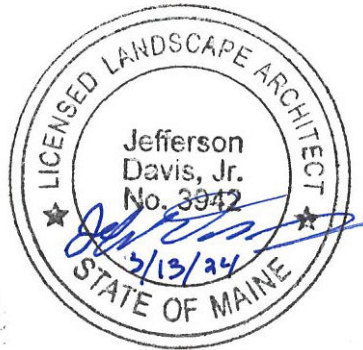




**CITY OF BANGOR**

## **Pickering Square Improvements**

### **Request for Bid**



**March 12, 2024**

**CITY OF BANGOR, MAINE**  
**ENGINEERING DEPARTMENT**

*JOHN M. THERIAULT, PE, PTOE*  
*CITY ENGINEER*

*DEBORAH A. LAURIE*  
*CITY MANAGER*

## NOTICE TO CONTRACTORS

Bids are requested for the

### **Pickering Square Improvements**

The City of Bangor, Maine invites sealed proposals from qualified applicants to complete utility, site, and landscaping improvements and all associated work at the Pickering Square, Bangor, ME.

General information is available on the City's website at the following web address: [www.bangormaine.gov/proposals](http://www.bangormaine.gov/proposals).

For consideration, the attached bid form sealed in an envelope, distinctly marked

### **"Proposal No. P24-43 Pickering Square Improvements"**

must be received at the Office of the City of Bangor Purchasing Department by

**2:00 PM, Wednesday, April 10, 2024.**

at which time all proposals will be opened and read aloud.

An informational **pre-bid meeting** will be held at **11:00 a.m on Tuesday, March 19, 2024** in the City Hall Council Chambers, 262 Harlow St., Bangor, ME.

Bid security in the amount of 5% of the bid price will be required in the form of cash, a certified check or bid bond.

The City reserves the right to waive any informalities in or to reject any or all bids submitted, or to accept any proposal considered to be the most advantageous to the City.

Specifications may be obtained at the Engineering Department, 1 Dutton Street, Bangor, Maine 04401, for a one hundred dollar **(\$100.00)** charge. If plans need to be mailed, an additional fee of forty-five **(\$45.00)** will be charged.



## CITY OF BANGOR

**Request for Proposals  
Pickering Square Improvements  
Proposal No. P24-43**

**Purchasing Department  
262 Harlow Street  
Bangor, ME 04401  
207-992-4282**

**Issue Date: March 12, 2024**

### **I. Introduction**

The City of Bangor (City) is soliciting sealed construction bids from qualified applicants to complete site, utility, landscaping improvements and all associated work. Refer to "Scope of Services" and "Plans and Specifications" for additional information.

### **II. General Information**

Available at the following web address: [www.bangormaine.gov/proposals](http://www.bangormaine.gov/proposals) on the City's website. By submitting a response to this solicitation, the Proposer accepts the responsibility for downloading, reading, and bidding by the terms and conditions set forth in the City's "General Information for Vendors".

In your proposal, please specify whether you currently have or are in the process of developing a domestic violence policy. If you do not have such a policy, let us know if you would like to receive a copy of the City of Bangor's policy as a reference.

### **III. Submission**

For consideration, submit the proposal Bid Form in an envelope marked "**Proposal No. P24-43: Pickering Square Improvements**" by 2:00 P.M. on Wednesday, April 10, 2024. Interested Proposers must submit one (1) original hard copy and an electronic version submitted either via email by sending to: [bids@bangormaine.gov](mailto:bids@bangormaine.gov) with reference "**P24-43: Pickering Square Improvements**" in the subject line or via flash drive. Submissions will be publicly opened on the date and time stated above.

Submission of documents and/or flash drive can be completed by:

- A. **Emailing** to [bids@bangormaine.gov](mailto:bids@bangormaine.gov) ; or
- B. **Hand Deliver** to 262 Harlow Street, Bangor, ME (back entrance of building at City of Bangor entrance); or
- C. **US Post Office** addressed to 73 Harlow Street, Purchasing Department, Bangor, ME 04401; or

D. **All Other Delivery Services** addressed to 262 Harlow Street, City of Bangor, Bangor, ME 04401.

All submissions should reference “**Proposal No. P24-43: Pickering Square Improvements**”. Proposals will be publicly opened at the time stated above in the temporary Council Chambers, 262 Harlow Street, Bangor, Maine (see **Appendix D - Meeting Location Map**).

