor(s) for this project.

12. List major equipment available for this project and identify ownership or rental.

13. Will you furnish a detailed financial statement and other information, requested by the Owner?

14. List bank references for verifying financial ability of your company.

Name	Address

15. The undersigned hereby authorized and requests any person, firm or corporation, to furnish all information requested by the Owner and/or its designated agents relative to the recitals comprising this Statement of the Bidder's Qualifications.

Dated at _____this _____day of _____20_____.

_____
(Name of Bidder)

By: _____

_____
(Title)

State of _____

County of _____

_____being duly sworn in person, deposes and says

that he is _____of _____,
(Title) (Name of Bidder)

that he is the firm's duly authorized agent to execute these contract documents, and that the

answers to the foregoing questions and all statements therein contained are correct and true.

Subscribed and sworn to before me this _____day of _____20_____.

(SEAL)

_____
(Notary Public)

_____
(My Commission Expires)

STATEMENT OF PROPOSED SUBCONTRACTORS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work as bid upon, in accordance with the contract drawings and specifications. The Bidder must state the names and appurtenant information of all major subcontractors he proposed to use to complete the work as bid upon. Additional data may be submitted on separate attached sheets.

If subcontractors are not to be used to complete the Work and/or any portion thereof, as herein bid upon, the Bidder must acknowledge by writing "NONE" _____.

Description of Work _____

Approximate percentage of Total Bid _____

Proposed Subcontractor, Name _____

Address _____

Description of Work _____

Approximate percentage of Total Bid _____

Proposed Subcontractor, Name _____

Address _____

Description of Work _____

Approximate percentage of Total Bid _____

Proposed Subcontractor, Name _____

Address _____

Bidder to insert description of work, percentage of Total BID, and subcontractors' names as may be required.

This is to certify that all names of the above-mentioned subcontractors are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed subcontractors have any conflict of interest as respects this contract.

Date _____

Bidder

_____
(Name of Bidder)

By

_____
(Signature)

_____
(Title)

_____
(Business Address)

_____
(City and State)

STATE OF RHODE ISLAND

UTILIZATION OF MINORITY BUSINESS ENTERPRISES

This project is subject to Chapter 37-14.1 of the Rhode Island General Laws, and regulations promulgated thereunder, which require that ten percent (10%) of the dollar value of work performed on the project be performed by minority business enterprises.

The Bidder, as part of the Bid, must submit a MBE PLAN outlining the manner in which he shall make a substantial and concerted effort to meet the ten percent (10%) MBE requirement and submit said plan to the Director of the Rhode Island Department of Administration for approval.

The plan shall include a projection of the number and types of subcontracts to be awarded and a projection of the number and types of MBE's likely to be available to compete for subcontracts from the prime contractor over the period of the project.

PROPOSED MBE PLAN

(All bidders must complete and submit this State Plan with Bid, attach additional sheets as needed)

Proposed MBE Subcontractor	Description of Work	Dollar Value ($)	% of Total Contract

Total MBE Participation $ _____

Bidder to insert description of work, percentage of Total BID, and MBE subcontractors' names as may be required.

This is to certify that all names of the above-mentioned MBE subcontractors are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed MBE subcontractors have any conflict of interest as respects this contract.

Date _____ Bidder

_____

(Name of Bidder)

By

_____

(Signature)

_____

(Title)

_____

(Business Address)

_____

(City and State)

SECTION 00400
CONTRACT BONDS

PERFORMANCE BOND

(NOTE: This Bond is issued simultaneously with the attached Labor and Materials Bond in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(an individual, a partnership, a corporation)

duly organized under the Laws of the State of _____,

and having a usual place of business at _____,

_____,

as Principal, and _____, a corporation duly organized

under the Laws of the State of _____,

and duly authorized to do business in the State Rhode Island of _____,

and having a usual place of business at _____

as Surety, are holden and stand firmly bound and obligated unto **City of Warwick,** Rhode Island, as obligee, in the sum of

_____

lawful money of the United States of America, to and for the true payment whereof we bind ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____ , has entered into a contract with the said obligee for **"Bid #2024-352 CONIMICUT POINT PARK SHADE STRUCTURE PROJECT"** in the **City of Warwick,** Rhode Island**,** a copy of which agreement is attached hereto and by references made a part hereof.

NOW THEREFORE, THE CONDITION of this obligation is such that if the Principal shall well and truly keep and fully and faithfully perform all of the terms and conditions of said AGREEMENT and of the "Contract Documents" referred to in said AGREEMENT (which collectively are hereinafter and in said AGREEMENT sometimes referred to as the "Contract") and all modifications thereof on the Principal's part to be performed, this obligation shall be void; otherwise it shall remain in full force and effect.

Whenever the said Principal shall be, and declared by the Owner to be, in default under the said Contract, the Owner having performed the Owner's obligations thereunder Surety, for value received, shall promptly remedy the default, or, at the option of the Owner, shall promptly.

(a) Complete the said AGREEMENT and/or Contract in accordance with its terms and conditions, or

(b) Obtain a bid or bids for submission to and the approval of the Owner for completing the said AGREEMENT and/or Contract and any modifications thereof in accordance with the terms and conditions thereof, and upon determination by the Owner and the Surety of the lowest responsible and acceptable bidder, arrange for a contract between such bidder and the Owner, and make available to the Owner as the work progresses (even though there should be default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less a sum that shall be equal to the difference between the Contract price as fixed and provided in said AGREEMENT and/or Contract or any modifications thereof to be pair thereunder to the Principal and the amount previously paid by the Owner to and/or for the account of and/or chargeable against the Principal, but not exceeding (including other costs and damages for which the Surety may be liable hereunder) the amount set forth in the first paragraph hereof.

The Surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way effect the Surety's obligations on this bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

No right of action shall accrue on this Bond to or for the use of any persons other than the Owner named herein or the heirs, executors, administrators, successors and assigns of the Owner.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____

_counterparts of this bond, this _____day of _____,

in the year Two Thousand and _____.

_____(SEAL)
Principal

_____(SEAL)
Principal

_____(SEAL)
Principal

_____(SEAL)
Surety

_____(SEAL)
Surety

NOTE:

If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the Bond corresponding to the number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

Important

Surety Companies executing BONDS must appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts and be authorized to transact business in the state where the PROJECT is located.

The attention of the Surety Companies and Principal executing this Performance Bond is Directed to the fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty periods stipulated in the Contract Documents and/or Agreement.

LABOR AND MATERIALS BOND

(NOTE: This Bond is issued simultaneously with the attached Performance Bonds in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(an individual, a partnership, a corporation)

duly organized under the Laws of the State of _____,

having a usual place of business at _____,

_____,

as Principal, and _____a corporation duly organized

under the Laws of the State of _____,

and duly authorized to do business in the State of Rhode Island,

and having a usual place of business at _____,
as Surety, are holden and stand firmly bound and obligated unto the City of Warwick, Rhode Island, as obligee, in the sum of

_____
lawful money of the United States of America, to and for the true payment whereof we bind ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract") dated _____ , has entered into a contract with the said obligee for "CONIMICUT POINT PARK SHADE STRUCTURE PROJECT, Bid# 2024-352" in the City of Warwick, Rhode Island**,** a copy of which agreement is attached hereto and by references made a part hereof.

NOW, THEREFORE, THE CONDITION of this obligation is such, that if the Principal shall promptly make payments to all claimants as hereinafter defined, for all labor performed or furnished and for all materials and equipment furnished for or used in or in connection with the Work called for by said AGREEMENT and/or Contract and any modifications thereof, including lumber used but not incorporated in said Work, and for the rental or hire of vehicles, tools and other appliances and equipment furnished for or used in connection with said Work, this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

(a) A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, materials and/or equipment used or reasonably required for use in the performance of the said Work, labor and materials being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental or equipment directly applicable to the said AGREEMENT and/or Contract and any modifications thereof.

(b) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials or equipment were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

(c) No suit or action shall be commenced hereunder by any claimant.

Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials or equipment for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials or equipment were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the said Work is located, save that such service need not be made by a public officer;

After the expiration of one (1) year following the date on which the Principal ceased work on said AGREEMENT and/or Contract and any modifications thereof, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the State in which the said Work, or any part thereof, is situated, or in the United States District Court for the district in which the said Work, or any part thereof, is situated, and not elsewhere.

(d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said AGREEMENT and/Contract or said Work, whether or not claim for the amount of such lien be presented under and against this bond.

The surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way affect the Surety's obligations on this Bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

IN WITNESS WHEREOF, we have hereunto set our hands and seals to _____

counterparts of this Bond, this _____day of _____, in

the year Two Thousand and _____.

_____(SEAL)
Principal

_____(SEAL)
Principal

_____(SEAL)
Principal

_____(SEAL)
Surety

_____(SEAL)
Surety

NOTE:
If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an approximate number of counterparts of the Bond corresponding to the number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

Important

Surety Companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

The attention of the Surety Companies and Principal executing this Labor and Materials Bond is directed to the fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty periods stipulated in the Contract Documents and/or Agreement.

CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR (IF A CORPORATION)
FOR CONTRACT BONDS

State of _____

County of _____

On this _____day of _____, 20 _____, before

me personally came _____to me known, who being by me duly

sworn, did depose and say as follows:

That he resides at _____

and is the _____

of _____

the corporation described in and which executed the foregoing instrument; that he knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he signed thereto his name and official designation.

_____
Notary Public (Seal)

My commission expires _____

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SECTION 00500

GENERAL CONDITIONS

1.01 GENERAL PROVISIONS

A. The duties and obligations imposed by these General Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

B. Sections of Division 1, General Requirements govern the execution of the Work of all sections of the specifications.

C. The Specifications are written in imperative and streamlined form. This imperative language is directed to the Contractor, unless stated otherwise.

1.02 DEFINITIONS

A. Wherever the words as listed in subsection 1.01 of the AGREEMENT or pronouns used in their stead occur in the Contract Documents, they shall have the meanings as given in the AGREEMENT.

1.03 MATERIALS AND EQUIPMENT

A. General

1. Unless otherwise provided in the Contract Documents, only new materials and equipment shall be incorporated in the Work.

2. As soon as possible after execution of the AGREEMENT, submit to the Owner the names and addresses of the manufacturers and suppliers of all materials and equipment proposed to be incorporated into the Work.

3. When shop and working drawings are required as specified below, submit, prior to the submission of such drawings, data in sufficient detail to enable the Owner to determine whether the manufacturer and/or the supplier have the ability to furnish a product meeting the Specifications.

4. Submit data relating to the materials and equipment proposed to be incorporated into the Work in sufficient detail to enable the Owner to identify and evaluate the particular product and to determine whether it conforms to the Contract requirements. Such data shall be submitted in a manner similar to that specified for submission of shop and working drawings.

B. Handling

1. Handle, haul, and distribute materials and all surplus materials on the different portions of the Work, required to complete the Work in accordance with the Contract Documents.

2. Provide suitable storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished under this Contract, until the final completion and acceptance of the Work.

3. Pay all storage and demurrage charges by transportation companies and vendors.

C. Storage of Excavated Material

1. Place excavated materials and equipment to be incorporated in the Work so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work.

2. Materials shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

D. Inspection

1. All materials and equipment furnished by the Contractor to be incorporated in the Work shall be subject to the inspection of the Owner.

2. No material shall be processed or fabricated for the Work or delivered to the work site without prior concurrence of the Owner.

3. Facilities and labor for the storage, handling, and inspection of all materials and equipment shall be furnished by the Contractor.

4. Defective materials and equipment shall be removed immediately from the site of the Work.

E. Inspection away from Site

1. If work to be done, away from the construction site, is to be inspected on behalf of the Owner during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Owner of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Owner in ample time, as determined solely by the Owner, so that the necessary arrangements for the inspection can be made.

F. Samples

1. Submit samples of materials for tests, as the Owner deems necessary to demonstrate conformance with the Specifications. Such samples, including concrete test cylinders, shall be furnished, taken, stored, packed, and shipped by the Contractor as directed by the Owner.

2. Pack samples so as to reach their destination in good condition, and label to indicate the material represented, the name of the building or work and location for which the material is intended, and the name of the Contractor submitting the sample. To ensure consideration of samples, notify the Owner by letter/email that the samples have been shipped and properly describe the samples in writing. Send letter of notification separate from the samples.

3. Submit data and samples, or place his orders, sufficiently early to permit consideration, inspection and testing before the materials and equipment are needed for incorporation in the Work. The consequences for failure to do so shall be the Contractor's sole responsibility.

4. In order to demonstrate the proficiency of workmen, or to facilitate the choice among several textures, types, finishes, surfaces, etc., provide such samples of workmanship of wall, floor, finish, etc., as may be required.

5. After review of the samples, data, etc. the materials and equipment used for the Work shall in all respects conform therewith.

G. Shop Testing

1. When required, furnish to the Onwer in triplicate, sworn copies of manufacturer's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.

1.04 CONTRACTOR'S SHOP AND WORKING DRAWINGS

A. Submit shop drawings to the Owner for review and approval.

B. All submittals will be identified as the Owner may require and in the number of copies also as required by the Owner.

C. The data shown on the Shop Drawings will be complete regarding quantities, dimensions, specified performance and design criteria, materials and other data as particular to the Work that the Contractor proposes to provide.

1.05 OCCUPYING PRIVATE LAND

A. Entering or occupying with men, tools, materials, or equipment, any land outside the rights- of-way or property of the Owner (except after written consent from the proper parties) will not be permitted. A copy of the written consent shall be given to the Owner.

1.06 INTERFERENCE WITH AND PROTECTION OF STREETS

A. Obtain permits from the governing authorities prior to obstructing any portion of a street, road, or private way. If any street, road or private way is rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as ordered by the governing authorities.

B. Maintain streets, roads, private ways, and walks not closed in a passable and safe condition,

C. Provide at least 24 hours in advance, notice to the Owner, Police, Fire and School Departments in writing, with a copy to the Owner, if the closure of a street or road is necessary. Cooperate with all Departments in the establishment of alternate routes and provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

1.07 SAFETY

A. Take all precautions and provide safeguards to prevent personal injury and property damage. Provide protection for all persons including but not limited to employees and employees of other contractors and subcontractors; members of the public; and employees, agents and representatives of the Owner, the Owner, and regulatory agencies that may be on or about the Work. Provide protection for all public and private property including but not limited to structures, pipes, and utilities, above and below ground.

B. Provide and maintain all safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire-fighting equipment.

C. Comply with all applicable Federal, State and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.

D. Designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

1.08 EXISTING FACILITIES

A. Dimensions of Existing Structures

1. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

B. Proposed Pipe Location

1. Exterior pipelines will be located substantially as indicated on the Drawings, but the right is reserved to the Owner, acting through the Owner, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him for laying and jointing different or additional items where required.

2. Small interior piping is indicated diagrammatically on the Drawings, and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, so as not to interfere with equipment or access way, and, in general, without diagonal runs.

C. Interference with Existing Works

1. Conduct operations so as to interfere as little as possible with existing works. Develop a program, in cooperation with the Owner and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the

operation of the existing facilities for the shortest time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Electrical connections should be coordinated with the Owner so as to minimize disruption of normal plant operations. Before starting work which will interfere with the operation of existing facilities, perform preparatory work and see that all tools, materials and equipment are made ready and at hand.

2. Repair utilities damaged by the Contractors operations during the progress of the work and be responsible for correcting all damages to existing utilities and structures at no additional expense to the Owner. Contact the proper utility or authority to correct or make any changes due to utility or other obstructions during the work but the entire responsibility and expense shall be with the Contractor.

3. Make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

4. Submit no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for continuous flow of sewage.

D. Existing Utilities or Connections

1. The location of existing underground pipes, conduits, and structures, as shown, has been collected from the best available sources. The Owner, together with its agents, does not imply nor guarantee the data and information in connection with underground pipes, conduits, structures and such other parts as to their completeness, nor their locations as indicated. The Contractor shall assume that there are existing water, sewer, gas and other utility connections to each and every building enroute, whether they appear on the drawings or not. An expense and/or delay occasioned by utilities and structures, or damage thereof, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner.

2. Above ground utilities may be present in the areas of the proposed Work. Take all necessary actions and/or precautions, including, but not limited to, utility company notification and necessary relocations (both temporary and permanent), to ensure proper protection of those aboveground utilities and appurtenances to be affected by his operations. All costs associated with the aboveground utilities shall be paid by the Contractor at no additional expense to the Owner.

3. If and when encountered, existing utilities shall be properly supported and protected during the construction work and the Owner shall be notified accordingly. The operation of existing utilities shall not be interrupted except with written permission of the operator and owner of such utilities. Allow ample time for all measures as may be required for the continuance of existing utility operations. Take extreme precautions to minimize disruption of utilities. Make prompt and full restitution for repairs by others for all disruptions caused by operations required to perform the Work.

4. Comply with all requirements of utility organizations involved.

E. Failure to Repair

1. Any emergency rising from the interruption of electric, telephone, gas, water, or sewer service due to the activities of the Contractor, shall be repaired by the Contractor as quickly as is possible.

2. If and when, in the opinion of the Owner, the Contractor is not initiating repair work as expeditiously as possible upon notification to do so, the Owner, may at his own option, make the necessary repairs using his own forces or those of others. The cost of such repairs shall be subtracted from the payments due to the Contractor.

F. Disturbance of Bounds

1. Replace all bounds disturbed during the construction operation, at no additional cost to the Owner. The bounds shall be relocated by a land surveyor approved by the Owner and registered in the State that the Work is to be done.

1.09 WORK TO CONFORM

A. During its progress and on its completion, the Work shall confirm to the lines, levels, and grades indicated on the Drawings or given by the Owner and shall be built in strict accordance with the Contract Documents and the directions given from time to time by the Owner.

B. All work done without instructions having been given therefore by the Owner, without proper lines or levels, or performed during the absence of the Owner, will not be estimated or paid for except when such work is authorized by the Owner in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the Contractor's expense.

1.10 PLANNING AND PROGRESS SCHEDULES

A. Before starting the Work and from time to time during its progress, as the Owner may request, the Contractor shall submit to the Owner a written description of the methods he plans to use in doing the Work and the various steps he intends to take.

B. Within 14 calendar days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Owner (a) a written schedule fixing the dates on which additional drawings, if any, will be needed by the Contractor and
(b) a written schedule fixing the respective dates for the start and completion of various parts of the Work. Each such schedule shall be subject to review from time to time during the progress of the Work.

1.11 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather and against the possibility thereof, take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required by the manufacturer of the material or equipment to be installed, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.

B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means that will result in a moist or dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.12 TEMPORARY HEAT

A. If temporary heat is required for the protection of the Work, provide and install suitable heating apparatus, provide adequate and proper fuel, and shall maintain heat as required.

B. Temporary heating apparatus shall be installed and operated in such manner that finished work will not be damaged.

1.13 ELECTRICAL ENERGY

A. Make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. Provide and pay for all temporary wiring, switches, connections, and meters.

B. Provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.14 CERTIFICATES OF CONFORMANCE

A. Furnish to the Owner, in the manner as directed and prior to actual installation, notarized certificates of conformance for all materials to be furnished under this Contract. The notarized certificates of conformance shall state that the material to be furnished meets or exceeds all requirements specified under the Contract Documents. When so directed, the manufacturer's notarized certificates of conformance, certifying that the materials meet the requirements specified shall accompany each shipment of material. Unless otherwise specifically specified and/or directed by the Owner, all testing of materials required under this Contract shall be provided by the Contractor at no additional expense to the Owner.

1.15 PATENTS

A. Pay, at no additional expense to the Owner, all applicable royalties and license fees associated with the materials and construction methods to be used under this Contract. Defend all suits or claims for infringements of any patent rights, and save the Owner and Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer (s) is specifically specified with no option to the Contractor. However, if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner.

B. Refer to Specification Section 00500, 1.07, Patents, regarding the Contractor's responsibilities for any patent rights associated with the materials and construction methods to be used under this Contract.

1.16 " OR EQUAL" CLAUSE

A. Whenever a material or article required is specified or shown on the drawings by using the name of the proprietary product of a particular manufacturer or vendor, any material or article which will perform adequately, in the Owner's sole judgment and/or opinion, the duties imposed by the general design may be considered equal and satisfactory providing the material or article so proposed is of equal substance. It shall not be purchased or installed without his written approval. In all cases new material shall be used in the project.

B. If more than one brand, name of material, device, or piece of equipment is shown or specified, each should be regarded as the equal of the other. Any other brand make of material, device or equipment, which in the opinion of the OWNER and/or OWNER, is the recognized equal of that specified (considering quality, workmanship, and economy of operation), and is suitable for the purpose intended, may be accepted.

C. OWNER will be allowed a reasonable time within which to evaluate submittals for Substitute Items. OWNER will be the sole judge of acceptability. No “Or Equal” or Substitute Item will be ordered, installed or utilized without OWNER’s prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR’s expense a special performance guarantee or other surety with respect to any “or equal” or substitute. OWNER will record time required by OWNER and OWNER’s Consultants in evaluating substitutes proposed or submitted by CONTRACTOR and in making changes to the Contract Documents. Whether or not OWNER accepts a Substitute Item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of OWNER and OWNER's Consultants for evaluating each such proposed Substitute Item.

1.17 ADDITIONAL OR SUBSTITUTE BONDS

A. If at any time the Owner, for justifiable cause, shall be or become dissatisfied with any Surety or Sureties than upon the performance or payment bonds, the Contractor shall, within five (5) calendar days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be acceptable to the Owner. The Contractor shall pay the premiums on such bonds with no additional expense to the Owner. No further payments shall be deemed due nor will be made until the new Surety or Sureties shall have furnished such as acceptable bond to the Owner.

1.18 SEPARATE CONTRACTS

A. The Owner reserves the right to let other contracts in connection with the construction of the contemplated work of this project or contiguous projects of the Owner. The Contractor, therefore, will afford any such other contractors reasonable opportunity for the introductions and storage of their materials and the execution of their work, will properly connect and coordinate his work with theirs, and will not commit or permit any act which will interfere with the performance of their work.

B. Coordinate operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work.

C. It is essential that all parties interested in the project cooperate to the end that the entire project will be brought to a successful conclusion as rapidly as possible, but the Owner cannot guarantee that no interference or delay will be caused thereby. Interference and delay resulting from such cooperation shall not be basis of claims against the Owner.

1.19 PAYROLLS OF CONTRACTOR AND SUBCONTRACTORS

A. The Contractor and each of his Subcontractors shall prepare his payrolls on forms prescribed and in accordance with instructions to be furnished by the Owner. Within seven (7) days after the regular payment date of the payroll, the Contractor shall deliver to the Owner, with copies to the Owner, a certified legible copy or copies of each such payroll. Each such payroll shall contain the statement required by the Federal Regulations issued pursuant to the "Anti-Kickback Statute", (48 Stat. 948; 18 U.S.C. 874; 40 U.S.C. 276C).

B. Carrying any person on his payrolls not employed by him will not be permitted. Carrying employees of a subcontractor on his payrolls will not be permitted, but such employees must be carried on the payrolls of the employing subcontractor.

C. Each Contractor or Subcontractor shall preserve his weekly payroll records for a period of three (3) years form the date of completion of the Contract. The payroll records shall set out accurately and completely the name, occupational classification, and hourly wage rate of each employee, hours worked by him during the payroll period and full weekly wages earned by him, and deductions made from such weekly wages and the actual weekly waged paid to him. Such payroll records shall be made available at all times for inspection by the Owner or his authorized representatives, the Owner or by agents of the United States Department of Labor.

1.20 PAYMENTS BY CONTRACTOR

A. Pay for all traffic control, safety, transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered. Reimbursable costs for services rendered, as specified in the Contract Documents, shall not be incorporated into partial payment estimates until such time that the Contractor submits to the Owner actual paid invoices from those in which services were rendered.

1.21 " DIG SAFE" LAW

A. Comply with the Rhode Island General Law, Chapter 39-1.2, "Excavation Near Underground Utility Facilities" which became effective on July 1, 1984.

B. Before proceeding with construction operations, the Contractor shall notify the State of Rhode Island Underground Plant Damage Prevention Systems (DIG SAFE at 811), and shall make such supplemental investigations, including exploratory excavations, by hand digging, as he deems necessary to uncover and determine the exact locations of utilities and structures, and shall have no claims for damages due to encountering subsurface structures or utilities in locations other than that shown on the drawings, or which were made known to the Contractor prior to construction operations. The Contractor shall be responsible and liable for all damages to the existing utilities and structures.

C. Before commencing with the construction of any work, identify any water main, gas main, telephone duct, electric duct, and/or other utility present which is or could be in conflict with the proposed work.

D. Relocation of the affected utilities shall be done as directed by the Owner and in accordance with the requirements of the utility company.

E. The attention of the Contractor is directed to the fact that certain utility companies may not fall under the provisions of "DIG SAFE". Individual utility company notifications by the Contractor shall be necessary to ensure proper notification and protection of all existing utilities affected by this Contract.

1.22 FIRE PREVENTION AND PROTECTION

A. State and municipal rules and regulations with respect to fire prevention, fire-resistant construction and fire protection shall be strictly adhered to and all work and facilities necessary therefore shall be provided and maintained by the Contractor in an approved manner.

B. Provide fire protection equipment such as water tanks, hoses, pumps, extinguishers, and other materials, and apparatus, for the protection of the contract work, and adjacent property. Trained personnel experiences in the operation of all fire protection equipment and apparatus shall be available on the site whenever work is in progress, and at such other times as may be necessary for the safety of the public and the work.

1.23 DUST CONTROL

A. Exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining pipe trench shall be kept clean of excess materials wherever and whenever directed by the Owner. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until permanent pavement repairs are made and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures, compensation shall be considered to be included in the prices stipulated for the appropriate items as listed in the Bid.

1.24 DISPOSAL OF DEBRIS

A. The materials from the demolition, and those used in the construction of the Work throughout the project, shall be deposited in such a manner so as to

not endanger persons or the Work, and so that free access may be had at any time to all hydrants, gates and existing equipment in the vicinity of the work. The materials shall be kept trimmed-up so as to be of as little inconvenience as possible to the public travel and plant operations. All excavated materials not approved for backfill and fill, all surplus material, and all rock and boulders resulting from the excavations, shall be removed and satisfactorily disposed of off the site by the Contractor, at no additional expense to the Owner.

B. The materials being removed from the pipelines and manholes during the cleaning process shall be deposited in such a manner as to not endanger the public, plant personnel or persons performing the work. Such debris deposits may be of such nature, high in biological organic contents, or chemically aggressive that they will require proper disposal in a safe, health risk free, environment. (Considered to be "Special Wastes" by Rhode Island Department of Environmental Management) Contact the Owner and Owner and all agencies having jurisdiction thereof, for approval of debris disposal methods and locations of disposal, prior to disposing of any or all debris removed from pipe cleaning methods. All debris shall be removed and satisfactorily disposed of off the work site, at no additional expense to the Owner.

1.25 NIGHT, SATURDAY, SUNDAY AND HOLIDAY WORK

A. No work shall be done at night or on Saturdays, or Sundays or holidays without the prior written approval of the Owner and Owner.

1.26 LENGTH OF WORK DAY

A. The Owner retains the right to restrict the Contractor to an eight-hour workday. Such restrictions shall not be the basis for damages or claims against the Owner.

B. The Contractor's attentions is also directed to the fact that should it be deemed necessary to perform various items of work during off-peak flow or traffic hours, early morning or late night hours, then he shall notify the Owner a minimum of 24 hours in advance as to his intentions and reasons for the change in work hours. The Contractor shall be responsible for properly contacting and informing all involved parties of such a change in work hours. The Contractor shall not be entitled to any additional compensation from the Owner for any expenses that may be incurred by change of working hours and/or scheduling.

1.27 HURRICANE PROTECTION

A. Should hurricane warnings be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools and/or equipment from exposed locations; and removing or securing scaffolding and other temporary work.

1.28 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work should the Owner deem it to be in the public interest to do so. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the contract or at any time during the progress of the work. The Owner further reserves the right, at anytime during the progress of the work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

END OF SECTION

SECTION 00600

SUPPLEMENTARY CONDITIONS

1.01 GENERAL

A. These Supplementary Conditions are requirements which amend or supplement the General Conditions specified elsewhere.

B. The duties and obligations imposed by these Supplementary Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

C. Assertion of any claim for any additional compensation or damages on account of and/or the fulfillment of these Supplementary Conditions will not be allowed.

1.02 LIMITS OF NORMAL EXCAVATION

A. In determining the quantities of excavation to which unit prices shall apply, the limits of normal width and depth of excavation shall be as described below, unless other limits are indicated in the Contract Documents.

1. For pipes in trenches, less than or equal to a depth of 10.0-feet, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 48 inches plus the nominal inside diameter of the pipe.

2. For pipes in trenches, between a depth greater than 10.0-feet and a depth of 20.0-feet, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 60-inches plus the nominal inside diameter of the pipe.

3. If the width so computed is less than 5.0-feet for trenches up to 10.0 feet deep than a width of 5.0 feet shall be the normal width. If the width so computed is less than 6.0-feet for trenches greater than 10.0- feet up to 20.0-feet than a width of 6.0-feet shall be the normal width.

4. The normal depth shall be measured to a distance of 0.5 feet below the bottom of the pipe in earth and 0.5 feet in rock, unless there be a cradle underneath the pipe, in which case the normal depth shall be measured to the underside of the cradle. The trench width for the cradle shall be assumed to be that specified above for pipes in the trench.

B. Quantities for payment shall be in accordance with the above limits or the actual widths, **whichever is less.**

C. For concrete placed directly against undisturbed earth, the normal width and depth of the excavation for such concrete shall be measured to the neat lines of the concrete as indicated on the Drawings or as ordered.

D. For concrete placed against rock surfaces resulting from rock excavation, the normal width and depth of the excavation shall be measured to 4 inches outside the neat lines of the concrete as indicated on the Drawings or as ordered.

E. For other structures, except manholes as noted below, the normal width shall be measured between vertical planes 1.0 feet outside the neat lines of the several parts of the structure, except that the width at any elevation shall be measured as not less than the width at a lower elevation. The normal depth shall be measured to the underside of that part of the structure for which the excavation is made.

F. No additional width or depth of trenches excavated in earth or rock shall be allowed at standard circular manholes. The pay limit for rock removed outside proposed manholes shall commence one foot (1.0) outside the widest dimension of the structure or shall be the maximum connecting trench width, whichever is greater.

G. Wherever bell holes are required for jointing pipe, they shall be provided without additional compensation over and above that resulting from measurements as above described.

1.03 BOLTS, ANCHOR BOLTS AND NUTS

A. Furnish bolts, anchor bolts, nuts, washers, plates and bolt sleeves required by equipment to be installed under this Contract in accordance herewith. Anchor bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. Anchor bolts, nuts, washers, plates, and bolt sleeves shall be galvanized unless otherwise indicated or specified.

C. Expansion bolts shall have malleable iron and lead composition elements of the required number of units and size.

D. Unless otherwise specified, stud, tap, and machine bolts, and nuts shall conform to the requirements of ASTM Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307. Hexagonal nuts of the same quality of metal as the bolts shall be used. All threads shall be clean cut and shall conform to ANSI Standard B1.1-1974 for Unified Inch Screw Threads (UN and UNR Thread Form).

E. Bolts, anchor bolts, nuts and washers, specified to be galvanized, shall be zinc coated, after being threaded, by the hot-dip process in conformity with the ASTM Standard Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip, Designation A123, or the ASTM Standard Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware, Designation A153, as is appropriate.

F. Bolts, anchor bolts, nuts, and washers specified to be stainless steel shall be Type 316 stainless steel unless otherwise indicated or specified.

G. Anchor bolts and expansion bolts shall be set accurately. If anchor bolts are set before the concrete has been placed, they shall be carefully held in suitable templates of acceptable design. Where indicated on the Drawings, specified, or required, anchor bolts shall be provided with square plates at least 4 inches by 4 inches by 3/8 inches or shall have square heads and washers and be set in the concrete forms with suitable pipe sleeves, or both. If anchor or expansion bolts are set after the concrete has been placed, all necessary drilling and grouting or caulking shall be done by the Contractor and care shall be take not to damage the structure or finish by cracking, chipping, spalling, or otherwise during the drilling and caulking.

1.04 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.05 CUTTING AND PATCHING

A. The Contractor shall leave all chases or openings for the installation of his own or any other contractor's or subcontractor's work, or shall cut the same in existing work, and shall see that all sleeves or forms are at the Work and properly set in ample time to prevent delays. He shall see that all such chases, openings, and sleeves are located accurately and are of proper size and shape and shall consult with the Owner and the contractors and subcontractors concerned in reference to this work.

B. In case of his failure to leave or cut all such openings or have all such sleeves provided and set in proper time, he shall cut them or set them afterwards at his own expense, but in so doing he shall confine the cutting to the smallest extent possible consistent with the work to be done. In no case shall piers or structural members be cut without the written consent of the Owner.

C. The Contractor shall carefully fit around, close up, repair, patch, and point around the work specified herein to the satisfaction of the Owner.

D. All of this work shall be done by careful workmen competent to do such work and with the proper small hand tools. Power tools shall not be used except where, in the opinion of the Owner, the type of tool proposed can be used without damage to any work or structures and without inconvenience or interference with the operation of any facilities. The Owner's concurrence with the type of tools shall not in any way relieve or diminish the responsibility of the Contractor for such damage, inconvenience, or interference resulting from the use of such tools.

E. The Contractor shall not cut or alter the work of any subcontractors or any other contractor, nor permit any of his subcontractors to cut or alter the work of any other contractor, or subcontractor, except with the written consent of the contractor or subcontractor whose work is to be cut or altered or with the written consent of the Owner. All cutting and patching or repairing made necessary by the negligence, carelessness, or incompetence of the Contractor or any of his subcontractors shall be done by or at the expense of the Contractor and shall be the full responsibility of the Contractor.

1.06 FOUNDATIONS, INSTALLATION AND GROUTING

A. Furnish materials and construct suitable concrete foundation for all equipment installed under this Contract, even though such foundations may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting as specified below.

B. Equipment shall be installed by skilled mechanics and in accordance with the instruction of the manufacturer.

C. In setting pumps, motors, and other items of equipment customarily grouted, make an allowance of at least 1-in. for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable nonshrink grout.

D. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.

E. Where such procedure is impracticable, the method of placing grout shall be as permitted by the Owner. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner, if necessary, given a burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.07 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. Arrange for the services of qualified factory service representatives from the companies manufacturing or supplying equipment and/or materials to be used or installed in the work as specified, to perform the following duties.

B. After installation of the listed equipment has been completed and the equipment is presumably ready for operation, but before others operate it, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but shall not be limited to, the following points as applicable:

1. Soundness (without cracked or otherwise damaged parts).

2. Completeness in all details, as specified.

3. Correctness of setting, alignment, and relative arrangement of various parts.

4. Adequacy and correctness of packing, sealing and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his work, the manufacturer's or supplier's representative shall submit in triplicate to the Owner a complete signed report of the result of his inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that specifically states "the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the

installation will render the manufacturer's warranty null and void".

E. After the Owner has reviewed the reports from the manufacturer's representatives, the Contractor shall make all arrangements to have the manufacturer's representatives present when the field acceptance tests are made by the Owner without additional cost to the Owner.

1.08 OPERATING INSTRUCTIONS AND PARTS LISTS

A. Where reference is made in the Technical Specifications to operating instructions and spare parts lists, furnish, for each piece of equipment, six complete sets giving the information listed below:

1. Clear and concise instructions for the operation, adjustment, and lubrication and other maintenance of the equipment. These instructions shall include a complete lubrication chart.

2. List of all parts for the equipment, with catalog numbers and other data necessary for ordering replacement parts.

B. Such instructions and parts lists shall be annotated to indicate only the specific equipment furnished. References to other sizes and types or models of similar equipment shall be deleted or neatly lined out.

C. Such operating instructions and parts lists shall be delivered to the Owner at the same time that the equipment to which they pertain is delivered to the site.

1.09 LUBRICANTS

A. During testing and prior to acceptance, Furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

1.10 SPECIAL TOOLS

A. For each type of equipment furnished provide a complete set of all special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, maintenance, and disassembly of such equipment. Tools shall be high-grade, smooth, forged, alloy, tool steel. Grease guns shall be lever type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. Properly store and safeguard such special tools until completion of the work, at which time they shall be formally transmitted and delivered to the Owner.

1.11 EQUIPMENT DRIVE GUARDS

A. All equipment driven by open shafts, belts, chains, or gears shall be provided with acceptable all-metal guards enclosing the drive mechanism. Guards shall be constructed of galvanized sheet steel or galvanized woven wire or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps that will permit easy removal for servicing the equipment. The guards shall conform in all respects to all applicable safety codes and regulations.

1.12 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or by other acceptable materials.

1.13 COVERING EXCAVATED TRENCH

A. In addition to the requirements in Section 00700 titled Interference with and Protection of Streets. Cover all open excavations when construction operations are suspended at the end of the day, or in excavated trenches where work is not actually in progress. Cover shall be capable of withstanding AASHTO H20-S16 loading. This cover shall consist of steel plates or some other satisfactory cover of adequate size and strength suitably held in place to keep all traffic out of excavations, all as verified in writing by the Contractor. The cover shall be laid over the excavation until it is backfilled.

1.14 MAINTAINING TRENCH EXCAVATIONS

A. The length of trench opened at any time, from point where ground is being broken to completed backfill, and also the amount of space in streets or public and private lands occupied by equipment, trench, and supplies, shall not exceed the length of space considered reasonably necessary and expedient by the Owner. In determining the length of open trench or spaces for equipment, materials, supplies and other necessities, the Owner will consider: the nature of the lands or streets where work is being

done; types and methods of construction and equipment being used; inconvenience to the public or to private parties; possible dangers; and other proper matters. All work must be constructed with a minimum inconvenience and danger to the public and all other parties concerned.

B. Whenever any trench obstructs pedestrian and vehicular traffic in or to any public street, private driveway or property entrance, or on private property, take such means as may be necessary to maintain pedestrian and vehicular traffic and access. Until such time as the work may have attained sufficient strength to support backfill, or if for any other reason it is not expedient to backfill the trench immediately, construct and maintain suitable plank crossing and bridges to carry essential traffic in or to the street, driveway or property in question, as specified or directed.

C. Suitable signs, lights, and such items required by Police Authorities to direct traffic, shall be furnished and maintained by the Contractor at his own expense.

D. Keep streets and premises free from unnecessary obstructions, debris and all other materials. The Owner may, at any time, order all equipment, materials, surplus from excavations, debris and all other materials lying outside that length of working space, promptly removed. Should the Contractor fail to remove such material within 24 hours after notice to remove the same, the Owner may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense; and may deduct the costs thereof from payments which may be or may become, due to the Contractor under the Contract. In special cases, where public safety urgently demands it, the Owner may cause such materials to be removed at the Contractor's expense without prior notice.

1.15 DISRUPTION OF STORM DRAINS

A. Portions of the Work may be located in areas that are serviced by storm drains. Take extreme precaution to minimize disruption of the drains, and repair and/or make restitution for repairs by others for all disruptions caused by the construction operations.

1.16 BLASTING AND PRE-CONSTRUCTION BLASTING SURVEY

A. Blasting will not be permitted.

1.17 NAMEPLATES

A. With the exceptions mentioned below, each piece of equipment shall be provided with a substantial nameplate of noncorrodible metal, securely fastened in place and clearly and permanently inscribed with the manufacturer's name, model or type designation, serial number, principal rated capacities, electrical or other power characteristics, and similar information as appropriate. Coordinate nameplate text requirements with Owner prior to fabrication. Nameplates shall be securely mounted in a readily visible location approved by the Owner. Equipment Specification sections may contain additional information regarding nameplates.

B. This requirement shall not apply to standard manually operated hydrants or to gate, globe, check, and plug valves.

C. Each process valve shall be provided with a substantial tag of noncorrodible metal securely fastened in place and inscribed with an identification number in conformance with the Valve Identification Schedule indicated on the drawings or furnished later by the Owner.

1.18 SPECIAL SAFETY PRECAUTIONS

A. Work includes the removal and demolition of the existing chlorine disinfection system. Chlorine is an extremely active chemical, which is extremely toxic and corrosive. Chlorine must be stored and handled very carefully to avoid possible serious injuries or death to workers and the public.

B. The existing chlorine disinfection system consists of 1 ton chlorine cylinders, which store liquid chlorine under pressure, chlorination equipment, and piping. (Under atmospheric pressure, chlorine exists in the gaseous form). The system draws liquid chlorine from the cylinders evaporates the chlorine to gaseous form and then injects the gas into a plant water line to form a chlorine solution. This solution is then transported to various points of application.

C. Contractor shall take all necessary safety precautions in completing the work including coordinating with and complying with emergency procedures and requirements of the Owner, Police Department, Fire Department, and the Rhode Island Department of Environmental Management. The Contractor shall comply with all applicable federal, state and local laws, ordinances, rules and regulations and lawful orders of all authorities

having jurisdiction for the safety of persons and protection of property. The Contractor shall have all necessary safety apparatus on-site and workers shall be instructed in its use.

1.19 LAND, EASEMENTS, AND RIGHTS-OF-WAY

A. As indicated, a portion of the work may be located within easements and/or rights-of-way, obtained or which will be obtained by the Owner, through private property. On all other lands, the Contractor has no rights unless he obtains them from the proper parties as specified in Section 00700, Occupying Private Land.

B. Prior to issuance of the Notice to Proceed, the Owner shall obtain all land, easements and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

C. The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

D. The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities or for storage of equipment and materials.

E. If however, lands, easements or rights-of-way cannot be obtained before work on the project begins, the Contractor shall begin his work upon such land, easements or rights-of-way as have been previously acquired by the Owner, and no claims for damages whatsoever will be allowed by reason of its inability to procure the lands, easements, or rights- of-way for the said work, the Contractor shall not be entitled to make or assert a claim for damages by reason of the said delay, or to withdraw from the Contract except by consent of the Owner. Time for completion of work will be extended to such time as the Owner determines will compensate for the time lost by such delay, such determination to set forth in writing.

1.20 CLEANING FINISHED WORK

A. After the work is completed, the pipes, manholes and structures shall be carefully cleaned free of debris and dirt, broken masonry, and mortar, and left in first class condition, ready to use. All temporary or excess materials shall be disposed of off-site and the work left broom clean, to the satisfaction of the Owner.

END OF SECTION

Appendix A

Technical Specifications

APPENDIX A

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work covered by the Contract, listing of Owner, Project location. Sequence requirements, the Contractor's use of the premises and Owner's occupancy requirements.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The work in this contract includes, but is not necessarily limited to, the removal and disposal of existing concrete sidewalk, section of timber guardrail, curbing (this item may be stockpiled if in reusable condition), bituminous concrete as necessary.
Installation shall include but not be limited to furnishing and installing all materials as necessary to: line stripe (2) accessible handicap parking spaces and access aisle, associated signage, bituminous concrete, cement concrete sidewalk wheelchair ramp, granite curbing/ transition curbs, detectable warning panel, concrete walkways/pad, a steel pavilion structure. All as more particularly indicated, shown or described in the Drawings, Specifications, and other Contract Documents.

1.03 OWNER

A. City of Warwick
3275 Post Road
Warwick, Rhode Island 02886
Telephone: 401-921-9605
Contact: David A. Kurowski, Field Construction Inspector, Department of Public Works – Engineering, david.a.kurowski@warwickri.gov

1.04 PROJECT LOCATION

A. Conimicut Point Park,
Point Street,
Warwick, Rhode Island

1.05 WORK SEQUENCE

A. In order that Work may be conducted with minimum inconvenience to the public and, work under this Contract may be coordinated with other work which may be under construction or contemplated, and that work under the Contract may conform to conditions which it has been undertaken or conditions attached to a right-of-way or particular location for this work, the City's project manager may determine the point or points and time or times when portions of work will commence or be carried on and may issue orders pertaining to the work sequence, relative to the rate of progress on several portions of the Work.

1.06 CONTRACTOR USE OF PREMISES

A. The Contractor's use of premises shall be within the limits of the work shown on the Drawings for the performance of the Work.

B. The Contractor shall assume full responsibility for security of all materials and equipment on the site, including those of his subcontractor's.

C. If directed by the Owner, the Contractor shall move any stored items that interfere with operations of the Owner.

D. If necessary, the Contractor, at no additional cost to the owner, shall obtain and pay for use of additional storage or work areas if needed to perform the Work.

1.07 OWNER OCCUPANCY REQUIREMENTS

A. Contractor shall take special cautions not to damage any existing conditions not to be removed or repaired. Any damage to existing conditions will be the contractor's responsibility at no additional cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01020

ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Contingencies and their respective value which have been established in the BID as an estimated lump sum to facilitate comparison of bids only.

B. Related Sections

1. Section 00300 - Bid
2. Section 01025 - Measurement and Payment

1.02 ALLOWANCES

A. Allowance No 1 – Owner’s Allowance

1.03 PAYMENT PROCEDURES

A. Under these items, the Contractor shall be reimbursed for charges for the allowances required and authorized by the Owner, as detailed in Section 01025 - Measurement and Payment.

B. The lump-sum price for allowances is established in Section 00300 - Bid as an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this item shall constitute full compensation for services rendered.

C. The lump-sum price for this item shall NOT include any costs associated with services rendered for routine utility markings, repair damages incurred as a result of the Contractor's operations, relocations of utilities done at the Contractor's request and/or convenience, or any other unauthorized services rendered by utility companies. The purpose of this item is strictly for the Contractor's reimbursement for those services authorized by the Owner or Owner’s Representative prior to the work being performed.