A tabulation of all received proposals will be posted on the City's website by 4:30 P.M. on the opening date. Visit [www.bangormaine.gov/bidtabs](http://www.bangormaine.gov/bidtabs) for results.

#### **IV. Questions**

Any questions must be directed in writing to [bids@bangormaine.gov](mailto:bids@bangormaine.gov) no later than 4:30 P.M., Friday, March 22, 2024.

The City will provide a response by 4:30 P.M. on Friday, March 28, 2024. This response will be in the form of an addendum, accessible on the City's website. Notifications will be sent to the Registered Vendor List when new addenda are released. To receive these updates, the City strongly encourages all potential bidders to register as vendors at [www.bangormaine.gov/vendorregistration](http://www.bangormaine.gov/vendorregistration).

#### **V. Project Review Meeting**

A non-mandatory pre-bid meeting will be held at 11:00 AM on Tuesday, March 19, 2024 at the temporary Council Chambers, 262 Harlow St., to review the scope of the project and to address any questions. Any questions after the project meeting must be directed in writing to [bids@bangormaine.gov](mailto:bids@bangormaine.gov) no later than 4:30 PM, Friday March 22, 2024.

#### **VI. Late Proposals**

It is the responsibility of the Proposer(s) to see that their proposals have sufficient time to be received by the Purchasing Department before the submittal deadline. Any proposal, portion of a proposal, or requested proposal revision received at the City Purchasing Department after the time and date specified, will be returned to the Proposer unopened.

#### **VII. Withdrawal of Proposals**

No Proposer may withdraw their proposal for a period of ninety (90) days from the date of opening. All proposals shall be subject to acceptance by the City during this period.

To withdraw a proposal prior to the opening, the Proposer shall request the withdrawal in writing. All costs associated with the withdrawal (i.e. mailing fees) will be borne by the Proposer.

## VIII. Rejection

The City reserves the right to reject any proposals, waive any informalities or defects in proposals, or accept a higher cost proposal if it is deemed to be in the best interest of the City. The City also reserves the right to request clarification of any details with the successful Proposer.

## IX. Information for Proposers

- A. All Federal and State taxes must be excluded from the proposal price. Upon request, a tax exemption certificate for the City of Bangor shall be furnished to the successful Proposer.
- B. The Bid Form, included with this request must be completed and returned for a proposal to be considered.
- C. Proposals should be prepared providing a straightforward, concise delineation of the capabilities proposed to satisfy the requirements of the City. Completeness and clarity of content are requested. All brochures, presentations, and items submitted in support of proposals will become part of the contract.
- D. Proposers are required to maintain the following insurance policies throughout the life of the project and name the City of Bangor as an **additional insured** where applicable:

1. Worker's Compensation Insurance	Statutory
2. Employer's Liability Insurance	\$500,000 each accident \$500,000 disease – policy unit \$500,000 disease – each employee
3. Comprehensive Automobile Liability	\$1,000,000 combined, single limit per accident
4. Commercial & General Liability	\$2,000,000 combined single limit \$4,000,000 aggregate
5. Professional Liability (Errors & Omissions)	\$2,000,000 combined single limit \$4,000,000 aggregate
6. Pollution Liability Insurance	\$2,000,000 combined single limit \$4,000,000 aggregate
7. Umbrella Liability Policy	\$5,000,000 each occurrence

- E. The Proposer may visit the project site with City personnel to confirm the locations of proposed work and to discuss the specific scope of work.

## **X. Scope of Services**

A bid form is included as **Appendix A**. Specifications (General and Sitework) are attached as **Appendix B**. Plans and details are attached as **Appendix C**.

In addition, the scope of services includes, but is not limited to, the following:

- A. Provide a designated project manager.
- B. Provide adequate erosion control measures to protect adjacent natural resources in accordance with all state and local regulations.
- C. Obtain all necessary permits.
- D. Confirm the location of all existing utilities in the field.
- E. Provide and install all utility improvements as shown on attached plans and details, and all other associated work.
- F. Provide and install all surface and landscaping improvements as shown on attached plans and details, and all other associated work.
- G. **All work must be completed by October 31, 2024.**

## **XI. Proposal Organization**

The proposal shall include a work schedule and a brief description of the methods and resources the Proposer will employ to accomplish the proposed work.

In addition to the General Qualifications, the following items must be provided:

- A. The Proposer shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of the Proposer's obligations under the Contract. The Proposer shall obtain the required bonds from the surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located in issue bonds in the required amounts.
- B. Each Proposer must submit with bid, a certified check, bid bond, or cash in the amount of 5% of his total bid price as his guarantee that the Proposer will enter into the Contract, if awarded. Said check, bid bond, or cash will be returned to all except the two (2) lowest Proposers immediately following the opening of bids, and the remaining sureties will be returned after the Owner and Proposer have executed the Contract. If the Contract has not been awarded within thirty (30) days of the bid opening, the surety will be returned at any time thereafter to any Proposer who so requests, so long as they have not been notified of the acceptance of the bid.

## **XII. Selection**

The evaluation of proposals and determination of the award will be at the discretion of the City and its judgment shall be final and without right of recourse by any Proposer.

Each proposal will be evaluated according to the following criteria:

- A. The qualifications and experience of the individual(s) who will perform the work.
- B. The availability and capacity of the Proposer to perform the services required.
- C. The ability to meet the schedule.
- D. The cost of the services offered.

### **XIII. Warranty Period**

All work shall be guaranteed by the Proposer for a period of one (1) year from the date the work reaches substantial completion as determined by the City Engineer.

### **XIV. Consent Decree**

**All Proposers and sub-contractors are hereby notified that the City of Bangor has entered into a Consent Decree with the United States and the State of Maine. For the purposes of the Consent Decree, Proposers and sub-contractors are deemed agents of the City. Any and all work performed by Proposers and sub-contractors must conform with the terms of the Consent Decree. Proposers must familiarize themselves with the contents of the document and must make the document available to all sub-contractors.**

**This document is available in hard-copy in the City of Bangor's Engineering Department or electronically at**

**[http://www.bangormaine.gov/filestorage/318/350/7758/ENV\\_ENFORCEMENT.PDF](http://www.bangormaine.gov/filestorage/318/350/7758/ENV_ENFORCEMENT.PDF)**

## Sample Contract



CITY OF BANGOR

### *Sample Contract for Professional Services* between **The City of Bangor** and **Contractor**

This AGREEMENT made this \_\_\_\_\_ day of \_\_\_\_\_, 2024 by and between City of Bangor, a body politic in the State of Maine (hereinafter the "CITY"), and \_\_\_\_\_, (hereinafter the "CONTRACTOR").

The parties do hereby agree as follows:

#### **Article 1: Services:**

CONTRACTOR agrees to provide the personnel, supplies, equipment, labor, and all incidentals necessary for the following:

Complete the Pickering Square Improvements in accordance with bid dated March 8, 2024 attached hereto.

#### **Article 2: Contractor's Performance:**

CONTRACTOR accepts the relationship of trust and confidence established between itself and the CITY by this AGREEMENT and agrees to perform the services hereunder in the best and most expeditious and economical manner consistent with the interests of the CITY. The CONTRACTOR shall be, and remain, fully responsible to the CITY for the technical completeness, sufficiency and accuracy of all professional services furnished by or under this AGREEMENT and shall, without additional cost or fee to the CITY, correct and revise any errors or deficiencies in its performance including payment of attorney's fees.

#### **Article 3: Performance:**

CONTRACTOR agrees to perform in accordance with all reasonable requirements of the CITY. CITY agrees to cooperate in helping to implement any timeframe established. In the event of delay for reasons beyond its control and not its fault, CONTRACTOR may request necessary adjustments to said timeframe. The CITY's representative may approve any adjustments and said approval will not be unreasonably withheld.



#### **Article 4: Quality of Service:**

CONTRACTOR shall perform its services with care, skill, and diligence, in accordance with the applicable professional standards currently recognized by such profession, and shall be responsible for the professional quality, technical accuracy, completeness, and coordination of all reports, plans, information, specifications, and other items and services furnished under this AGREEMENT.

CONTRACTOR shall comply with all applicable Federal, State and local laws, ordinances, codes and regulations in performing its services. If CONTRACTOR fails to meet applicable professional standards CONTRACTOR shall without additional compensation, correct or revise any errors or deficiencies in its reports, plans or other services.

#### **Article 5: Project Team; Personnel; Independent Contractor:**

CONTRACTOR represents that it has, or will secure at its own expense, all personnel required in performing its services under this AGREEMENT. Such personnel shall not be officers or employees of the CITY, or have any contractual relationship with the CITY.