D. The Contractor will be paid based on the actual PAID invoiced amount from the authority in question as approved by the Owner or Owner’s Representative. If the total cost for such charges is greater or less than the allowance amount stated under this item of the BID, a debit or credit of the difference in cost shall be to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials as required and ordered by the Owner or Owner's Representative shall conform to the Contract Documents.

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Measurement and payment criteria applicable to the Work performed under a lump sum payment method of Items listed in the BID.

B. RELATED SECTIONS

1. Section 00300 - Bid
2. Section 01020 - Allowances
3. Section 01026 - Schedule of Values

1.02 LUMP SUM PRICES

A. Payment will be computed on the basis of the percentage of work completed on each item in the contract BID as determined by the Owner or Owner's Representative. Lump sum prices are to include the cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs. (See Par. 1.04, this Section.)

B. The Contractor's breakdown (submit under SECTION 01026) of the lump sum bid will be used only as a guide to determine the percentage of completion.

1.03 PRICES INCLUDE

A. The prices stated in the Proposal include full compensation not only for furnishing all the labor, equipment and material needed for, and for performing the work and building the structures contemplated by, the Contract, but also for assuming all risks of any kind for expenses arising by reason of the nature of the soil, ground water, or the action of the elements; for all excavation and backfilling; for the removal of and delay or damage occasioned by trees, stumps, tracks, pipes, ducts, timber, masonry or other obstacles; for removing, protecting, repairing, or restoring, without cost to the Owner, all pipes, ducts, drains, sewers, culverts, conduits, curbs, gutters, walks, fences, tracks, or other obstacles, road pavements and other ground surfacing whether shown on plans or not for draining, damming, pumping or otherwise handling and removing, without damage to the work or to other parties, and without needless nuisance, all water or sewage from whatever source which might affect the work or its progress, or be encountered in excavations made for the work;

B. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

C. The prices for those Items which involve excavation shall include compensation for disposal of surplus excavated material and handling water.

D. In all Items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price, therefore, shall be in addition to the cost of excavating earth and no deduction will be made in the amount for earth excavation.

1.04 PAYMENT

A. In general, payment will be made for all Contract work satisfactorily completed through the end of the previous month. The payment will include any additional work which has been completed and approved and change order work agreed upon by the Owner and Contractor which has been completed and approved.

B. Each application for payment will indicate the total of a minimum percent retainage, held by the Owner on the total of all work completed under the contract and approved for payment to-date.

C. Monthly applications for payment may also indicate reduction or increase of the total Contract price when an approved change order results in a net reduction or net increase in the cost and quantity of work to be performed under the Contract.

D. Special billings and charges against the Contract as credit or payment to the Owner, that are not for change order work, may be subtracted from monies due on any monthly application for payment but shall not serve to reduce the total Contract price.

E. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Owner or Owner's Representative multiplied by the unit price for work which is incorporated in or made necessary by the Work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01026

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for breakdown of lump sum bid.

B. Related Sections

1. Section 01300 - Submittals

1.02 BREAKDOWN OF LUMP SUM BID

A. Within 20 business days of the date of the executed Contract, a list detailing the breakdown of the lump sum bid by the appropriate Divisions of these Specifications or as otherwise directed by the Owner or Owner's Representative, shall be submitted for review and concurrence by the Owner or Owner's Representative. This list will be used by the Owner or Owner's Representative as a guide in preparing estimates for payment. The list shall be an accurate representation of costs required to complete the Work in accordance with the Contract Documents.

B. A schedule of the monthly value of work done based on the Progress Schedule submitted under Section 01300 - Submittals shall be submitted within 20 business days of the date of the executed Contract. The schedule shall show the total sum of work done for each month of the projected construction period and shall be updated monthly to reflect the actual amount requisitioned for payment.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

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SECTION 01035

MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Procedures for making modifications to the Contract by change orders or other means.

1.02 CHANGE ORDERS

A. In general Change Orders will be issued for modification of Contract documents which will incorporate changes in the Contract requirements, including additions or deletions in the Work; for unforeseen field conditions which will necessitate changes in the Work; changes in code provisions or other requirements of federal, state or local authority requiring changes in the Work; changes in the availability of products or for incorporating new products into the work and for changes directed by the Owner or Owner's Representative for the benefit of the Owner.

B. Authority to execute Change Orders shall be that of the Owner or Owner's Representative and not of the Contractor. Change Orders will, in general, originate by a "Change Order Proposal Request" or by issuance of a "Construction Change Authorization".

C. Unless authorized by the Owner or Owner's Representative, no work shall be performed that is involved in the change until a formal Change Order is issued.

D. To initiate a Change Order, the Owner or Owner's Representative will forward a Change Order proposal request describing the proposed changes and if required, include additional or revised drawings and specifications soliciting a formal quotation of cost and time to complete the proposed Change Order work. Upon reaching mutual agreement on the cost and time, the Owner or Owner's Representative will sign his approval of the Change Order and submit it to the Contractor for his full signature of acceptance.

1.03 FIELD ORDERS

A. The Owner or Owner's Representative may, to avoid costly removal of, or alterations to, present on-going work, issue a Work Directive Change authorizing the Contractor to proceed, subject to later negotiation of the price of the change.

1.04 PRICE AGREEMENTS

A. Prices agreed upon to cover the Change Orders may be either by mutual acceptance of a lump sum or by unit prices or actual direct cost plus a percentage for overhead, profit and other expenses.

B. Work done by a subcontractor entitles the General Contractor a percentage of the sum of the actual direct cost, not including the subcontractor's overhead and profit.

C. Method for computing the cost of the change shall be based on the net additional increase. No overhead and profit shall be deducted from prices for changes deleting work.

D. The Change Order form documents shall indicate the net adjustment (+/-) to the total Contract price as a result thereof including extension or reduction of time when applicable.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for coordinating the various parts of Work under this Contract.

1.02 REQUIREMENTS

A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordinate completion and clean- up of Work of separate Sections in preparation for Substantial Completion.

C. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

D. Coordinate work with all utility companies necessary for completion of work under this contract.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

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SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Survey work and other field responsibilities of the Contractor.

1.02 REQUIREMENTS

A. The Contractor shall be responsible for layout of the work and the establishing of lines and grades.

B. Establish elevations, lines, levels, reference marks, batter boards, etc., required during the progress of the Work. Verify such marks by instrument to confirm accuracy.

C. Establish or locate and protect survey control and reference points.

D. Make, check, and be responsible for all measurements and dimensions necessary for the proper construction of the Work.

E. The Owner or Owner’s Representative will be permitted to check the lines, elevations, reference marks, batter boards, etc., set by the Contractor. The Contractor shall correct any errors found in lines, elevations, reference marks, batter boards, etc.. Such a check shall not be construed as approval of the Contractor's work and shall not relieve or diminish the responsibility of the Contractor for the accurate construction and completion of the Work.

F. Control datum for survey as shown on Drawings.

1.03 QUALITY ASSURANCE

A. Qualifications

1. Employ a Civil Engineer or Land Surveyor registered within the State of Rhode Island, acceptable to the Owner.

B. Certifications

1. Submit certificate signed by the Contractor’s Engineer or Land Surveyor stating elevations and locations of the Work are in conformance with the Contract Documents.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01067

STATE OF RHODE ISLAND AND FEDERAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. RHODE ISLAND SALES AND USE TAX
B. HISTORICAL ARTICLES
C. EXCERPTS FROM RHODE ISLAND LAWS
D. REQUIREMENTS FOR MINORITY BUSINESS ENTERPRISE, EQUAL OPPORTUNITY, AND NONDISCRIMINATION
E. ATTACHMENTS

1.02 RHODE ISLAND SALES AND USE TAX

A. Materials and equipment purchased for installation under this Contract are exempt from the Rhode Island Sales Tax. The Contractor shall file for exemption on behalf of the Owner, with the State of Rhode Island Department of Taxation as required by law. The exemption from the Sales Tax shall be taken into account by the Contractor during bidding.

1.03 HISTORICAL ARTICLES

A. During the life of this Contract, the Contractor is herewith required to immediately notify the following organizations in the event that any articles such as "charcoal," "bone," "shell," "cultural objects - fire cracked stones or stone flaking material" or any other such related items of historical significance are discovered.

1. Owner
2. Local Historical Society
3. Rhode Island Historical Commissioner
4. Owner’s Representative

1.04 EXCERPTS FROM RHODE ISLAND LAWS

A. The Contractor and each of his subcontractors shall especially note his obligations to comply with the following statues or excerpts therefrom and any current revisions thereof contained in the General Laws of Rhode Island.

B. These laws reflect changes made through the end of the 1992 legislative session. While every attempt at accuracy has been made, these are not certified true copies of these laws. The responsibility for compliance with all applicable provisions of Rhode Island laws relating to bidding, award, and performance of public works contracts is the Contractor’s. Certified true and complete copies of any Rhode Island laws and regulations may be obtained from the Office of the Rhode Island Secretary of State.

R.I.G.L.
Title, Chapter, Section EXCERPT

5-6-2 WORK FOR WHICH LICENSE REQUIRED

"No person, firm, or corporation shall enter into, engage in, or work at the business of installing wire, conduits, apparatus, fixtures and other appliances for carrying or using electricity for light, heat or other purpose, unless such person, firm or corporation shall have received a license and a certificate therefore, issued by the State Board of Examiners of Electricians."

28-26-6 LICENSE REQUIRED FOR OPERATION OF HOISTING MACHINERY - PUBLIC CONTRACTS

"No persons shall operate or be in direct charge of a hoisting or excavation gasoline, steam, diesel, electric or compressed air hoist, shovel, crane, excavator, of five horsepower or more without obtaining a license to do so as provided in this chapter. No user or agent of use of any such described steam, gasoline, diesel, electric or compressed air hoisting machinery shall permit it to be operated unless it is operated by a duly licensed person as hereinafter provided by this chapter.

Every contract in the construction of public works by the State, or by any City of Town, or by persons contracting therewith for such construction, shall contain a clause embodying the provisions of this section."

Chapter 116

From Chapter 116 of the General Laws of Rhode Island, 1938, relative to the conditions precedent, etc., to carrying on business within this State by foreign corporations:

"The certificate and power of attorney mentioned in the General Corporation Law, properly filled out, subscribed and sworn to, and accompanied by a certified copy of the Charter, articles of association or other similar organization papers, together with all amendments thereto, must be filed in the office of the Secretary of State by all foreign corporations intending to carry on business within this State, or for a foreign corporation to enforce in the courts of this State any contract made within the State."

Detailed information regarding Chapter 116 of the General Laws of Rhode Island, 1938, relative to the conditions precedent, etc., to carrying on business within this State for foreign corporations may be obtained from the Secretary of State, State House, Smith Street, Providence, Rhode Island.

Title 37 (chapters as provided at the end of this Specification Section.)

1.05 REQUIREMENTS FOR MINORITY BUSINESS ENTERPRISE, EQUAL OPPORTUNITY, AND NONDISCRIMINATION

A. Contracts for work under the bid (proposal) will obligate the contractors and subcontractors not to discriminate in employment practices.

B. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and the employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading, demotions, or transfers; recruitment or recruitment advertising, selection for training including apprenticeship; and participation in recreational and educational activities. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notice to be provided, setting forth the provisions of this non-discrimination clause. The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Contract so that such provisions will be binding upon each subcontractor and upon subcontractors for standard commercial supplies or raw materials.

C. The Contractor shall keep such records and submit such reports concerning the racial and ethnic origin of applicants for employment and employees as the Owner may require as consistent with Federal and State law.

D. The Contractor agrees to comply with such rules, regulations, or guidelines as the State of Rhode Island may issue to implement these requirements. The Contractor further warrants, that it will comply with, Title VI of the Civil rights Act of 1964, 42 U.S.C. 200d to d4.

E. Contractors shall comply with the provisions of the General Laws of Rhode Island and attention is called to Title 37, Chapter 13, Section 1-16, relative to the payment of wages, obligations and charges by Contractors on public works projects. Non-resident Contractors are subject to Section 44-1-6 of the RI General Laws, as amended, regarding OUT-OF- STATE CONTRACTORS.

F. The Contractor will be required to comply with Equal Opportunity for Public Works Projects for all employees on the job. It is the responsibility of contractors to inform themselves as to the local labor conditions, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustment of wage rates. Information is available at the Department of Labor.

G. The attention of the Contractor is directed to the fact that this Contract is subject to both Federal and State requirements regarding Minority Business Enterprises (MBE) and Woman's Business Enterprises (WBE) participation. The Contractor hereby agrees to ensure

compliance with all Federal and State MBE/WBE requirements to provide maximum opportunity for such participation.

H. The Contractor's attention is directed to the following Federal and State requirements contained in APPENDIX A of the bid documents.

I. The Contractor further agrees to ensure that minority business enterprises as defined in RIGL Section 37-14.1-3, shall have the maximum opportunity to participate in the performance of subcontracts performed under this Contract. The Contractor will take reasonable steps in accordance with regulations promulgated under Chapter 37-14.1 of the RIGL to ensure that minority business enterprises have the maximum opportunity to compete for and perform subcontracts under this Contract. DEPARTMENT OF ADMINISTRATION RI STATE EQUAL OPPORTUNITY OFFICE GENERAL CONTRACT COMPLIANCE CERTIFICATE AND AGREEMENT, Pages 1 through 6, are provided at the end of this Specification.

1.06 ATTACHMENTS

NOT USED

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reference material, abbreviations, and terms used in the Construction Documents and establishes edition dates and complete titles for standards referenced elsewhere in the Specifications.

1.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Obtain copies of standards when required by Contract Documents.

C. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.

D. Should a conflict exist between references in these Specifications, the State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda shall prevail. If a RIDOT Standard Specification is not available, the ASTM standard and/or manufacturer's specification shall prevail.

E. Should specified reference standards conflict with Contract Documents, request clarification from Owner or Owner's Representative before proceeding.

F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.03 SCHEDULE OF REFERENCES

AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480

AISI	American Iron and Steel Institute 25 Massachusetts Drive Washington, DC 20001
ANS	American National Standard
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036
API	American Petroleum Institute 1220 L Street, NW Washington, DC 20005
ASCE	American Society of Civil Owners 1801 Alexander Bell Drive Reston, VA 20191
ASME	American Society of Mechanical Owners Two Park Avenue New York, NY 10016-5990
ASPA	American Sod Producers Association 1855 A Hicks Road Rolling Meadows. IL 60008
ASTM	American Society for Testing and Materials 100 Bar Harbor Drive PO Box C700 West Conshohocken, PA 19428-2959
AWG	American or Brown and Sharpe Wire Gage
AWPA	American Wood-Preservers' Association 100 Chase Park South Birmingham, AL 35244-1851
AWS	American Welding Society
CS	Commercial Standard
EJCDC	Owners' Joint Contract Document Committee American Consulting Owners Council 1015 15th Street, N.W. Washington, DC 20005
Fed Spec.	Federal Specification General Services Administration Specification and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407

HMA	Hot Mix Asphalt
ICBO	International Conference of Building Officials 900 Montclair Road Birmingham, AL 35213-2298
JIC	Joint Industry Conference Standards
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171
NEMA	National Electrical Manufacturers' Association 1300 North 17th Street Arlington, VA 22209
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
Stl. WG	U.S. Steel Wire Washburn and Moen, American Steel and Wire or Roebling Gage
UL	Underwriters' Laboratories, Inc. 333 Pfingston Road Northbrook, IL 60062
USS Gage	United States Standard Gage
125-lb. ANS 250-lb. ANS	American National Standard for Cast-Iron Pipe Flanges and Flange Fittings, Designation B16.1-1975, for the appropriate class

1.04 EDITION DATES

A. Reference to publications and reference material shall be understood to mean the latest edition, unless stated otherwise.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

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SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for project meetings.

1.02 PRE-CONSTRUCTION CONFERENCE

A. The Owner or Owner's Representative will schedule and administer a pre-construction conference.

B. The pre-construction conference will be scheduled and administered within fourteen (14) calendar days after the dated "Notice to Proceed". The Contractor shall be prepared to address such topics as projected construction schedules, major personnel, critical work areas, construction facilities and shop drawing submittals.

1.03 PROGRESS MEETINGS

A. The Owner or Owner's Representative will schedule and administer progress meetings and specially called meetings throughout the duration of the Work at minimum monthly intervals.

B. The time and location of such meetings shall be designated by the Owner and shall be convenient for all parties involved.

C. The Owner or Owner's Representative will prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies to participants, and those affected by decisions made.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

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SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for submission of schedules and shop drawings.

1.02 PROGRESS SCHEDULE

A. Within fourteen (14) calendar days after execution of the Contract Documents, the Contractor shall submit to the Owner or Owner's Representative for review a construction progress schedule conforming to requirements specified. This schedule should show the proposed dates of commencement and completion of each of the various subdivisions of work required under this Contract and the anticipated monthly percentage of completion based on the total contract price. The Contractor shall be responsible for updating and/or revising this schedule whenever directed by the Owner or Owner's Representative throughout the duration of the Contract.

B. Special attention is directed to the requirement that the Contractor shall start the Work, as specified under this Contract, no later than thirty (30) calendar days after the execution of the Contract Documents, unless otherwise directed by the Owner. The Contractor shall comply with all pre-construction requirements as specified. The Owner reserves the right to delay the commencement of the Work or any part thereof if the specified requirements as determined by the Owner or Owner's Representative have not been satisfied. The Owner further reserves the right to limit or, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest and/or safety to do so.

C. The Contractor shall contact the appropriate authorities concerning any public or semi-public events that may occur during the construction period that may affect construction. The Contractor alone shall be responsible for arranging his construction sequence to conform to any restrictions these events may impose. No claims for extras will be allowed because of any delay, extra materials handling, extra excavation, etc. caused by the imposed restrictions. However, additional time may be granted for completion of the work to compensate for delays caused by said restrictions.

1.03 SHOP DRAWINGS

A. Submit digital PDFs of all shop and working drawings of concrete reinforcement and materials fabricated especially for the Contract, and materials and equipment for which such drawings are specifically requested.

B. A maximum of two (2) submittals of each shop drawing will be reviewed by the Owner or Owner's Representative. If more submittals are required due to the Contractor's neglect or failure to fulfill the requirements of the Contract plans and specifications, or to make corrections or modifications required by the Owner or Owner's Representative in the review of

the first two submittals, the Owner or Owner's Representative will review the submittal and the Contractor will be responsible for the cost of the review, as determined by the Owner based on the Owner's Representative documentation of time and rates for additional services established in the Agreement between the Owner and the Owner's Representative.

C. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When the dimensions are of particular importance, or when specified, the drawings shall be certified by the manufacturer or fabricator as correct for the Contract.

D. When so specified or if considered by the Owner or Owner's Representative to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted in place of shop and working drawings.

E. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings to eliminate delay to the Work due to the absence of such drawings. All shop and working drawings must be submitted to the Owner or Owner's Representative within thirty (30) calendar days prior to incorporation into the Work, unless otherwise permitted by the Owner or Owner's Representative. **Prior to the submittal of any shop drawings, the Contractor shall submit a schedule of proposed shop drawing transmittals.** The schedule shall identify the subject matter of each transmittal, the corresponding specification section number and the proposed date of submission. Prior to and during the progress of the Work the schedule shall be revised and resubmitted as requested by the Owner or Owner's Representative.

F. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

G. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which review is required.

H. All shop and working drawings shall be submitted to the Owner or Owner's Representative by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those which are made by changing existing standard shop and working drawings. All drawings shall be clearly marked with the names of the Owner, Contractor, and building, equipment, or structure to which the drawing applies, and shall be suitable numbered. Submitted shop drawings shall be accompanied by a letter of transmittal, completed by the Contractor as provided by the Owner or Owner's Representative.

I. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Owner or Owner's Representative, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and

indication of the Contractor's approval, and then shall be submitted to the Owner or Owner's Representative; other drawings shall be returned for correction.

J. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal.

K. The review of shop and working drawings by the Owner or Owner's Representative will be general only, and nothing contained in this Section shall relieve, diminish, or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance as specified. The Contractor shall be responsible for errors and omissions in shop drawings.

L. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires, appurtenances, or layouts etc., either existing or as detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do the work necessary to make such modifications.

M. The Contractor shall furnish additional copies of shop drawings or catalog cuts when so requested.

N. Expected submittals include but are not limited to:

1. Compost Filter Tube/ Erosion Controls
2. Line Striping Paint
3. Gravel Borrow
4. Crushed Stone
5. Bituminous Asphalt (Wearing/Base Course)
6. Concrete
7. Curbing
8. Loam
9. Planting Soil
10. Plant Material

PART 2 PRODUCTS

NOT USED

EXECUTION

NOT USED

END OF SECTION

SECTION 01310

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for computer generated Critical Path Method (CPM) construction scheduling and Narrative progress report.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01300-Submittals

1. Quality Assurance/Control Submittal
   a. Name and version of CPM software proposed for use.
   b. List of construction projects completed on which progress of work was controlled with CPM software.
2. Schedule
   a. Within **14 days** following the receipt of the Notice to Proceed, the Contractor shall submit **two** color copies of a computer-generated schedule and a list of activities to the Owner. Following review by the Owner's Representative and Owner the Contractor shall meet with the Owner and/or Owner's Representative to discuss the review. The Contractor shall incorporate the Owner or Owner's Representative's comments into the schedule and submit eight color copies of the revised schedule within 14 days following receipt of the Owner or Owner's Representative's comments.

PART 2 PRODUCTS

2.01 SOFTWARE

A. Computer based scheduling software used by the Contractor shall be the product of a recognized commercial computer software producer and shall be capable of meeting the requirements specified herein.

PART 3 EXECUTION

3.01 PREPARATION

A. General

1. The Contractor shall prepare his proposed CPM schedule based on a breakdown of work tasks that he has developed.
2. The construction schedule and updates shall be prepared by the Contractor or the Contractor's qualified consultant.

B. Schedule

1. Each schedule shall be prefaced with the following summary data:
   a. Contract name and number
   b. Contractor's Name
   c. Contract duration
   d. The effective or starting date of the schedule
   e. Revision date of the latest schedule.
2. The CPM schedule shall be sequenced by early start date and shall include the following minimum items:
   a. Activity Name
   b. Estimated duration
   c. Activity description
   d. Early start date (calendar date)
   e. Early finish date (calendar date)
   f. Latest allowable start date (calendar date)
   g. Latest allowable finish date (calendar date)
   h. Status (whether critical)
   i. Estimated cost of the activity
   j. Float (total and free)
   k. Major milestones
3. Separate milestones shall be included for Notice-to-Proceed and Project Completion Date.
4. Activities shall include major components of the work including submittals that might impact the critical path, subcontractor work, major and critical equipment design, fabrication, testing, delivery and installation times, system/subsystem/component testing, process and facility startup, training, demobilization, project cleanup and closeout. Critical portions of process instrumentation and control system work, shall be defined in detail in a sub schedule.
5. The sum of the costs assigned to the activities shall be equal to the Contract price. Activity costs shall not be assigned to submittals or submittal reviews. Comply with SECTION 01026-Schedule of Values. Provide a table showing the anticipated monthly percentage of completion, based on the total contract price.
6. Critical activities, predecessors, free float and total float shall be clearly displayed on the schedule in graphical form. Schedules that contain activities showing negative float or that extend beyond the contract completion date will not be approved.
7. Each schedule submittal shall also include a list of activities in the order in which the activities will be performed, along with activity durations, activity predecessors, type of predecessor (finish-start, finish-finish, start-start, lead/lag), and any dependency or required date.
8. The schedule shall be based on a standard 5-day work week with allowance for holidays and adverse weather.
9. Owner's or Owner's Representative's approval of the CPM schedule is advisory only and shall not relieve the Contractor of responsibility for accomplishing the work prior to the

contract completion date. Omissions and errors in the approved CPM schedule shall not excuse performance less than that required by the Contract. Approval by the Owner or Owner's Representative in no way makes the Owner and/or Owner's Representative an insurer of the CPM schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of approval by its agent, the Owner or Owner's Representative, of the CPM schedule.

C. Narrative Progress Report

1. Include as a minimum:
   a. Summary of work completed during the previous period (since submission of last narrative progress report).
   b. Explanation for variations between actual work completed in previous period and planned work as reported in last period.
   c. Summary of work planned during the next period.
   d. Current and anticipated delaying factors and their estimated impacts on other activities and milestones, both critical and non-critical.
   e. Corrective actions taken or proposed.
2. A Narrative Progress Report shall be submitted monthly to the Owner or Owner's Representative, at least 5 working days prior to the progress meeting.
3. At the discretion of the Owner or Owner's Representative, the Contractor may be required to submit a revised CPM schedule showing completion to date and any changes to the previous schedule.

3.02 MONITORING SCHEDULE

A. The CPM approved construction schedule shall be used by the Contractor throughout the duration of the project for planning, organizing, and directing the Work, and for reporting progress of the Work

B. The Contractor is solely responsible for monitoring schedule compliance. When a delay to the critical path occurs, the Contractor shall immediately notify the Owner or Owner's Representative in writing. Within one week of the notification, the Contractor shall submit for the Owner or Owner's Representative's approval, a description of proposed actions to return the project to schedule.

3.03 MODIFYING SCHEDULE

A. If the Contractor desires to make changes in his method of operating which affect the approved CPM schedule, he shall notify the Owner or Owner's Representative in writing stating what changes are proposed and the reason for the change. If the Owner or Owner's Representative approves these changes, the Contractor shall revise and submit for approval, without additional cost to the Owner, all of the affected portions of the CPM schedule.

B. It may be necessary for the contract schedule or completion time to be adjusted by the Owner to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the Owner or its representatives and other unforeseeable conditions which may indicate schedule adjustments or completion time extensions. Under such conditions, the Owner or Owner's Representative will direct the Contractor to reschedule the

work or contract completion time to reflect the changed conditions and the Contractor shall revise his schedule accordingly.

C. Float time is a project resource available to both the Contractor and the Owner to meet contract milestones and completion dates. Use of float suppression techniques such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and use of float time disclosed or implied by use of alternate float suppression techniques shall be shared to proportionate benefit of OWNER and CONTRACTOR.

D. If the Contractor provides an accepted schedule with an early completion date, the Owner reserves the right to reduce the Time of Completion to match the early completion date by issuing a deductive Change Order at no change in Contract Price.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for Contractor's quality control of products, suppliers, manufacturers, services, site conditions, and workmanship, to produce Work of specified quality.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Comply fully with manufacturers' instructions, including each step in sequence.

B. Should manufacturers' instructions conflict with Contract Documents, request clarification from Owner or Owner's Representative before proceeding.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified to be removed, clear area only after field sample has been accepted by the Owner or Owner's Representative.

1.04 CERTIFIED WELDERS

A. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required.

B. Pipe welds shall be made only by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the Owner or Owner's Representative before any work is performed.

C. Shop welding shall be in accordance with the "Code for Welding in Building Construction".

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Qualification, duties, and responsibilities of testing laboratories.
2. Coordination and scheduling responsibilities of the Contractor.

B. Related Sections

1. Section 01020 - Allowances
2. Section 01600 - Materials and Equipment

1.02 PAYMENT PROCEDURES

A. Initial Testing

1. The Contractor will pay for initial testing services required by the Owner’s, unless noted otherwise.

B. Retesting

1. When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.

C. Contractors Convenience Testing

1. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.04 REQUIREMENTS

A. Work included:

1. Cooperate with the Owner's selected testing agency and all others responsible or testing and inspecting the Work.
2. Provide other testing and inspecting as specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.
3. Where no testing requirements are described, but the Owner directs testing, the Contractor shall provide testing under the requirements of this Specification.

B. Work not included:

1. Selection of testing laboratory: The Owner will select a qualified independent testing laboratory.

1.05 QUALITY ASSURANCE

A. Qualifications

1. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Regulatory requirements

1. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.
2. Regulatory Requirements Inspections and tests required by codes or ordinances, or by a plan approved authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01600 - Materials and Equipment.

B. Promptly process and distribute, to the Owner’s Representative, required copies of test reports and instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

1.07 SCHEDULING

A. Establishing schedule

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
2. Provide all required time within the construction schedule.
3. Coordinate testing activity with the appropriate testing laboratory.

B. Revising schedule

1. When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule

1. When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests

1. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
2. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

END OF SECTION

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SECTION 01560

TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for cleaning, maintenance of the site, barriers and fences required during construction.

1.02 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various trade Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

1. Control accumulation of waste materials and rubbish; periodically dispose of off-site. Bear all costs, including fees resulting from disposal.
2. Clean interior areas prior to start/ finish work and maintain areas free of dust and other contaminants during finishing operations.
3. Maintain project in accordance with all local, State and Federal Regulatory Requirements.
4. Store volatile wastes in covered metal containers and remove from premises.
5. Prevent accumulation of wastes that create hazardous conditions.
6. Provide adequate ventilation during use of volatile or noxious substances.

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.
2. Do not dispose or 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.
4. Use only those materials which will not create hazards to health or property, and which will not damage surfaces.
5. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
6. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and wind-blown debris, resulting from construction operations.
7. Provide on-site containers for collection of waste materials, debris, and rubbish.
8. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal disposal areas off the construction site.
9. Handle material in a controlled manner with as little handling as possible. Do not drop or throw materials from heights.
10. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.
11. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall

be removed, and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

12. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, work done under this contract, or elsewhere during the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc. shall, upon completion of the work, be left in a clean and neat condition.

1.03 DUST CONTROL

A. Provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions or performance obligations of the General Contractor.

1.04 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts for clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Construct sediment control devices for discharge from dewatering trenches.

G. Construct all sedimentation control devices shown on the plans.

1.05 NOISE CONTROL

A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with Silencers, and power equipment with mufflers.
2. Manage vehicular traffic and scheduling to reduce noise.

1.06 POLLUTION CONTROL

A. Special care shall be taken to prevent contamination or muddying up or interfering in any way with the stream flows, if any along the line of work. No waste matter of any kind will be

allowed to discharge into the stream flows or impounded water of any pools or other bodies of water.

1.07 SURFACE WATER CONTROL

A. Take all precautions to prevent damage to the work or equipment by high waters or by storms. The Owner's Representative with the approval of the Owner may prohibit the carrying out of any work at any time when in his judgment, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress.

B. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Owner's Representative may require, at no additional expense to the Owner.

1.08 BARRIERS AND ENCLOSURES

A. Fences and Barricades

1. Provide and maintain temporary fences, barriers, lights, guardrails, and barricades as indicated in the Contract Documents, or as necessary to secure the Work and adjacent property and protect persons and property.
2. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate tasks requiring items mentioned herein.

B. Protection of Trees

1. The Contractor shall take care not to harm trees along the sides of roads or with in the existing facility in which the construction work is to be done or trees on adjacent lands except as indicated on the drawings or with the written permission of the Owner and any other owner of the trees involved. Care shall be taken not to cut tree roots so as to harm the growth of trees to remain.
2. If, in the opinion of the Owner's Representative, any trees damaged during construction can be repaired, the Contractor shall satisfactorily repair same at no further cost to the Owner.
3. If, in the opinion of the Owner's Representative, any tree damaged during construction cannot be repaired and should be removed, the Contractor shall satisfactorily remove and replace, in kind, same at no further cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

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SECTION 01580

PROJECT SIGNS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for fabricating and erecting Project signs

B. Related Sections

1. Section 01067 – State of Rhode Island and Federal Requirements

1.02 SEQUENCING

A. Signage to be in place prior to start of construction.

1.03 SUBMITTALS

A. Shop drawing shall be submitted for the Project Sign for approval by Owner before the manufacturing shall begin. The owner is allowed one set of changes and a second review for sign-off.

1. Design vendor will provide “Final Draft” text, typestyles, graphic elements, and layout for the park entrance sign.

B. Shop Drawings: Show fabrication and installation details for signs.

1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
2. Include fabrication and installation details and attachments to other work.
3. Owner is allowed changes to the sign fabrication drawings during the submittal process. This includes a second proof of the entire drawing package at no additional charge.

PART 2 PRODUCTS

2.01 PROJECT SIGN

A. Contractor shall furnish, install and maintain one (1) 4' x 8' single sided project sign. This sign shall be installed within seven (7) calendar days of the date of commencement in location to be selected by the Owner or Owner’s Representative.

B. Project sign shall be constructed out of a single sheet of 4' x 8' x 1/2" MDF, all sides painted white, with a single sheet of vinyl graphics applied to the board.

C. Secure sign to three 4” x 4” x 12' pressure-treated wood posts with tamper resistant fasteners. Locate as directed by Owner or Owner's representative and install no later than 7 days following notice to proceed.

D. Digital copy of the City Seal to be provided by Owner’s Representative in .JPG or similar high resolution digital format.

E. Metal Fasteners and Screws - All metal fasteners shall be heavy-duty stainless steel. All fasteners shall be tamper-resistant type fasteners. Provide shop drawings and / or samples of method of attachment of Project Sign.

F. Sign Graphic

1. Shall be supplied by the Owner.

PART 3 EXECUTION

3.01 INSTALLATION

A.

1. Fabricate, construct and install sign as indicated, using mounting methods and of types described and complying with applicable manufacturer's written instructions.
2. Install signs level, plumb, and at heights indicated, keep sign surfaces free of distortion and other defects in appearance.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

2.01 SUMMARY

A. Section Includes

1. Requirements for delivery, storage, handling and installation of systems, materials, manufactured units, equipment, components, and accessories used in the Work.

B. Related Sections

1. Section 01300 - Submittals

2.02 DELIVERY

A. Refer to Specifications' Sections for requirements pertaining to delivery and handling of materials and equipment.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' unopened containers or packaging, dry.

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

2.03 STORAGE AND PROTECTION

A. Refer to Specifications' Sections for requirements pertaining to storage and protection of materials and equipment.

B. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.

C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged and are maintained under required conditions.

2.04 INSTALLATION STANDARDS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Components required to be supplied in quantity within a Specification Section shall be the same and shall be interchangeable.

C. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

F. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01300 - Submittals, distribute copies to persons involved, and maintain one set in field office.

G. Perform work in accordance with details of instructions and specified requirements.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01700

CONTRACT CLOSE-OUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for specific administrative procedures, record keeping, close-out submittals, and forms used at substantial and final completion of the Work.

B. Contractor shall satisfy all administrative requirements within the Contract Documents and the Requirements listed in this section prior to Contract Close-out.

1.02 FINAL CLEANING

A. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

B. The Contractor shall restore or replace, when and as directed, any public or private property damage by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required, all necessary highway or driveway, walk and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

C. Unless otherwise specified under the various Sections of the Specifications, the Contract or shall perform final cleaning operations as herein specified prior to final inspection.

D. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

E. Cleaning shall include all surfaces, interior and exterior in which the Contractor and all Subcontractors have had access whether existing or new.

F. Refer to Sections of the Specifications for cleaning of specific products or work.

G. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

H. Use only those cleaning materials and methods that are recommended by the manufacturer of surfaces material to be cleaned.

I. Employ experienced workmen, or professional cleaners, for final cleaning operations.

1.03 PROJECT RECORD DOCUMENTS

A. Project Record Documents also referred here as Record Drawings shall consist of all the contract drawings.

B. The Contractor and all Subcontractors shall be required to maintain one set of Record Drawings, as the work relates to their Sections of the Specifications, at the site.

C. Record Drawings shall be stored and maintained by the General Contractor. The Record Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. Record Drawings shall be available at all time for inspection by the Owner. All deficiencies noted shall be promptly corrected.

E. The following information shall be indicated on the Record Drawings for building construction:

1. Record all changes, including change orders, in the location, size, number, and type both horizontally and vertically of all elements of the projects which deviate from those indicated on all the contract drawings.
2. The tolerance for the actual location of utilities and appurtenances within the building to be marked on the Record Drawings shall be plus or minus two (2) inches.
3. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) ft. intervals and at all changes of direction.
4. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, clean outs, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps and maintenance devices. The location of these internal utilities, appurtenances and devices shall be shown by offsets to the column grid lines on the drawings.
5. Each of the utilities and appurtenances shall be referenced by showing a tag number, area served and function on the Record Drawings.
6. Prior to the installation of all finish materials, a review of the Record Drawings shall be made to confirm that all changes have been recorded. All costs to investigate such conditions shall be borne by the applicable party as demonstrated by the Owner.

F. At the end of each month and before payment for materials installed, the Contractor, and his Subcontractors, shall review Record Drawings for purpose of payment. If the changes in location of all installed elements are not shown on the Record Drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

G. At the completion of the contract, each Subcontractor shall submit to the Contractor a complete set of his respective Record Drawings indicating all changes. After checking the above drawings, the Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the Record Drawings to the Owner.

1.04 WARRANTIES

A. Comply with requirements of Section 01740 Warranties.

1.05 FINAL INSPECTION

A. The Contractor shall submit written certification that:

1. Project has been inspected for compliance with Contract Documents.
2. Equipment and systems have been tested in the presence of the manufacturer's representative and are operational and satisfactory.
3. Project is completed, and ready for final inspection.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01740

WARRANTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1.02 SUBMITTALS

A. Submit written warranties to the Owner prior to the date fixed for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than a date of Substantial Completion for the Work, or a designed portion of the Work, submit written warranties upon request of the Owner.

B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner prior to acceptance of this portion of the Work.

C. Refer to individual Sections for specific content requirements, and particular requirements for submittal of special warranties.

1.03 WARRANTY REQUIREMENT

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.

F. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.04 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01800

MAINTENANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for maintaining work completed under this Contract.

1.02 MAINTENANCE PERIOD

A. The general maintenance period for all construction or materials under this Contract shall be one (1) year subsequent to the date of the acceptance of the work by the Owner, or as provided by other sections of this Specification.

B. If the Owner puts any structure or equipment to use prior to acceptance of all work under the Contract, the maintenance period for such structures or equipment shall be calculated from the time use begins.

C. Contractor agrees to replace the material which does not conform to the Contract requirements, and to repair any damage of material or work without cost to the Owner, to satisfaction of Owner, in conformance with Contract Documents provided orders for replacement and/or repairs are received in writing by the Contractor within the one year period.

D. This Section shall in no way limit the duration of the Contractor's responsibility for the correction of any defect due to workmanship or materials provided by the Contractor which are not in compliance with the Contract Documents.

1.03 ABUSE OF WORK

A. Contractor is not obligated to perform work of replacement or repair that they may prove is required because of abuse by parties other than the Contractor, after the date the Owner puts to continuous use the work requiring replacements or repair, or after date the Owner has approved the Certificate of Completion.

1.04 EMERGENCY REPAIRS

A. If the Owner deems necessary, the Owner shall order replacement or repairs be undertaken within 24 hours.

B. If the Contractor delays or fails to make the ordered replacement or repairs within the time specified, the Owner shall have the right to make such replacements or repairs and the expense shall be deducted from moneys due the Contractor, or moneys of the Contractor retained by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02050

DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for demolition of existing facilities and removal of equipment and materials for reuse or salvage.

1.02 SUBMITTALS

A. Shop Drawings

1. In accordance with Specification SECTION 01300 1.03 Shop Drawings.
2. Schedule of demolition included in and consistent with requirements of Specification SECTION 01300 1.02 Progress Schedules and SECTION 01310 Construction Progress Schedule.

B. Quality Assurance/Control Submittals

1. Methods of demolition and equipment proposed for use in demolition
2. Copies of Permits required for demolition.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Equipment Salvage and Reuse

1. Do not remove equipment or materials without approval of Owner.
2. Properly store and maintain equipment and materials to be reused in the Work.

3.02 SEQUENCE

A. Sequence for demolition and site preparation shall be coordinated during the Pre-Construction Meeting.

3.03 SAFETY

A. Protect persons and property throughout progress of work.

B. Burning of demolition debris not permitted on or near site.

C. Explosives not to be used or brought to site without prior written permission by Owner.

D. Provide and maintain temporary passageways for safe access within area of demolition operation.

E. Take precautions to minimize spread of dust and flying particles. Keep work area wet down to prevent dust from rising.

F. Provide maximum practical protection from inclement weather to materials, equipment, and personnel in partially dismantled structures.

3.04 DEMOLITION

A. Confine demolition work, new construction and operations to areas that will not interfere with continued use and operation of entire site.

B. On exposed surfaces, where there will be in the finish work a joint between old and new concrete, the existing concrete at the face shall be removed to a straight rather than a rough line.

3.05 REPAIR/RESTORATION

A. The Contractor shall exercise extreme caution when removing existing play structures and equipment walls that are to be utilized as part of the new construction. Over-excavated areas and material shall be replaced at the Contractor's expense and to the satisfaction of the Owner. Any damage to the existing bituminous concrete (HMA), play structures, or site amenities caused by the Contractor's operations shall be satisfactorily repaired at the Contractor's expense.

3.06 DISPOSAL

A. All mechanical equipment, including interior piping, valves and other appurtenances indicated on the drawings or specified and directed by Owner to be demolished or removed will be removed from the property of the Owner immediately after disassembly and will become the property of the Contractor. The Owner reserves the right to remove any equipment or piping prior to signing of the agreement.

B. Debris from structures, including concrete, masonry, steel or other rubble shall become the property of the Contractor, unless otherwise directed by the Owner, and shall be promptly removed from site at the Contractor's expense.

3.07 CLEANING

A. Leave affected areas of demolition in a clean, safe and orderly condition, ready to accept new work if proposed.

END OF SECTION

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SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for removal of vegetation, topsoil and amenities at the site.

1.02 DEFINITIONS

A. Clearing: Removal of trash, vegetation, or organic matter alive or dead.

B. Grubbing: Removal of vegetation including stumps, buried logs and roots.

C. Scalping: Removal of grass turf to a depth of 3 inches.

D. Stripping: Removal of topsoil after scalping operation is complete.

1.03 QUALITY ASSURANCE

A. Obtain Owner or Owner's Representative's approval of staked work limits prior to starting the clearing, grubbing, and stripping.

1.04 PROJECT/SITE CONDITIONS

A. Environmental Requirements

   A. Install erosion and sediment controls prior to starting the Work.

B. Existing Conditions

   A. Temporarily remove property improvements, to the minimum extent necessary, to complete the work and restore improvements to condition which existed prior to construction.

   B. Prior to the start of construction, coordinate construction access with Owner and/or Owner's representative. Site shall be accessed from Point Avenue.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Chips from cleared trees and brush.

2.02 COMPOST FILTER TUBE

A. Compost Filter Tube size shall be 12" diameter and conform to the plans and details.

B. Filter Tube 'sock' shall be bio-degradable, tubular, knitted mesh containing the media.

C. The compost media shall be approximately 70% partially decomposed wood chips.

D. The compost media shall be approximately 30% weed-free compost.

A. 100% of the media shall pass 2" sieve, with 30% passing 3/8" sieve.

2.03 CATCH BASIN SEDIMENT CONTROL DEVICE – SILT SACK

A. The silt sack for catch basin sediment control shall be manufactured of ultra-violet light stable, durable woven polypropylene fabric.

B. The erosion control shall be designed to collect sediment and debris while allowing water to pass through and enter the storm drainage system. The fabric shall be rated for a minimum flow rate of 150 gpm.

PART 3 EXECUTION

3.01 PROTECTION

A. Do not cut or injure any trees or other vegetation outside the limits of disturbance, as indicated on the drawings.

B. Trees, shrubbery, or planting shall not be removed except with the written approval of the Owner or Owner's Representative.

C. Preserve certain vegetation such as trees, shrubs, hedges, and plants within the construction area, as indicated on the drawings to be protected.

D. Work In Improved Property

A. Protect trees, cultivated hedges, lawns, shrubs, and plants that might be damaged by the Contractor's operations.

B. Temporarily replant and care for trees less than 4 inches in diameter that would be damaged by the construction operation. After the construction operations have been substantially completed, replant in their original positions and care for until growth is reestablished. If trees, cultivated hedges, lawns, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced at the Contractor's expense by items of kind and quality existing at the start of the work.

C. Do such handwork as may be required to prevent damage to buildings and improvements.

D. Protect fences and stone walls and if needed to be removed to facilitate construction or if damaged, upon completion of the work, properly restore or repair to at least as good condition as existed prior to start of the work.

3.02 CLEARING

A. Cut or remove all trees, saplings, brush, and vines, windfalls, logs, and trees lying on the ground, dead trees, and stumps more than 1 foot high above the ground surface.

B. Except where clearing is done by uprooting with machinery or where stumps are left longer to facilitate subsequent grubbing operations, trees, stumps, and the stubs to be cleared shall be cut as close to the ground surface as practicable, but no more than 6-inches above the ground surface in the case of small trees, and 12-inches in the case of larger trees. Saplings, brush, and vines shall be cut off close to the ground.

C. Selective Trimming

A. Cut back limbs and branches of trees to be preserved only to the extent necessary for construction.

B. Trim neatly, and cleanly so that the remaining tree will not be damaged, and healing will be facilitated. Where limbs and branches over 1 inch in diameter have been cut, the newly cut area of the tree shall be given a thorough application of approved tree-healing paint.

D. Salvaged Wood

A. Logs, timber and other wood removed in the course of clearing found to be acceptable, as determined solely by the Owner or Owner's Representative, shall remain the property of the applicable private property owner or the Owner, unless otherwise directed by the Owner or Owner's Representative.

B. Cut logs, timber and other wood in 4-foot lengths and stack, as directed by the Owner or Owner's Representative.

C. Prior to the final completion of the contract, all unclaimed logs, timber, and other wood previously cut and stacked shall be removed from the site and properly disposed of by the Contractor at no additional cost to the Owner.

E. Chips from Cleared Wood and Brush

A. Stockpile for future use on cleared easements as indicated on the Drawings.

B. Spread at locations shown on the drawings once work is substantially complete.

C. If the wood chips from the cleared wood are not of sufficient amount, the Contractor at his own expense shall furnish the required amount to provide a minimum thickness as shown on the Contract Drawings.

D. Elm wood and elm bark shall not be used as chips for ground cover.

3.03 GRUBBING

A. Remove completely all stumps.

B. Remove to a depth of 12-inches all roots larger than 3-inches in diameter.

C. Remove to a depth of 6-inches all roots larger than 1/2-inches in diameter.

D. Measure depths from the existing ground surface or the proposed finished grade, whichever is the lower.

3.04 STRIPPING

A. Strip topsoil, loam, and unsuitable earth from the ground surface in areas cleared and grubbed.

B. Topsoil shall be stockpiled on site for re-use. No topsoil or loam shall be exported off-site.

C. Utilize topsoil and loam, where possible, for finished surfacing.

D. Dispose of unsuitable materials off site at authorized disposal location.

3.05 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

A. Dispose of cleared and grubbed materials off site at authorized disposal location.

B. Such disposal shall be carried on as promptly as possible after removal of material in the clearing and grubbing operations and shall not be left until the final period of cleaning up.

C. Elm bark whether stripped from the wood or intact with the wood shall be either buried at least 1 ft. below grade in approved dumping areas or burned in a suitable incinerator off-site with satisfactory anti pollution and fire prevention controls to prevent the spread of Dutch Elm Disease.

END OF SECTION

SECTION 02115

TREE PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for furnishing and placing standardized snow fencing or construction fencing for tree protection, at locations shown as indicated on the Plans or as directed by the Owner or Owner's Representative, all in accordance with these Specifications.

1.02 REFERENCES

A. State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.

1.03 SUBMITTALS

A. Shop Drawings

1. Provide Material Specifications and Manufacturer's Data Sheets.

1.04 QUALITY ASSURANCE

A. Field Samples

1. The attention of the Contractor is directed to the fact that all materials furnished by the Contractor to be incorporated into the Work shall be subject to the inspection of the Owner or Owner's Representative. The Owner or Owner's Representative shall be the sole judge as to the acceptability of proposed materials and said judgement shall be final, conclusive, and binding.

PART 2 PRODUCTS

2.01 MATERIALS

A. DRIP-LINE TREE PROTECTION

1. Shall be in accordance with the State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.
2. Shall be standardized snow fencing or construction fencing and standard steel posts a minimum of 8 feet in length.
3. Owner's Representative may elect to sample material supplied at the source.

PART 3 EXECUTION

3.01 INSTALLATION

A. Drip-Line Tree Protection

1. The Tree Protection shall be placed around the tree in a circumferential manner as indicated on the Plans. It securely erected and be vertically plumb. The Tree Protection shall not be secured to the tree in any manner. At no time shall restraining lines be secured to the tree or to surrounding vegetative growth. The Tree Protection shall be removed when all mechanical work within the project areas has been completed and approved. Removal of the fence shall be approved by the Owner or Owner's Representative.

END OF SECTION

SECTION 02200

EARTH EXCAVATION, BACKFILL, FILL AND GRADING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for; excavating in earth for trenches and structures; backfilling excavations; furnishing necessary material; compaction; constructing embankments and fills; miscellaneous earth excavations and miscellaneous grading.

B. Related Sections

1. Section 01410 - Testing Laboratory Services
2. Section 02215 - Aggregate Materials

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM).

1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

1.03 QUALITY ASSURANCE

A. Field Samples

1. Provide samples of materials as requested by the Owner or Owner's Representative, to the Quality Control Owner or Owner's Representative hired by the Owner, prior to delivery of materials on site, in order to facilitate field testing of compaction operations and material properties.

1.04 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. There may be pipes, drains, and other utilities in locations not indicated on drawings, no attempt has been made to show all services, and completeness or accuracy of information given is not guaranteed.

1.05 MAINTENANCE

A. Maintain all work in accordance with SECTION 01800.

PART 2 PRODUCTS

2.01 MATERIALS

A. Suitable Aggregate

1. The nature of materials will govern both acceptability for backfill and methods best suited for placement and compaction.
2. All material whether from excavations or from borrow pits, after being placed and properly compact, will make a dense stable fill and containing no vegetation, masses of roots, individual roots more than 18 inches long, or more than 1/2 inch in diameter, stones over 6 inches in diameter, or porous matter.
3. Organic matter to be well distributed and not to exceed minor quantities.

B. Trench and Excavation Backfill

1. In general, and unless other material is indicated on drawings or specified, material used for backfilling trenches and excavations shall be suitable material which was removed in the course of making the construction excavations. If sufficient suitable material is not available from the excavations, the backfill material shall be crushed stone, gravel borrow or select borrow as directed by the Owner or Owner's Representative, in according to respective Specification Sections.

C. Structure Backfill

1. Unless otherwise indicated or specified, all fill and backfill under structures and pavement adjacent to structures shall be compacted gravel borrow containing not more than 10 percent material passing a 200 sieve. When coarse aggregate and fine aggregate are indicated or specified for use under structures, they shall conform to the requirements for coarse and fine aggregate specified in SECTION 03300.

D. Filling and Embankment Backfill

1. Suitable selected materials available from the excavations and not required for backfill around pipes or against structures may be used for filling and building embankments, except as otherwise specified. Material needed in addition to that available from construction operations shall be obtained from suitable gravel banks or other suitable deposits. The Contractor shall furnish, at his own expense, all borrow material needed on the work.

E. Additional materials

1. Crushed stone: In accordance with SECTION 02215.
2. Gravel borrow: In accordance with SECTION 02215.
3. Select borrow: In accordance with SECTION 02215.

2.02 EQUIPMENT

A. Well Points

1. Designed to drain soil and prevent saturated soil from flowing into excavation.

B. Pumping Units

1. Designed for use with the wellpoints, capable of maintaining a high vacuum and, handling large volumes of air and water at the same time.

C. Underdrain Pipe

1. HDPE pipe enclosed in crushed stone encased in filter fabric.
2. Sewer pipe of quality know as "seconds".

2.03 SOURCE QUALITY CONTROL

A. Provide Owner or Owner's Representative with access to location of off site sources of materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Contractor shall verify all existing utilities and facilities prior to excavation.

3.02 PROTECTION

A. Utilities

1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Owner or Owner's Representative decides must be preserved in place without being temporarily or permanently relocated.
2. Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

B. Trees

1. Tree Protection shall be in accordance with Section 02115 – Tree Protection.

C. Plantings

1. Protect by suitable means or temporarily replant and maintain cultivated hedges, shrubs, and plants which may be injured by the Contractor's operations

2. Replant in their original positions and care for until growth is re-established, once the construction operations have been substantially completed.
3. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to which existed prior to the start of the Work.

D. Paved surfaces

1. Do not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels shaped as to cut or injure paved surfaces.
2. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to which existed prior to start of the Work.
3. Suitable materials and methods shall be used for such restoration.

3.03 PREPARATION

A. Pavement Removal

1. Remove only existing pavement as necessary for the prosecution of the work.
2. Owner or Owner's Representative may require that pavement be cut with pneumatic tools or saws without extra compensation to Contractor, where in the opinion of the Owner or Owner's Representative it is necessary to prevent damage to the remaining road surface.
3. Dispose large of pieces of broken pavement before proceeding with excavation.

B. Top Soil Removal

1. From areas which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated. Top soil removal and stockpiling shall be coordinate with Section – 02100 Site Preparation.

C. Subgrade

1. Remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas where embankments will be built or material will be placed for grading.
2. Shape as indicated on the drawings and prepare by forking, furrowing, or plowing to bond first layer of the new material placed.

3.04 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES

A. The structures to which the provisions of this article apply include pipes, wires, and other structures which meet all of the following:

1. Are not indicated on the drawings or otherwise provided for.
2. Encroach upon or are encountered near and substantially parallel to the edge of the excavation.
3. In the opinion of the Owner or Owner's Representative will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

B. In removing existing pipes or other structures, the Contractor should use care to avoid damage to materials, and the Owner or Owner's Representative shall include for payment

only those new materials which, in his judgment, are necessary to replace those unavoidably damaged.

C. Whenever the Contractor encounters certain existing structures as described above and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed to change the location of, remove and later restore, or replace such structures, or to assist the Owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.

D. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to a condition which existed prior to the start of the Work, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.05 SHEETING AND BRACING

A. Furnish, put in place, and maintain such sheeting, bracing, etc., as necessary to support the sides of the excavation and to prevent any movement of earth which could in any way diminish the width of the excavation to less than that necessary for proper construction, or could otherwise injure or delay the work, or endanger adjacent structures.

B. Whenever possible, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside of the sheeting, but, if voids occur, they shall be filled immediately with sand and compacted.

C. Leave in place to be embedded in the backfill, or concrete, all sheeting, bracing, etc., which is indicated on the drawings to be left in place. Leave in place any and all other sheeting, bracing, etc., which the Owner or Owner’s Representative may direct to leave in place, at any time during the progress of the work, for the purpose of preventing injury to structures or property.

D. The Owner or Owner’s Representative may direct that sheeting and bracing to be left in place be cut off at any specified elevation.

E. All sheeting and bracing not to be left in place shall be carefully removed in such manner as not to endanger the construction or other structures. All voids left or caused by the withdrawal of sheeting shall be backfilled immediately using suitable materials and compaction methods.

3.06 DEWATERING

A. Ensure proper conditions at all times during construction, provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdowns) to intercept and/or remove promptly and dispose properly all water entering trenches and other excavations. Keep excavations dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged.

B. Dispose of all water pumped or drained from the work in a suitable manner without undue interference with other work, damage to pavements, other surfaces, or property. Provide suitable temporary pipes, flumes, or channels for water that may flow along or across the site of the work.

C. Provide adequate sedimentation and/or erosion control methods at all times to ensure soil stabilization and protection of surrounding areas including any designated wetlands and/or waterways encountered.

D. Underdrains

1. Temporary underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding gravel.
2. Underdrains, if used, shall be laid at a suitable distance below the bottom of the normal excavation and with open joints wrapped in cheesecloth or filter fabric approved by the Owner or Owner's Representative, and entirely surrounded by graded gravel, or crushed stone to prevent the admission of sand or other soil into the underdrains. The distance between the bottom of the pipe or structure and the top of the bell of the underdrain pipe shall be at least 3 in. unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled with graded gravel or crushed stone which shall be rammed if necessary and left with a surface suitable for laying the pipe or building the structure.

E. Drainage Wellpoint System

1. If necessary, dewater the excavations by means of an efficient drainage wellpoint system which will drain the soil and prevent saturated soil from flowing into the excavation.
2. The installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work which is necessary for the wellpoint system to operate for the successful dewatering of the excavations.

3.07 EXCAVATION

A. Execute operation of dewatering, sheeting, and bracing without undermining or disturbing foundations of existing structures or of work previously completed under this contract.

B. Excavate to widths that provide suitable room for:

1. Installing footings per the Drawings and these Specifications.
2. Placing all sheeting, bracing, and supports.

C. Render bottom of excavations firm, dry and acceptable in all respects.

D. Do not plow, scrap or dig by machinery, earth at finished subgrade which results in disturbance of material below subgrade, unless indicated or specified, and remove with pick and shovel, last of material to be excavated, just before placing pipe, masonry or other structure.

E. Make all excavations in open, except as otherwise specified or permitted.

F. Excavation Near Existing Facilities

1. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools. Such manual excavation when incidental to normal excavation shall be included in the work to be done under items involving normal excavation.

G. Unauthorized Excavation

1. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted gravel borrow.

H. Unsuitable Material

1. If material unsuitable for foundations or footings (in the opinion of the Owner or Owner's Representative) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted, crushed stone, gravel borrow, fine aggregate or concrete as directed.

3.08 TRENCHING

A. Trench Excavation

1. Where pipe is to be laid in specified bedding material or concrete cradle, the trench may be excavated by machinery to, or to just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed.
2. Where pipe is to be laid directly on the trench bottom, the lower part of trenches in earth shall not be excavated to subgrade by machinery, but, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom.

B. Depth of Trench

1. Excavate trench to depths permitting the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.

C. Width of Trench

1. Excavate trench as narrow as practicable and do not widen by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.
2. Excavate trenches with approximately vertical sides between the elevation of the center of the pipe and an elevation 1 ft. above the top of the pipe.

D. Trench Excavation In Fill

1. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least 1 ft. above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall then be excavated as though in undisturbed material.

E. Length of trench open at any one time will be controlled by conditions, subject to any limits that may be prescribed by Owner or Owner's Representative.

3.09 BACKFILLING

A. General

1. Frozen material shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed or shall be otherwise treated as required, before new backfill is placed.

B. Fill And Backfill Under Structures

1. The fill and backfill materials shall be placed in layers not exceeding 6 in. in thickness. Unless otherwise indicated or specified, each layer shall be compacted to 95 percent in accordance with ASTM D1557.

C. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion. The best of the excavated materials shall be used in backfilling within 2 ft. of the structure. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.
2. The material shall be placed and compacted to 90 percent in accordance with ASTM D1557 unless otherwise indicated or specified.

D. Placing and Compacting Embankment Material

1. After the subgrade has been prepared as hereinbefore specified, the material shall be placed thereon and built up in successive layers until it has reached the required elevation.
2. Layers shall not exceed 12 in. in thickness before compaction. In embankments at structures, the layers shall have a slight downward slope away from the structure; in other embankments the layers shall have a slight downward slope away from the center. In general, the finer and less pervious materials shall be placed against the structures or in the center, and the coarser and more pervious materials, upon the outer parts of embankments.
3. Each layer of material shall be compacted by the use of approved rollers or other approved means so as to secure a dense, stable, and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.
4. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.

5. The portion of embankments constructed below proposed structures shall be compacted to 95 percent in accordance with ASTM D1557. The top 2 ft. of an embankment below a pavement base shall be compacted to 95 percent. All other embankments shall be compacted to 90 percent in accordance with ASTM D1557.

3.10 METHODS OF COMPACTION

A. Water-Jetting

1. Saturate backfill material throughout its full depth and at frequent intervals across and along the trench until all slumping ceases.
2. Furnish one or more jet pipes, each of sufficient length to reach the specified depth and of sufficient diameter (not less than 1-1/4 in.) to supply an adequate flow of water to compact the material.
3. Equip jet pipe with a quick-acting valve, supply water through a fire hose from a hydrant or a pump having adequate pressure and capacity to achieve the required results.

B. Tamping and Rolling

1. Deposit backfill material and spread in uniform, parallel layers not exceeding 8 in. thick before compaction. Before the next layer is placed, each layer shall be tamped to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar power equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting.
2. If necessary to ensure proper compaction by tamping (or rolling), the backfill material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

C. Miscellaneous Requirements.

1. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only suitable quantities of stones and rock fragments shall be used in the backfill; the Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.
2. All voids left by the removal of sheeting shall be completely backfilled with suitable materials, and thoroughly compacted.

3.11 DISPOSAL OF SURPLUS EXCAVATED MATERIALS

A. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or permitted by the Owner or Owner's Representative.

B. Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes within a haul of 1 mile from the point of excavation; all as directed or permitted and without additional compensation.

C. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

D. All excess materials deemed “suitable” by the Owner’s Representative are the property of the Owner. The Contractor shall place these materials at a location specified by the Owner within the confines of the area designed on the Drawings or to an off-site location designated by the Owner. The materials shall be placed in a manner that utilizes the available space efficiently and to the satisfaction of the Owner. Reworking the dumped materials to efficiently use stockpile area is considered incidental to the contract and no separate payment will be made.

3.12 DISPOSAL OF SPECIAL WASTES

A. The Contractor's attention is directed to the requirements set forth by the State of Rhode Island, Department of Environmental Management, (RIDEM) regarding "Special Hazardous Wastes" and the proper disposal thereof. All waste materials and debris, as designated by the Owner and/or Owner’s Representative, including but not limited to any sewers, storm drains, catch basins, and combined system pipelines and associated structures, or any portions thereof, including but not limited to sludge, grit, sediment, dirt, sand, rock, grease, roots and other liquid, solid or semi-solid materials contained therein, shall be considered "Type 5 - Rhode Island Special Hazardous Waste (005)" In addition, any excavated soils contaminated in any manner, as designated by the Owner and/or Owner’s Representative, shall also fall under this category and shall be handled the same. When so encountered, all such materials and debris shall be removed to the extent so ordered by the Owner or Owner’s Representative and properly disposed of in strict compliance with the requirements of the RIDEM, Division of Waste Management, Rules and Regulations for Hazardous Waste Management, amended 4/19/92. and other regulating authorities to an approved and certified waste disposal site. It shall remain the sole responsibility of the Contractor to apply for and obtain all required permits, bonds and/or insurance relative to such disposal. The Contractor shall also pay all costs associated with the disposal, required permits, bonds and insurance with no additional expense to the Owner. All handling of such "Special Hazardous Waste" shall be done in strict compliance with the RIDEM requirements and/or any other federal, state or local agency having jurisdiction or authority over the same. Under no circumstances shall sewage, solids or other "Special Hazardous Wastes" removed from the sewer lines be dumped or spilled onto the streets or into ditches, catch basins or storm drains. The Contractor must use watertight and State approved vehicles in transporting any wastes as hereinbefore designated.

B. The Contractor shall indemnify and save harmless the Owner and Owner’s Representative and all persons acting for or on behalf of the Owner and Owner’s Representative from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorney's fees and penalties, arising from the improper handling, transportation or disposal of

"Special Hazardous Wastes" as determined by the RIDEM and/or any other federal, state or local agency having jurisdiction or authority over the same.

3.13 DUST CONTROL

A. During the progress of the Work, maintain the area of activities, by sweeping and sprinkling of streets to minimize the creation and dispersion of dust. If the Owner or Owner's Representative decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed.

3.14 FIELD QUALITY CONTROL

A. Site Tests

1. In accordance with SECTION 01410

3.15 CARE AND RESTORATION OF PROPERTY

A. Restoration of existing property or structures done as promptly as practicable and not left until the end of the construction period.

END OF SECTION

SECTION 02215

AGGREGATE MATERIALS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for furnishing and placing materials, which include Crushed Stone, Gravel Borrow and Select Borrow.
2. Location of specified materials as detailed on the Drawings or as directed by the Owner for excavation below normal depth, utility support, replacement of unsuitable material or elsewhere, as ordered.

B. Related Sections

1. Section 02200 - Earth Excavation, Backfill, Fill and Grading.
2. Section 02500 – HMA Pavement

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO).

1. T11, Amount of Material Finer than 0.075 mm Sieve in Aggregate
2. T27, Sieve Analysis of Fine and Coarse Aggregates.

B. American Society for Testing and Materials (ASTM).

1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

1.03 DEFINITIONS

A. The term Screened Gravel as used in the Contract Documents shall mean Crushed Stone.

1.04 SUBMITTALS

A. Shop Drawings

1. Provide sieve analysis when gradation requirements are given in the Specifications or details.

B. Samples

1. Furnish representative sample including location of source with Shop Drawing transmittal sheet.

1.05 QUALITY ASSURANCE

A. Field Samples

1. The attention of the Contractor is directed to the fact that under Specification SECTION 00500, 1.03 Materials and Equipment, all materials furnished by the Contractor to be incorporated into the Work shall be subject to the inspection of the Owner. The owner shall be the sole judge as to the acceptability of proposed materials and said judgement shall be final, conclusive, and binding.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection

1. In accordance with Specification SECTION 00500, 1.03 Materials and Equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Crushed Stone

1. Crushed Stone shall conform to the State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.
2. Clean, hard, and durable particles or fragments, free from dirt, vegetation, or other objectionable matter, and free from an excess of soft, thin elongated, laminated, or disintegrated pieces.
3. Screened Stone of similar size and grading to this specification may be used instead of Crushed Stone.

B. Gravel Borrow

1. Gravel Borrow shall conform to the State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.
2. Granular material well graded from fine to coarse with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
3. Gravel shall not contain vegetation, masses of roots, or individual roots more than 18 inches long or more than 1/2 inches in diameter.
4. Gravel shall be substantially free from loam and other organic matter, clay and other fine or harmful substances.
5. Gradation requirements for gravel shall be determined by AASHTO-T11 and T27 and conform to the following:

Sieve	Percent Passing
1/2 inch	60-95
No. 4	50-85
No. 50	8-28
No. 200	0-8

C. Select Borrow

1. Use inorganic natural soils and/or rock, having not more than 8 percent by weight passing the No. 200 sieve and having a maximum stone size no greater than 6-inches.

2. Use only material well-graded throughout entire size range, free of roots, leaves and other organic material, ice or frost and aggregations of frozen soil particles.
3. Moisture content to be within plus minus 3 percent optimum at the borrow source.
4. Material must meet compaction requirements indicated or as specified.

D. Gravel Base Course

1. In accordance with SECTION 02500.

E. Angular Trap Rock

1. Granular material with a min. size of 2", obtained from approved natural deposits and unprocessed except for the removal of unacceptable material.
2. Angular trap rock shall not contain vegetation, masses of roots, or individual roots more than 18 inches long or more than 1/2 inches in diameter.
3. Angular trap rock shall be substantially free from loam and other organic matter, clay and other fine or harmful substances.

2.02 SOURCE QUALITY CONTROL

A. Test, Inspection

1. Owner may elect to sample material supplied at the source.
2. Assist the Owner and/or personnel from the designated testing laboratory in obtaining samples.

PART 3 EXECUTION

3.01 INSTALLATION

A. Crushed Stone

1. Spread in layers of uniform thickness not greater than 6 inches.
2. Compact thoroughly by means of a suitable vibrator or mechanical tamper.

B. Gravel Borrow

1. Spread in layers of uniform thickness not exceeding 12 inches before compaction and moistened or allowed to dry as directed.
2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment.
3. Compaction shall conform to 95% of minimum dry density per ASTM D1557.
4. The percolation rate for the compacted bank-run gravel shall not exceed 5 minutes per inch.

C. Select Borrow

1. Spread in layers of uniform thickness not exceeding 12 in. (loose lift) before compaction and moistened or allowed to dry.
2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment unless otherwise directed by the Owner.

3.02 FIELD QUALITY CONTROL

A. Material and compaction testing

1. In accordance with SECTION 01410.

END OF SECTION

SECTION 02500

HOT MIX ASPHALT (HMA) PAVEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for construction of all temporary and permanent pavements on paved areas affected or damaged by the Contractors operations, whether inside or outside the normal trench limits, as indicated on the Drawings and as herein specified.

B. Related Sections

1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.

1. Rhode Island Department of Transportation, Standard Specifications for Road and Bridge Construction, including all addenda, issued by the State of Rhode Island Department of Public Works. (Referred to as the Standard Specification).

1.03 DEFINITIONS

B. The term Bituminous Concrete as used in the Construction Drawings shall mean Hot Mix Asphalt (HMA) Pavement.

1.04 PAVEMENT SCHEDULE

A. The Contractors attention is directed to the various pavements required under this Contract, and their locations as detailed on the Contract Drawings.

1. All pavement thickness indicated on the Contract Drawings shall be of the thickness required after compaction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Tack

1. Tack coat shall conform to the applicable provisions of Section M0.3, Materials, and Section 403, Asphalt Emulsion Tack Coat of the Standard Specifications.

B. Binder Course, Full Width

1. Base Course shall conform to the requirements of the RIDOT Standard Specification Section 401, Class 12.5.

C. Wearing Surface, Full Width

1. Surface Course shall conform to the requirements of the RIDOT Standard Specification Section 401, Class 9.5.

D. Temporary Pavement

1. Temporary Pavement shall be Surface Course conforming to the requirements of the RIDOT Standard Specification Section 410, Class 9.5 or High Performance Cold Patching Material, as set forth in Subsection M03.04 of the Standard Specification.

E. Gravel Borrow Base Course

1. The Gravel Sub-Base Course in accordance with Standard Specification Subsection M01.09, meeting the gradation requirements of Table 1, Column 1, with 100% passing 3-inch Square Mesh Sieves.

2.02 SOURCE QUALITY CONTROL

A. The paving plant used by the Contractor for preparation of all paving materials shall be acceptable to the Owner who shall have the right to inspect the plant and the making of the material as specified in RIDOT Standard Specification.

B. The Contractor shall provide Quality Control including but not limited to preparing and maintaining an approved Quality Control Plan, preparing HMA mix designs, conducting construction quality and pre pavement placement meetings, providing a field reference system, performing QC inspection, sampling and testing. Evaluating all QC data and maintaining all QC records. Providing samples and construction of test/control strip if required.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to placing pavement, all backfill shall have been properly compacted as specified under Section 02200 to eliminate settling of backfill. No pavement shall be placed over poorly compacted backfill. Backfill and gravel base course shall be compacted, brought to the proper elevation, and dressed so that new pavement construction shall be at the required grade. The Contractor shall maintain the surfaces of all excavated and disturbed areas until the pavement is placed. If there is a time lapse of more than 24 hours between completion of preparation of subgrade or placing of gravel base course and placing of pavement, or if subgrade or gravel base course has been eroded or disturbed by traffic, the subgrade or gravel base course shall be restored before placing pavement.

B. When installing permanent trench pavement on roadways with existing bituminous pavement, the edges of existing pavement shall be cut back 12-inches, or more as required, from the trench excavation wall or damaged area to sound undamaged material, straightened, and cleaned. Existing surface courses shall be stripped from the bituminous base course for at least a 6-inch width and trimmed square and straight so that new pavement shall be placed on existing, sound bituminous base course. Existing pavement that will

underlay or butt new pavement shall be swept clean and have all edges and surfaces exposed to new pavements painted with asphalt emulsion to ensure a satisfactory bond.

C. Before permanent pavement is installed all undelaying temporary pavement and excess gravel base shall be removed and the base shall be brought to the proper grade

D. All manhole covers, catch basin grates, valve and meter boxes, curbs, walks, walls and fences shall be adequately protected and left in a clean condition. Where required, the grades of manhole covers, catch basin grates, valve boxes, and other similar items shall be adjusted to conform to the finished pavement grade.

E. The Contractor shall remove and acceptably dispose of all surplus and unsuitable material.

3.02 INSTALLATION

A. General,

1. Unless indicated otherwise, all permanent HMA pavements shall be installed in multiple courses.
2. Trench width HMA base courses shall be carefully spread and raked to a uniform surface and thoroughly rolled.
3. All surface courses of permanent paving shall be applied with acceptable mechanical spreaders in widths of at least 9 feet.
4. The rolling for all HMA and gravel base courses shall conform to the standards listed in the appropriate Subsection of the RIDOT Standard Specification.
5. Pavements shall be placed so that the entire roadway or paved area shall have a true and uniform surface, and the pavement shall conform to the proper grade and cross section with a smooth transition to existing pavement.

B. Gravel Borrow Base Course

1. Place to such depth that the finished compacted base course is the depth as indicated on the Contract Drawings and specified herein.
2. The top of the base course shall be below the finish grade a distance required to accommodate the compacted pavement material as indicated on the Contract Drawings and specified herein.
3. The gravel base shall be spread and compacted in layers not exceeding 8 inches in depth compacted measurement, to not less than 95 percent of the maximum dry density of the material, as determined by the Standard AASHTO Test Designation T99 compaction test Method C within 5% of optimum moisture content as determined by the Owner. Any stone with a dimension greater than the maximum size specified shall be removed from the base material before the gravel is compacted. Compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of ½-inch above or below the required cross sectional elevations and to a maximum irregularity not exceeding ½ inch under a l0 foot line longitudinally. Any specific area a gravel sub-base which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the Contractor without additional compensation.

C. Temporary Pavement

1. Install over all trenches in paved areas where directed by the Owner.

2. Construct upon completing the backfilling and compaction of the trenches and the placing of the gravel base courses in the streets or other paved areas unless directed otherwise by the Owner.
3. Install in one course to the thicknesses indicated on the Contract Drawings, as specified or as directed by the Owner.
4. Maintain in good repair and flush with the existing pavement at all times until the permanent pavement is placed.
5. The temporary pavement shall not be removed until 60 days after installation or until such time that the Owner authorizes the placement of permanent pavement at an earlier time.

D. HMA Base Course

1. Install as indicated on the Contract Drawings.
2. Install in accordance with the applicable requirements of Section 401 of the RIDOT Standard Specification and as detailed in the Contract Drawings.
3. Prior to placing Base Course, all temporary pavement and sufficient gravel base course shall be removed, to proper depths as detailed in the Contract Drawings.

E. HMA Surface Course

1. Install as indicated on the Contract Drawings.
2. Install in accordance with the requirements of the applicable requirements of Section 401 the RIDOT Standard Specification and as detailed in the Contract Drawings.

F. Sidewalks, Driveways, Parking Lots and Curbing,

1. Sidewalks, driveways, parking lots and curbing that are removed or damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they are found immediately prior to the start of operations. Materials and methods used for such restoration shall be in conformance with the requirements of the RIDOT Standard Specification and this Section.
2. Gravel base course under bituminous asphalt pathways and sidewalks shall not be less than 8-inches thick.
3. Gravel base course under bituminous asphalt driveways and roadways shall not be less than 12-inches.

G. Surface Maintenance

1. During the guarantee, period, the Contractor shall maintain the new HMA surface in a safe and satisfactory condition for traffic and shall promptly make good all defects such as cracks, depressions, and holes that may occur. After removing the defective HMA, the Contractor shall correct the cause of the defect and replace all pavements in accordance with these specifications.

END OF SECTION

SECTION 02870

SITE AMENITIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to purchase, deliver and install site Amenities in locations as shown and detailed on the Drawings.

1.02 SUBMITTALS

A. Submit manufacturer's product data, shop drawings and standard manufacturer warranty for the following:

1. Pergola Structure

1.03 DELIVERY, STORAGE AND HANDLING

A. Site Amenities shall be protected against theft and damage. Missing or damaged items shall be replaced at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pergola Structure shall be:

1. Model number: OSP28, 28’ Octagonal Steel Pavilion, Hot Dipped Galvanized Steel, Roman Blue In color. Or Approved Equal.

   -Provided by: O’Brien & Sons, 17 Trotter Drive, Medway, MA 02053

   Phone: 508-359-4200 Email: meghan@obrienandsons.com

   -Manufactured by: Cedar Forest Products, P.O. Box 145, West Olive, MI 49460

   Phone: 800-552-9495

   *See Appendix B for manufacturer’s installation drawings and structural calculations.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to excavating, complete site layout and confirm locations with Owner.

B. Positively verify that there are no utilities present in conflict with the excavation.

C. Inspect all abutting conditions and confirm final line and grading prior to starting work.

3.02 INSTALLATION

A. General

1. Review the manufacturer's data regarding installation of structure and required footing/ pilings.

2. Confirm location with the Owner or Owner's Representative prior to installation.

B. Install structure per manufacturer's recommendations at location shown on the drawings and verified by the Owner or Owner's Representative. Install plumb and level. Repair minor damage to finish in accordance with manufacturer's instructions and as approved by the Owner or Owner's Representative. Remove and replace any damaged components that cannot be successfully repaired. Clean promptly after installation per manufacturer's instructions using materials that will not damage the finish.

END OF SECTION

SECTION 02930

LOAMING AND SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for loaming, fertilizing, seeding, and related work in areas disturbed in the process of performing the Work under this contract.

1.02 SUBMITTALS

A. In accordance with SECTION 01300 submit the following:

1. Submit with seed, certificates confirming seed mixture, purity, germinating value, and crop year identification.
2. Submit test samples of loam.

1.03 DELIVERY, STORAGE AND HANDLING

A. Fertilizer:

1. Delivered mixed as specified in standard size, unopened containers showing weight, analysis, and name of manufacturer.
2. Store in weather proof place.

B. Seed:

1. Delivered in original unopened containers with mixture listed.

1.04 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall familiarize themselves with all requirements reference by this specification.

1. State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.

PART 2 PRODUCTS

2.01 LOAM

A. Fertile, natural topsoil, typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in approximately equal proportions. Free of stumps, roots, heavy or stiff clay, stones large than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 5 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

C. Loam test samples dried to constant weight at temperature of 230 degrees. F., plus or minus nine degrees.

D. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.

2.02 LIME, FERTILIZER AND SEED

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Complete fertilizer, at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight:

Nitrogen 10% Phosphorus 10% Potash 10%

C. Turf grass seed, clean, high in germinating value and latest year's crop mixture as follows:

Name	Minimum Proportion by Weight	Percent Purity	Percent Germination
Kentucky bluegrass	20%	87%	85%
Merion Kentucky bluegrass	20%	87%	85%
Red Chewings fescue	45%	98%	85%
Italian rye	15%	98%	90%

PART 3 EXECUTION

3.01 GENERAL

A. Supply suitable quantities of water, hose, and appurtenances.

3.01 LOAM

A. Spread loam on areas to 4-inch depth after compaction, fine grade and compact.

3.02 LIME, FERTILIZER AND SEEDING

A. Apply lime by mechanical means at rate of 3000 pounds per acre.

B. Apply fertilizer at rate of 1200 pounds per acre.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 175 pounds per acre on calm day, by mechanical means. "Hydro-Seeding" not permitted unless otherwise permitted or required by the Owner or Owner’s Representative. Sow one-half of seed in one direction, and other half

at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.

D. Water lawn areas adequately at time of sowing and daily thereafter, initially with fine spray, and continue throughout maintenance and protection period.

E. Seed during approximate time periods of April 1 to May 15 and August 15 to October 1, and only when weather and soil conditions are suitable for such work, unless otherwise permitted.

3.03 MAINTENANCE OF SEEDED AREAS

A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and re-fertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

B. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.

C. Repair or replace all seeded areas which, in judgment of Owner or Owner's Representative, have not survived and grown in satisfactory manner, for a period of one year after acceptance.

D. Seeding replacement, same seed mixture as specified and furnished and installed as specified.

3.04 TEMPORARY COVER CROP

A. Sow a temporary cover crop of buckwheat, domestic rye grass or other acceptable seed if there is insufficient time in the planting season to complete seeding, fertilizing, and permanent seeding at the option of Contractor or order of Owner or Owner's Representative. Cut and water cover crop as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into soil, the areas shall be fertilized and permanent seed crop sown as specified.

END OF SECTION

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SECTION 02950

LANDSCAPE PLANTINGS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The work under this item consists of furnishing new plant material: planting, watering, mulching, staking and guying trees of the type and sizes indicated on the Plans, in accordance with these Specifications and/or as directed by the Owner's Representative or Owner.

B. The principal work of this section includes, but may not be limited to, the following:

1. Transplanting Operations
2. Layout and Excavation of Plant Holes
3. Planting and Backfilling
4. Watering
5. Pre-emergent Weed Control
6. Mulching
7. Fertilizing
8. Tags and Labels
9. Maintenance of trees and shrubs
10. Plant Replacement Guarantee

1.02 REFERENCES

ANSI Z-60.1 - Nursery Stock, latest edition (American Association of Nurserymen, Inc.).

SPN: "Standardized Plant Names," latest edition, by the American Joint Committee on Horticultural Nomenclature.

AOAC: Association of Official Agricultural Chemist."

Pruning Standards: ANSI A300 Practices for Trees, Shrubs &Other Woody Plant Maintenance: Secretariat, National Arborist Association, P. O. Box 1094 Amherst, MA.

1.03 QUALITY ASSURANCE

A. The Contractor shall Sub-contract planting work to a firm specializing in such work unless the Contractor is fully experienced and qualified. The Landscape Contractor shall have five years continuous experience and expertise in management, handling, and installation of ornamental plant material in large scale landscape construction projects. Site foreman shall have at least five years' experience and shall be on-site during all times of transplanting and plant installation.

B. The Landscape Contractor shall be responsible to coordinate with plant material suppliers in sufficient time to ensure that all of the plants as specified in the contract plant list are available in sufficient quantity for installation.

C. Do not make substitutions without written approval. If specified landscape material is not available, obtain approval for substitution from the Owner or Owner's Representative.

D. The Owner's Representative reserves the right to inspect all plant materials for compliance with specifications, and to reject unsatisfactory or defective work at any time during progress of work.

1.04 SUBMITTALS

A. Certifications and/or labels of proposed plant materials or substitutions, listing common, scientific names and sizes of each.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect all products from weather or other damaging or deteriorating conditions.

B. Plants which have been damaged or have deteriorated in transit or storage are not acceptable.

C. Keep plants moist, fresh, and protected against exposure to sun, wind, and freezing temperatures whether in the receiving yard, in transit, while being handled, or at the job site awaiting planting.

D. Planting Window: Spring – April 30 to June 30 Fall - August 15 to October 15

E. Those species known to be fall digging hazards shall be dug during the spring season only. Fall planting of these species shall be permitted only with certification, from the nursery, of the time of digging and at the discretion of the Owner's Representative.

F. Correlate planting schedule with specified maintenance periods to provide maintenance to date of acceptance.

G. Coordination with Lawns: Plant shrubs, and groundcover after final grades are established and prior to planting of lawns, unless otherwise acceptable to Owner's Representative. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.06 SPECIAL CONDITIONS

A. Should discrepancies exist between plant quantities or plant sizes as shown in the Planting Schedule and on the Planting Plan, quantities and sizes shown on the Planting Plan shall govern. Contractor shall install all plants as shown on the plan at no additional cost to the Owner.

1.07 WARRANTY

A. Provide a warranty for plant material for a minimum of one year including one continuous growing season. Commence warranty on date identified in the Certificate of Final Acceptance.

B. Warranty: Include coverage of plants from death or unhealthy conditions.

C. Replacements: Plants of same size and species as specified, planted as soon as possible in the next growing season, with a new warranty and an extended maintenance service commencing on date of replacement.

1.08 MAINTENANCE

A. Maintenance of all plant material to be performed by installer includes:
- Replacing of dead plant material
- Resetting plants to proper grades, or to upright position

PART 2 - PRODUCTS

2.01 LOAM:

A. Certified Clean, the Loam shall contain not less than 5 1/2 percent nor more than 10 percent organic matter as determined by the loss on ignition of oven-dried samples. The loam shall have an acidity range of 5.5 pH to 7.6 pH.

B. Loam shall be free of debris and other extraneous matter. It shall be uncontaminated by salt water, foreign matter and substances harmful to plant growth. The electrical conductivity (EC2) of a 1:2 soil-water suspension shall be equal to or less than 1.0 milliohms/cm. (Test minus sieve #10 material). Soils shall not have levels of extractable aluminum greater than 200 parts per million.

C. No loam shall be delivered to the site until the review and approval of loam test results by the Owner or Owner’s Representative, but such approval shall not constitute final acceptance. The Owner or Owner’s Representative will reject any material delivered to the site which, after on-site, post-delivery testing, does not meet these specifications.

2.02 ANTIDESSICANT

A. Anti-desiccant shall be an emulsion which permits transpiration while retarding excessive loss of moisture from plants.

B. Deliver in manufacturer's fully identified containers and mix according to manufacturer's direction. Use "Wiltproof" or approved equal.

2.03 FERTILIZER:

A. Complete fertilizer in granular form, from commercial sources bearing manufacturer’s analysis; 10-10-10 ratio of N-P-K.

B. Significant quantities of trace elements such as iron, boron, etc. shall be contained in the fertilizer.

C. Fifty percent (50%) of available nitrogen shall be in a slow release form as found in certain urea form products or natural organic forms or a combination of both.

D. Salt index shall not exceed 35.

2.04 PRE-EMERGENT WEED CONTROL:

A. Pre-Emergent weed control for application in mulch areas shall be granular and have the active ingredient "Trifluralin 5.0%". All application rates and product use shall be in accordance with manufactures guidelines.

2.05 MULCH:

A. Pine Bark Mulch shall be derived from evergreen tree bark aged to a minimum of six months and no more than eighteen months. The bark shall be shredded so that the resulting pieces are no more than 1/2 inch thick and no longer than 3 inches. The mulch shall be ninety-eight percent (98%) organic matter with a pH of 3.5 to 4.5. The mulch shall be free of stringy material and shall not contain an excess of fine particles. The mulch shall be brown in color, free of leaves, twigs, sod, weeds, shavings and other foreign materials which are injurious to health plant growth.

2.06 WATER:

A. Clean, fresh potable water free from injurious chemicals and other toxic substances harmful to plant life. No brackish water will be permitted.

B. The Owner's Representative may reject any water delivered to the site which, after on-site, post-delivery testing, does not meet these specifications.

2.07 PLANT MATERIALS:

A. Plant materials shall conform in size, grade and quality to the "American Association of Nurserymen Standards for Nursery Stock." As approved by the United States of America standards institute, in effect at the time of bidding.

B. Plants of other kinds than those named in the Plant Schedule on the Drawings shall not be accepted without written approval of the Owner's Representative.

C. Unless otherwise approved by Owner's Representative, all plants shall be nursery-grown in accordance with good horticultural practices and shall have been grown under climatic conditions similar to those in the locality of the project for at least two years. They shall have been transplanted or root pruned at least nine months previous to moving to the site.

D. Plants shall be dug, handled and transported so as to prevent damage of any sort including but not limited to breakage of branches or limbs, scraped or bruised trunk or broken root ball. Plants shall be protected from desiccation during digging, storage and transportation by watering, covering and application of anti-desiccants as necessary to ensure their continued health and viability.

E. All plant material shall comply with the state and federal law with respect to inspection for plant disease and insect infestation.

F. Replacement plants larger in size than existing may be used if approved by the Owner's Representative provided use of larger plants does not increase Contract price.

G. If use of larger plants is approved, increase ball of earth of spread of roots in proportion to size of plant.

PART 3 - EXECUTION

3.01 PLANTING OPERATIONS

A. Layout: Determine location of underground utilities and layout plants so as to avoid possible damage to such structures. Plant shown graphically and/or verbally on plans, shall be staked on ground by contractor and approved by the Owner's Representative prior to excavation. Should discrepancies exist between plant quantities in Planting Schedule and Planting Plan, quantities shown on the Planting Plan shall govern. Adjustments in locations and outline shall be made as directed in field. Labor, equipment, and new smooth stakes are to be furnished by the Contractor for this purpose.

B. Excavation: Planting locations shall conform to the approved staked locations and outlines. Holes dug for plantings shall in all cases be large enough to include the complete root system of the plant (tree, shrub, and groundcover) to be received and also sufficient amounts of approved backfill around the periphery of the root ball. All sod, weeds, roots, cobbles, and stones and other objectionable materials excavated from the plant holes, which is unsuitable for backfill shall be removed from the site immediately and legally disposed of.

C. Plant Hole Size: The minimum plant hole size, unless otherwise specified, shown on the plans or directed by the Owner or Owner's Representative shall be as follows:

1. Trees - The planting hole shall be twice the diameter of the root ball in width and no deeper than 2 inches less than the distance from the bottom of the root ball to the root collar (i.e. a 12 inch tall ball will require a 10 inch deep hole). Any excavation in excess of that required shall be replaced and compacted to eighty-five percent (85%) of maximum density.

D. Any rocks or underground obstructions shall be removed to a depth necessary for planting as specified, unless alternate locations for the planting are approved by the Owner or Owner's Representative. If removal of obstructions results in a deeper hole than specified for planting, backfill material shall be added and compacted to eighty-five percent (85%) of maximum density to the correct depth.

E. Backfill Mix: Add loam to suitable soil excavated from the planting hole to create mix for planting pits. Backfill mix shall be at least thirty-three percent (33%) loam.

3.02 SETTING PLANTS

A. Plants shall be handled in such a manner that the soil of the root ball will not be loosened from the roots. Carefully place plant into the prepared hole. Set plants plumb and fill in around the root ball to one-half the depth of the hole with backfill mix. Thoroughly tamp the backfill mix to eighty-five percent (85%) of maximum density.

B. Fill remaining area of planting hole with water. Once the water has completely drained loosen burlap and peel down at least the top one-third. If required wire baskets to be cut off and removed. Roots that have been wrapped around the ball within the burlap shall be made to lay in as natural a manner as possible. Cut broken or frayed roots cleanly.

C. Fill remaining area of hole with backfill mix and thoroughly tamp to eighty-five percent (85%) of maximum density. Form a saucer around the edge of through backfill hole by constructing a berm. The finish height of the compacted berm shall be 4 inches higher than the surrounding grade. No excess soil shall be allowed to remain within the plant saucer. Fill saucer with water.

3.03 PRUNING OF NEW PLANT MATERIAL

A. After planting, prune only dead, broken or deformed branches and in such manner as to preserve natural character of plant.

B. Perform all pruning with sharp tools, with cuts flush and clean. Do not apply paint or asphalt emulsion tree wound compound on cut area.

C. Trees which have had their leaders cut, or so damaged that cutting is necessary, will not be accepted. There shall be no abrasion of bark, nor fresh cuts of limbs over ½ inch.

3.04 WATERING

A. The plants shall be watered immediately following planting.

B. Soak the plants thoroughly again within a twenty-four hour period after the initial planting.

C. Additional watering shall be made at least once every week, or as directed by the Owner or Owner's Representative based on weather conditions, until final acceptance of the plant material.

3.05 FERTILIZING

A. During backfill operations, place fertilizer in upper foot of back fill around perimeters at a rate of two ounces per foot of diameter of plant pit, or as recommended by manufacturer.

3.06 MULCHING PLANTS

A. Application of mulch should only occur after planting operations have been completed and initial watering has taken place. Mulch shall be applied no later than forty-eight hours after planting.

B. Prior to the placement of mulch, the contractor shall apply a pre-emergent weed control with the entire area to be mulched. Pre-emergent weed control shall be applied by a commercial applicator, licensed by the State of Rhode Island at a rate in accordance with the manufacturer's instructions.

C. Mulch shall be applied a minimum of 3 inches in depth for all individual trees and planting beds, as indicated graphically or verbally on the drawings.

D. Where mulch abuts seeded lawn areas or other finish grade materials, edge of planting bed shall be cut smooth and cleanly. Mulch shall be placed carefully so as not to spill into adjacent areas. Any excess or spilled mulch shall be promptly removed from the project area. The cost of the mulch is incidental to new plantings.

3.10 ANTIDESSICANT SPRAYING

A. Spray anti-desiccants as directed by the manufacturer's recommendations if so directed by the Owner's Representative and or Owner.

3.11 TAGS AND LABELS

A. Leave all tree tag and label seals unbroken and visible on plant material until final inspection. Remove all seals immediately after final inspection.

3.12 MAINTENANCE

A. Contractor is responsible for protection and maintenance of all work prior to final acceptance. No plants will be accepted unless they show a healthy growth and satisfactory condition.

3.13 PLANT REPLACEMENT GUARANTEE

A. Guarantee that, upon completion and final acceptance tree, shrub and groundcover planting conforms to requirements of contract documents and that all plants except transplant materials are healthy and will remain so for a period of one year. Such period shall commence with date of final acceptance.

B. At any time within period of guarantee, Contractor shall replace any planting which for any reason, other than vandalism, has died or is in a dying condition, or which has failed to flourish in such a manner or to such a degree that its usefulness or appearance has been impaired.

C. The Owner or Owner's Representative will not maintain plantings until after guarantee period. Contractor shall not have any claim that materials have failed to flourish as a result of Owner's Representative's maintenance operations, or lack of maintenance, and shall abide by terms stated herein for guarantee and replacement of plant materials.

D. Decision of Owner's Representative as to necessity to replace any plant materials or repair any defects on workmanship, or cause of any destruction or loss, impairment or failure to flourish, shall be conclusive and binding upon Contractor. Replacements shall be of same species and size as specified on Plant List. All plant replacements shall be inspected, sealed, furnished, planted and mulched as specified herein at Contractor's expense.

E. "Vandalism," is intended to mean any acts, whether intentional or accidental, by other persons occurring following final acceptance, which clearly result in breakage or other damage to individual plants or plant

beds, and which may reasonable be considered to be beyond Contractor's reasonable control, as determined by the Owner’s Representative.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for forms to be used for all concrete masonry including concrete slabs, pathways and footings, except as otherwise permitted.

B. Related Sections

1. Section 03200 - Concrete Reinforcement.
2. Section 03300 - Cast-In-Place Concrete.

1.02 REFERENCES

A. American Concrete Institute (ACI)

1. ACI 318, Building Code Requirements for Structural Concrete.
2. ACI 347R, Guide to Formwork for Concrete.

1.03 SUBMITTALS

A. Submit in accordance with Section 01300.

B. Shop Drawings:
1. As requested by the Owner

C. Samples:
1. As requested by the Owner

D. Quality Control Submittals:

1. Manufacturer’s Certificate of Proper Installation. (After installation)

1.04 QUALITY ASSURANCE

A. Qualifications: Formwork, falsework, and shoring designs prepared by an engineer licensed in the State of Rhode Island.

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Forms shall be made of wood, metal, or other acceptable material. Wooden forms shall be constructed of sound lumber or plywood of suitable dimensions, free from knotholes and loose knots. Plywood shall be reasonable good, as accepted. Metal forms shall be of an acceptable type for the work involved. Edges of forms in contact with concrete shall be flush within 1/16 in.

B. Forms shall be of suitable material, design, and construction as to be rigid, tight enough to prevent the passage of mortar, and plane surfaces shall be plane within 1/16 in. in 4 ft. Particular care shall be taken to ensure that forms are true to line where deviations in the concrete would be obvious or objectionable, as where building superstructures are to be built thereon, or where the tops of walls are exposed. All such deviations which may occur shall be corrected by, and at the expense of the contractor, as directed, even to the extent of tearing down and rebuilding the concrete.

C. Forms shall be sufficiently rigid to prevent displacement or sagging between supports, and so constructed that the concrete will not be damaged by their removal. The Contractor shall be entirely responsible for their adequacy.

D. Form Sealer:

1. Material: Surface sealer will not bond with, stain, or adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces, when applied to most forms of form liners. A ready-to-use water based material formulated to reduce or eliminate surface imperfections, containing no mineral oil or organic solvents. Environmentally safe, meeting local, state, and federal regulations and can be used in clean water treatment plants.
2. Manufacturer and Product: Master Builders, Inc.; Rheofinish; or Equal.

E. Rustication Grooves and Beveled Edge Corner Strips: Nonabsorbent material, compatible with form surface, fully sealed on all sides prohibiting loss of paste or water between the two surfaces. Match the rustication grooves with the existing configuration and style located at the plant.

PART 3 EXECUTION

3.01 SYSTEM DESIGN REQUIREMENTS

A. Design formwork in accordance with ACI 347R and ACI 318 to provide the concrete finishes specified in Section 03300, CAST-IN-PLACE CONCRETE.

B. Make joints in forms watertight.

C. Limit panel deflection to 1/360 of each component span to achieve tolerances specified.

3.02 ERECTION

A. General: Unless specified otherwise, follow the applicable recommendations of ACI347R.

B. Forms shall be so constructed and placed that the resulting concrete will be of the shape, lines, dimensions, and to the elevations indicated on the drawings or specified, and exposed concrete will be substantially free from board or grain marks, poorly matched joints, and other irregularities or defects.

C. Beveled Edges (Chamfer):

1. Form 3/4-inch bevels at concrete edges, unless otherwise shown.
2. Where beveled edges on existing adjacent structures are other than 3/4-inch, obtain Owner or Owner's Representative's approval of size prior to placement of beveled edge.

D. Forms for Concrete Slabs and Concrete Pavement:

1. Provide standard steel or wood forms to prevent movement.
2. Set forms to true lines and grades, and securely stake in position.

E. Form Tolerances: Provide forms in accordance with ACI 347R and ACI 318 and the following tolerances for finishes specified:

1. Slab Tolerances:
   a. Exposed Slab Surfaces: Comprise of flat planes as required within tolerances specified.
   b. Slab Finish Tolerances and Slope Tolerances: Crowns on floor surface not too high as to prevent 10-foot straight edge from resting on end blocks, nor low spots that allow a block of twice the tolerance in thickness to pass under the supported 10-foot straightedge.
   c. Steel gauge block 5/16-inch thick.
   d. Slab drainage.
      1) Finish Slab Elevation: Slope slabs to floor drain and gutter, and shall adequately drain regardless of tolerances.
      2) Thickness: Maximum 1/4-inch minus or 1/2-inch plus from thickness shown, except where thickness tolerance will not affect slope, drainage, or slab elevation.

3.03 FORM SURFACE PREPARATION

A. Thoroughly clean form surfaces in contact with concrete or previous concrete, dirt,

B. Exposed Wood Forms in Contact with Concrete: Apply form sealer as recommended by the sealer material manufacturer.

C. Steel Forms: Apply form sealer to steel forms as soon as they are cleaned to prevent discoloration of concrete from rust.

3.04 FORM COATINGS

A. All forms shall be oiled with an acceptable nonstaining oil or liquid form coating before reinforcement is placed.

B. Before form material is reused, all surfaces that are in contact with the concrete shall be thoroughly cleaned, all damaged pieces repaired, and all projecting nails withdrawn.

3.05 REMOVAL OF FORMS

A. Except as otherwise specifically authorized by the Owner or Owner's Representative. forms shall not be removed until the concrete has aged for the following number of day-degrees*:

1. Formwork not supporting weight of concrete, (i.e., sides of beams, walls, columns, and similar parts of the Work) may be removed after cumulatively curing at not less than a total of three 50-degree F days after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing protection operations are maintained.
2. Leave forms and shoring for elevated structural slabs or beams in place, in accordance with ACI 318, Chapter 6, and until concrete has reached compressive strength equal to 80 percent of the specified 28-day compressive strength as determined by test cylinders.
3. *Day-degree: total number of days times average daily air temperature at surface of concrete. For example, 5 days at a daily average temperature of 60 deg. F. equals 300 day-degrees.

3.06 MANUFACTURER'S SERVICES

A. Provide form manufacturer's representative at site for installation assistance, and inspection.

END OF SECTION

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SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Requirements for reinforcing steel bars, wire fabric and accessories as shown on the drawings, specified herein, and as needed for a complete and proper installation.

B. Related Sections
   1. Section 03100 - Concrete Formwork.
   2. Section 03300 - Cast-In-Place Concrete.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM).
   1. A82, Specification for Steel Wire, Plain for Concrete Reinforcement.
   2. A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
   3. A497, Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
   4. A615, Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
   5. A706, Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
   6. A775, Specification for Epoxy-Coated Reinforcing Steel Bars.

B. American Concrete Institute (ACI).
   1. ACI 318, Building Code Requirements for Structural Concrete.

1.03 SUBMITTALS

A. In accordance with Section 01300 submit cutting and bending drawings and schedules for all reinforcement to be furnished.

B. Shop Drawings:
   1. Prepare in accordance with Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice and ACI SP-66 Detailing Manual:
      a. Bending lists.
      b. Placing drawings.
   2. Welded splice, Cadweld splice, and mechanical threaded splice.

C. Quality Control Submittals:
   1. Lab test reports for reinforcing steel showing stress-strain curves and ultimate strengths.
   2. Mechanical Threaded Connections:

a. Current International Conference of Building Officials (ICBO) Research Report or equivalent code agency report listing findings to include acceptance, special inspection requirements, and restrictions.
b. Manufacturer's instructions.
c. Verification that device threads have been checked and meet all requirements for thread quality, in accordance with manufacturer's published methods.

3. Epoxy-Coated Reinforcing Bars: Written certification in accordance with paragraph 4.2.1 of ASTM A775.
4. Welding Qualification: Prior to welding, submit welder qualifications and radiographic nondestructive testing procedures.

1.04 QUALITY ASSURANCE

A. The steel shall be newly rolled stock substantially free from mill scale, rust, dirt, oil, grease, or other foreign matter. Bars shall be of billet steel and, unless otherwise indicated, shall be Grade 60 bars or as indicated by the manufacturer.

B. Billet steel bars shall conform to ASTM A 615.

C. All bars shall be rolled by an acceptable mill. The Contractor shall submit at his own expense certified copies of tests of the bars furnished. The tests shall be as specified in the appropriate ASTM Specification referred to above and shall be made by an acceptable laboratory.

D. Welder Qualifications: Certified in accordance with AWS D1.4-79.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Unload, store, and handle bars in accordance with CRSI publication "Placing Reinforcing Bars."

B. Coated Bars:
1. Protect epoxy-coated bars contact areas from handling equipment.
2. Lift bundles of coated bars at multiple pickup points to minimize bar-to-bar abrasion from sags in bundles.
3. Do not drop or drag coated bars or bundles of coated bars.
4. Store coated bars on protective cribbing.
5. Color fading of coating is not cause for rejection of epoxy-coated reinforcing bars.

PART 2 PRODUCTS

2.01 MATERIALS

A. Deformed Billet-Steel Reinforcing Bars:
1. Includes stirrups, ties, and spirals.
2. ASTM A615, Grade 60, including Supplemental Requirements S1 where welding is not required.

3. ASTMA706, Grade 60, including Supplemental Requirements for reinforcing to be welded.

B. Splices and Mechanical Connections:
   1. Metal Sleeve: Furnish with cast filler metal, capable of developing, in tension or compression, 125 percent of minimum tensile strength of the bar.
   2. Mechanical Threaded Connections: Furnish metal coupling sleeve for splicing reinforcing in secondary members or in areas of low stress with internal threads engaging threaded ends of bars developing in tension or compression 125 percent of yield strength of bar.
      a. Manufacturers and Products:
         1) Erico Products, Inc., Cleveland, OH; Lenton Reinforcing Steel Couplers.
         2) Richmond Screw Anchor Co., Inc. Fort Worth, TX; Richmond DB-SAE Dowel Bar Splicers.
         3) Or equal.

C. Epoxy-Coated Reinforcing Bars: ASTM A775, deformed bars, with bond strength not less than 80 percent of uncoated bars.

D. Reinforcement shall be accurately formed to the dimensions indicated on the drawings. Stirrups and tie bars shall be bent around a pin having a diameter not less than two times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum thickness except for bars larger than 1 in., in which case the bends shall be made around a pin of eight bar diameters. All bars shall be bent cold.

E. Bars shall be shipped to the work with bars of the same size and shape fastened in bundles with securely wired-on metal identification tags giving size and mark.

F. Deformations on bars for concrete reinforcement shall conform to the requirements of the above-mentioned ASTM Specifications.

2.02 ACCESSORY MATERIALS

A. Tie Wire:
   1. Black, soft-annealed 16-gauge wire.
   2. Nylon-, epoxy-, or plastic-coated wire.

B. Bar Supports and Spacers:
   1. Precast concrete bar supports, cementitious fiber-reinforced bar supports, or all-plastic bar supports and side form spacers meeting the requirements of CRSI Manual of Standard Practice. Do not use other types of supports or spacers.
   2. In Beams, Columns, Walls, and Slabs Exposed to View After Stripping: Small rectangular concrete blocks made up of same color and strength as concrete being placed around them or all-plastic bar supports and side form spacers.

3. Use supports made of dielectric material for epoxy-coated reinforcing bars supported from formwork.
4. If epoxy-coated reinforcing is used, furnish epoxy-coated reinforcing bars for spreader bars.
5. Precast concrete supports of same strength as concrete for reinforcing in concrete place don grade.

C. Welded steel wire fabric shall conform to the ASTM A 185. The gage and spacing of wires shall be as indicated on the drawings.

D. Soffit Clips: Made galvanized steel wire not lighter than No. 12 Stl. W.C. They shall be shared so that the greater portion of the wire is held about 1 in. from the flange of the steel beam, and shall be spaced not less than 9 in. on centers, the spacing being maintained by suitable longitudinal wires.

2.03 FABRICATION

A. Follow CRSI Manual of Standard Practice.

B. Bend all bars cold.

PART 3 EXECUTION

3.01 PREPARATION

A. Notify Owner or Owner's Representative when reinforcing is ready for inspection and allow sufficient time for inspection prior to placing concrete.

B. Repair epoxy coating damaged due to handling, shipment, and placing. Repair with patching material in accordance with ASTM A775, and manufacturer's recommendations.

C. Clean metal reinforcement of loose mill scale, oil, earth, and other contaminants.

D. Coat wire projecting from precast concrete bar supports with dielectric material, epoxy, or plastic.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings, including ice, that tend to interfere with development of proper bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement which is to be exposed for a considerable length of time after having been placed shall be painted with a heavy coat of cement grout, if required.

3.02 Reinforcing Bar Installation

A. Bundle or space bars, instead of bending where construction access through reinforcing is necessary.

B. Spacing and Positioning: Conform to ACI 318/318R.

C. Location Tolerances: In accordance with CRSI publication, “Placing Reinforcing Bars”.

D. Splicing:
1. Follow ACI 318/318R.
2. Use lap splices unless otherwise shown or permitted in writing by Owner or Owner’s Representative.
3. Welded Splices: Accomplish by full penetration groove welds and develop at least 125 percent of yield strength of bar.
4. Stagger splices in adjacent bars.
5. Metal sleeves may be used.

E. Mechanical Splices and Connections:
1. Use only in areas specifically approved in writing by the Owner or Owner’s Representative.
2. Install as required by manufacturer with threads tightened and in accordance with ICBO Research Report.
3. Maintain minimum edge distance and concrete cover.

F. Tying Deformed Reinforcing Bars:
1. Tie every other intersection on mats made up of Nos. 3, 4, 5, and 6 bars to hold them firmly at required spacing.
2. Bend all noncoated tie write to prevent tie wire from being closer than 1 inch from the surface of concrete.
3. Epoxy-Coated Bars:
   a. Use epoxy-coated or nonmetallic clips.
   b. Repair coating damage at clipped or welded intersection.

G. Reinforcement Around Openings: Place an equivalent area of steel bars or fabric around pipe or opening and extend as shown, on each side sufficiently to develop bond with each bar. See drawing details.

H. Welding Reinforcement:
1. Only A706/A706M bars may be welded.
2. Do not perform welding until welder qualifications are approved.
3. Provide suitable ventilation when welding epoxy-coated reinforcing bars.
4. After completion of welding on epoxy-coated reinforcing bars, repair coating damage, welds, and steel splice members with same material as used for repair of coating damage.

I. Straightening and Rebending: Field bending of reinforcing steel bars is not permitted.

J. Unless permitted by Owner or Owner’s Representative, do not cut reinforcing bars in the field. When epoxy-coated reinforcing bars are cut in the field, coat ends of bars with same material used for repair of coating damage.

K. Reinforcement shall be accurately positioned as indicated on the drawings, and secured against displacement by using annealed iron wire ties or suitable clips at intersections. Concrete blocks having a minimum bearing area of 2 in. by 2 in., and equal in quality to that

specified for the slab, shall be used for supporting reinforcing bars for slabs on grade. Where the underside of slabs will be exposed to view in the finished work, stainless-steel supports shall be used

L. Furnish and place all concrete reinforcement as indicated on the drawings and as herein specified. Concrete reinforcement in sizes No. 3 (3/8 in.) and larger shall be deformed steel bars of the shapes and sizes indicated on the drawings.

3.03 TESTS AND INSPECTION

A. Test 10 percent of all welds using radiographic, nondestructive testing procedures referenced in AWS D1.4-79.

B. Inspect each splice and verify each component is in accordance with manufacturer's instructions and ICBO Research Report.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for furnishing and installing forms, reinforcing steel, concrete and expansion and/or construction joints

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall familiarize themselves with all requirements reference by this specification.

1. State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.
2. American Society for Testing and Materials (ASTM)
   a. A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
   b. A615, Specification for deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   c. C31, Practice for Making and Curing Concrete Test Cylinders in the Field.
   d. C33, Specification for Concrete Aggregates.
   e. C39, Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   f. C42, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   g. C94, Specification for ready Mixed Concrete.
   h. C143, Test Method for Slump of Hydraulic Cement Concrete.
   i. C150, Specification for Portland Cement.
   j. C172, Practice for Sampling Freshly Mixed Concrete.
   k. C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   l. C260, Test Method for Air-Entraining Admixtures for Concrete.
   m. C494, Specification for Chemical Admixtures for Concrete.
   n. C920, Specification for Elastomeric Joint sealants.
   o. D994, Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
   p. D1056, Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
   q. D1751, Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

3. American Concrete Institute (ACI):
   a. ACI 301, Specification for Structural Concrete for Buildings.
   b. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
   c. ACI 305, Recommended Practice for Hot Weather Concreting.
   d. ACI 306, Recommended Practice for Cold Weather Concreting.
   e. ACI 315, Building Code Requirements for Reinforced Concrete.
   f. ACI 347, Guide to Formwork for Concrete.
4. Concrete Reinforcing Steel Institute (CRSI):
   a. Manual of Standard Practice.

1.03 SUBMITTALS

A. Submit Shop Drawings in accordance with SECTION 01300 for the following:

1. Reinforcing Steel
   a. Furnish in detail and completeness that all fabrication and placement at the site can be accomplished without the use of contract drawings for reference.
   b. Include number of pieces, sizes, and grade of reinforcing steel, accessories, and any other information required for fabrication and placement.
   c. Show joint layout and design
   d. Check structural and site drawings for anchor bolts, anchors, inserts, conduits, sleeves, and any other items which are required to be embedded in concrete, and make necessary provisions as required so that reinforcing steel will not interfere with the placement of such embedded items.
2. Concrete mix designs.
3. Grout manufacturer/design mix (if included in this section)
4. Manufacturer’s data for ancillary materials such as joint fillers and sealants, epoxy bonding compound.

1.04 QUALITY ASSURANCE

A. Selection of testing laboratory in accordance with SECTION 01410.

B. Sample and Test Concrete as follows:

1. Test Specimens: Make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM C172, C31 and C39. One cylinder shall be broken after seven days and three cylinders after twenty-eight day.
2. Slump: A slump test shall be made for each truckload of concrete in accordance with ASTM C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.
3. Air Content: An air content test shall be made from each day's pour of concrete by the pressure method in accordance with ASTM C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.
4. In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the Owner or Owner’s Representative may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C42. If such test indicates that the core specimen is below the required strength, the concrete in

question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete removal shall be replaced with new materials to the satisfaction of the Owner or Owner's Representative at no additional cost to the Owner. The cost of coring will be deducted from the contract amount. Where the Testing Laboratory has taken core cylinders and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the Owner's Representative at no additional cost to the Owner.

5. The Contractor shall coordinate the date and location of tests with the Owner or Owner's Representative before any concrete work is started.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing steel

1. Transport to the site, store, and cover in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete or chip protective epoxy coating.
2. Store on the site at all times, a supply of approved reinforcing steel to ensure that there will be no delay of the work.
3. Identification of steel shall be maintained after bundles are broken.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement

1. Shall conform with the State of Rhode Island Department of Transportation (RIDOT) Standard Specifications, 2004 Edition with latest addenda.
2. Only one brand of cement shall be used on the project.

B. Aggregates

1. Fine aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to fines.
2. Coarse aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to maximum sizes hereinafter specified.

C. Air Entraining Agent

1. In accordance with ASTM C260.

D. Water Reducing Agent

1. In accordance with ASTM C494 Type A.

E. Microsilica Admixture

1. Packaged in easily dispersing form.

F. Water

1. Clean and potable,
2. Free of impurities detrimental to concrete.

G. Reinforcing Bars

1. New, deformed billet steel bars, in accordance with ASTM A615, Grade 60.

H. Accessories

1. Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place.
2. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards.

I. Tie wire.

1. 16 gauge or heavier black annealed wire.

J. Form Ties and Spreaders

1. Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
2. Provide form tie with water stop for all walls to be in contact with earth or liquid.
3. Inner tie rod shall be left in concrete when forms are removed.
4. No wire ties or wood spreaders will be permitted. Use ½" x 1" C.T. plastic cones for sinkages.

K. Form Coatings

1. Non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface.
2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Company, or approved equal.
3. Coatings containing mineral oils or the non-drying ingredients will not be permitted.

L. Grout

1. High-strength, non-shrink grout with saltwater resistance.
2. Five Star Special Grout 120 or equivalent.

2.02 CONCRETE STRENGTHS AND PROPORTIONS

A. Cast-in-place concrete shall have the minimum compressive strength at 28 days as indicated on the Drawings.

B. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.

C. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed not he work, but without permitting the materials to segregate or excess free water to collect on the surface.

D. Air-Entrainment: The air content in all concrete shall be maintained at 5 to 7 percent.

2.03 PREMOLDED JOINT FILLER

A. Bituminous Type.

1. In accordance with ASTM D994 or D1751.

B. Sponge Rubber Type.

1. Neoprene, closed-cell, expanded in accordance with ASTM D1056, Type 2C5, with a compression deflection, 25 percent deflection (limits), 17 to 24 psi (119 to 168 kPa) minimum.

2.04 POURABLE JOINT FILLERS

A. Filler for Nonpotable Water Structures

1. Specific Gravity: Greater than 1.0 for cured, in-place filler.
2. Vertical and Sloped Joints: Furnish gun grade material that will remain as placed in joints and will not run down slope.
3. Suitable for continuous immersion and exposure to liquid being contained in the structure.

2.05 JOINT SEALANTS

A. In slabs.

1. In accordance with ASTM C920 for poured 2-component polyurethane sealant.
2. Sikaflex-2c, as manufactured by Sika Corporation or approved equivalent.

2.06 EPOXY BONDING COMPOUND

A. The epoxy bonding compound shall be a three-component, solvent-free, moisture-tolerant, epoxy modified, cementitious product specifically formulated as a bonding agent and anti-corrosion coating. The product shall have suitable contact time, fluidity, and application temperature for this type of application.

PART 3 EXECUTION

3.01 FORMWORK

A. Falsework for Forms

1. Build and maintain necessary false work for the forms.

B. Construction of Forms

1. General
   a. Construct in accordance with ACI 347.

b. Construct of sound material, to the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.

2. Embedded Items
   a. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
   b. Do not embed wood, other than necessary nailing blocks, in concrete.
   c. Extended complete cooperation to suppliers of embedded items in their installation.
   d. Secure information for embedded items from other trades as required.
   e. Securely anchored embedded items in correct location and alignment prior to placing concrete.
3. Openings for Items Passing Through Concrete
   a. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
   b. Coordination work of this nature in order that there will be no unnecessary cutting and patching of concrete.
   c. Cutting and repairing of concrete as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

C. Removing Forms and False work

1. Forms shall not be removed for at least 72 hours after concrete has been placed.
2. Forms shall not be removed until the concrete has attained sufficient strength to insure stability.

3.02 REINFORCING STEEL

A. General

1. Place reinforcing steel in accordance with the drawings and approved shop drawings and the applicable requirements of the CRSI, Manual of Practice.
2. Install reinforcement accurately and secure against movement, particularly under the weight of workmen and the placement of concrete.

B. Reinforcing Steel Supports

1. Support bars on approved plastic or dielectric-coated metal chairs or spacers, accurately placed and securely fastened to forms or steel reinforcement in place.
2. Supply additional bars, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place.
3. Support legs of accessories in forms without embedding in form surface.
4. Spacing of chairs and accessories shall conform to CRSI, Manual of Standard Practice. Accurately space hoops and stirrups and wire to the reinforcement.
5. Permit no lose wood inside forms.
6. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

C. Placing and Tying

1. Set in place, space, and rigidly and securely tie or wire with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed.

2. Rebending of bars on the job to accommodate the job to accommodate existing conditions will not be permitted without the written approval of the Owner or Owner's Representative.
3. Points ends of wire ties away from forms.

D. Spacing

1. Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1½ inches or less than 1½ times the maximum size aggregate.

E. Splices

1. Maximum 50% of steel spliced occurring within lap length.
2. Top bars shall be 1.3 times values given in 3.01.D.5.c.
3. Splice lengths.
   a. #6 bars and smaller: 50-bar diameter
   b. #7 bars and larger: 60-bar diameter

F. Concrete Covering

1. In accordance with ACI 315, except where shown otherwise on drawings.

3.03 CONCRETE

A. Mixing of Concrete

1. All concrete shall be ready-mixed concrete and shall be mixed and delivered in accordance with ASTM C 94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.
3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.
4. No admixtures, except those mentioned in paragraph 2.1 shall be used. Calcium chloride will not be permitted.
5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the Owner or Owner's Representative at the end of each pour.

B. Cold Weather Concreting.

1. In accordance with ACI 306.
2. Concrete shall not be mixed or placed when the temperature is below 40 degrees F, or when conditions indicate that the temperature will fall below 40 degrees F within 72 hours unless precautions are taken to protect the concrete.
3. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.

4. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.
5. Calcium chloride shall not be used.

C. Hot Weather Concreting.

1. In accordance with ACI 305.
2. The maximum temperature of the concrete, when deposited, shall be 85 degrees F. If the weather causes the placing temperature to exceed 85 degrees F., the mix shall be cooled by methods approved by the Owner or Owner's Representative.
3. No concrete shall be deposited when the air temperature is greater than 90 degrees F.

D. Conveying and Placing Concrete.

1. In accordance with ACI 304.
2. Notification: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.
3. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Owner or Owner's Representative. Any flow of water into an excavation shall be diverted through proper side drains into a sump or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.
4. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).
5. Anchors and Embedded Items: Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.

E. Handling and Depositing

a. Before any concrete is placed, notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
b. Immediately before concrete is placed, inspect all forms to ensure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled and free from foreign materials, and that all reinforcement is in proper position.
c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid rehandling or flowing.
e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
f. Concrete that has partially hardened shall not be deposited in the work.

F. Pumping

a. Concrete may be placed by pumping if first approved in writing by the Owner or Owner's Representative for the location proposed.
b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.
c. The concrete mix shall be designed to the same requirements as herein before specified and may be richer in lubricating components in order to allow proper pumping.
d. Concrete shall not be pumped through aluminum pipes.

G. Vibrating and Compacting

a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.
b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than seven thousand (7,000) impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.
c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed or the heavier aggregates are caused to settle. Care shall be taken to not disturb concrete that has its initial set.
d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall first be deposited in the forms, to a depth of at least on inch.
e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.

3.04 CONSTRUCTION JOINTS

A. Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Owner or Owner's Representative for approval.

B. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete.

C. Approved keys shall be used at all joints, unless detailed otherwise.

D. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.

E. Bonding Concrete at Construction Joints

1. To new concrete construction joints:
    a. Thoroughly clean and saturate joint with water.
    b. Cover horizontal wall surfaces as specified in this Section, and immediately place concrete.
    c. Limit concrete lift placed immediately on top of bonding compound to 12 inches thick.
    d. Thoroughly vibrate to mix and consolidate bonding compound and concrete together.

3.05 BONDING NEW CONCRETE TO OLD CONCRETE:

1. Mechanically roughen existing concrete surfaces to a clean, rough surface using appropriate mechanical means to remove the existing concrete surface and provide a minimum roughness profile of ¼-inch.
2. Saturate surface with water for 24 hours, cover with epoxy bonding compound and place concrete as specified for new concrete.

3.06 EXPANSION JOINTS

1. Expansion joints shall be located as shown on contract drawings.
2. The joint shall include a joint filler, a bond breaker and joint sealant and installed as indicated on contract drawings.

3.07 JOINT SEALANTS.

1. Prepare surface in accordance with manufacturers directions.
2. Apply primer as recommended by sealant manufacturer.
3. Install sealant with the proper tools and methods as directed by the sealant manufacturer.

3.08 PATCHING

1. Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry.
2. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1 part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Owner's Representative's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.
3. The Contractor shall do all the cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, or shall any structural members or reinforcement be cut.
4. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.

3.09 PROTECTION AND CURING

1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.

2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least (7) days.
3. Carefully protect exposed concrete corners from damage.
4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound.
5. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.

3.10 CONCRETE FINISHES

1. Unexposed Surfaces: All unexposed surfaces shall have any form finish, at the Contractor's option.
2. Wearing Surface Finish: Float the surface by hand using a wooden or magnesium float. Finish with a flexible bristle broom. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.
3. Addition of Material: The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.

3.11 DEFECTIVE WORK

1. The following concrete work shall be considered defective and may be ordered by the Owner or Owner’s Representative to be removed and replaced at Contractor's expense:
   a. Incorrectly formed.
   b. Not plumb or level.
   c. Not specified strength.
   d. Containing rock pockets, voids, honeycomb, or cold joints.
   e. Containing wood or foreign matter.
   f. Otherwise not in accordance with the intent of the Drawings and Specifications.

END OF SECTION

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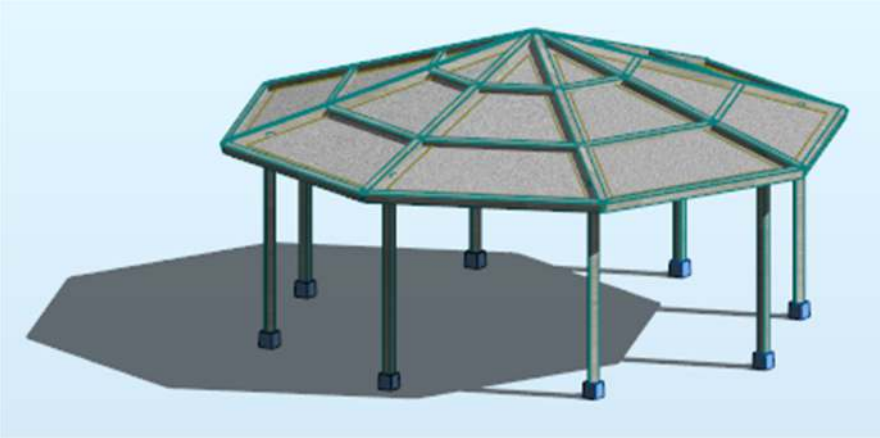
Appendix B

Pavilion Structure (including Footing/Pilings)
Manufacturer Stamped Engineered Drawings
-Structural Calculations

CEDAR FOREST PRODUCTS

Structural Calculations



Job Number: *4338*

Standards: *2018 International Building Code*

Structure Name: *OSP28*

Client: *Conimicut Park*

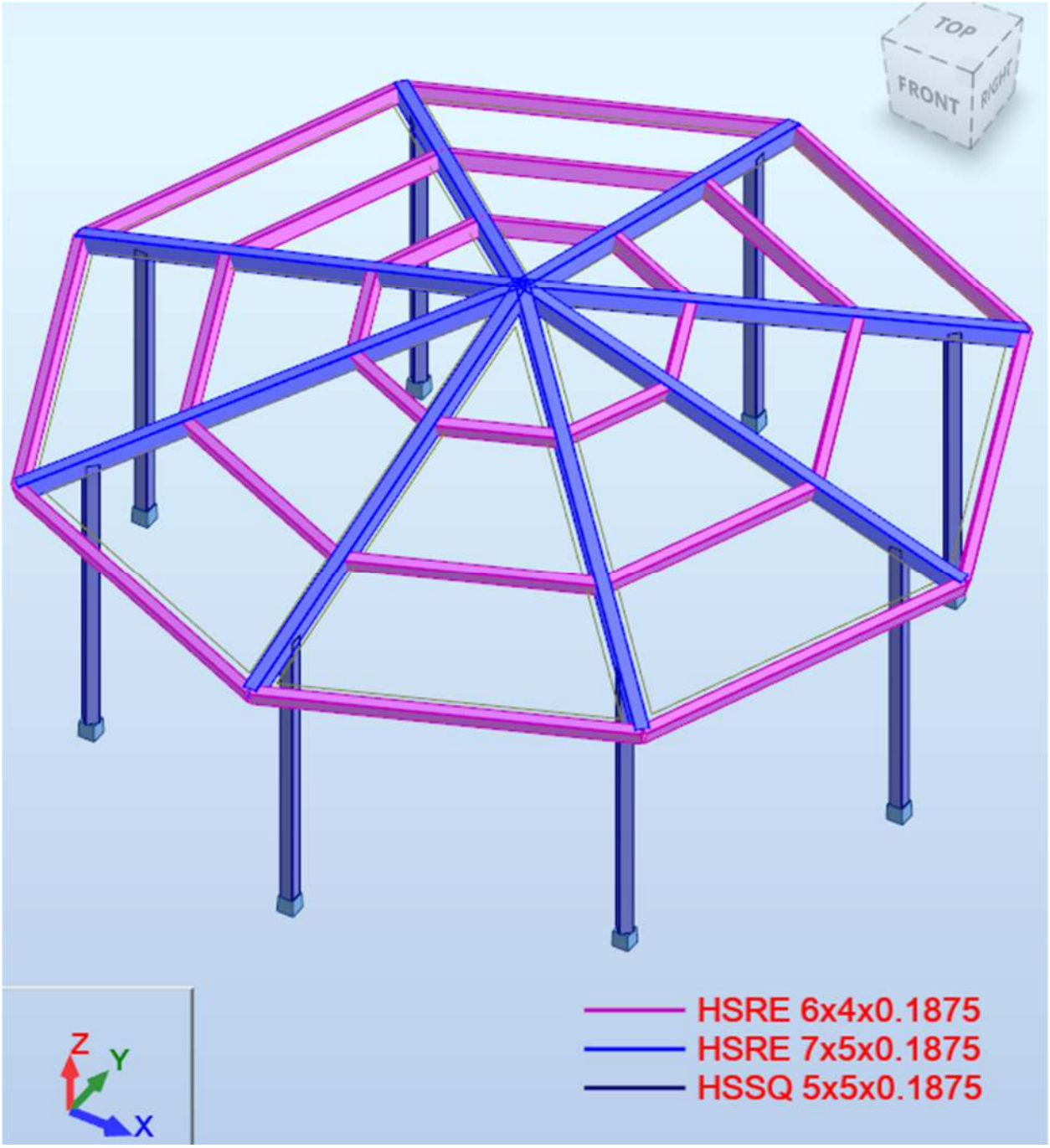
Date: *12/14/2023*

Author: *Troy Garland, P.E., S.E.*

Site Location: *Point Ave., Warwick, RI 02889*

TROY L. GARLAND
No. 11357
REGISTERED
PROFESSIONAL ENGINEER
(STRUCTURAL)
12/14/23

Structure View



Design Criteria

Codes

2018 International Building Code
ASCE 7-16 Minimum Design Loads for Buildings and Other Structures
2015 AWC National Design Standard for Wood Construction
ACI 318-14 Building Code Requirements for Structural Concrete
AISC 360-16 Specification for Structural Steel Buildings

Dead Loads

Total Dead Load (psf) = 12.1
Frame Weight (psf) = 9.1
Roofing Load (psf) = 3.0

Live Loads

Live Load (psf) = NA
Roof Live Load (psf) = 20

Snow Loads

See snow load calculation sheets

Wind Loads

See wind load calculation sheets

Seismic Loads

See seismic load calculation sheets

Load Combinations

Strength Design Load Combinations — ASCE 7, Section 2.3.2

1.4D
$1.2D + 1.6L_R + 0.5W$
$1.2D + 1.0W + 0.5L_R$
$(1.2+0.2S_{DS})D + 1.0E$
$0.9D + 1.0W$
$(0.9-0.2S_{DS})D + 1.0E$

Allowable Stress Design Combinations — ASCE 7, Section 2.4.1

D
$D + L_R$
$D + 0.6W$
$(1+0.14S_{DS})D + 0.7E$
$D + 0.75(0.6W) + 0.75L_R$
$(1+0.14S_{DS})D + 0.75(0.7E)$
$0.6D + 0.6W$
$(0.6-0.14S_{DS})D + 0.7E$

Snow Loads

Roof surface = *Main Roof*
Description = *Snow Loads*

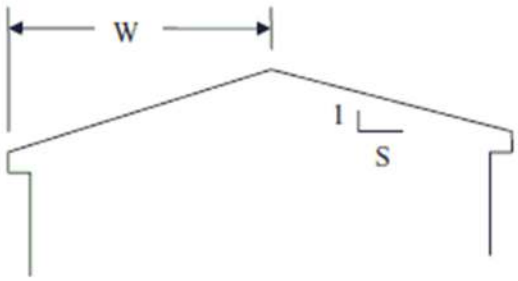
Ground Snow Load (p_g - psf) = *30.00*		ASCE 7-16, Figure 7.2-1
Thermal Factor (C_t) = *1.20*		ASCE 7-16, Table 7.3-2
Exposure Factor (C_e) = *1.00*		ASCE 7-16, Table 7.3-1
Risk Category = *II*		ASCE 7-16, Table 1.5-1
Snow Importance Factor (I_s) = *1.00*		ASCE 7-16, Table 1.5-2
Surface Condition = *Unslippery*		*ASCE 7-16, Section 7.4*
Ventilated = *False*		*ASCE 7-16, Section 7.4*
R value = *0*		*ASCE 7-16, Section 7.4*
Roof angle (θ - deg) = *18.43*		
Roof slope run for a rise of one (S) = 3.00		*ASCE 7-16, Section 7.6.1*
Flat Roof Snow Load (p_f - psf) = *30.00*		
Snow Density (γ - pcf) = *18.64*	$\gamma = 0.13p_g + 14 < 30\ pcf$	ASCE 7-16, Equation 7.7-1

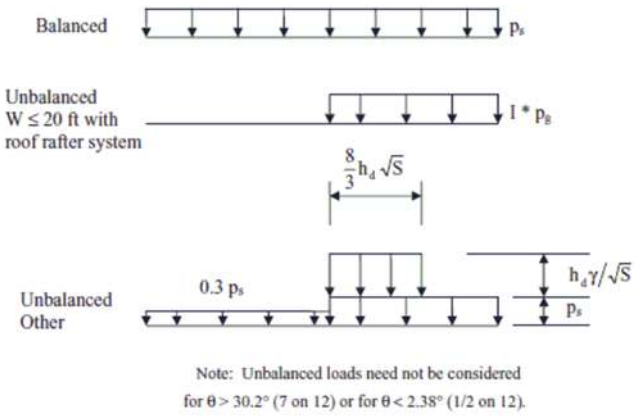
Balanced Snow Loads

Roof Slope Factor (C_s) = *1.00*		ASCE 7-16, Figure 7.4-1
Sloped Roof Snow Load (p_s - psf) = *30.00*	$p_s = C_s p_f$	ASCE 7-16, Equation 7.4-1
Sloped Snow Depth (h_b - ft.) = *1.61*	$h_b = {}^{p_s}/_{\gamma}$	ASCE 7-16, Section 7.7.1
Rain on Snow Surcharge Load (p_{ros} - psf) = *0.00*		*ASCE 7-16, Section 7.10*

Unbalanced Snow Loads

Unbalanced Required = *True*		ASCE 7-16, Section 7.6.1
Rafter System = *True*		ASCE 7-16, Section 7.6.1
Windward Load (p_{ubw} - psf) = *0.00*	$p_{ubw} = 0.3p_s\ or\ 0$	ASCE 7-16, Figure 7.6-2
Leeward Load (p_{ubl} - psf) = *30.00*	$p_{ubl} = Ip_g\ or\ p_s$	ASCE 7-16, Figure 7.6-2
Drift Depth (h_d - ft.) = *0.00*	$h_d = 0.43\sqrt[3]{l_u}\sqrt[4]{p_g + 10} - 1.5$	ASCE 7-16, Figure 7.6-2
Drift Load (p_{ubd} - psf) = *0.00*	$p_{ubd} = h_d\gamma/\sqrt{S}$	ASCE 7-16, Figure 7.6-2
Drift Width (w_{ubd} - ft.) = *0.00*	$w_{ubd} = \frac{8}{3}h_d\sqrt{S}$	ASCE 7-16, Figure 7.6-2





Wind Loads

Wind Design Criteria Type = *OpenGableMWFR*
Eave Height (h_e - ft) = *8.00*
Mean Roof Height (h - ft) = *10.50*
Ridge Direction (Deg from X) = *0.00*
Width in the X direction (W_x - ft) = *28.00*
Width in the Y direction (W_y - ft) = *28.00*
Roof angle (θ - deg) = *18.43*
Structure Shape = Gable
Multi Roof Structure = False
Enclosure Classification = Open — *ASCE 7-16, Section 26.12*
Wind Procedure = *Directional* — ASCE 7-16, Section 26.1.2.1
Basic Wind Speed (V - mph) = *127.00* — ASCE 7-16, Figure 26.5-1
Structure Type = *BuildingMWFRS* — *ASCE 7-16, Table 26.6-1*
Exposure Category = D — *ASCE 7-16, Section 26.7*
Low Rise = True
Rigid Structure = True
CNC Edge and Corner Zone Width = 3.00

Global Wind Parameters

Directionality Factor (K_d) = *0.85* — *ASCE 7-16, Table 26.6-1*
Topographic Factor (K_{zt}) = *1.00* — *ASCE 7-16, Figure 26.8-1*
Gust-effect Factor (G) = *0.85* — *ASCE 7-16, Section 26.11*
Velocity pressure exposure coefficient for MWFRS at mean roof height (K_h) = *1.03* — *ASCE 7-16, Table 26.10-1*
Velocity pressure exposure coefficient for CNC at mean roof height (K_h) = *1.03* — *ASCE 7-16, Table 26.10-1*

Velocity pressure $q_z = 0.00256 K_z K_{zt} K_d V^2$ — ASCE 7-16, Equation 26.10-1

Velocity pressure at mean roof height for MWFRS (q_h - psf) = *36.16*
Velocity pressure at mean roof height for CNC (q_h - psf) = *36.16*

Wind Loads Transverse

Dimensional Parameters

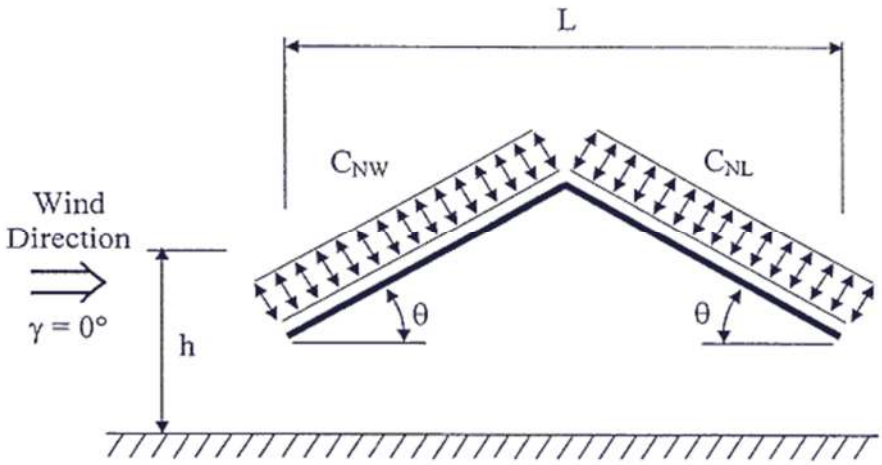
Dimension of Structure in the Wind Direction (L - ft) = *28.00*
Dimension of Structure Perpendicular to the Wind Direction (B - ft) = *28.00*
Height to Length (h/L) = *0.38*
Length to Width (L/B) = *1.00*

Design Wind Pressures (Transverse Wind)

Wind Direction (γ - deg) = *0.00*
Ridge Direction (Deg from X) = *0.00*
Roof Angle (θ - deg) = *18.43*
Mean Roof Height (h - ft) = *10.50*
Roof Length (L - ft) = *28.00*
Clear Wind Flow = *True*
Roofing Solidity Factor (ε) = *1.00*

Design pressures (p - psf) $p = q_h G C_N \varepsilon$ ASCE 7-16, Section 27.3.2

Wind Zone	Pressure Coefficient (C_n)	Design Pressure (p - psf)
Windward Roof Case A	*1.10*	*33.81*
Leeward Roof Case A	*-0.17*	*-5.26*
Windward Roof Case B	*0.01*	*0.26*
Leeward Roof Case B	*-0.96*	*-29.58*



**Plus and minus signs signify pressures acting towards and away from the top roof surface, respectively.*
**Pressure Coefficients are from ASCE 7-16, Figure 27.3-5*

Wind Loads Parallel

Dimensional Parameters

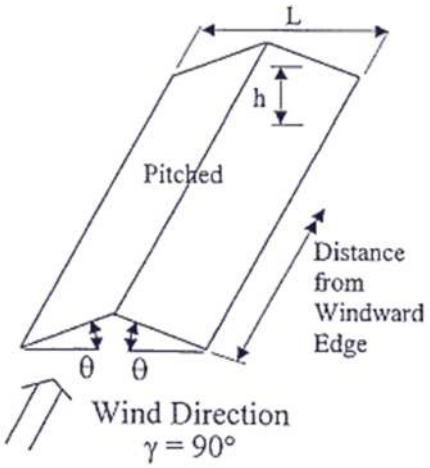
Dimension of Structure in the Wind Direction (L - ft) = *28.00*
Dimension of Structure Perpendicular to the Wind Direction (B - ft) = *28.00*
Height to Length (h/L) = *0.38*
Length to Width (L/B) = *1.00*

Design Wind Pressures (Longitudinal Wind)

Wind Direction (γ - deg) = *90.00*
Ridge Direction (Deg from X) = *0.00*
Roof Angle (θ - deg) = *18.43*
Mean Roof Height (h - ft) = *10.50*
Roof Length (L - ft) = *28.00*
Clear Wind Flow = *True*
Roofing Solidity Factor (ε) = *1.00*

Design pressures (p - psf) $p = q_h G C_N \varepsilon$ ASCE 7-16, Section 27.3.2

Wind Zone	Pressure Coefficient (C_n)	Design Pressure (p - psf)	Zone Ends at (X from Windward Edge - ft)
Roof Area 1 Case A	*-0.80*	*-24.59*	*10.50*
Roof Area 2 Case A	*-0.60*	*-18.44*	*21.00*
Roof Area 3 Case A	*-0.30*	*-9.22*	*28.00*
Roof Area 1 Case B	*0.80*	*24.59*	*10.50*
Roof Area 2 Case B	*0.50*	*15.37*	*21.00*
Roof Area 3 Case B	*0.30*	*9.22*	*28.00*



**Plus and minus signs signify pressures acting towards and away from the top roof surface, respectively.*
**Pressure Coefficients are from ASCE 7-16, Figure 27.3-7*

Seismic Loads

Seismic Ground Motion Values

Short Period spectral response acceleration parameter (S_s) = *0.198* — ASCE 7-16, Chapter 22

One Second Period spectral response acceleration parameter (S_1) = *0.055* — ASCE 7-16, Chapter 22

Site Class = *D*

Site Coefficient (F_a) = *1.600* — ASCE 7-16, Table 11.4-1

Site Coefficient (F_v) = *2.400* — ASCE 7-16, Table 11.4-2

MCER spectral response acceleration parameters

Short Period (S_{MS}) = *0.317* — $S_{MS} = F_a S_s$ — ASCE 7-16, Equation 11.4-1

1sec period (S_{M1}) = *0.132* — $S_{M1} = F_v S_1$ — ASCE 7-16, Equation 11.4-2

Design spectral Acceleration Parameters

Short Period (S_{DS}) =*0.211* — $S_{DS} = (2/3)S_{MS}$ — ASCE 7-16, Equation 11.4-3

1sec Period (S_{D1}) = *0.088* — $S_{D1} = (2/3)S_{M1}$ — ASCE 7-16, Equation 11.4-4

Short-period transition period (T_s - sec) = *0.417* — $T_S = S_{D1}/S_{DS}$ — ASCE 7-16, Section 11.4.5

Long-period transition period (T_L - sec) = *6.000* — ASCE 7-16, Figure 22-12

Seismic Design Category

Importance Factor (I_e) = *1.000* — ASCE 7-16, Table 1.5-2

Risk Category = *II* — ASCE 7-16, Table 1.2-1

Based on Short Period (SDC_s) =*B* — ASCE 7-16, Table 11.6-1

Based on 1sec Period (SDC_1) = *B* — ASCE 7-16, Table 11.6-2

Seismic Design Category (SDC) = *B*

Seismic Coefficients

Structure Type = *Seismic Structure*

Seismic System Name =*Steel ordinary cantilever column systems* — ASCE 7-16, Table 12.2-1

Detailing Requirements = *14.1*

(R) = *1.25*

(Ω_o) = *1.25*

(Cd) = *1.25*

Analysis Procedure Selection

Structural Analysis Procedure = *Equivalent Lateral Force Procedure* — ASCE 7-16, Table 12.6-1

Equivalent lateral Force Procedure

Fundamental period of the structure (T - sec) = *0.5* — From dynamic analysis

Seismic response coefficient (Cs 8-2) = *0.169* — $C_s = S_{DS}/(R/I_e)$ — ASCE 7-16, Equation 12.8-2

Cs need not exceed for T≤T_L (Cs 8-3) = *0.141* — $C_s = S_{D1}/(T(\frac{R}{I_e}))$ — ASCE 7-16, Equation 12.8-3

Cs need not exceed for T>TL (Cs 8-4) = *1.690* — $C_s = S_{D1}/(T^2(\frac{R}{I_e}))$ — ASCE 7-16, Equation 12.8-4

Cs shall not be less than (Cs 8-5) = *0.010* — $C_s = 0.044 S_{DS} I_e \geq 0.01$ — ASCE 7-16, Equation 12.8-5

Where S1 ≥ 0.6g Cs shall not be less than (Cs 8-6) = *0.022* — $C_s = 0.5 S_1/(R/I_e)$ — ASCE 7-16, Equation 12.8-6

Cs to use in the Calculation of base shear (Cs) = *0.141*

**Additional loads due to connection plates and fasteners have been accounted for by multiplying Cs by 1.2.*

Effective seismic weight (W - kip) = 6.715 — *ASCE 7-16, Section 12.7.2*

Seismic Base Shear (V - kip) = 0.945 — $V = C_s W$ — *ASCE 7-16, Equation 12.8-1*

Vertical Distribution

Structure period factor (k) = *1.000* ASCE 7-16, Section 12.8.3

Seismic Weight factor sum (Sum C_{vx}) = *67.148* $\sum_{i=1}^{n} w_i h_i^k$ ASCE 7-16, Equation 12.8-12

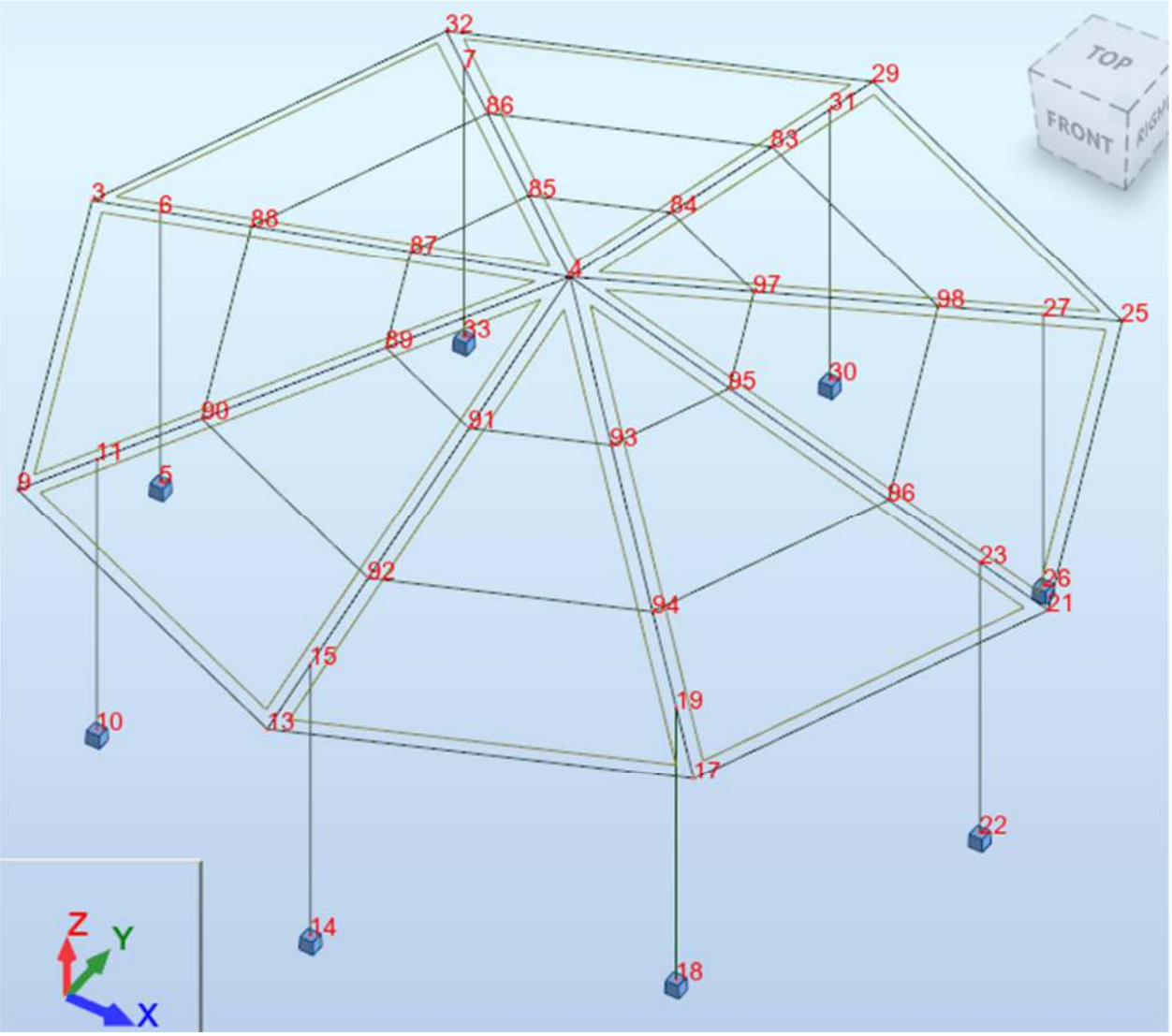
Level	h_x (ft)	W_x Ratio [a]	C_{vx} [b]	F_x (Kip)[c]
1	*10*	*1.00*	*1.00*	*0.95*

(a) Portion of the seismic weight that is assigned to the level.

(b) $C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k}$ - (ASCE 7-16, Equation 12.8-12)

(c) $F_x = C_{vx} V$ - (ASCE 7-16, Equation 12.8-11)

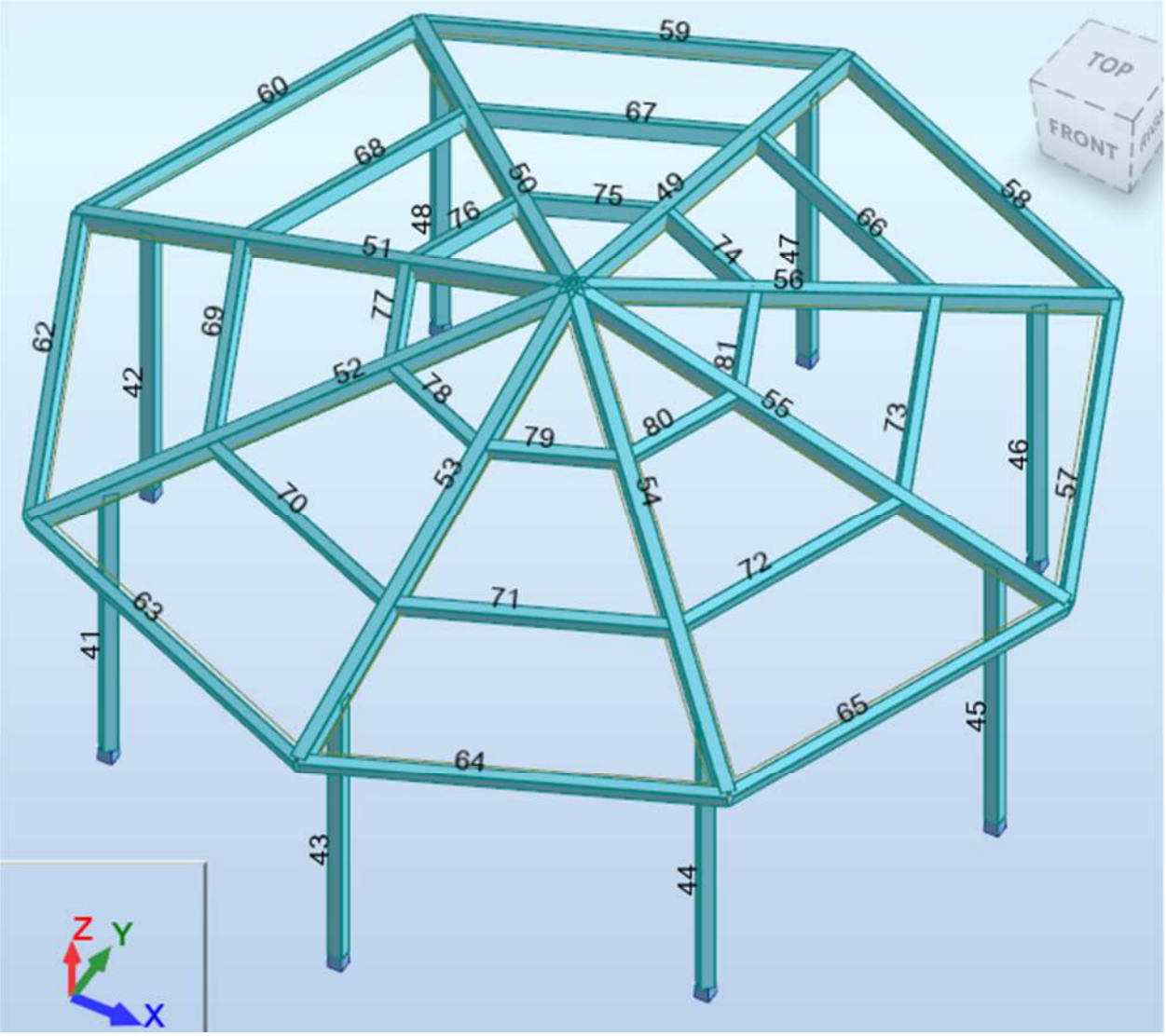
Structure Nodes



NODE	X (FT)	Y (FT)	Z (FT)	SUPPORT
3	*-9.40*	*-3.18*	*8.50*	
4	*4.60*	*-3.18*	*12.81*	
5	*-7.40*	*-3.18*	*0.00*	*Fixed*
6	*-7.40*	*-3.18*	*9.12*	
7	*-3.89*	*5.30*	*9.12*	
9	*-5.30*	*-13.08*	*8.50*	
10	*-3.89*	*-11.67*	*0.00*	*Fixed*
11	*-3.89*	*-11.67*	*9.12*	
13	*4.60*	*-17.18*	*8.50*	
14	*4.60*	*-15.18*	*0.00*	*Fixed*
15	*4.60*	*-15.18*	*9.12*	
17	*14.50*	*-13.08*	*8.50*	

18	*13.08*	*-11.67*	*0.00*	*Fixed*
19	*13.08*	*-11.67*	*9.12*	
21	*18.60*	*-3.18*	*8.50*	
22	*16.60*	*-3.18*	*0.00*	*Fixed*
23	*16.60*	*-3.18*	*9.12*	
25	*14.50*	*6.72*	*8.50*	
26	*13.08*	*5.30*	*0.00*	*Fixed*
27	*13.08*	*5.30*	*9.12*	
29	*4.60*	*10.82*	*8.50*	
30	*4.60*	*8.82*	*0.00*	*Fixed*
31	*4.60*	*8.82*	*9.12*	
32	*-5.30*	*6.72*	*8.50*	
33	*-3.89*	*5.30*	*0.00*	*Fixed*
83	*4.60*	*6.15*	*9.94*	
84	*4.60*	*1.48*	*11.37*	
85	*1.30*	*0.12*	*11.37*	
86	*-2.00*	*3.42*	*9.94*	
87	*-0.07*	*-3.18*	*11.37*	
88	*-4.74*	*-3.18*	*9.94*	
89	*1.30*	*-6.48*	*11.37*	
90	*-2.00*	*-9.78*	*9.94*	
91	*4.60*	*-7.85*	*11.37*	
92	*4.60*	*-12.52*	*9.94*	
93	*7.90*	*-6.48*	*11.37*	
94	*11.20*	*-9.78*	*9.94*	
95	*9.26*	*-3.18*	*11.37*	
96	*13.93*	*-3.18*	*9.94*	
97	*7.90*	*0.12*	*11.37*	
98	*11.20*	*3.42*	*9.94*	

Structure Bars



BAR	NODE 1	NODE 2	LENGTH (FT)	SECTION	MATERIAL	GAMMA	TYPE
41	10	11	9.12	HSSQ 5x5x0.1875	STEEL A500-50	45.00	Column
42	5	6	9.12	HSSQ 5x5x0.1875	STEEL A500-50	0.00	Column
43	14	15	9.12	HSSQ 5x5x0.1875	STEEL A500-50	0.00	Column
44	18	19	9.12	HSSQ 5x5x0.1875	STEEL A500-50	45.00	Column
45	22	23	9.12	HSSQ 5x5x0.1875	STEEL A500-50	0.00	Column
46	26	27	9.12	HSSQ 5x5x0.1875	STEEL A500-50	45.00	Column
47	30	31	9.12	HSSQ 5x5x0.1875	STEEL A500-50	0.00	Column
48	33	7	9.12	HSSQ 5x5x0.1875	STEEL A500-50	45.00	Column
49	4	29	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
50	4	32	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
51	4	3	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
52	4	9	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam

53	4	13	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
54	4	17	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
55	4	21	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
56	4	25	14.65	HSRE 7x5x0.1875	STEEL A500-50	0.00	Hip Beam
57	21	25	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
58	25	29	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
59	29	32	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
60	32	3	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
62	3	9	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
63	9	13	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
64	13	17	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
65	17	21	10.72	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
66	98	83	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
67	83	86	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
68	86	88	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
69	88	90	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
70	90	92	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
71	92	94	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
72	94	96	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
73	96	98	7.14	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
74	97	84	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
75	84	85	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
76	85	87	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
77	87	89	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
78	89	91	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
79	91	93	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
80	93	95	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin
81	95	97	3.57	HSRE 6x4x0.1875	STEEL A500-50	18.40	Steel Purlin

Loads

CASE	CASE NAME	LOAD TYPE	LIST	LOAD VALUES
1	*DL1*	*self-weight*	*33to60 62to81*	*PZ Negative Factor=1.1500*
1	*DL1*	*(FE) uniform*	*33to40*	*PZ=-0.0030(kip/ft2)*
2	*SN1*	*(FE) uniform*	*33to40*	*PZ=-0.0300(kip/ft2) projected*
3	*SN2*	*(FE) uniform*	*33 38to40*	*PZ=-0.0300(kip/ft2) projected*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*49*	*PY=-0.0029(kip/ft) PZ=0.0085(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*50*	*PY=-0.0031(kip/ft) PZ=0.0038(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*41*	*PY=-0.0098(kip/ft) PZ=-0.0032(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*51*	*PY=0.0005(kip/ft) PZ=0.0004(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*52*	*PY=0.0029(kip/ft) PZ=0.0041(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*53*	*PY=0.0027(kip/ft) PZ=0.0086(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*42*	*PY=-0.0006(kip/ft) PZ=-0.0123(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*54*	*PY=0.0006(kip/ft) PZ=0.0098(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*55*	*PY=-0.0000(kip/ft) PZ=0.0079(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*56*	*PY=-0.0003(kip/ft) PZ=0.0097(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*43*	*PY=-0.0029(kip/ft) PZ=-0.0074(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*57*	*PY=-0.0044(kip/ft) PZ=0.0020(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*58*	*PY=-0.0060(kip/ft) PZ=0.0021(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*59*	*PY=0.0029(kip/ft) PZ=0.0011(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*44*	*PY=-0.0063(kip/ft) PZ=-0.0031(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*60*	*PY=0.0141(kip/ft) PZ=-0.0017(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*62*	*PY=0.0137(kip/ft) PZ=-0.0017(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*63*	*PY=0.0023(kip/ft) PZ=0.0012(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*45*	*PY=-0.0002(kip/ft) PZ=-0.0042(kip/ft) local*

4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*64*	*PY=-0.0059(kip/ft) PZ=0.0023(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*65*	*PY=-0.0043(kip/ft) PZ=0.0021(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*66*	*PY=-0.0010(kip/ft) PZ=0.0079(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*46*	*PY=-0.0028(kip/ft) PZ=-0.0059(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*67*	*PY=-0.0006(kip/ft) PZ=0.0021(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*68*	*PY=-0.0006(kip/ft) PZ=-0.0030(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*69*	*PY=-0.0009(kip/ft) PZ=-0.0025(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*47*	*PY=0.0022(kip/ft) PZ=-0.0079(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*70*	*PY=-0.0008(kip/ft) PZ=0.0024(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*71*	*PY=-0.0007(kip/ft) PZ=0.0080(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*72*	*PY=0.0007(kip/ft) PZ=0.0079(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*48*	*PY=-0.0043(kip/ft) PZ=-0.0102(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*73*	*PY=0.0009(kip/ft) PZ=0.0080(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*33*	*PZ=-0.0053(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*34*	*PZ=0.0087(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*35*	*PZ=0.0220(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*36*	*PZ=0.0218(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*37*	*PZ=0.0213(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*38*	*PZ=0.0224(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*39*	*PZ=0.0096(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*40*	*PZ=-0.0048(kip/ft2) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*74*	*PY=-0.0018(kip/ft) PZ=0.0082(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*75*	*PY=-0.0008(kip/ft) PZ=0.0065(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*76*	*PY=0.0004(kip/ft) PZ=0.0035(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*77*	*PY=0.0003(kip/ft) PZ=0.0034(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*78*	*PY=-0.0009(kip/ft) PZ=0.0065(kip/ft) local*

4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*79*	*PY=-0.0019(kip/ft) PZ=0.0079(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*80*	*PY=0.0002(kip/ft) PZ=0.0075(kip/ft) local*
4	*Wind X+ 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*81*	*PY=0.0002(kip/ft) PZ=0.0076(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*80*	*PY=-0.0004(kip/ft) PZ=0.0065(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*81*	*PY=0.0003(kip/ft) PZ=0.0029(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*49*	*PY=0.0024(kip/ft) PZ=0.0037(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*50*	*PY=0.0025(kip/ft) PZ=0.0087(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*41*	*PY=-0.0005(kip/ft) PZ=0.0042(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*51*	*PY=0.0000(kip/ft) PZ=0.0096(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*52*	*PY=0.0000(kip/ft) PZ=0.0080(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*53*	*PY=-0.0005(kip/ft) PZ=0.0101(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*42*	*PY=-0.0030(kip/ft) PZ=0.0063(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*54*	*PY=-0.0032(kip/ft) PZ=0.0087(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*55*	*PY=-0.0028(kip/ft) PZ=0.0037(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*56*	*PY=0.0006(kip/ft) PZ=0.0004(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*43*	*PY=-0.0057(kip/ft) PZ=0.0030(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*57*	*PY=0.0140(kip/ft) PZ=-0.0013(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*58*	*PY=0.0133(kip/ft) PZ=-0.0008(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*59*	*PY=0.0018(kip/ft) PZ=0.0005(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*44*	*PY=-0.0023(kip/ft) PZ=0.0079(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*60*	*PY=-0.0056(kip/ft) PZ=0.0023(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*62*	*PY=-0.0044(kip/ft) PZ=0.0020(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*63*	*PY=-0.0046(kip/ft) PZ=0.0020(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*45*	*PY=-0.0103(kip/ft) PZ=0.0042(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*64*	*PY=-0.0056(kip/ft) PZ=0.0023(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*65*	*PY=0.0024(kip/ft) PZ=0.0006(kip/ft) local*

5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*66*	*PY=-0.0009(kip/ft) PZ=-0.0031(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*46*	*PY=0.0005(kip/ft) PZ=0.0124(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*67*	*PY=-0.0004(kip/ft) PZ=0.0019(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*68*	*PY=0.0003(kip/ft) PZ=0.0088(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*69*	*PY=0.0007(kip/ft) PZ=0.0074(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*47*	*PY=-0.0042(kip/ft) PZ=0.0110(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*70*	*PY=0.0007(kip/ft) PZ=0.0080(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*71*	*PY=0.0005(kip/ft) PZ=0.0090(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*72*	*PY=-0.0008(kip/ft) PZ=0.0017(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*48*	*PY=0.0027(kip/ft) PZ=0.0074(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*73*	*PY=-0.0006(kip/ft) PZ=-0.0029(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*33*	*PZ=0.0218(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*34*	*PZ=0.0091(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*35*	*PZ=-0.0045(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*36*	*PZ=-0.0054(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*37*	*PZ=0.0086(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*38*	*PZ=0.0220(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*39*	*PZ=0.0220(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*40*	*PZ=0.0211(kip/ft2) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*74*	*PY=0.0001(kip/ft) PZ=0.0030(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*75*	*PY=-0.0010(kip/ft) PZ=0.0066(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*76*	*PY=-0.0008(kip/ft) PZ=0.0077(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*77*	*PY=-0.0005(kip/ft) PZ=0.0078(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*78*	*PY=-0.0002(kip/ft) PZ=0.0080(kip/ft) local*
5	*Wind X-Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*79*	*PY=-0.0004(kip/ft) PZ=0.0079(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*43*	*PY=-0.0041(kip/ft) PZ=0.0002(kip/ft) local*

6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*80*	*PY=-0.0014(kip/ft) PZ=0.0081(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*49*	*PY=0.0005(kip/ft) PZ=0.0004(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*50*	*PY=0.0026(kip/ft) PZ=0.0043(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*41*	*PY=-0.0037(kip/ft) PZ=0.0065(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*51*	*PY=0.0030(kip/ft) PZ=0.0088(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*52*	*PY=0.0002(kip/ft) PZ=0.0098(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*53*	*PY=-0.0007(kip/ft) PZ=0.0080(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*42*	*PY=-0.0075(kip/ft) PZ=0.0029(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*54*	*PY=-0.0005(kip/ft) PZ=0.0099(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*55*	*PY=-0.0032(kip/ft) PZ=0.0087(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*56*	*PY=-0.0026(kip/ft) PZ=0.0040(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*46*	*PY=-0.0098(kip/ft) PZ=0.0042(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*57*	*PY=0.0028(kip/ft) PZ=0.0011(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*58*	*PY=0.0140(kip/ft) PZ=-0.0019(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*59*	*PY=0.0136(kip/ft) PZ=-0.0018(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*44*	*PY=-0.0057(kip/ft) PZ=0.0030(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*60*	*PY=0.0021(kip/ft) PZ=0.0012(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*62*	*PY=-0.0061(kip/ft) PZ=0.0022(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*63*	*PY=-0.0043(kip/ft) PZ=0.0023(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*45*	*PY=-0.0077(kip/ft) PZ=-0.0026(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*64*	*PY=-0.0044(kip/ft) PZ=0.0023(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*65*	*PY=-0.0062(kip/ft) PZ=0.0022(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*66*	*PY=-0.0009(kip/ft) PZ=-0.0028(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*81*	*PY=-0.0008(kip/ft) PZ=0.0065(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*67*	*PY=-0.0012(kip/ft) PZ=-0.0024(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*68*	*PY=-0.0005(kip/ft) PZ=0.0023(kip/ft) local*

6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*69*	*PY=-0.0006(kip/ft) PZ=0.0083(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*47*	*PY=-0.0123(kip/ft) PZ=0.0004(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*70*	*PY=0.0004(kip/ft) PZ=0.0078(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*71*	*PY=0.0007(kip/ft) PZ=0.0078(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*72*	*PY=-0.0008(kip/ft) PZ=0.0080(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*48*	*PY=-0.0041(kip/ft) PZ=0.0107(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*73*	*PY=-0.0002(kip/ft) PZ=0.0022(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*33*	*PZ=0.0095(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*34*	*PZ=-0.0047(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*35*	*PZ=-0.0052(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*36*	*PZ=0.0087(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*37*	*PZ=0.0221(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*38*	*PZ=0.0220(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*39*	*PZ=0.0213(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*40*	*PZ=0.0223(kip/ft2) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*74*	*PY=0.0004(kip/ft) PZ=0.0034(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*75*	*PY=0.0002(kip/ft) PZ=0.0033(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*76*	*PY=-0.0009(kip/ft) PZ=0.0065(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*77*	*PY=-0.0019(kip/ft) PZ=0.0079(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*78*	*PY=0.0002(kip/ft) PZ=0.0075(kip/ft) local*
6	*Wind Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*79*	*PY=0.0002(kip/ft) PZ=0.0076(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*52*	*PY=0.0029(kip/ft) PZ=0.0088(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*80*	*PY=-0.0006(kip/ft) PZ=0.0078(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*49*	*PY=-0.0031(kip/ft) PZ=0.0039(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*50*	*PY=-0.0004(kip/ft) PZ=0.0004(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*41*	*PY=-0.0083(kip/ft) PZ=0.0036(kip/ft) local*

7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*51*	*PY=0.0026(kip/ft) PZ=0.0041(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*43*	*PY=-0.0064(kip/ft) PZ=-0.0030(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*53*	*PY=-0.0001(kip/ft) PZ=0.0095(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*42*	*PY=-0.0107(kip/ft) PZ=-0.0040(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*54*	*PY=-0.0001(kip/ft) PZ=0.0079(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*55*	*PY=-0.0004(kip/ft) PZ=0.0096(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*56*	*PY=-0.0028(kip/ft) PZ=0.0085(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*81*	*PY=-0.0003(kip/ft) PZ=0.0079(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*57*	*PY=-0.0057(kip/ft) PZ=0.0022(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*58*	*PY=0.0023(kip/ft) PZ=0.0004(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*59*	*PY=0.0136(kip/ft) PZ=-0.0010(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*44*	*PY=-0.0041(kip/ft) PZ=0.0001(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*60*	*PY=0.0136(kip/ft) PZ=-0.0011(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*62*	*PY=0.0017(kip/ft) PZ=0.0006(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*63*	*PY=-0.0057(kip/ft) PZ=0.0023(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*45*	*PY=-0.0029(kip/ft) PZ=-0.0058(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*64 65*	*PY=-0.0045(kip/ft) PZ=0.0020(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*66*	*PY=-0.0007(kip/ft) PZ=0.0017(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*46*	*PY=-0.0077(kip/ft) PZ=-0.0025(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*67*	*PY=-0.0009(kip/ft) PZ=-0.0031(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*68*	*PY=-0.0008(kip/ft) PZ=-0.0027(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*69*	*PY=-0.0004(kip/ft) PZ=0.0019(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*47*	*PY=-0.0048(kip/ft) PZ=-0.0107(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*70*	*PY=0.0003(kip/ft) PZ=0.0090(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*71*	*PY=0.0004(kip/ft) PZ=0.0076(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*72 79*	*PY=0.0006(kip/ft) PZ=0.0077(kip/ft) local*

7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*48*	*PY=-0.0124(kip/ft) PZ=0.0003(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*73*	*PY=0.0010(kip/ft) PZ=0.0088(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*33*	*PZ=-0.0048(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*34*	*PZ=-0.0048(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*35*	*PZ=0.0083(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*36*	*PZ=0.0215(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*37*	*PZ=0.0215(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*38*	*PZ=0.0213(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*39*	*PZ=0.0224(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*(FE) uniform*	*40*	*PZ=0.0093(kip/ft2) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*74*	*PY=-0.0006(kip/ft) PZ=0.0066(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*75*	*PY=0.0004(kip/ft) PZ=0.0030(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*76*	*PY=0.0001(kip/ft) PZ=0.0031(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*77*	*PY=-0.0003(kip/ft) PZ=0.0066(kip/ft) local*
7	*Wind X+Y- 186.3000 ft/s (f = 1.00-2.00) Simulation*	*uniform load*	*78*	*PY=-0.0008(kip/ft) PZ=0.0077(kip/ft) local*
8	*EX*	*(FE) uniform*	*33to40*	*PX=0.0030(kip/ft2) projected*
9	*EY*	*(FE) uniform*	*33to40*	*PY=0.0030(kip/ft2)*

Load Combinations

COMBINATION	NAME	ANALYSIS TYPE	COMBINATION NATURE [A]	CASE NATURE	DEFINITION
10 (C)	LRFD1	Linear Combination	ULS	dead	1*1.4000
11 (C)	LRFD3.0	Linear Combination	ULS	snow	1*1.2000+2*1.6000+4*0.5000
12 (C)	LRFD3.1	Linear Combination	ULS	snow	1*1.2000+2*1.6000+5*0.5000
13 (C)	LRFD3.2	Linear Combination	ULS	snow	1*1.2000+2*1.6000+6*0.5000
14 (C)	LRFD3.3	Linear Combination	ULS	snow	1*1.2000+2*1.6000+7*0.5000
15 (C)	LRFD3.4	Linear Combination	ULS	snow	1*1.2000+3*1.6000+4*0.5000
16 (C)	LRFD3.5	Linear Combination	ULS	snow	1*1.2000+3*1.6000+5*0.5000
17 (C)	LRFD3.6	Linear Combination	ULS	snow	1*1.2000+3*1.6000+6*0.5000
18 (C)	LRFD3.7	Linear Combination	ULS	snow	1*1.2000+3*1.6000+7*0.5000
19 (C)	LRFD4.0	Linear Combination	ULS	wind	1*1.2000+4*1.0000+2*0.5000
20 (C)	LRFD4.1	Linear Combination	ULS	wind	1*1.2000+5*1.0000+2*0.5000
21 (C)	LRFD4.2	Linear Combination	ULS	wind	1*1.2000+6*1.0000+2*0.5000
22 (C)	LRFD4.3	Linear Combination	ULS	wind	1*1.2000+7*1.0000+2*0.5000
23 (C)	LRFD4.4	Linear Combination	ULS	wind	1*1.2000+4*1.0000+3*0.5000
24 (C)	LRFD4.5	Linear Combination	ULS	wind	1*1.2000+5*1.0000+3*0.5000
25 (C)	LRFD4.6	Linear Combination	ULS	wind	1*1.2000+6*1.0000+3*0.5000
26 (C)	LRFD4.7	Linear Combination	ULS	wind	1*1.2000+7*1.0000+3*0.5000
27 (C)	LRFD5.0	Linear Combination	ULS	seismic	1*1.2400+8*1.0000+2*0.2000
28 (C)	LRFD5.1	Linear Combination	ULS	seismic	1*1.2400+8*-1.0000+2*0.2000
29 (C)	LRFD5.2	Linear Combination	ULS	seismic	1*1.2400+9*1.0000+3*0.2000
30 (C)	LRFD5.3	Linear Combination	ULS	seismic	1*1.2400+9*-1.0000+3*0.2000
31 (C)	LRFD6.0	Linear Combination	ULS	wind	1*0.9000+4*1.0000
32 (C)	LRFD6.1	Linear Combination	ULS	wind	1*0.9000+5*1.0000

33 (C)	*LRFD6.2*	*Linear Combination*	*ULS*	*wind*	*1*0.9000+6*1.0000*
34 (C)	*LRFD6.3*	*Linear Combination*	*ULS*	*wind*	*1*0.9000+7*1.0000*
35 (C)	*LRFD7.0*	*Linear Combination*	*ULS*	*seismic*	*1*0.8600+8*1.0000*
36 (C)	*LRFD7.1*	*Linear Combination*	*ULS*	*seismic*	*1*0.8600+8*-1.0000*
37 (C)	*LRFD7.2*	*Linear Combination*	*ULS*	*seismic*	*1*0.8600+9*1.0000*
38 (C)	*LRFD7.3*	*Linear Combination*	*ULS*	*seismic*	*1*0.8600+9*-1.0000*
39 (C)	*ASD1.0*	*Linear Combination*	*SLS*	*dead*	*1*1.0000*
40 (C)	*ASD3.0*	*Linear Combination*	*SLS*	*snow*	*(1+2)*1.0000*
41 (C)	*ASD3.1*	*Linear Combination*	*SLS*	*snow*	*(1+3)*1.0000*
42 (C)	*ASD5.0*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+4*0.6000*
43 (C)	*ASD5.1*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+5*0.6000*
44 (C)	*ASD5.2*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+6*0.6000*
45 (C)	*ASD5.3*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+7*0.6000*
46 (C)	*ASD6.0*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+4*0.4500+2*0.7500*
47 (C)	*ASD6.1*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+5*0.4500+2*0.7500*
48 (C)	*ASD6.2*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+6*0.4500+2*0.7500*
49 (C)	*ASD6.3*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+7*0.4500+2*0.7500*
50 (C)	*ASD6.4*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+4*0.4500+3*0.7500*
51 (C)	*ASD6.5*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+5*0.4500+3*0.7500*
52 (C)	*ASD6.6*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+6*0.4500+3*0.7500*
53 (C)	*ASD6.7*	*Linear Combination*	*SLS*	*wind*	*1*1.0000+7*0.4500+3*0.7500*
54 (C)	*ASD6.8*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+8*0.5250+2*0.7500*
55 (C)	*ASD6.9*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+8*-0.5250+2*0.7500*
56 (C)	*ASD6.10*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+9*0.5250+2*0.7500*
57 (C)	*ASD6.11*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+9*-0.5250+2*0.7500*
58 (C)	*ASD6.12*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+8*0.5250+3*0.7500*

59 (C)	*ASD6.13*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+8*-0.5250+3*0.7500*
60 (C)	*ASD6.14*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+9*0.5250+3*0.7500*
61 (C)	*ASD6.15*	*Linear Combination*	*SLS*	*seismic*	*1*1.0300+9*-0.5250+3*0.7500*
62 (C)	*ASD7.0*	*Linear Combination*	*SLS*	*wind*	*(1+4)*0.6000*
63 (C)	*ASD7.1*	*Linear Combination*	*SLS*	*wind*	*(1+5)*0.6000*
64 (C)	*ASD7.2*	*Linear Combination*	*SLS*	*wind*	*(1+6)*0.6000*
65 (C)	*ASD7.3*	*Linear Combination*	*SLS*	*wind*	*(1+7)*0.6000*
66 (C)	*ASD8.0*	*Linear Combination*	*SLS*	*seismic*	*1*0.5700+8*0.7000*
67 (C)	*ASD8.1*	*Linear Combination*	*SLS*	*seismic*	*1*0.5700+8*-0.7000*
68 (C)	*ASD8.2*	*Linear Combination*	*SLS*	*seismic*	*1*0.5700+9*0.7000*
69 (C)	*ASD8.3*	*Linear Combination*	*SLS*	*seismic*	*1*0.5700+9*-0.7000*

(a) SLS = Service Limit State, ULS = Ultimate Limit State

Member Design

ANSI/AISC 360-10 - Code Group Verification (ULS) 1to3

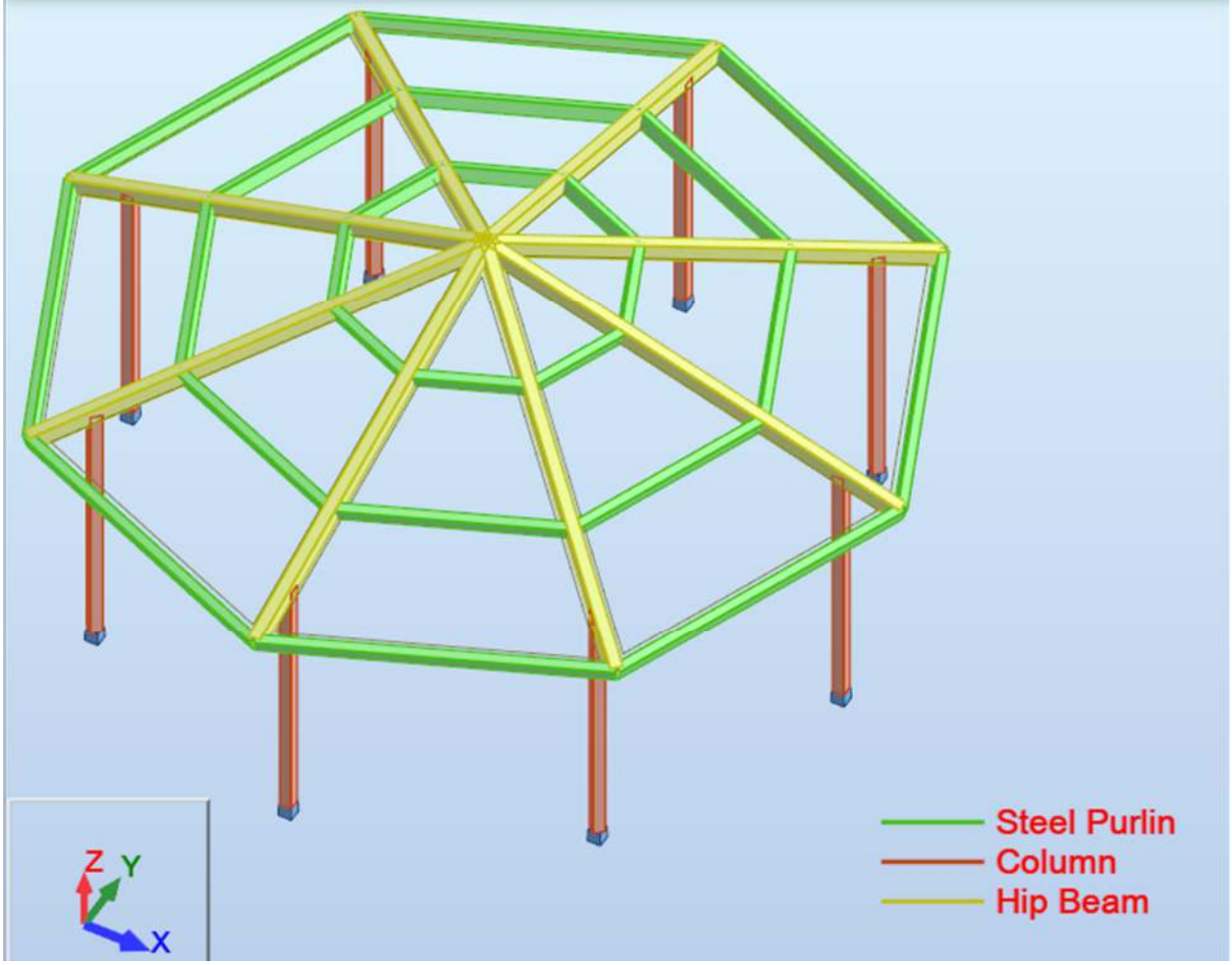
Results | Messages

Member		Section	Material	Lay	Laz	Ratio	Case
Code group : 1 Column							
47 Column_47	OK	HSSQ 5x5x0.1875	STEEL A500-50	55.8127	55.8127	0.1773	20 LRFD4.1
Code group : 2 Hip Beam							
53 Hip Beam_53	OK	HSRE 7x5x0.1875	STEEL A500-50	66.3932	86.0740	0.1377	13 LRFD3.2
Code group : 3 Purlin							
60 Steel Purlin_60	OK	HSRE 6x4x0.1875	STEEL A500-50	57.5036	78.6801	0.1071	11 LRFD3.0

Calc. Note | Close | Help

Ratio: Analysis | Map

Calculation points
Division: n = 3
Extremes: none
Additional: none



STEEL DESIGN

CODE: *ANSI/AISC 360-10 An American National Standard, June 22, 2010*
ANALYSIS TYPE: Code Group Verification

CODE GROUP: 1 Column
MEMBER: 47 Column_47 **POINT:** 1 **COORDINATE:** x = 0.00 L = 0.0000 ft

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LOADS:
Governing Load Case: 20 LRFD4.1 1*1.2000+5*1.0000+2*0.5000

MATERIAL:
STEEL A500-50 Fy = 50.0000 ksi Fu = 62.0000 ksi E = 29000.0000 ksi

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SECTION PARAMETERS: HSSQ 5x5x0.1875

d=5.00 in	Ay=1.498 in2	Az=1.498 in2	Ax=3.280 in2
bf=5.00 in	Iy=12.600 in4	Iz=12.600 in4	J=19.900 in4
tw=0.17 in	Sy=5.040 in3	Sz=5.040 in3	
tf=0.17 in	Zy=5.890 in3	Zz=5.890 in3	

MEMBER PARAMETERS:

Ly = 9.1159 ft	Lz = 9.1159 ft	
Ky = 1.0000	Kz = 1.0000	Lb = 9.1159 ft
KLy/ry = 55.8127	KLz/rz = 55.8127	Cb = 1.0000

INTERNAL FORCES:

Tr = 0.2748 kip*in

Pr = 1.4766 kip
Mry = 21.7667 kip*in Vry = 0.3706 kip
Fiv*Vny = 40.4404 kip
Mrz = 23.5664 kip*in Vrz = -0.2490 kip

DESIGN STRENGTHS

FiT*Tn = 218.2860 kip*in

Fic*Pn = 117.5356 kip
Fib*Mny = 265.0500 kip*in

Fib*Mnz = 265.0500 kip*inFiv*Vnz = 40.4404 kip

SAFETY FACTORS

Fib = 0.9000 Fic = 0.9000 Fiv = 0.9000

SECTION ELEMENTS:

Flange = Compact Web = Compact

VERIFICATION FORMULAS:

Pr/(2*Fic*Pn) + Mry/(Fib*Mny) + Mrz/(Fib*Mnz) = 0.1773 < 1.0000 LRFD (H1-1b) Verified
Vry/(Fiv*Vny) = 0.0092 < 1.0000 LRFD (G2-1) Verified
Vrz/(Fiv*Vnz) = 0.0062 < 1.0000 LRFD (G2-1) Verified
Ky*Ly/ry = 55.8127 < (K*L/r),max = 200.0000 Kz*Lz/rz = 55.8127 < (K*L/r),max = 200.0000 STABLE

Section OK !!!

STEEL DESIGN

CODE: *ANSI/AISC 360-10 An American National Standard, June 22, 2010*
ANALYSIS TYPE: Code Group Verification

CODE GROUP: 2 Hip Beam
MEMBER: 53 Hip Beam_53 **POINT:** 3 **COORDINATE:** x = 0.86 L = 12.5561 ft

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LOADS:
Governing Load Case: 13 LRFD3.2 1*1.2000+2*1.6000+6*0.5000

MATERIAL:
STEEL A500-50 Fy = 50.0000 ksi Fu = 62.0000 ksi E = 29000.0000 ksi

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SECTION PARAMETERS: HSRE 7x5x0.1875

d=7.00 in	Ay=1.498 in2	Az=2.194 in2	Ax=3.980 in2
bf=5.00 in	Iy=27.900 in4	Iz=16.600 in4	J=32.900 in4
tw=0.17 in	Sy=7.971 in3	Sz=6.640 in3	
tf=0.17 in	Zy=9.520 in3	Zz=7.570 in3	

MEMBER PARAMETERS:

Ly = 14.6488 ft	Lz = 14.6488 ft	
Ky = 1.0000	Kz = 1.0000	Lb = 14.6488 ft
KLy/ry = 66.3932	KLz/rz = 86.0740	Cb = 1.0000

INTERNAL FORCES:
Tr = 0.0725 kip*in

Pr = 3.2256 kip
Mry = -51.8076 kip*in Vry = -0.0045 kip
Fiv*Vny = 40.4404 kip
Mrz = 0.3113 kip*in Vrz = -1.6810 kip

DESIGN STRENGTHS
FiT*Tn = 308.9762 kip*in

Fic*Pn = 102.9521 kip
Fib*Mny = 428.4000 kip*in

Fib*Mnz = 289.8296 kip*in Fiv*Vnz = 59.2324 kip

SAFETY FACTORS
Fib = 0.9000 Fic = 0.9000 Fiv = 0.9000

SECTION ELEMENTS:
Flange = Compact Web = Slender

VERIFICATION FORMULAS:
Pr/(2*Fic*Pn) + Mry/(Fib*Mny) + Mrz/(Fib*Mnz) = 0.1377 < 1.0000 LRFD (H1-1b) Verified
Vry/(Fiv*Vny) = 0.0001 < 1.0000 LRFD (G2-1) Verified
Vrz/(Fiv*Vnz) = 0.0284 < 1.0000 LRFD (G2-1) Verified
Ky*Ly/ry = 66.3932 < (K*L/r),max = 200.0000 Kz*Lz/rz = 86.0740 < (K*L/r),max = 200.0000 STABLE

Section OK !!!

STEEL DESIGN

CODE: *ANSI/AISC 360-10 An American National Standard, June 22, 2010*
ANALYSIS TYPE: Code Group Verification

CODE GROUP: 3 Purlin
MEMBER: 60 Steel Purlin_60 **POINT:** 2 **COORDINATE:** x = 0.50 L = 5.3576 ft

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LOADS:
Governing Load Case: 11 LRFD3.0 1*1.2000+2*1.6000+4*0.5000

MATERIAL:
STEEL A500-50 Fy = 50.0000 ksi Fu = 62.0000 ksi E = 29000.0000 ksi

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SECTION PARAMETERS: HSRE 6x4x0.1875

d=6.00 in	Ay=1.150 in2	Az=1.846 in2	Ax=3.280 in2
bf=4.00 in	Iy=16.400 in4	Iz=8.760 in4	J=18.200 in4
tw=0.17 in	Sy=5.467 in3	Sz=4.380 in3	
tf=0.17 in	Zy=6.600 in3	Zz=5.000 in3	

MEMBER PARAMETERS:



Ly = 10.7152 ft	Lz = 10.7152 ft	
Ky = 1.0000	Kz = 1.0000	Lb = 10.7152 ft
KLy/ry = 57.5036	KLz/rz = 78.6801	Cb = 1.0000

INTERNAL FORCES:
Tr = -0.2421 kip*in

Pr = -3.1383 kip
Mry = 21.0061 kip*in

Fiv*Vny = 31.0444 kip

Mrz = -5.4116 kip*in

DESIGN STRENGTHS
FiT*Tn = 208.8900 kip*in

Fity*Pnty = 147.6000 kip
Fib*Mny = 297.0000 kip*in

Fib*Mnz = 210.5297 kip*inFiv*Vnz = 49.8364 kip

SAFETY FACTORS
Fib = 0.9000 Fity = 0.9000

SECTION ELEMENTS:
Flange = Compact Web = Non-compact

VERIFICATION FORMULAS:
Pr/(2*Fity*Pnty) + Mry/(Fib*Mny) + Mrz/(Fib*Mnz) = 0.1071 < 1.0000 LRFD (H1-1b) Verified
Ky*Ly/ry = 57.5036 < (K*L/r),max = 300.0000 Kz*Lz/rz = 78.6801 < (K*L/r),max = 300.0000 STABLE

Section OK !!!

Foundation Design

Cantilever Column Foundation Design

Reaction Forces Local to Column (ASD)

$D := \text{READEXCEL}\left(\text{".\4338-Forces.xlsx"}, \text{"Sheet1!A2:I14"}\right)$

$D =$

"Bar"	"Point"	"Case"	"Fx (Kip)"	"Fy (Kip)"	"Fz (Kip)"	"Mx (Kip-in)"	"My (Kip-in)"	"Mz (Kip-in)"
42	1	11	2.889	−0.012	0.098	0.105	−8.62	−0.999
46	1	31	−0.518	0.161	0.145	0.489	−13.946	12.835
47	1	25	0.658	0.319	−0.024	−0.092	2.484	19.419
47	1	37	0.593	−0.227	0.017	0.042	−1.825	−14.443
42	1	31	0.522	−0.028	0.204	0.212	−18.265	−2.248
46	1	32	0.516	−0.036	−0.204	−0.226	18.194	−2.756
45	1	24	0.485	0.181	−0.14	0.508	13.929	12.872
42	1	24	0.284	0.155	−0.149	−0.527	14.227	12.185
46	1	32	0.516	−0.036	−0.204	−0.226	18.194	−2.756
42	1	31	0.522	−0.028	0.204	0.212	−18.265	−2.248
43	1	21	0.509	0.313	−0.025	0.046	2.648	19.932
47	1	29	0.834	−0.226	0.017	0.019	−1.859	−14.529

$F_x := \text{submatrix}\left(D, 1, 12, 3, 3\right) \cdot \textit{kip}$ $\quad M_x := \text{submatrix}\left(D, 1, 12, 6, 6\right) \cdot \textit{kip} \cdot \textit{in}$

$F_y := \text{submatrix}\left(D, 1, 12, 4, 4\right) \cdot \textit{kip}$ $\quad M_y := \text{submatrix}\left(D, 1, 12, 7, 7\right) \cdot \textit{kip} \cdot \textit{in}$

$F_z := \text{submatrix}\left(D, 1, 12, 5, 5\right) \cdot \textit{kip}$ $\quad M_z := \text{submatrix}\left(D, 1, 12, 8, 8\right) \cdot \textit{kip} \cdot \textit{in}$

Loads are given in coordinates local to member. X is axial, Y is horizontal axis and Z is vertical axis. Tension is given as a negative value.

Pier Properties

$B := 2\ \textit{ft}$	Diameter of the pier footing
$\gamma_c := 150\ \textit{pcf}$	Unit weight of concrete
$c_f := 0.25$	Coefficient of friction at base of footing
$q_l := 200\ \frac{\textit{psf}}{\textit{ft}}$	Allowable Lateral Bearing Pressure at depth below natural grade with increase per 1806.3.4
$q_v := 1500\ \textit{psf}$	Allowable net vertical bearing pressure
$G := 120\ \textit{pcf}$	Unit weight of soil
$K := 0.5$	Coefficient of lateral earth pressure
$P_r := B \cdot \pi = 6.283\ \textit{ft}$	Perimeter of the footing
$A_b := \pi \cdot B^2 \cdot 0.25 = 3.142\ \textit{ft}^2$	Bearing area at base of footing
$\phi_f := 30\ \textit{deg}$	Friction angle
$d_{frost} := 44\ \textit{in}$	Minimum depth
$\rho_{min} := 0.005$	Minimum reinforcement ratio
$d_{bar} := 0.75\ \textit{in}$	Diameter of vertical bars
$d_{agg} := 0.75\ \textit{in}$	Max aggregate diameter
$d_{tie} := 0.5\ \textit{in}$	Diameter of the tie

Lateral Force Resistance

$\textit{UnconstrainedDepthCheck} := \textit{CapacityCheck}\left(D_u, D_{requ}\right) = \text{"OK"}$ $\quad D_u = 44\ \textit{in}$

$\textit{ConstrainedDepthCheck} := \textit{CapacityCheck}\left(D_c, D_{reqc}\right) = \text{"OK"}$ $\quad D_c = 44\ \textit{in}$

Uplift Resistance

$UnconstrainedUpliftCheck := CapacityCheck\left(UL_{nUncon}, UL_{max}\right) = \text{“OK”}$
$ConstrainedUpliftCheck := CapacityCheck\left(UL_{nCon}, UL_{max}\right) = \text{“OK”}$

Soil Bearing Resistance

$UnconstrainedBearingCheck := CapacityCheck\left(q_v, Q_{netUncon}\right) = \text{“OK”}$
$ConstrainedBearingCheck := CapacityCheck\left(q_v, Q_{netCon}\right) = \text{“OK”}$

Rebar

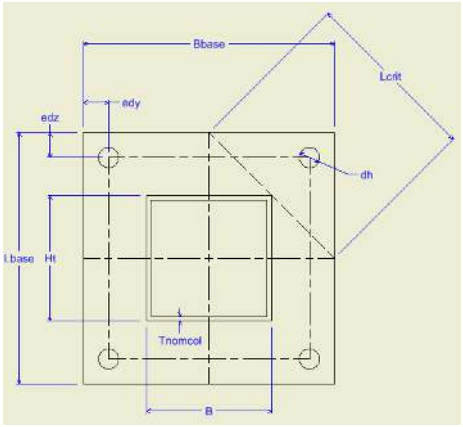
Summary

$B = 24\ in$	Footing Diameter
$D_u = 44\ in$	Unconstrained Depth
$D_c = 44\ in$	Constrained Depth
$d_{bar} = 0.75\ in$	Diameter of the vertical bars
$n_{bar} = 6$	Vertical bar count
$d_{tie} = 0.5\ in$	Tie Diameter
$s_{max} = 12\ in$	Tie Spacing max

Base Plate Design

Unstiffened Base Plate Calculations

Connection Properties



$Ht := 5\ in$ Height of the Column

$B := 5\ in$ Width of the Column

$Tnom_{col} := 0.1875\ in$ Nominal Thickness of the Column

$d_b := 0.75\ in$ Diameter of the anchor bolt

$d_h := d_b + 0.25\ in$ Diameter of the bolt hole

$ed_y := d_b \cdot 2 = 1.5\ in$ Hole edge distance in the x direction

$ed_z := ed_y$ Hole edge distance in the y direction

$B_{base} := B + 4 \cdot ed_y = 11\ in$ Width of the base plate

$L_{base} := Ht + 4 \cdot ed_z = 11\ in$ Length of the base plate

$t_{base} := 0.625\ in$ Thickness of the base plate

$d_{ped} := 24\ in$ Diameter of the pedestal

$h_{ped} := 44\ in$ Depth of the pedestal

$T_{Areinforced} := 0$ Anchor tension reinforcement present

$d_{tr} := 0.75\ in$ Diameter of tension rebar

$V_{Areinforced} := 0$ Anchor shear reinforcement present

$d_{vr} := 0.5\ in$ Diameter of shear rebar

$F_{ybp} := 36\ ksi$ Yield stress of the plate material

$F_{ubp} := 58\ ksi$ Ultimate stress of the plate material

$F_{ucol} := 62\ ksi$ Ultimate stress of the column pipe material

$F_{ycol} := 50\ ksi$ Yield stress of the column pipe material

$s_w := Tnom_{col} = 0.016\ ft$ Leg size of the fillet weld

$F_{EXX} := 70\ ksi$ Strength classification of the filler metal

$n_{blt} := 4$ Number of bolts in the pattern

$h_{ef1} := 12\ in$ Effective embedment depth

$s_{yblt} := B_{base} - 2 \cdot ed_y = 8\ in$ Spacing in the y direction

$s_{zblt} := L_{base} - 2 \cdot ed_z = 8\ in$ Spacing in the z direction

$f_{ya} := 36\ ksi$ yield stress of the bolts

$f_{uab} := min\left(58\ ksi, 1.9 \cdot f_{ya}\right) = 58\ ksi$ ultimate tensile strength of the anchor steel

$f'_c := 3\ ksi$ Compressive strength of the concrete

$\lambda := 1$ Lightweight concrete modification factor

$\gamma_c := 150\ pcf$ Unit weight of concrete

$f_y := 60\ ksi$ Yield stress of the rebar

Loads

$D := \text{READEXCEL}\left(\text{".\4338-Forces.xlsx"}, \text{"Sheet1!A17:I29"}\right)$

$D =$

"Bar"	"Point"	"Case"	"Fx (Kip)"	"Fy (Kip)"	"Fz (Kip)"	"Mx (Kip-in)"	"My (Kip-in)"	"Mz (Kip-in)"
42	1	11	4.333	−0.018	0.146	0.157	−12.93	−1.498
46	1	31	−0.777	0.241	0.218	0.733	−20.919	19.252
47	1	25	0.987	0.479	−0.036	−0.139	3.726	29.129
47	1	37	0.889	−0.34	0.025	0.063	−2.738	−21.665
42	1	31	0.783	−0.041	0.307	0.318	−27.398	−3.372
46	1	32	0.774	−0.055	−0.306	−0.339	27.291	−4.135
45	1	24	0.727	0.272	−0.21	0.762	20.894	19.308
42	1	24	0.425	0.232	−0.224	−0.791	21.341	18.278
46	1	32	0.774	−0.055	−0.306	−0.339	27.291	−4.135
42	1	31	0.783	−0.041	0.307	0.318	−27.398	−3.372
43	1	21	0.763	0.469	−0.037	0.069	3.972	29.898
47	1	29	1.25	−0.339	0.026	0.029	−2.788	−21.794

Loads are given in coordinates local to column. X is axial, Y is horizontal axis and Z is vertical axis. Tension is given as a negative value.

Bending in the Base Plate

Out

$$BendCheck := \left\| \begin{array}{l} \text{if } \phi_b \cdot M_n > \max\left(M_u\right) \\ \quad \text{"OK"} \\ \text{else} \\ \quad \text{"NG"} \end{array} \right\| = \text{"OK"}$$

$\phi_b \cdot M_n = 26.848\ \textbf{kip} \cdot \textbf{in}$

$\max\left(M_u\right) = 7.063\ \textbf{kip} \cdot \textbf{in}$

$t_{base} = 0.625\ \textbf{in}$

Weld Calculations (Elastic Method)

Out

$$WeldToBaseCheck := \left\| \begin{array}{l} \text{if } \phi_w \cdot R_{nb} > \max\left(V_{uw}\right) \\ \quad \text{"OK"} \\ \text{else} \\ \quad \text{"NG"} \end{array} \right\| = \text{"OK"}$$

$\phi_w \cdot R_{nb} = 4.176\ \frac{\textbf{kip}}{\textbf{in}}$

$\max\left(V_{uw}\right) = 1.244\ \frac{\textbf{kip}}{\textbf{in}}$

$s_w = 0.188\ \textbf{in}$

$$t_{minr} := \frac{F_{EXX} \cdot \sin\left(45\ \textbf{deg}\right) \cdot s_w}{F_{ucol}} = 0.15\ \textbf{in}$$

Minimum thickness of pipe required to develop the shear rupture strength of the base metal

Out

$$ColThickCheck := \left\| \begin{array}{l} \text{if } \left(Tnom_{col} \cdot 0.93\right) > t_{minr} \\ \quad \text{"OK"} \\ \text{else} \\ \quad \text{"NG"} \end{array} \right\| = \text{"OK"}$$

$Tnom_{col} \cdot 0.93 = 0.174\ \textbf{in}$

$t_{minr} = 0.15\ \textbf{in}$

Anchor Bolt Calculations

Steel strength of anchor in tension

Concrete breakout strength of anchor in tension

Pullout strength of anchor in tension

Concrete side-face blowout strength in tension

Shear strength of steel

Concrete breakout strength

Concrete pry out strength

Combined Tension and Shear

Max tension strength ratio for each load case

$$N_{sr} = \begin{bmatrix} 0.004 \\ 0.261 \\ 0.256 \\ 0.185 \\ 0.244 \\ 0.247 \\ 0.261 \\ 0.267 \\ 0.247 \\ 0.244 \\ 0.27 \\ 0.176 \end{bmatrix}$$

Max shear strength ratio for each load case

$$V_{sr} = \begin{bmatrix} 0.024 \\ 0.065 \\ 0.067 \\ 0.048 \\ 0.05 \\ 0.052 \\ 0.055 \\ 0.05 \\ 0.052 \\ 0.05 \\ 0.069 \\ 0.048 \end{bmatrix}$$

$$InteractionCheck = \begin{bmatrix} \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \end{bmatrix}$$

Base and anchor Summary

$t_{base} = 0.625\ in$	Thickness of the base plate
$L_{base} = 11\ in$	Length of the base plate
$B_{base} = 11\ in$	Width of the base plate
$d_h = 1\ in$	Hole diameter
$d_b = 0.75\ in$	Bolt diameter
$n_{blt} = 4$	Number of bolts
$s_{yblt} = 8\ in$	Bolt spread width
$s_{zblt} = 8\ in$	Bolt spread length
$ed_y = 1.5\ in$	Bolt Edge Distance
$s_w = 0.188\ in$	Size of the weld
$L_{Anchor} = 28\ in$	Length of the anchor to eliminate concrete breakout
$h_{ef1} = 12\ in$	Length of anchor if concrete breakout is considered

$$L_{AnchorEmbed} := \left\| \begin{array}{l} \text{if } T_{Areinforced} = 1 \\ \quad \left\| L_{Anchor} \right. \\ \text{else} \\ \quad \left\| h_{ef1} \right. \end{array} \right\| = 12\ in$$

Connection Designs

Column to Hip - Plate Calculations

Internal Forces

$D := \text{READEXCEL}\left(\text{".\4338-Forces.xlsx"}, \text{"Sheet1!A32:I44"}\right)$

$D =$

"Bar"	"Point"	"Case"	"Fx (Kip)"	"Fy (Kip)"	"Fz (Kip)"	"Mx (Kip-in)"	"My (Kip-in)"	"Mz (Kip-in)"
42	5	11	4.192	−0.021	0.09	0.157	0.001	0.608
46	5	31	−0.883	0.216	0.164	0.733	0.001	−5.734
43	5	25	0.519	0.442	−0.034	0.158	0.001	−20.471
47	5	37	0.788	−0.34	0.025	0.063	0.001	15.564
45	5	23	−0.455	−0.05	0.223	−0.271	0.001	1.422
41	5	20	0.469	−0.056	−0.222	0.379	0.001	1.681
45	5	24	0.587	0.178	−0.172	0.762	0.001	−5.285
42	5	24	0.285	0.205	−0.166	−0.791	0.001	−5.602
41	5	10	1.008	0	−0.002	0.003	0.001	0.014
41	5	10	1.008	0	−0.002	0.003	0.001	0.014
47	5	37	0.788	−0.34	0.025	0.063	0.001	15.564
43	5	25	0.519	0.442	−0.034	0.158	0.001	−20.471

Loads are given in coordinates local to member. X is axial, Y is horizontal axis and Z is vertical axis. Tension is given as a negative value.

$V_{angle} := 18.435\ \textbf{deg}$ Vertical Angle

$H_{angle} := 0\ \textbf{deg}$ Horizontal Angle

$P := F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right) \cdot \cos\left(H_{angle}\right) - F_y \cdot \sin\left(H_{angle}\right)$ Force normal to plate (+= compression)

$V_v := F_x \cdot \sin\left(V_{angle}\right) + F_z \cdot \cos\left(V_{angle}\right)$ Vertical shear force acting on the plate

$V_h := \left(F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right)\right) \cdot \sin\left(H_{angle}\right) + F_y \cdot \cos\left(H_{angle}\right)$ Horizontal shear force acting on the plate

$F_v := \sqrt{V_v^{\,2} + V_h^{\,2}}$ Resultant shear

Member and End Plate Properties

$H_t := 5\ \textbf{in}$ Height of the member

$B_t := 5\ \textbf{in}$ Width of the member

$T_{nom} := 0.1875\ \textbf{in}$ Nominal thickness

$F_{yield} := 50\ \textbf{ksi}$ Yield stress of the member

$B_0 := 5\ \textbf{in}$ Width of the connector's face being connected to

$B_1 := 7\ \textbf{in}$ Width connector's side face

$T_{consec} := 0.1875\ \textbf{in}$ Thickness of the connector

$T_{backer} := 0.375\ \textbf{in}$ Thickness of the backing plate in the connector

$T_p := 0.75\ \textbf{in}$ Thickness of the plate

$F_{yieldP} := 50\ \textbf{ksi}$ Yield stress of the end plate

$B_{size} := 0.75\ \textbf{in}$ Bolt diameter

$F_{nt} := 90\ \textbf{ksi}$ nominal tensile strength of bolt

$F_{nv} := 54\ \textbf{ksi}$ nominal shear strength of bolt

$B_{count} := 2$ Bolt Count

$Z := \left(\frac{H_t}{\cos\left(V_{angle}\right)} - 3\ \textbf{in}\right) \cdot 0.5 = 1.135\ \textbf{in}$ Bolt vertical edge distance

$Y_{pre} := 1.375\ \textbf{in}$ Bolt horizontal edge distance (more than 2 bolts)

$F_{exx} := 70\ \textbf{ksi}$ Weld filler metal classification strength

$\phi_{con} := 0.75$ strength reduction for connections

Connection Properties

Weld Design

$WeldCheck := CapacityCheck\left(\phi Ft_{nomWeld}, \max\left(Fres_{weld}\right)\right) = \text{“OK”}$

$t_{weld} = 0.188\ in$

Bolt Design

$BoltTensionCheck := CapacityCheckVector\left(\phi R_{nt}, R_{ut}\right) = \text{“OK”}$

$BoltShearCheck := CapacityCheck\left(\phi R_{nv}, \max\left(R_{uv}\right)\right) = \text{“OK”}$

$B_{count} = 2$

$B_{size} = 0.75\ in$

$D_y = 0.001\ in$

$D_z = 3\ in$

Plate Design

$PlateBendCheck := CapacityCheck\left(\phi M_{nplate}, \max\left(M_{total}\right)\right) = \text{“OK”}$

$T_p = 0.75\ in$

Connector Design

$ConnectorCheck := CapacityCheck\left(\phi M_{nComp}, \max\left(M_{uCon}\right)\right) = \text{“OK”}$

$T_{consec} = 0.188\ in$

$T_{backer} = 0.375\ in$

Hip to Peak - Plate Calculations

Internal Forces

$D := \text{READEXCEL}\left(\text{".\4338-Forces.xlsx"}, \text{"Sheet1!A47:I59"}\right)$

$D =$

"Bar"	"Point"	"Case"	"Fx (Kip)"	"Fy (Kip)"	"Fz (Kip)"	"Mx (Kip-in)"	"My (Kip-in)"	"Mz (Kip-in)"
53	1	13	0.904	0	0.048	−0.374	0.001	0.001
54	1	32	−0.307	0.048	−0.069	1.369	0.001	0.001
50	1	15	0.336	0.08	0.257	0.074	0.001	0.001
54	1	15	0.515	−0.072	−0.011	−0.191	0.001	0.001
51	1	15	0.297	0.038	0.637	−0.816	0.001	0.001
53	1	33	0.394	−0.001	−0.309	−0.86	0.001	0.001
51	1	24	0.132	−0.01	−0.05	2.454	0.001	0.001
56	1	19	0.244	0.025	−0.131	−2.424	0.001	0.001
49	1	10	0.268	0	0.079	0.01	0.001	0.001
49	1	10	0.268	0	0.079	0.01	0.001	0.001
49	1	10	0.268	0	0.079	0.01	0.001	0.001
49	1	10	0.268	0	0.079	0.01	0.001	0.001

Loads are given in coordinates local to member. X is axial, Y is horizontal axis and Z is vertical axis. Tension is given as a negative value.

$V_{angle} := 18.435\ \textbf{deg}$ — Vertical Angle

$H_{angle} := 0\ \textbf{deg}$ — Horizontal Angle

$P := F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right) \cdot \cos\left(H_{angle}\right) - F_y \cdot \sin\left(H_{angle}\right)$ — Force normal to plate (+= compression)

$V_v := F_x \cdot \sin\left(V_{angle}\right) + F_z \cdot \cos\left(V_{angle}\right)$ — Vertical shear force acting on the plate

$V_h := \left(F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right)\right) \cdot \sin\left(H_{angle}\right) + F_y \cdot \cos\left(H_{angle}\right)$ — Horizontal shear force acting on the plate

$F_v := \sqrt{V_v^{\,2} + V_h^{\,2}}$ — Resultant shear

Member and End Plate Properties

$H_t := 7\ \textbf{in}$ — Height of the member

$B_t := 5\ \textbf{in}$ — Width of the member

$T_{nom} := 0.1875\ \textbf{in}$ — Nominal thickness

$F_{yield} := 50\ \textbf{ksi}$ — Yield stress of the member

$B_0 := 5\ \textbf{in}$ — Width of the connector's face being connected to

$B_1 := 5\ \textbf{in}$ — Width connector's side face

$T_{consec} := 0.75\ \textbf{in}$ — Thickness of the connector

$T_{backer} := 0\ \textbf{in}$ — Thickness of the backing plate in the connector

$T_p := 0.75\ \textbf{in}$ — Thickness of the plate

$F_{yieldP} := 50\ \textbf{ksi}$ — Yield stress of the end plate

$B_{size} := 0.75\ \textbf{in}$ — Bolt diameter

$F_{nt} := 90\ \textbf{ksi}$ — nominal tensile strength of bolt

$F_{nv} := 54\ \textbf{ksi}$ — nominal shear strength of bolt

$B_{count} := 2$ — Bolt Count

$Z := \left(\frac{H_t}{\cos\left(V_{angle}\right)} - 4.5\ \textbf{in}\right) \cdot 0.5 = 1.439\ \textbf{in}$ — Bolt vertical edge distance

$Y_{pre} := 1.5\ \textbf{in}$ — Bolt horizontal edge distance (more than 2 bolts)

$F_{exx} := 70$ ***ksi*** Weld filler metal classification strength

$\phi_{con} := 0.75$ strength reduction for connections

Connection Properties

Weld Design

$WeldCheck := CapacityCheck\left(\phi Ft_{nomWeld}, \max\left(Fres_{weld}\right)\right) = \text{“OK”}$

$t_{weld} = 0.188$ ***in***

Bolt Design

$BoltTensionCheck := CapacityCheckVector\left(\phi R_{nt}, R_{ut}\right) = \text{“OK”}$

$BoltShearCheck := CapacityCheck\left(\phi R_{nv}, \max\left(R_{uv}\right)\right) = \text{“OK”}$

$B_{count} = 2$

$B_{size} = 0.75$ ***in***

$D_y = 0.001$ ***in***

$D_z = 4.5$ ***in***

Plate Design

$PlateBendCheck := CapacityCheck\left(\phi M_{nplate}, \max\left(M_{total}\right)\right) = \text{“OK”}$

$T_p = 0.75$ ***in***

Connector Design

$ConnectorCheck := CapacityCheck\left(\phi M_{nComp}, \max\left(M_{uCon}\right)\right) = \text{“OK”}$

$T_{consec} = 0.75$ ***in***

$T_{backer} = 0$ ***in***

Purlin to Hip- Plate Calculations

Internal Forces

$D := \text{READEXCEL}\left(\text{".\4338-Forces.xlsx"}, \text{"Sheet1!A62:I74"}\right)$

$D =$

"Bar"	"Point"	"Case"	"Fx (Kip)"	"Fy (Kip)"	"Fz (Kip)"	"Mx (Kip-in)"	"My (Kip-in)"	"Mz (Kip-in)"
74	1	12	3.855	0.061	0.189	0.281	0.001	0.001
62	1	12	−3.245	0.168	0.375	0.341	0.001	0.001
68	1	14	−1.705	0.24	0.754	0.058	0.001	0.001
68	5	14	−1.705	−0.24	−0.754	0.058	0.001	0.001
68	1	11	−1.684	0.239	0.757	−0.044	0.001	0.001
68	5	11	−1.684	−0.239	−0.757	−0.044	0.001	0.001
77	1	22	0.782	0.028	0.04	4.463	0.001	0.001
81	1	21	0.769	0.029	0.042	−4.51	0.001	0.001
74	5	12	3.855	−0.061	−0.189	0.281	0.001	0.001
62	5	12	−3.245	−0.168	−0.375	0.341	0.001	0.001
57	5	32	0.356	0.048	−0.133	−0.388	0.001	0.001
68	5	14	−1.705	−0.24	−0.754	0.058	0.001	0.001

Loads are given in coordinates local to member. X is axial, Y is horizontal axis and Z is vertical axis. Tension is given as a negative value.

$V_{angle} := 18.435\ \textbf{deg}$ Vertical Angle

$H_{angle} := 45\ \textbf{deg}$ Horizontal Angle

$P := F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right) \cdot \cos\left(H_{angle}\right) - F_y \cdot \sin\left(H_{angle}\right)$ Force normal to plate (+= compression)

$V_v := F_x \cdot \sin\left(V_{angle}\right) + F_z \cdot \cos\left(V_{angle}\right)$ Vertical shear force acting on the plate

$V_h := \left(F_x \cdot \cos\left(V_{angle}\right) - F_z \cdot \sin\left(V_{angle}\right)\right) \cdot \sin\left(H_{angle}\right) + F_y \cdot \cos\left(H_{angle}\right)$ Horizontal shear force acting on the plate

$F_v := \sqrt{{V_v}^2 + {V_h}^2}$ Resultant shear

Member and End Plate Properties

$H_t := 6\ \textbf{in}$ Height of the member

$B_t := 4\ \textbf{in}$ Width of the member

$T_{nom} := 0.1875\ \textbf{in}$ Nominal thickness

$F_{yield} := 50\ \textbf{ksi}$ Yield stress of the member

$B_0 := 7\ \textbf{in}$ Width of the connector's face being connected to

$B_1 := 5\ \textbf{in}$ Width connector's side face

$T_{consec} := 0.1875\ \textbf{in}$ Thickness of the connector

$T_{backer} := 0\ \textbf{in}$ Thickness of the backing plate in the connector

$T_p := 0.25\ \textbf{in}$ Thickness of the plate

$F_{yieldP} := 50\ \textbf{ksi}$ Yield stress of the end plate

$B_{size} := 0.75\ \textbf{in}$ Bolt diameter

$F_{nt} := 90\ \textbf{ksi}$ nominal tensile strength of bolt

$F_{nv} := 54\ \textbf{ksi}$ nominal shear strength of bolt

$B_{count} := 2$ Bolt Count

$Z := \left(\frac{H_t}{\cos\left(V_{angle}\right)} - 3\ \textbf{in}\right) \cdot 0.5 = 1.662\ \textbf{in}$ Bolt vertical edge distance

$Y_{pre} := 1.5\ \textbf{in}$ Bolt horizontal edge distance (more than 2 bolts)

$F_{exx} := 70$ ***ksi*** Weld filler metal classification strength

$\phi_{con} := 0.75$ strength reduction for connections

Connection Properties

Weld Design

$WeldCheck := CapacityCheck\left(\phi Ft_{nomWeld}, \max\left(Fres_{weld}\right)\right) = \text{“OK”}$

$t_{weld} = 0.188$ ***in***

Bolt Design

$BoltTensionCheck := CapacityCheckVector\left(\phi R_{nt}, R_{ut}\right) = \text{“OK”}$

$BoltShearCheck := CapacityCheck\left(\phi R_{nv}, \max\left(R_{uv}\right)\right) = \text{“OK”}$

$B_{count} = 2$

$B_{size} = 0.75$ ***in***

$D_y = 0.001$ ***in***

$D_z = 3$ ***in***

Plate Design

$PlateBendCheck := CapacityCheck\left(\phi M_{nplate}, \max\left(M_{total}\right)\right) = \text{“OK”}$

$T_p = 0.25$ ***in***

Connector Design

$ConnectorCheck := CapacityCheck\left(\phi M_{nComp}, \max\left(M_{uCon}\right)\right) = \text{“OK”}$

$T_{consec} = 0.188$ ***in***

$T_{backer} = 0$ ***in***

CEDAR FOREST PRODUCTS

STRUCTURAL NOTES

STANDARDS
1. 2018 INTERNATIONAL BUILDING CODE
2. ASCE/SEI 7 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
3. ANSI/AWC NDS-2012 NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION
4. ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
5. AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

BUILDING PROPERTIES
1. OCCUPANCY GROUP DESIGNATION = A-3
2. CONSTRUCTION TYPE = II-B

DESIGN LOADS
1. GROUND SNOW = 30 PSF
2. ROOF SNOW LOAD (UNHEATED) = 30 PSF
3. ROOF LIVE LOAD = 20 PSF
4. WIND LOAD BASED ON WIND VELOCITY OF V = 127 MPH
5. RISK CATEGORY II, EXPOSURE D
6. SEISMIC IMPORTANCE FACTOR I = 1
7. S_s = 0.198
8. S_1 = 0.055
9. S_{DS} = 0.211
10. S_{D1} = 0.087
11. SITE CLASS = D
12. DESIGN CATEGORY = B

STRUCTURAL STEEL
1. ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "SPECIFICATIONS FOR THE DESIGN FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS"

STRUCTURAL STEEL TO CONFORM TO:
1. STRUCTURAL STEEL PLATE = A-36
2. HOLLOW STRUCTURAL SECTIONS = A500 GRADE C
3. WIDE FLANGE SECTION = A992 GRADE 50
4. CHANNEL SECTIONS = A36
5. THESE MATERIAL SPECIFICATIONS SHALL BE USED UNLESS NOTED OTHERWISE.

HIGH STRENGTH BOLTING
1. HIGH STRENGTH BOLTS ARE A325 BOLTS WITH HEAVY HEX NUTS. THE BOLTS ARE TO BE INSTALLED UTILIZING THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AS PREPARED BY RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) FOR THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
2. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE PROPER TIGHTNESS.
3. ALL JOINTS MUST BE SNUG-TIGHTENED PRIOR TO PRETENSIONING.
4. ALL JOINTS MUST BE SNUG TIGHT UNLESS OTHERWISE SPECIFIED.

WELDING
1. ALL WELDING TO BE IN ACCORDANCE WITH THE LASTEST EDITION OF THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE - STEEL" D1.1 AND AS INDICATED ON THE STRUCTURAL DRAWINGS.
2. WELDING ELECTRODES, WELDING PROCESS, MINIMUM PREHEAT AND INTERPASS TEMPERATURES TO BE IN ACCORDANCE WITH THE AWS SPECIFICATIONS. ELECTRODES TO BE MIN 70KSI MATERIAL.

CONCRETE
1. ALL CONCRETE SHOULD HAVE STONE AGGREGATE (NORMAL WEIGHT). 28-DAY COMPRESSIVE STRENGTH (f'c) SHOULD BE 3000PSI MINIMUM FOR CAST-IN-PLACE CONCRETE.
2. MAX AGGREGATE DIAMETER OF $\varnothing\frac{3}{4}$"
3. REINFORCING BARS SHOULD BE MILD STEEL WITH A MINIMUM YIELD STRENGTH OF 60 KSI.
4. REINFORCING BAR PROTECTION:
   - 4.1. CONCRETE PLACED AGAINST EARTH - 3"
   - 4.2. CONCRETE PLACED IN FORMS - $1\frac{1}{2}$"
5. FIELD WELDING OF REINFORCING SHOULD NOT BE PERMITTED.
6. ALL REINFORCING BAR BENDS SHOULD BE MADE MECHANICALLY HEAT-BENDING SHOULD NOT BE PERMITTED.
7. NON-SHRINK GROUT = 5000 PSI
8. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF F1554 GRADE 36
9. 4" to 6" SLAB SHALL BE REINFORCED WITH W4.5XW4.5 (6" X 6") WELDED WIRE FABRIC

FOUNDATIONS
1. FOUNDATIONS DESIGNED BASED ON PRESUMPTIVE LOAD-BEARING VALUES GIVEN IN TABLE 1806.2 OF THE INTERNATIONAL BUILDING CODE.
   - 1.1. 1500 PSF VERTICAL FOUNDATION PRESSURE
   - 1.2. 100 PSF LATERAL BEARING PRESSURE
   - 1.3. FOUNDATION BACKFILL SHOULD CONSIST OF EXISTING SANDY FILL OR GRANULAR IMPORT MATERIAL. BACKFILL SHOULD BE PLACED IN THIN, LOOSE LIFTS, MOISTURE CONDITIONED TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AND COMPACTED TO AT LEAST 95% OF MAX MODIFIED PROCTOR DRY DENSITY.
2. THE FOUNDATIONS HAVE BEEN DESIGN BASED ON THE ABOVE AND SHALL BE REVIEWED BY THE ENGINEER ONCE A FINAL GEOTECHNICAL REPORT IS COMPLETED. THE SUPPORT SOILS SHALL BE PREPARED PER THE REFERENCED GEOTECHNICAL REPORT PRIOR TO THE PLACEMENT OF ANY CONCRETE.

STRUCTURAL WOOD
1. WOOD FRAMING SHALL COMPLY WITH THE SOUTHERN PINE INSPECTION BUREAU, OR SHALL CONFORM TO SPECIFICATIONS AS PUBLISHED BY THE WESTERN WOODS PRODUCTS ASSOCIATION.
2. WOOD FRAMING 2" X 4" AND LARGER SHALL BE NO. 1 SOUTHERN YELLOW PINE (U.N.O)
3. WOOD COLUMNS 6" X 6" AND LARGER SHALL BE NO. 1 SOUTHERN YELLOW PINE (U.N.O)
4. MECHANICALLY LAMINATED POSTS SHALL HAVE CERTIFIED STRUCTURAL GLUED END JOINTS.
5. ALL MEMBERS IN CONTACT WITH CONCRETE OR GROUND SHALL BE PRESSURE TREATED.
6. FASTENERS USED IN PRESSURE TREATED WOOD SHALL BE GALVANIZED, MADE FROM STAINLESS STEEL OR HAVE A COATING RATED FOR USE IN TREATED WOOD.
7. GLUED-LAMINATED MEMBERS (U.N.O)
   - 7.1. BEAMS SHALL USE 24F-V5 SP/SP FOR BALANCED LAYUPS
   - 7.2. BEAMS SHALL USE 24F-V3 SP/SP FOR UNBALANCED LAYUPS WITH THE TOP CLEARLY MARKED FOR INSTALLATION
   - 7.3. COLUMNS SHALL USE 24F-V5 SP/SP OR 20F-V15 POC/POC BALANCED LAYUPS
   - 7.4. 1-3/8" ACTUAL LAMINATION THICKNESS
   - 7.5. ADHESIVE TO BE WATERPROOF GLUE
   - 7.6. APPEARANCE GRADE TO BE AITC ARCHITECTURAL
   - 7.7. PROTECTION WRAPPED
8. CONNECTORS NOT MANUFACTURED BY CFP SHALL BE AS MANUFACTURED BY THE SIMPSON CO. OR APPROVED EQUAL. CONNECTORS USED WITH PRESSURE TREATED LUMBER OR IN UNCONDITIONED SPACE, SHALL HAVE THE ZMAX (G185) COATING.
9. NAILING, UNLESS NOTED OTHERWISE, SHALL BE PER THE INTERNATIONAL BUILDING CODE.
10. BOLTS USED FOR WOOD CONNECTIONS SHALL MEET THE REQUIREMENT OF ANSI/ASME STANDARD B18.2.1.
    - 10.1. HOLES SHALL BE A MINIMUM OF $\frac{1}{32}$" TO $\frac{1}{16}$" LARGER THAN THE BOLT DIAMETER.
    - 10.2. A STANDARD CUT WASHER OR METAL PLATE OF EQUAL OR GREATER DIMENSIONS SHALL BE PROVIDED BETWEEN THE WOOD AND THE BOLT HEAD AND NUT.
11. LAG SCREWS SHALL BE INSTALLED PER THE REQUIREMENTS OF ANSI/ASME STANDARD B18.2.1
    - 11.1. LEAD HOLES FOR THE THREADED PORTION SHALL HAVE A DIAMETER EQUAL TO 60% TO 70% OF THE SHANK DIAMETER WITH A DEPTH EQUAL TO AT LEAST THE LENGTH OF THE THREADED PORTION.
12. EACH COURSE OF STACKED CEDAR TIMBER WALLS SHALL BE CONNECTED TO THE COURSE BELOW WITH #14 X 10" TIMBER SCREWS AT 36" ON CENTER. EACH PIECE OF TIMBER SHALL BE CONNECTED WITH AT LEAST TWO SCREWS.

METAL ROOF
1. ROOF PANELS SHALL BE 24GA MULTI-RIB PANEL
2. YIELD STRENGTH = 50 KSI
3. SUBSTRATE = NONE
4. FINISH SHALL BE KYNAR 500

TROY L. GARLAND
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REGISTERED PROFESSIONAL ENGINEER (STRUCTURAL)

12/14/23

CFP CEDAR FOREST PRODUCTS
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WWW. CEDARFORESTPRODUCTS.COM

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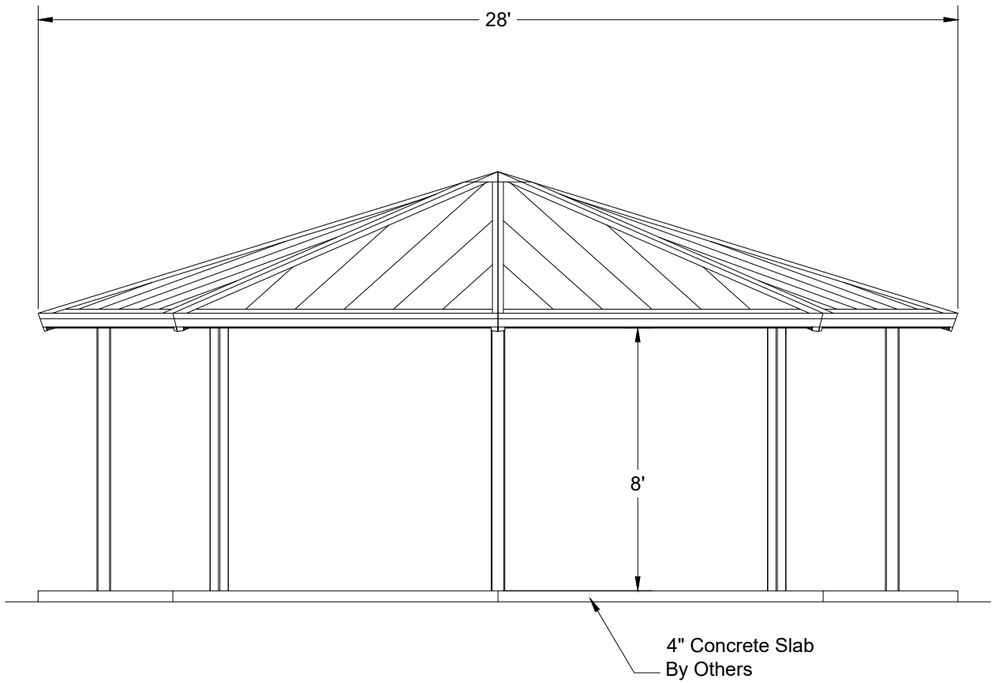
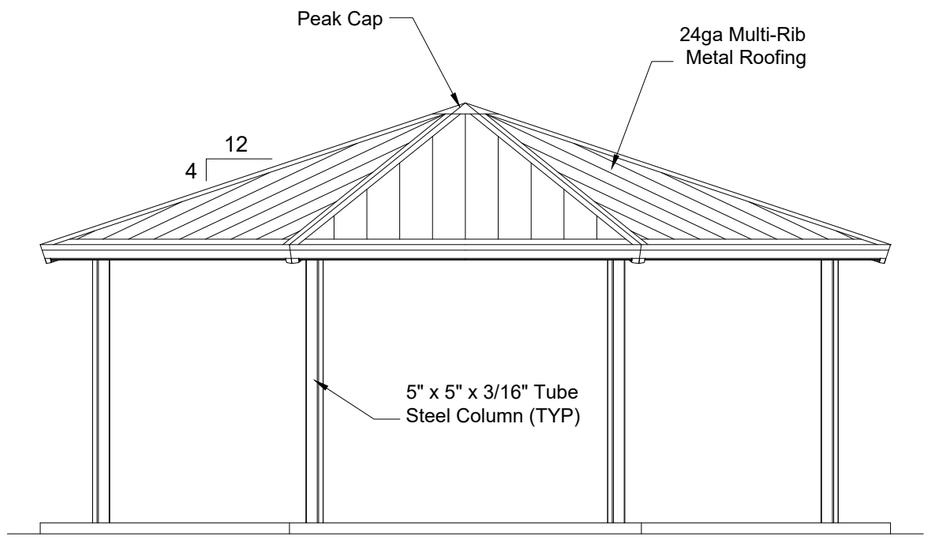
DESCRIPTION:	28' Octagonal Steel Pavilion	REV:	BEW	11-29-23
Project Details:	Project Name: Conimicut Park Sales Rep: O'Brien & Sons Site Location: Point Ave., Warwick, RI 02889	REV: REV: REV:	PRJ #: 4338	
			1 of 7	

SCALE: NTS

NOTE: Steel Frame to be Hot Dipped Galvanized





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				PG: 2 OF 7	

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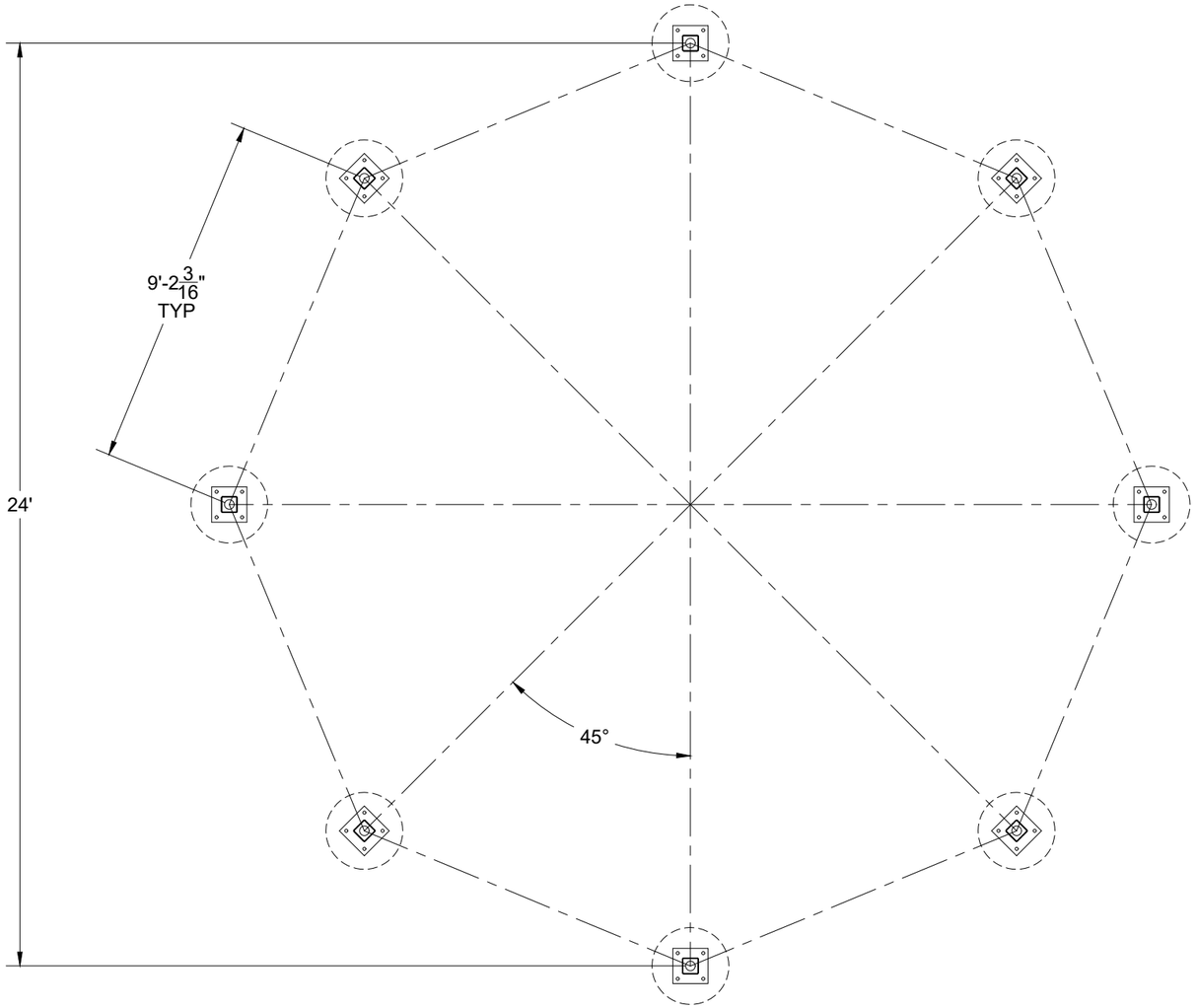
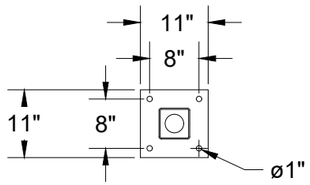
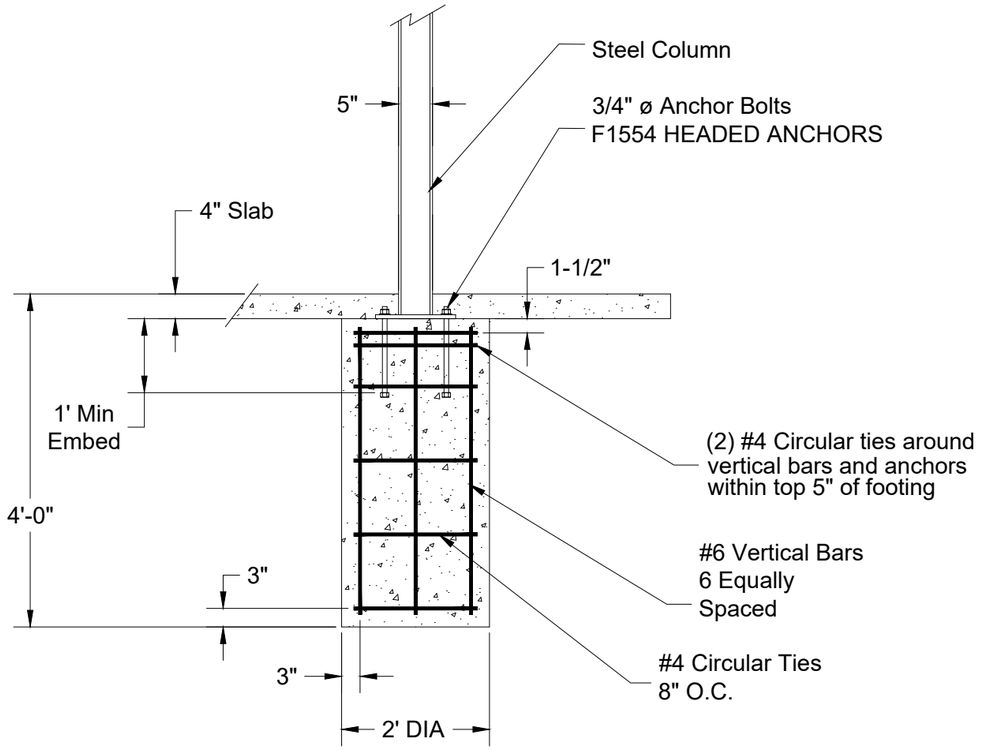




5/8" Thick Steel Base Plate



Column/Footing Detail

Concrete Pier By Others

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REV:	BEW	11-29-23
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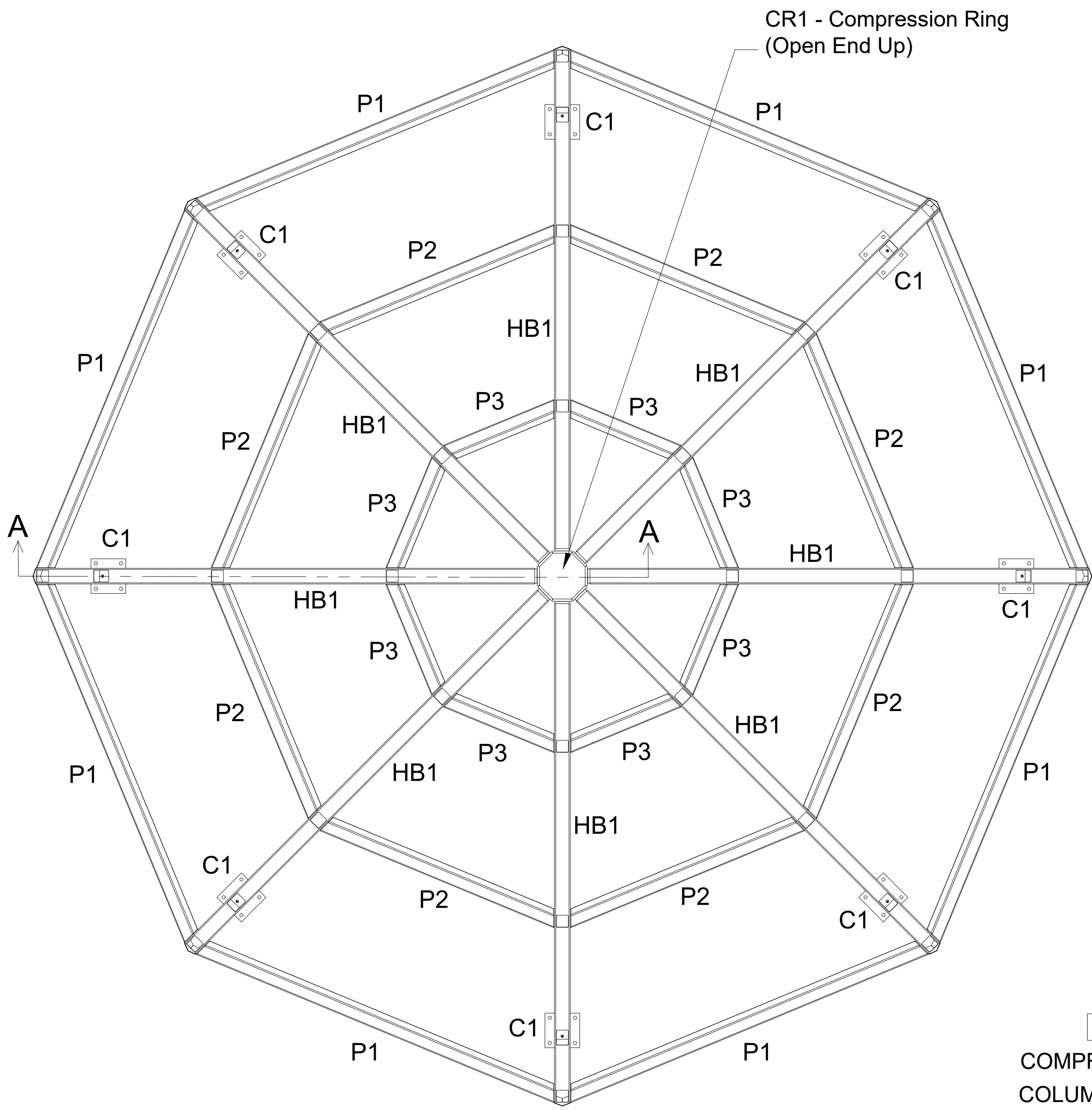
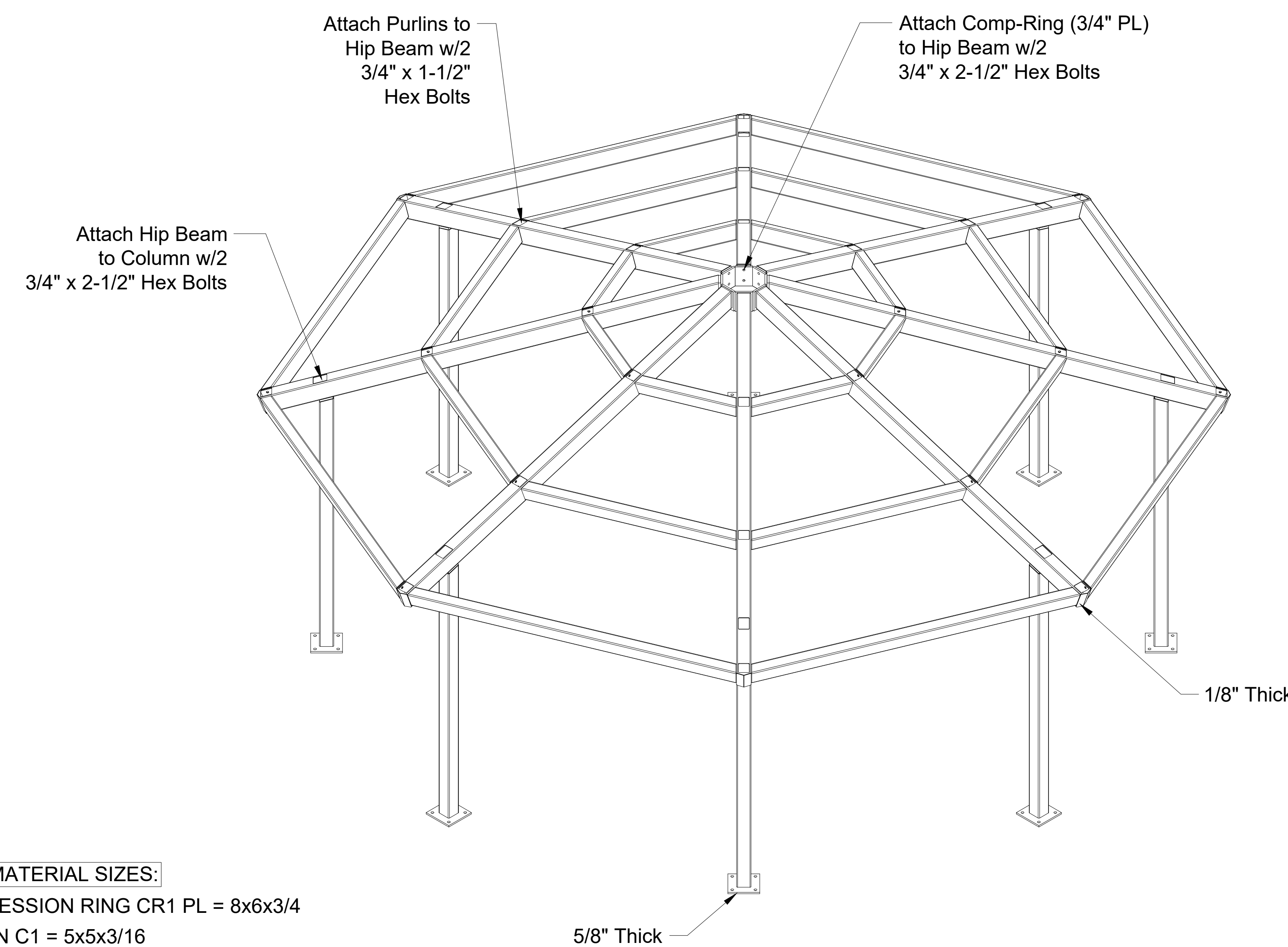
REV:	PG: 3 OF 7	
REV:		

SCALE: NTS



FRAMING PLAN



FRAMING ISO

MATERIAL SIZES:

COMPRESSION RING CR1 PL = 8x6x3/4

COLUMN C1 = 5x5x3/16

HIP BEAM HB1 = 7x5x3/16

PURLIN P1,P2,P3 = 6x4x3/16

Note: All Plates to be 1/4" thick,
unless noted otherwise.

TROY L. GARLAND
RHODE STATE OF ISLAND
No. 11357
HOPE
REGISTERED
PROFESSIONAL ENGINEER
(STRUCTURAL)

12/14/23

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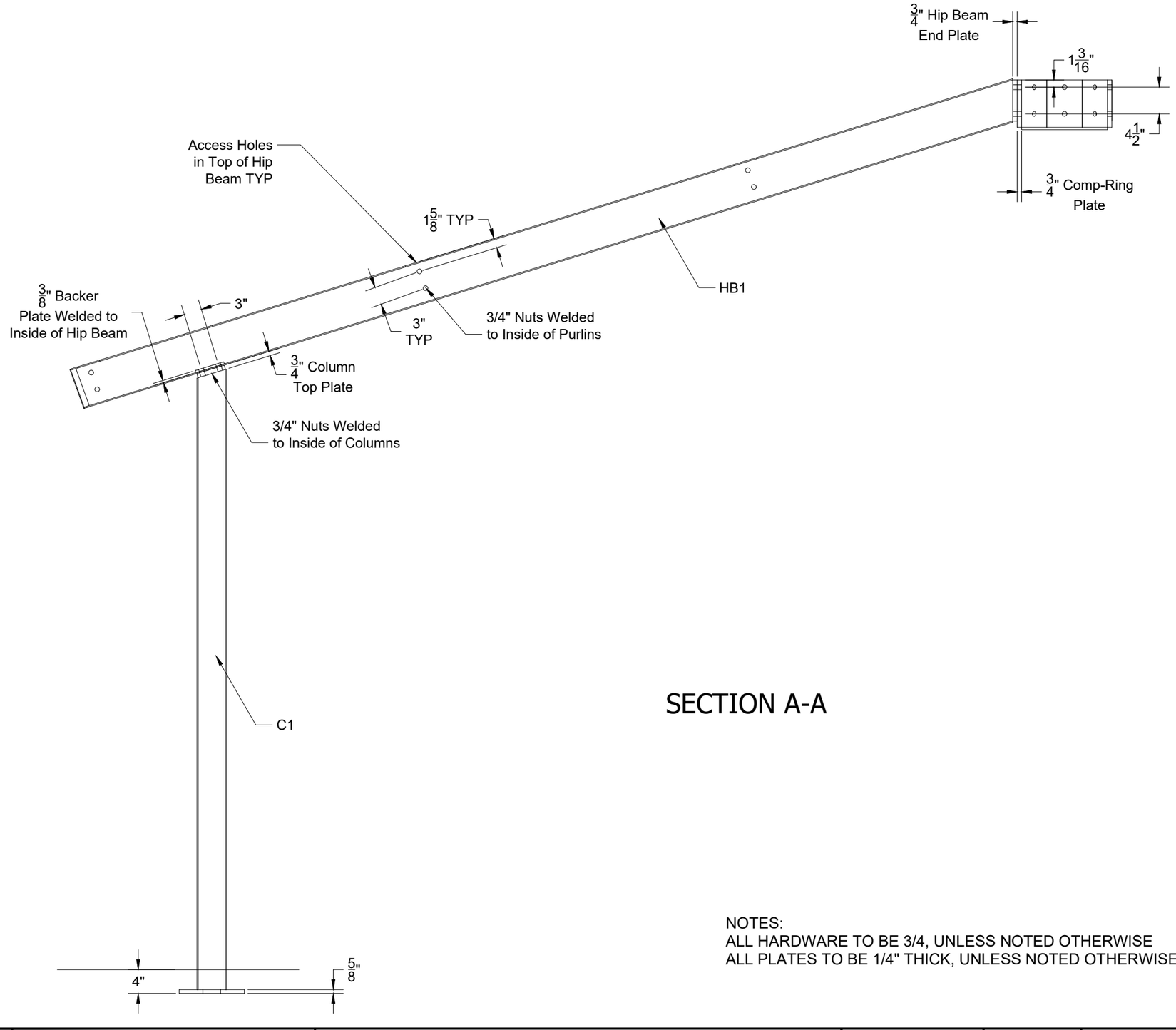
SCALE: NTS



SECTION A-A

NOTES:
ALL HARDWARE TO BE 3/4, UNLESS NOTED OTHERWISE
ALL PLATES TO BE 1/4" THICK, UNLESS NOTED OTHERWISE

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				PG: 5 OF 7	

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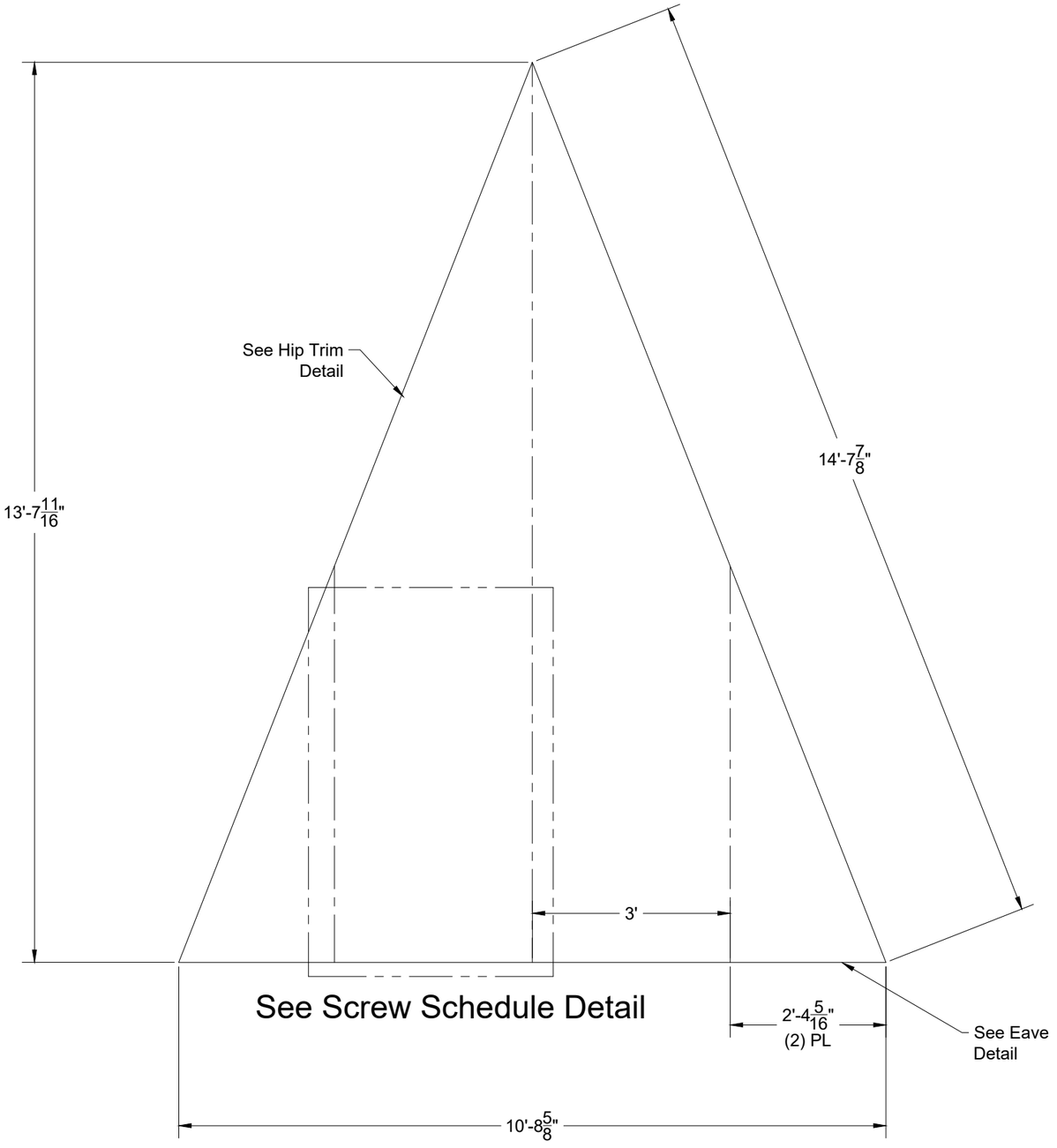

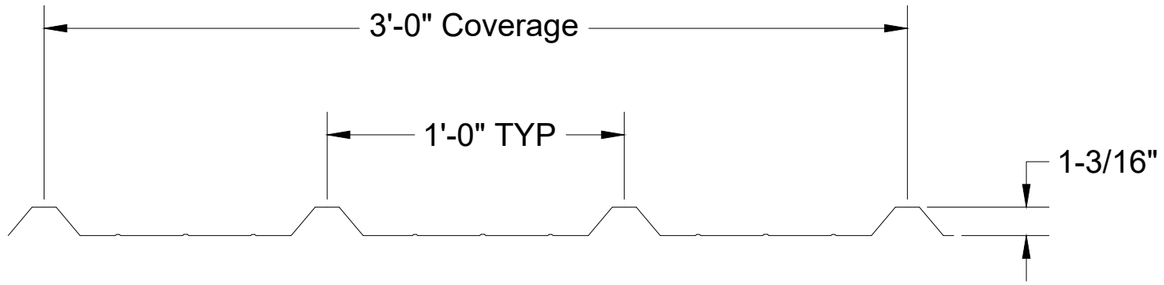

24ga Multi-Rib Panel Profile

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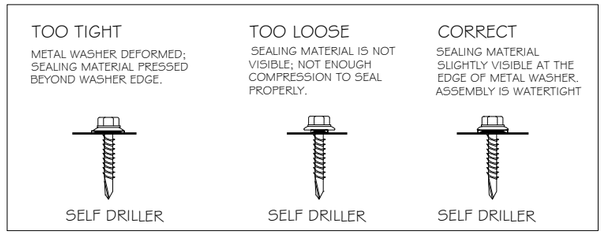
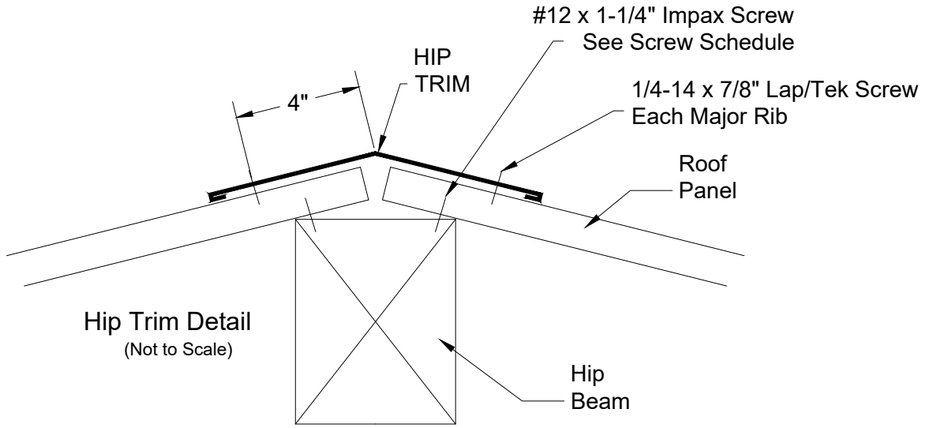
				PG: 6 OF 7	

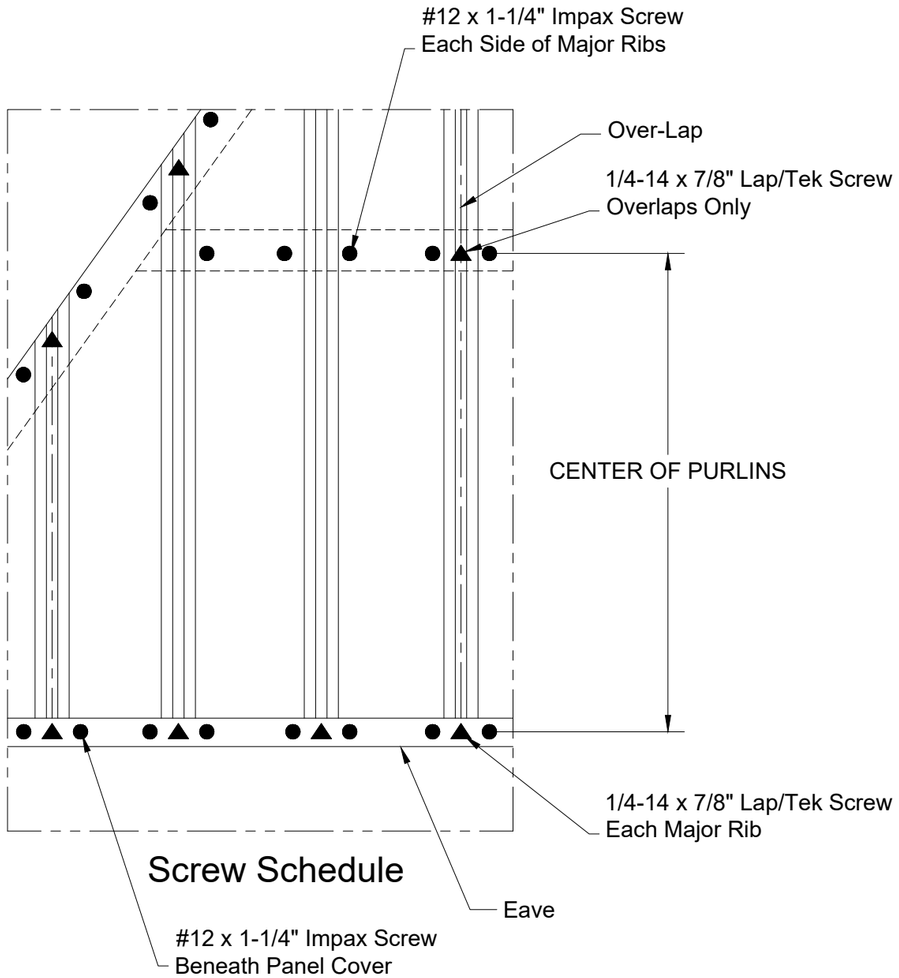
SCALE: NTS

PROPER SCREW ENGAGEMENT

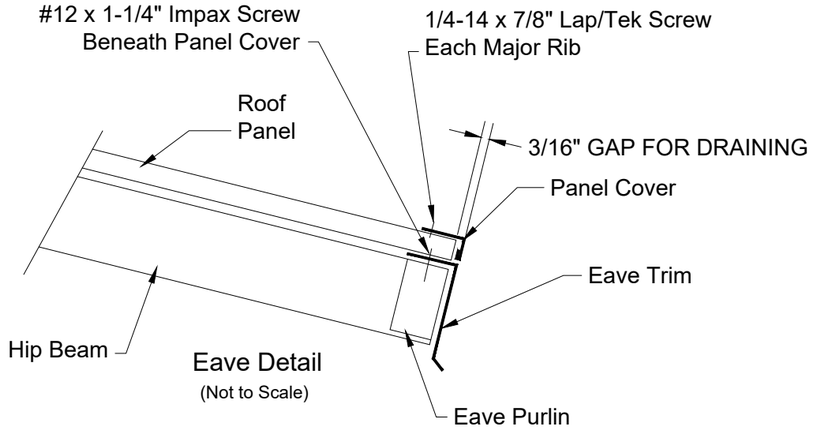




Hip Trim Detail
(Not to Scale)



Screw Schedule



Eave Detail
(Not to Scale)

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REV:	BEW	11-29-23
REV:	PRJ #: 4338	
REV:	PG: 7 OF 7	
REV:		

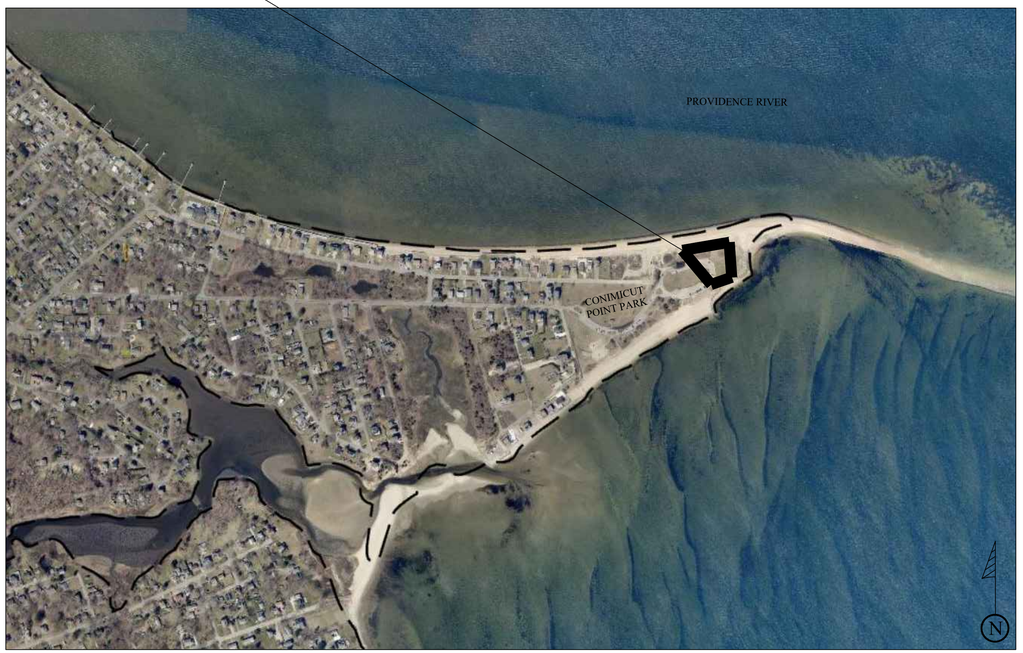
CONIMICUT POINT PARK
SHADE STRUCTURE PROJECT

CITY OF WARWICK
RHODE ISLAND
3275 POST RD, WARWICK, RI 02886

FRANK J. PICOZZI
MAYOR

JAMES MCELROY
COUNCILMAN
WARD 4

PROJECT SITE



PLAN INDEX

LOCATION:
CONIMICUT POINT PARK
PLAT 334/ LOT 459
WARWICK, RI 02889

JANUARY 2024

KEY - LEGEND:

GS - GRADE SPOT (SPOT GRADE)
EP - EDGE OF PAVEMENT
TC - TOP CURB
BC - BOTTOM CURB
FOW - FRONT OF WALL
⌖ - U.S. ARMY CORPS ENG. DISK SURVEY MARK (DO NOT DISTURB)
△ - MNLS - CONTROL POINT (MAG. NAIL SET)

NOTES:

1. CONTRACTOR MUST NOT DISTURB THE U.S. ARMY CORPS OF ENGINEERS SURVEY DISK.

0 10 20
SCALE: 1"=10'-0"

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF
PUBLIC WORKS
925 SANDY LANE,
WARWICK, RI 02886
PHONE:401-738-2003

Revisions:

Rev.	Date	Description

Issued For:

BIDDING
PURPOSES

Date: 08/10/2023
Scale: As Shown
Drawn By: MC
Approved By: MC

Drawing Title:

EXISTING
CONDITIONS

Sheet Number:

EC

NOTES:

1. SPECIFICATIONS TO GOVERN THIS PROJECT ARE THE R.I. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DECEMBER 2022, WITH ALL REVISIONS AND THE STATE AND FEDERAL SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS. STANDARD DETAILS FOR THIS PROJECT ARE R.I. STANDARD DETAILS, 1998 EDITION, WITH ALL REVISIONS.

2. ALL WORK SHALL COMPLY WITH THE AMERICANS DISABILITIES ACT OF 1990 (ADA) AND SECTION 504 OF THE REHABILITATION ACT OF 1973, SPECIFICALLY THE ADA STANDARDS FOR ACCESSIBLE DESIGN, LATEST EDITION, WITH ALL REVISIONS.

3. ALL SURFACE AND NEAR SURFACE WORK SHALL CONFORM TO THE RHODE ISLAND STATE BUILDING CODE AND TO THE CONTRACT DOCUMENTS. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

4. CONTRACTOR SHALL REFER TO AND COORDINATE THE PROJECT REQUIREMENTS AS INDICATED ON THE GENERAL, CIVIL, AND STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.

5. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL STRUCTURES AND PIPING AGAINST FLOODING, FLOTATION AND OTHER DAMAGE DURING CONSTRUCTION.

6. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT DAMAGE TO ADJACENT AND NEARBY STRUCTURES DURING CONSTRUCTION. ALL DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AND APPROVED BY THE CITY.

7. PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CALL "DIG SAFE" AT 1(888)-DIG-SAFE, AT LEAST 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) TO OBTAIN FIELD-MARKED UTILITY LOCATIONS.

8. CONTRACTOR IS APPRISED THAT SOME ENTITIES WITH UTILITY INFRASTRUCTURE WITHIN OR NEAR THE PROJECT AREA MAY NOT PARTICIPATE IN THE DIG-SAFE PROGRAM, AND MUST BE CONTACTED DIRECTLY TO HAVE THEIR UTILITIES FIELD-MARKED.

9. CONTRACTOR IS APPRISED THAT UTILITY PROVIDERS MAY NOT MARK ALL SUBSURFACE UTILITIES WITHIN THE PROJECT AREA, PARTICULARLY SERVICE CONNECTIONS AND/OR ABANDONED UTILITIES.

10. SEWER, WATER AND OTHER UTILITIES HAVE BEEN SHOWN ON THE SITE PLANS WHERE INFORMATION IS AVAILABLE. ALL ACTIVE SERVICE CONNECTIONS MUST BE MAINTAINED DURING CONSTRUCTION.

11. PIPING EXPOSED DURING EXCAVATION THAT IS NOT TO BE RELOCATED, ABANDONED, OR DEMOLISHED SHALL BE SUPPORTED IN-PLACE, BRACED, OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES.

12. CONTRACTOR SHALL FIELD VERIFY EXISTING STRUCTURE ELEVATIONS AND LOCATIONS, AND EXISTING PIPE INVERT ELEVATIONS AND LOCATIONS PRIOR TO SUBMITTING SHOP DRAWINGS FOR CONNECTING STRUCTURES.

13. THESE GENERAL NOTES ARE NOT INTENDED TO REPLACE THE SPECIFICATIONS FOR THIS CONTRACT. SEE SPECIFICATIONS
FOR OTHER REQUIREMENTS IN ADDITION TO THE GENERAL NOTES.

14. THE CONTRACTOR SHALL CONFINE ALL ACTIVITIES FOR CONSTRUCTION PURPOSES WITHIN THE INDICATED LIMITS OF WORK AS SHOWN IN THE CONTRACT DRAWINGS. ALL SURFACES DAMAGED OUTSIDE THE INDICATED LIMITS SHALL BE REPLACED IN KIND AT CONTRACTOR'S EXPENSE.

15. DUST CONTROL, SHALL BE PROVIDED FOR ALL SURFACES OF BACK FILLED AREAS, ALL EQUIPMENT ACCESS ROADWAYS AND/OR AS OTHERWISE DIRECTED BY THE OWNER/ENGINEER.

MAPPING:

1. DEPICTED BASE MAPPING AND TOPOGRAPHY HAVE BEEN COMPILED FROM VARIOUS SOURCES. A FIELD SURVEY WAS COMPLETED BY THE CITY'S SURVEY DEPARTMENT. THE OWNER DOES NOT WARRANTY THE ACCURACY OR CURRENCY OF THE DEPICTED INFORMATION.

2. THE LOCATION, SIZE, AND MATERIAL OF EXISTING PIPES, DUCTS, CONDUITS AND OTHER UNDERGROUND STRUCTURES AND/OR UTILITIES SHOWN ON THESE PLANS ARE FROM THE BEST SOURCES AVAILABLE AT PRESENT AND ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES, UTILITIES OR STRUCTURES ARE SHOWN. EXACT LOCATION TO BE DETERMINED BY CONTRACTOR IN FIELD.

3. EXISTING UTILITIES HAVE BEEN PLOTTED FROM THE BEST AVAILABLE DATA AND ARE APPROXIMATE ONLY. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES AND NOTIFY ALL UTILITY COMPANIES (PUBLIC AND PRIVATE).

4. PROPERTY LINES IF SHOWN ARE FOR INFORMATION ONLY.

5. THE HORIZONTAL COORDINATE SYSTEM IS RHODE ISLAND STATE PLANE, NAD83. THE VERTICAL DATUM IS NAVD88.

EXISTING UTILITIES:

1. EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION SHALL BE PROTECTED AND SUPPORTED AT ALL TIMES BY THE CONTRACTOR. THE CONTRACTOR SHALL CONDUCT OPERATIONS TO INTERFERE AS LITTLE AS POSSIBLE WITH EXISTING UTILITIES. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION BY REASON OF DELAY AND/OR INCONVENIENCE IN ADAPTING HIS OPERATIONS ACCORDINGLY.

2. WHERE AN EXISTING UTILITY IS FOUND TO BE IN CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER FOR THE RESOLUTION OF THE CONFLICT.

3. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION, RELOCATION AND ADJUSTMENT OF WATER, GAS, ELECTRIC, TELEPHONE, CABLE TV, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES AS REQUIRED.

REMOVAL AND DISPOSAL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND LEGALLY DISPOSING (R&D) ALL MATERIALS INDICATED ON THE PLANS TO BE DISPOSED, INCLUDING BUT NOT LIMITED TO, MANHOLES, CATCH BASINS, PIPING, CONCRETE AND BITUMINOUS PAVEMENT, COBBLES, ROCK, TREES AND STUMPS, ETC. ALL DEMOLITION MATERIAL INCLUDING CONCRETE, PIPE, AND BRICK THAT WAS IN CONTACT WITH SEWAGE SHALL BE DISPOSED OF IN ACCORDANCE WITH RIDEM REQUIREMENTS.

2. NOTIFY APPROPRIATE UTILITY COMPANIES TO TURN OFF AFFECTED SERVICES PRIOR TO REMOVAL AND DISPOSAL. SEAL WATER, SEWER, DRAINAGE AND GAS UTILITIES AND SERVICES AT EXCAVATION LIMITS OR AS REQUIRED, USING PLUGS, CAPS OR SEALS AS NEEDED.

3. UNDERGROUND PIPING TO BE ABANDONED AND REMAIN SHALL BE PROPERLY CAPPED UNLESS IT INTERFERES WITH NEW STRUCTURES, PIPES OR AS INDICATED, SPECIFIED AND DIRECTED BY OWNER.

SITE RESTORATION:

1. EXCEPT WHERE NOTED BY PROPOSED CONTOUR LINES AND/OR SPOT ELEVATIONS, ALL FINAL CONTOUR LINE ELEVATIONS SHALL BE THE SAME AS EXISTING CONTOUR LINE ELEVATIONS.

2. JOINTS BETWEEN NEW BITUMINOUS PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.

3. ALL CURBING DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE RESET, RESTORED OR REPLACED IN KIND, IF DAMAGED, INCLUDING CEMENT CONCRETE, IN ACCORDANCE WITH THE CITY OF WARWICK AND RIDOT STANDARDS, REGARDLESS OF IT'S PROXIMITY TO THE DRAIN OR SEWER, AS DIRECTED BY THE OWNER.

4. ALL SIDEWALK AND WHEELCHAIR RAMP AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IN CONFORMANCE TO THE AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS AND THE ARCHITECTURAL ACCESS BOARD (AAB) REQUIREMENTS AT THE CONTRACTOR'S EXPENSE.

5. THE CONTRACTOR SHALL REMOVE AND RESET ALL SIGNS DISTURBED DURING CONSTRUCTION, IN CONFORMANCE WITH THE RIDOT STANDARD SPECIFICATIONS AND CONSTRUCTION STANDARDS.

6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

PAVEMENT NOTES:

BITUMINOUS CONCRETE - VEHICULAR
SURFACE COURSE: 1.5" HMA SURFACE COURSE - CLASS 9.5 OVER
BASE COURSE: 2.5" HMA BASE COURSE - CLASS 12.5 OVER
SUB-BASE: 12" GRAVEL BORROW SUB-BASE COURSE

CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS
SURFACE: 4" DEPTH CEMENT CONCRETE WALK SURFACE
(SEE DETAILS AND PLANS FOR TYPE AND CONDITION)
4000 PSI, 3/4" OVER
BASE COURSE: 8" GRAVEL BORROW

EXCAVATION SUPPORT AND DEWATERING:

1. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN THE DRY. THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ALL PUMPS, DRAINS, WELL POINTS, SCREENS, OR OTHER FACILITIES NECESSARY TO CONTROL, COLLECT AND DISPOSE SURFACE AND SUBSURFACE WATER ENCOUNTERED IN THE PERFORMANCE OF THE WORK.

2. TRENCH/EXCAVATION DEWATERING MAY BE REQUIRED FOR THIS WORK; DISCHARGE OF FINES OR SEDIMENTS FROM DEWATERING OPERATIONS IS NOT PERMITTED. CONTRACTOR SHALL USE SILTATION BASIN/SEDIMENT CONTROL TRAPS.

3. DISCHARGE FROM DEWATERING OPERATIONS SHALL NOT BE DIRECTLY DISCHARGED INTO THE COMBINED SEWER. ALL CONSTRUCTION DEWATERING SHALL HAVE SILT AND SEDIMENT REMOVED PRIOR TO DISCHARGE.

SOIL EROSION AND SEDIMENT CONTROL:

1. ALL SITE SOIL EROSION AND SEDIMENTATION CONTROL (SESC) MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AND INSPECTED BY THE OWNER PRIOR TO THE START OF CONSTRUCTION. THE SESC MEASURES SHALL BE REGULARLY INSPECTED, CLEANED AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION OPERATIONS IN ACCORDANCE WITH THE SESC PLAN. SESC MEASURES SHALL ALSO BE INSPECTED AND CLEANED AFTER ALL SIGNIFICANT STORM EVENTS AS STIPULATED BY THE SESC PLAN AND AT THE DIRECTION OF THE OWNER.

2. CONTRACTOR SHALL MAINTAIN AN ADEQUATE SUPPLY OF SESC MEASURE MATERIALS ON SITE TO BE INSTALLED IN AREAS WHERE EXISTING SESC MEASURES HAVE FAILED OR ARE NECESSARY AS DETERMINED BY THE OWNER. NO WORK OR STORAGE OF CONSTRUCTION EQUIPMENT WILL BE PERMITTED OUTSIDE THE LIMIT OF DISTURBANCE.

4. SESC MEASURES SHALL BE MAINTAINED UNTIL SITE WORK IS COMPLETE AND ALL EXPOSED SOILS ARE SATISFACTORILY STABILIZED. UPON PERMANENT STABILIZATION OF ALL DISTURBED SOILS, THE SESC MEASURES SHALL BE REMOVED AND PROPERLY DISPOSED. PROVIDE SESC MEASURES AT PERIMETERS OF ALL EXCAVATION AREAS, DISTURBED SURFACES AND AT ALL CATCH BASINS ADJACENT TO DISTURBED AREAS. PROVIDE COMPOST FILTER SOCKS IN ACCORDANCE WITH THE DETAIL DRAWINGS.

5. ALL MITIGATIVE FEATURES, FACILITIES AND SYSTEMS OF TREATMENT AND CONTROL THAT MAY BE INSTALLED OR USED SHALL BE PROPERLY MAINTAINED TO PREVENT HARM TO AREAS ADJACENT TO THE SITE.

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF
PUBLIC WORKS
925 SANDY LANE,
WARWICK, RI 02886
PHONE:401-738-2003

Revisions:

Rev.	Date	Description

Issued For:

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PURPOSES

Date: 01/02/2024

Scale: As Shown

Drawn By: DMP

Approved By: WRF

Drawing Title:

GENERAL
NOTES

Sheet Number:

GN

KEY - LEGEND:

GS	GRADE SPOT (SPOT GRADE)
EP	EDGE OF PAVEMENT
TC	TOP CURB
BC	BOTTOM CURB
FOW	FACE OF WALL
	U.S. ARMY CORPS ENG. DISK SURVEY MARK
	CONTROL POINT
LOW	LIMIT OF WORK
	EROSION CONTROLS
	R&D TIMBER GUARDRAIL
	R&S CURBING
	SAWCUT
	R&D CONCRETE SIDEWALK
	R&D BITUMINOUS CONCRETE

NOTES:

1. ANY DAMAGE TO EXISTING SITE ELEMENTS/ FEATURES TO REMAIN WILL BE THE CONTRACTORS RESPONSIBILITY TO REPLACE AT NO ADDITIONAL COST TO THE CITY.
2. GIVEN THE SIZE AND SCOPE OF THE PROPOSED IMPROVEMENTS THE CITY IS NOT REQUIRING THE CONTRACTOR TO PROVIDE TEMPORARY CONSTRUCTION FENCING. HOWEVER, IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO ENSURE PROPER SITE SECURITY AT ALL TIMES. ANY DAMAGE OR VANDALISM DURING THE PERIOD OF CONSTRUCTION IS THE CONTRACTORS SOLE RESPONSIBILITY.
3. ALL EROSION CONTROLS SHALL BE INSTALLED AROUND ALL AREAS OF CONSTRUCTION PRIOR TO ANY WORK ACTIVITIES.

0 5 10

SCALE: 1"=5'-0"

N

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF
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PHONE:401-738-2003

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Date: 01/02/2024

Scale: As Shown

Drawn By: DMP

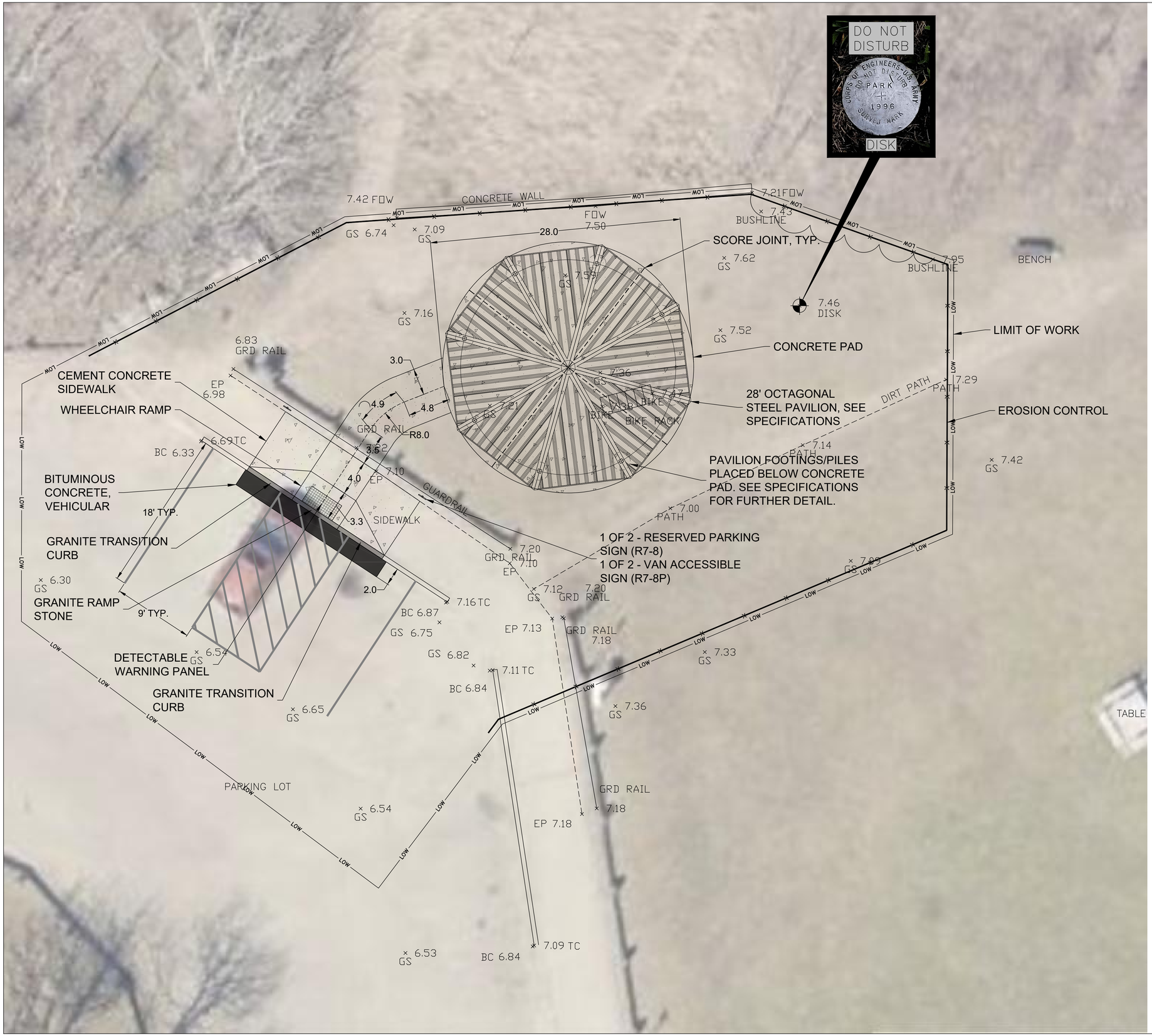
Approved By: WRF

Drawing Title:

SITE
PREPARATION
AND
DEMOLITION
PLAN

Sheet Number:

SP+D



KEY - LEGEND:

GS	GRADE SPOT (SPOT GRADE)
EP	EDGE OF PAVEMENT
TC	TOP CURB
BC	BOTTOM CURB
FOW	FACE OF WALL
	U.S. ARMY CORPS ENG. DISK SURVEY MARK
	CONTROL POINT
LOW	LIMIT OF WORK
	EROSION CONTROLS
	GRANITE CURB
	CONCRETE PATH/PAD
	BITUMINOUS CONCRETE-VEHICULAR
	CENTERLINE

NOTES:

1. CONTRACTOR SHALL CONFIRM ALL MEASUREMENTS IN FIELD PRIOR TO BID.
2. ALL DISTURBED AREAS WITHIN THE LIMIT OF WORK SHALL BE GRADED TO ELIMINATE STANDING OR POOLING WATER, AND SEEDED UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL RECEIVE OWNERS APPROVAL ON SITE LAYOUT PRIOR TO ANY IMPLEMENTATION.
4. PARKING LINE STRIPING SHALL BE 4" WIDE TYP. WITH WHITE LATEX TRAFFIC PAINT.

0 5 10

SCALE: 1"=5'-0"

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
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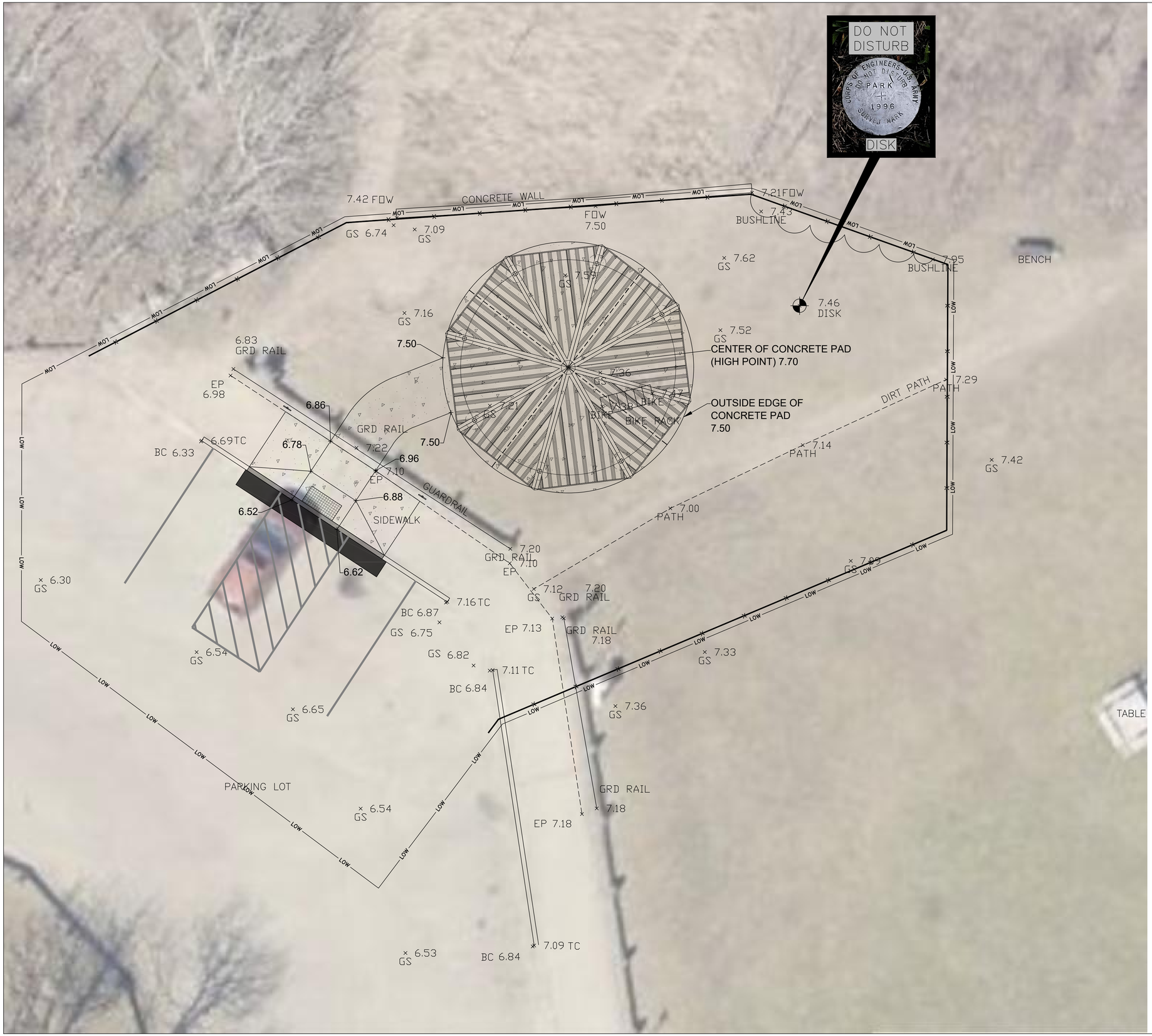
Drawing Title:

LAYOUT AND
MATERIALS
PLAN

Sheet Number:

L+M.1



KEY - LEGEND:

GS	GRADE SPOT (SPOT GRADE)
EP	EDGE OF PAVEMENT
TC	TOP CURB
BC	BOTTOM CURB
FOW	FACE OF WALL
⊕	U.S. ARMY CORPS ENG. DISK SURVEY MARK
△	CONTROL POINT
LOW	LIMIT OF WORK
×	EROSION CONTROLS
6.86	PROPOSED GRADE

NOTES:

1. ALL TRANSITIONS BETWEEN EXISTING AND PROPOSED IMPROVEMENTS SHALL BE FLUSH AND SMOOTH.
2. HANDICAP PARKING SPACES AND ACCESS AISLE SHALL BE A MAXIMUM 2% PITCH IN ALL DIRECTIONS.
3. CONTRACTOR MUST ENSURE POSITIVE DRAINAGE AWAY FROM PROPOSED IMPROVEMENTS TO ELIMINATE STANDING WATER ON AND DIRECTLY ADJACENT TO.
4. CONTRACTOR SHALL OFF-GRADE CONCRETE PATHS AND PADS WITH LOAM AND SEED. OFF-GRADING IN THESE AREAS SHALL NOT EXCEED A 4:1 SLOPE AND SHALL BE DONE AS GRADUAL AS POSSIBLE.

0 5 10

SCALE: 1"=5'-0"

N

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF
PUBLIC WORKS
925 SANDY LANE,
WARWICK, RI 02886
PHONE:401-738-2003

Revisions:

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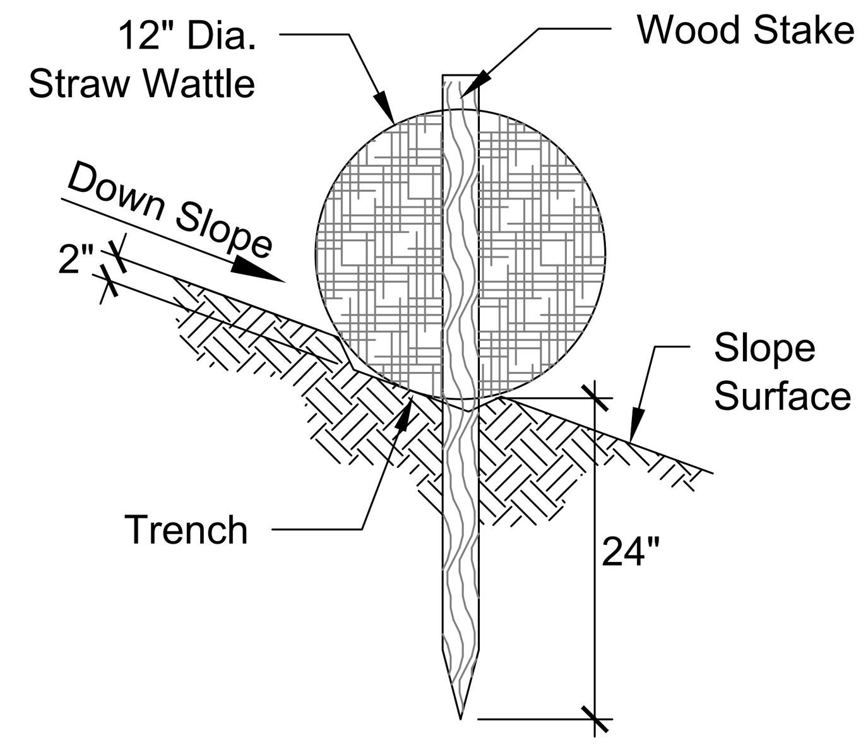
Approved By: WRF

Drawing Title:

GRADING
PLAN

Sheet Number:

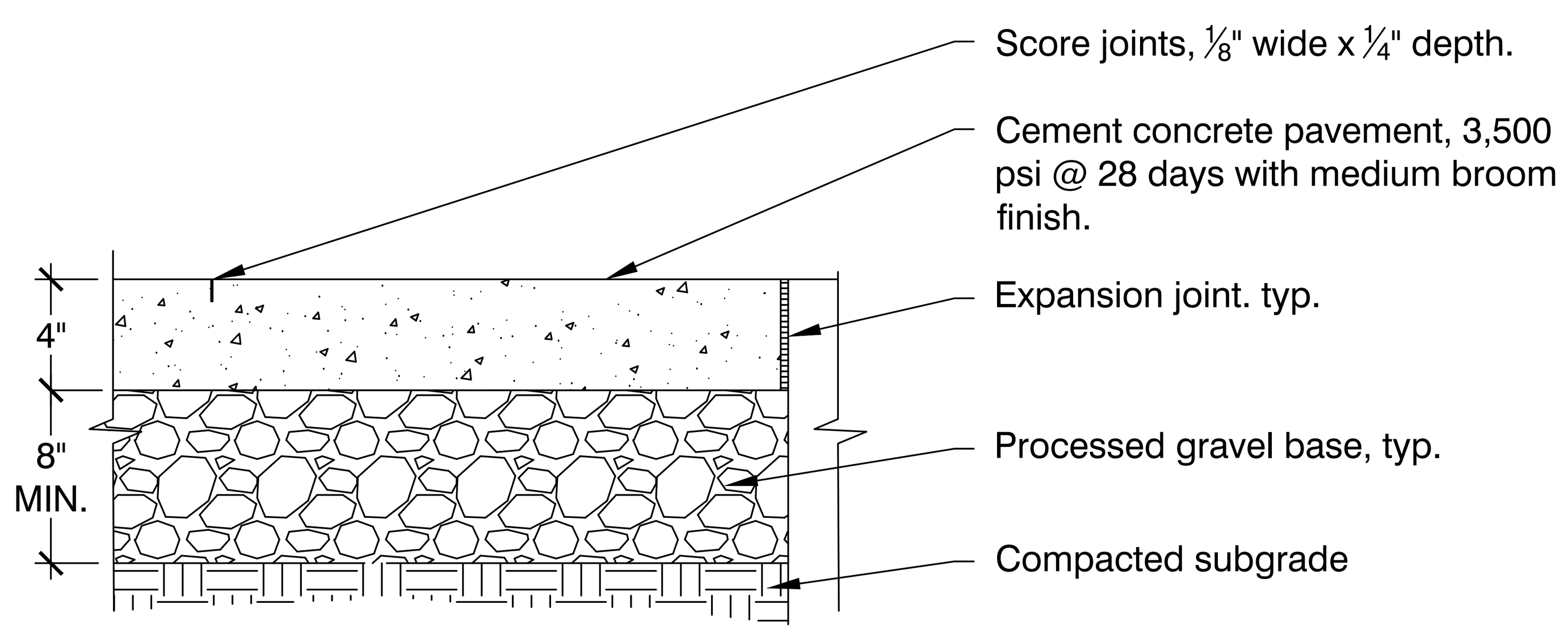
G.1



NOTES:

1. Place wattle along contours and perpendicular to flow.
2. Adjust location as required for optimum effectiveness throughout construction activities.
3. Place stakes min.18" O.C. as needed to secure wattles in place.

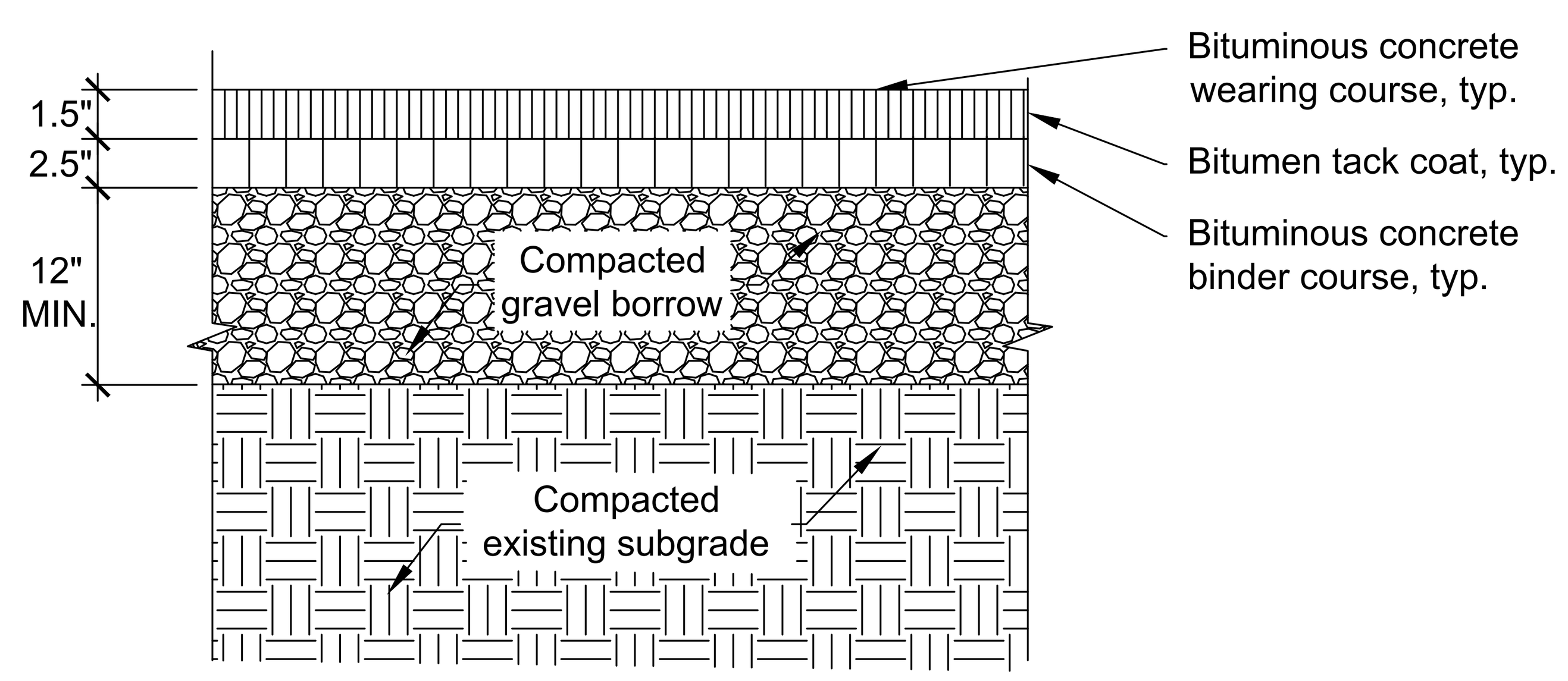
EROSION CONTROL
N.T.S.



NOTES:

1. Expansion joints shall be placed where new concrete pavement meets existing pavement.
2. See grading and layout plans for elevations and locations.

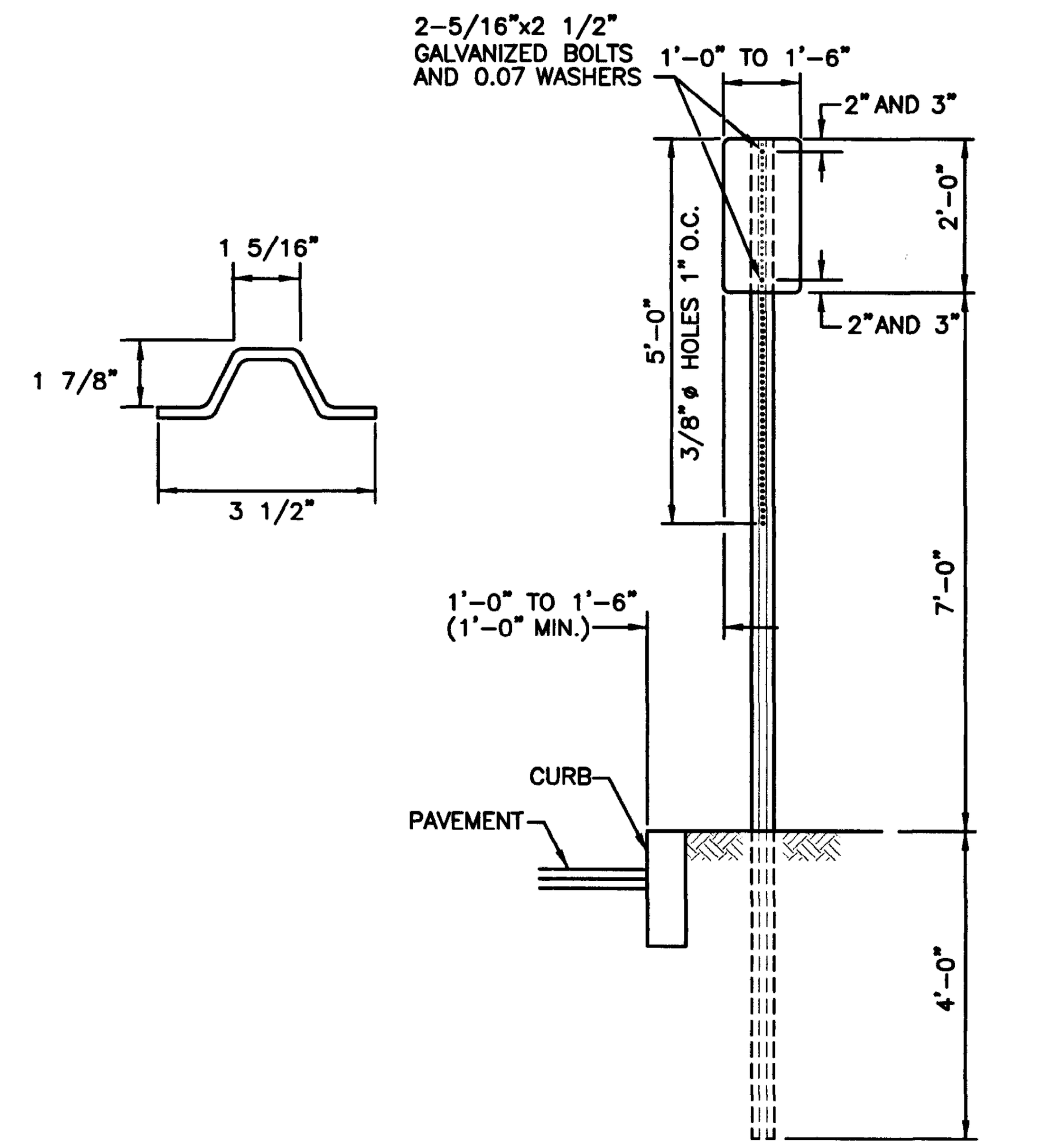
CONCRETE PAD
N.T.S.



NOTES:

1. Contractor to provide flush smooth transition where new pavement abuts existing pavement, typ.
2. See Grading and layout plans for grades and locations. Path shall have no greater than a 5% running slope and 2% cross pitch.

BITUMINOUS CONCRETE - VEHICULAR
N.T.S.



NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION T.15 OF THE STANDARD SPECIFICATIONS.
2. PARKING SIGNS SHALL BE SET AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° WITH A LINE PARALLEL TO FLOW OF TRAFFIC, 1'-6" (1'-0" MIN.) FROM EDGE OF CURB FACE.

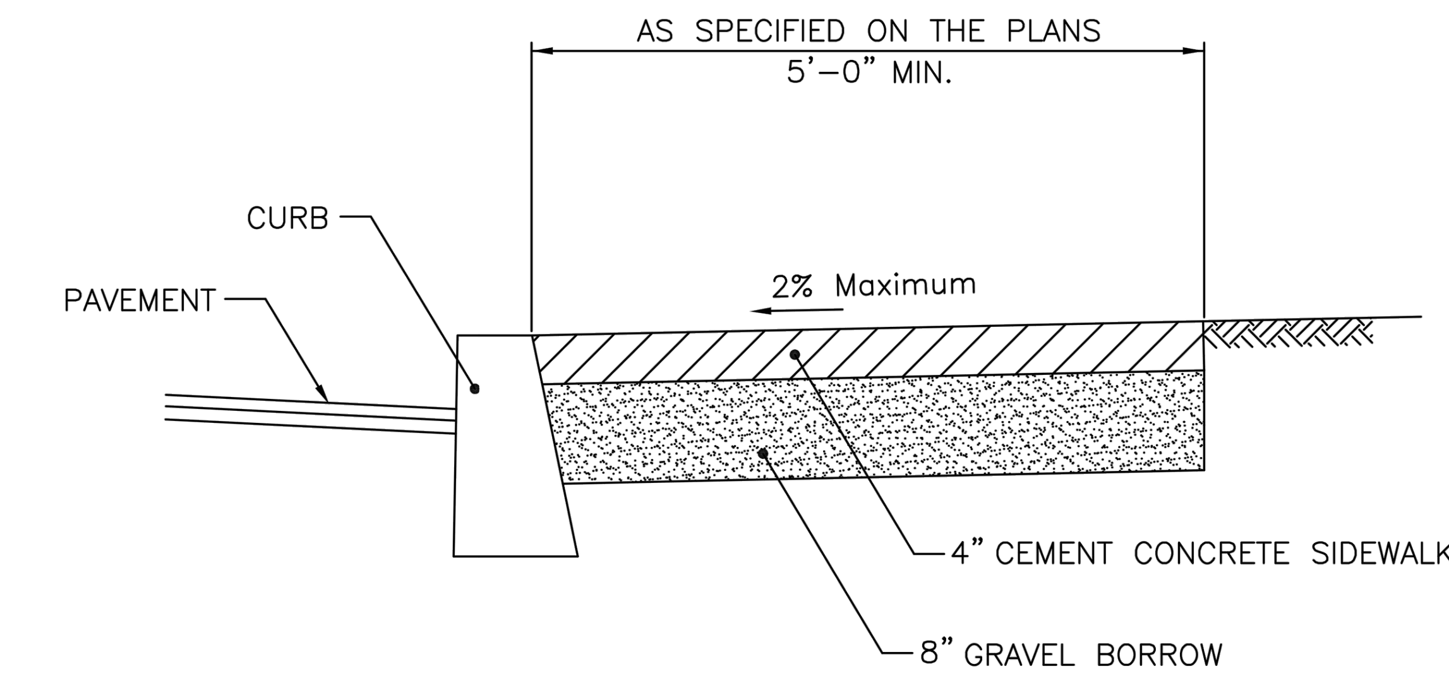
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS			
NO.	BY	DATE	

PARKING SIGN MOUNTING DETAIL

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 24.6.0



NOTES
1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. FOR CURB SETTING DETAIL REFERENCE STD. 7.6.0.

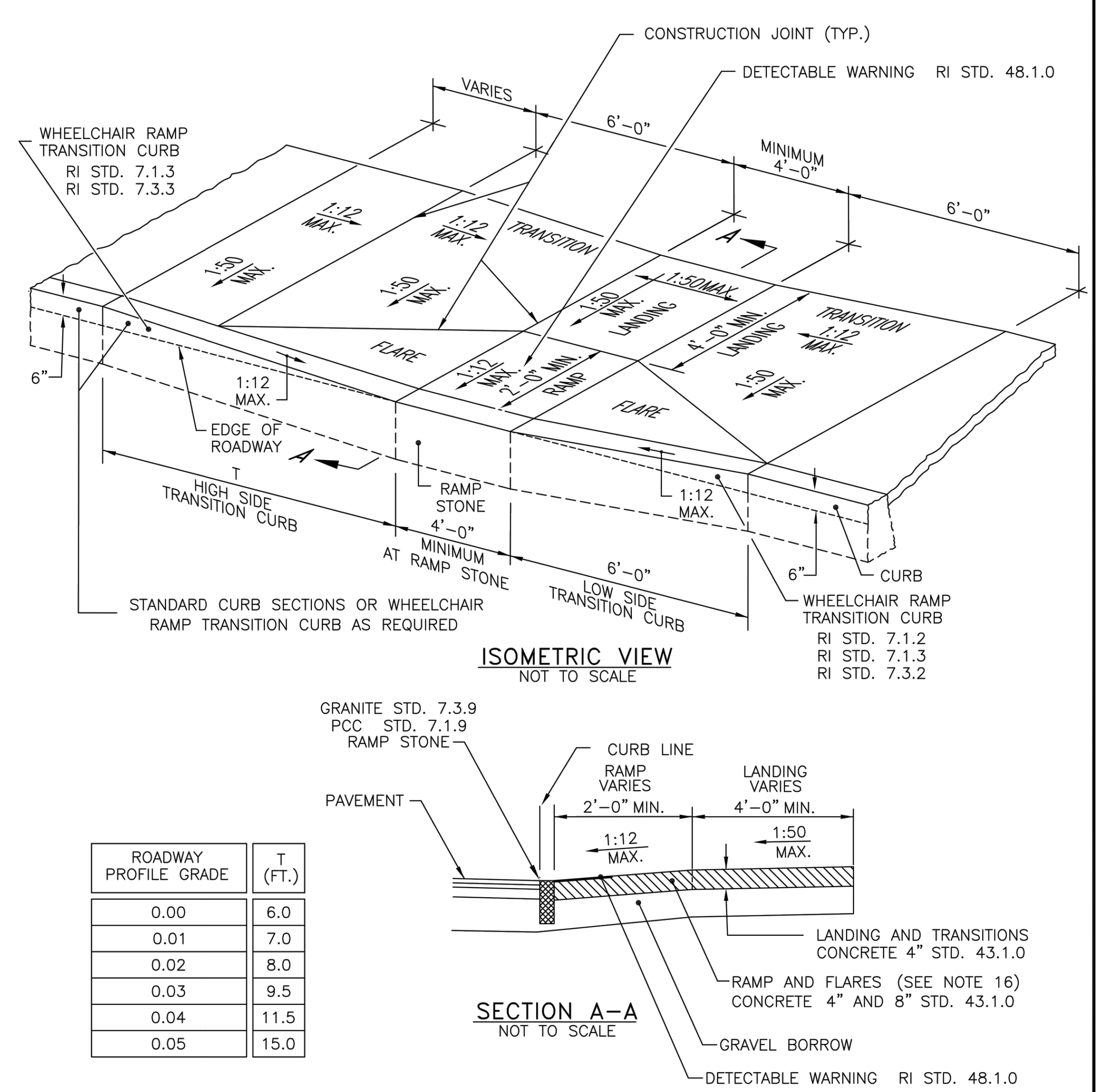
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

NO.	BY	DATE
1	MLP	3/1/05
2	MLP	06/01/10

CEMENT CONCRETE SIDEWALK

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 43.1.0



ROADWAY PROFILE GRADE	T (FT.)
0.00	6.0
0.01	7.0
0.02	8.0
0.03	9.5
0.04	11.5
0.05	15.0

NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE RI STANDARD SPECIFICATIONS.
2. WHEN ANY OBSTRUCTION LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP SHALL BE PLACED SUCH THAT THE OBSTRUCTION FALLS OUTSIDE OF THE RAMP.
3. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
4. DRAINAGE FACILITIES ARE TO BE LOCATED UP-GRADE OF ALL WHEELCHAIR RAMPS.
5. LOCATION OF WHEELCHAIR RAMPS IS AS SHOWN ON CONTRACT DRAWINGS.
6. IN NO INSTANCE SHALL THE SIDEWALK CROSS SLOPE EXCEED 1:50 EXCEPT WITHIN THE RAMP AREA.
7. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 4'-0" SHALL BE MAINTAINED.
8. THE WHEELCHAIR RAMP SLOPE AND SIDE SLOPES (TRANSITIONS), MUST NOT BE STEEPER THAN 1:12. HOWEVER, THESE SLOPES MAY BE FLATTER THAN 1:12 WHEN WARRANTED BY SURROUNDING CONDITIONS.
9. WHERE THE ROAD PROFILE EXCEEDS 5% THE HIGH SIDE TRANSITION LENGTH (T) SHALL BE EIGHTEEN FEET (18'-0").
10. IN NO CASE, WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED BEHIND THE STOP LINE.
11. THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
12. THE WHEELCHAIR RAMP SHALL BE CENTERED RADIALLY, OPPOSITE THE RADIUS POINT WHEN POSSIBLE.
13. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0" (GREATER LENGTHS PREFERRED).
14. ALL REQUIRED CUTTING OF CURB PIECES TO BE PAID FOR UNDER COST OF CURB.
15. DETECTABLE WARNINGS TO BE PAID FOR UNDER SECTION 942 OF THE RI STANDARD SPECIFICATIONS
16. 8" CONCRETE DEPTH FOR RADIUS WHEELCHAIR RAMPS ONLY. USE 4" DEPTH FOR TANGENT (MID-BLOCK) LOCATIONS.

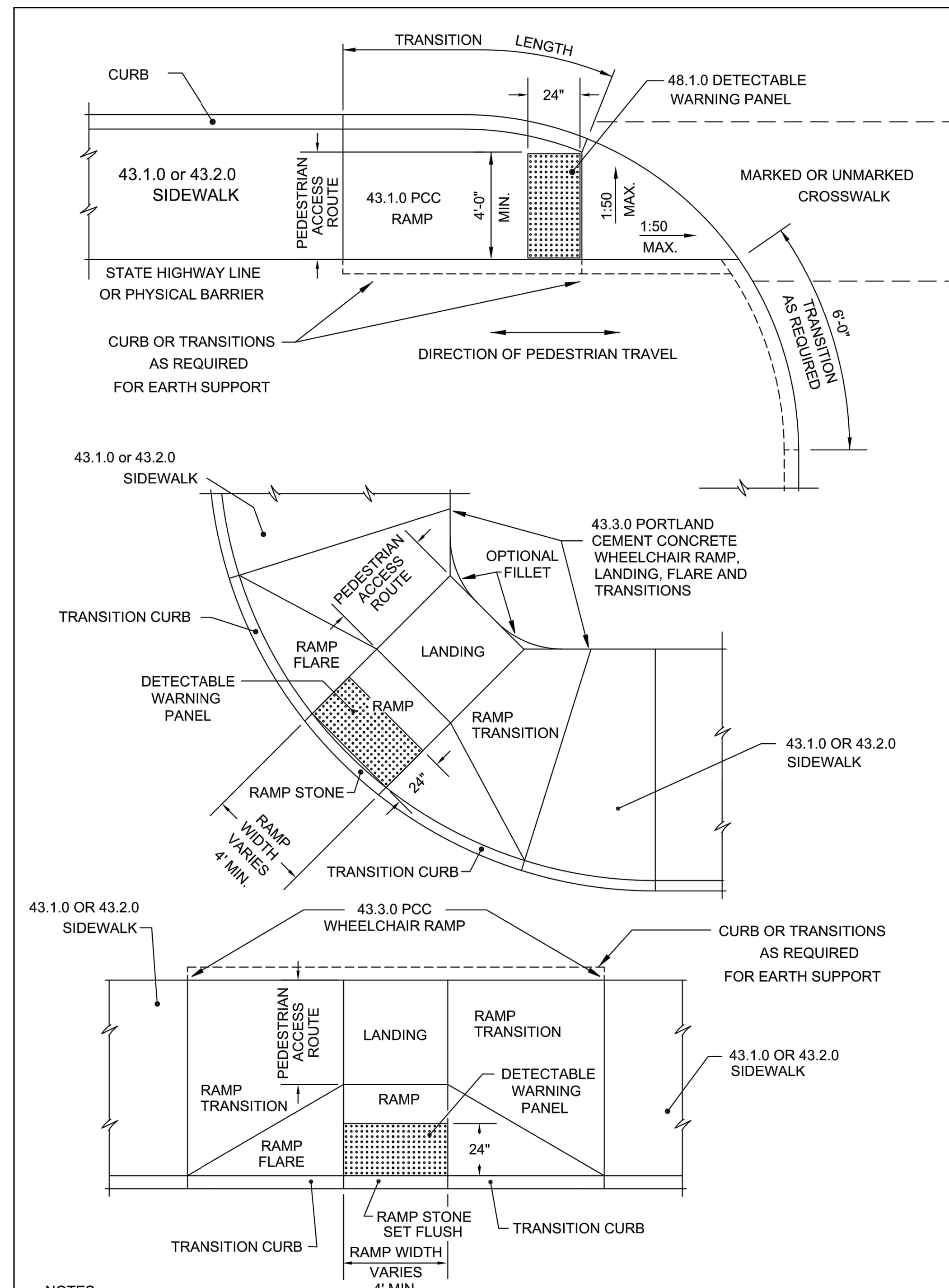
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

NO.	BY	DATE
1	MLP	Oct 2005
2	MLP	Jun 2008
3	MLP	Sep 2012

WHEELCHAIR RAMP

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 43.3.0



NOTES
1. DETECTABLE WARNING PANEL SHALL BE IN ACCORDANCE WITH SECTION 942 OF THE RHODE ISLAND STANDARD SPECIFICATIONS; PANEL TO MATCH RAMP WIDTH.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

NO.	BY	DATE
1	MLP	Mar 2005
2	MLP	Sep 2012

DETECTABLE WARNING PANEL PLACEMENT

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 48.1.0

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK SHADE STRUCTURE PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF PUBLIC WORKS
925 SANDY LANE,
WARWICK, RI 02886
PHONE:401-738-2003

Revisions:

Rev.	Date	Description

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Date: 01/02/2024

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Drawn By: DMP

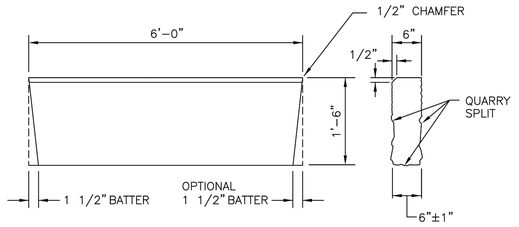
Approved By: WRF

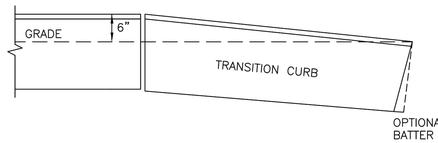
Drawing Title:

DETAILS

Sheet Number:

D.1





NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. THE CONTRACTOR MAY CUT EXISTING CURB SECTIONS AS REQUIRED TO MEET THIS DETAIL AND THE R.I. STANDARD SPECIFICATIONS, WHERE OLD CURBING IS BEING REUSED.
3. TOP SURFACE TO BE DRESSED BY SAW. REMAINDER MAY BE QUARRY SPLIT.

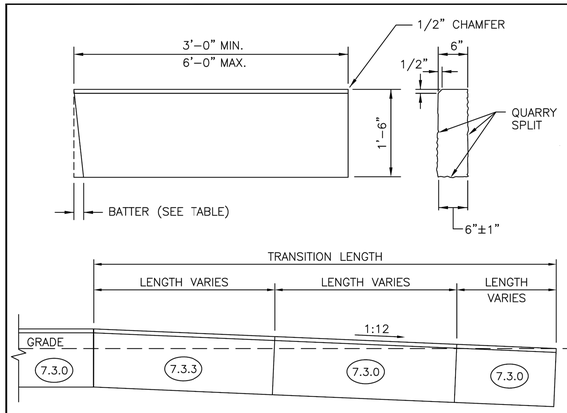
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS		
NO.	BY	DATE
1	MLP	Mar 2005
2	MLP	Sep 2012

6'–0" GRANITE TRANSITION CURB

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 7.3.2



TRANSITION LENGTH (FT.)	BATTER (IN.)
6.0	1.5
7.0	1.3
8.0	1.2
9.5	1.0
11.5	0.8
15.0	0.6
18.0	0.5

NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. THE CONTRACTOR MAY CUT EXISTING CURB SECTIONS AS REQUIRED TO MEET THIS DETAIL AND THE R.I. STANDARD SPECIFICATIONS, WHERE OLD CURBING IS BEING REUSED.
3. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR CURB FILLER PIECES TO BE 3'–0" (GREATER LENGTHS PREFERRED).
4. TOP SURFACE TO BE DRESSED BY SAW. REMAINDER MAY BE QUARRY SPLIT.

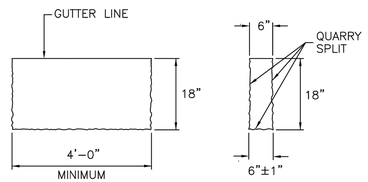
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

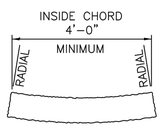
REVISIONS		
NO.	BY	DATE
1	MLP	Mar 2005
2	MLP	Jun 2012

GRANITE WHEELCHAIR RAMP TRANSITION CURB

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 7.3.3





CIRCULAR GRANITE RAMP STONE

NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. TOP SURFACE TO BE DRESSED BY SAW TO PROVIDE NO–SLIP SURFACE; REMAINDER MAY BE QUARRY SPLIT.
3. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR RAMP STONE TO BE 4'–0".
4. CIRCULAR RAMP STONE IS REQUIRED ON CURVES WITH RADII OF 160'–0" OR LESS. STRAIGHT RAMP STONE TO BE USED ON CURVES OF MORE THAN 160'–0" RADIUS.
5. RAMP STONE SHALL BE SET IN ACCORDANCE WITH STD. 43.3.0 AND IN CONJUNCTION

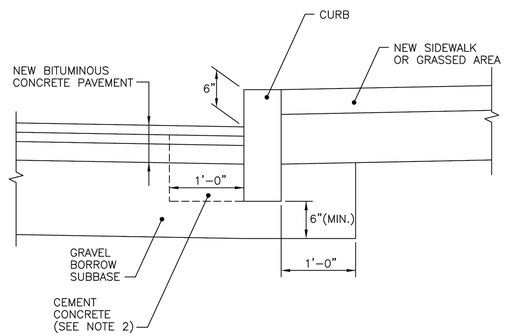
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS		
NO.	BY	DATE
1	MLP	Jun 2010
2	MLP	Sep 2012

GRANITE RAMP STONE

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 27, 2008 ISSUE DATE

R.I. STANDARD 7.3.9



NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. CEMENT CONCRETE SHALL BE USED ONLY WHEN THE CURB IS SET AFTER THE BASE AND/OR BINDER COURSES ARE IN PLACE, OTHERWISE THE CEMENT CONCRETE WILL BE ELIMINATED AND THE GRAVEL BROUGHT UP TO BOTTOM OF THE BASE COURSE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS		
NO.	BY	DATE
1	MLP	Mar 05

CURB SETTING DETAIL

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE

R.I. STANDARD 7.6.0

Project:

CITY OF WARWICK
RHODE ISLAND

CONIMICUT POINT PARK
SHADE STRUCTURE
PROJECT

PREPARED BY:

CITY OF WARWICK
DEPARTMENT OF
PUBLIC WORKS
925 SANDY LANE,
WARWICK, RI 02886
PHONE:401-738-2003

Revisions:

Rev.	Date	Description

Issued For:

BIDDING
PURPOSES

Date: 01/02/2024

Scale: As Shown

Drawn By: DMP

Approved By: WRF

Drawing Title:

DETAILS

Sheet Number:

D.2