The CONTRACTOR further agrees that consistent with its status as an Independent CONTRACTOR that its personnel will not hold themselves out to be, or claim to be, officers or employees of the CITY by reason of this AGREEMENT.

#### **Article 6: City Representative:**

The CITY shall assign an authorized representative, who shall act as the CITY's representative in all dealings with the CONTRACTOR for the project. CONTRACTOR's performance hereunder shall be subject to said representative's review and approval.

#### **Article 7: City Responsibility:**

CITY agrees to furnish or provide access to CONTRACTOR any information or material in its possession which is relevant to CONTRACTOR 's performance hereunder and CITY's staff will cooperate with CONTRACTOR. CONTRACTOR will not, without the CITY's written consent, disclose, or permit disclosure, by any officer, employee, agent, or subCONTRACTOR of CONTRACTOR, of any information or material furnished or generated under this AGREEMENT.

#### **Article 8: Ownership of Documents:**

All reports, memoranda, plans, specifications, and documents or other material to be developed by CONTRACTOR under this AGREEMENT shall be the property of the CITY and be promptly delivered to the CITY upon request. All data, internal reports, memoranda, and notes, calculation estimates and any other internal documents used to prepare the documents and memoranda submitted to the CITY shall be deemed the CONTRACTOR's "work papers", and as such the "work papers" will remain property of the CONTRACTOR generating that material.

CONTRACTOR shall be responsible for the protection and/or replacement of any work or material in its possession, including materials provided to CONTRACTOR by the CITY. The CONTRACTOR understands and agrees that all documents and materials provided to the CITY hereunder are or may be public documents and as such will be available generally to the public. Reasonable use of any such documents by the CITY or the general public shall not be subject to a claim for infringement of any copyrights claimed by the CONTRACTOR in such documents. CITY has no responsibility for any use which may be made of them by any third party and CITY may use them for any lawful purpose.

CONTRACTOR and sub CONTRACTORS disclaim any liability to any party other than the CITY for any reliance on the documents and further that the CONTRACTOR and Sub CONTRACTORS disclaim any liability to the CITY if the reports and documents are relied upon or used for any purpose for which they are not intended.

#### **Article 9: Sub CONTRACTORS:**

If specialists or sub CONTRACTORS are required to complete the services there under, CONTRACTOR shall propose such utilization for review and approval of the CITY. CONTRACTOR is and shall remain fully responsible for performance of all services hereunder.

#### **Article 10: Indemnification:**

The CONTRACTOR shall indemnify, defend and hold harmless the CITY from and against all claims and actions, and all expenses incidental to such claims or actions, based upon or arising out of damage to property or injuries to persons or other tortious acts caused or contributed to by the CONTRACTOR or anyone acting under its direction or control or in its behalf in the course of its performance under this AGREEMENT, provided the CONTRACTOR's aforesaid indemnity and hold harmless agreement shall not be applicable to any liability based upon the sole negligence of the CITY.

The CONTRACTOR hereby expressly agrees that it will defend, indemnify and hold the CITY harmless from any and all claims made or asserted by CONTRACTOR's agents, servants or employees arising out of CONTRACTOR's activities under this AGREEMENT. For this purpose, CONTRACTOR hereby expressly waives any and all immunity it may have under Maine's Workers Compensation Act in regard to such claims made or asserted by CONTRACTOR's agents, servants or employees. The indemnification provided under this paragraph shall extend to and include any and all costs incurred by the CITY to answer, investigate, defend and settle all such claims, including but not limited to the CITY's costs for attorney's fees, expert and other witness fees, the cost of investigators, and payment in full of any and all judgments rendered in favor of CONTRACTOR's agents, servants or employees against the CITY in regard to claims made or asserted by such agents, servants or employees.

## **Article 11: Insurance:**

The CONTRACTOR shall arrange insurance for the minimum limits indicated and shall maintain the below listed coverage throughout the period of performance.

- |  | <u>LIMITS</u>  |
|--|--|
| a. Workers' Compensation Insurance<br>Employer's Liability Insurance   | Statutory<br>\$500,000 each accident<br>\$500,000 disease - policy limit<br>\$500,000 disease - each empl. |
| b. Commercial & General Liability  | \$2,000,000 combined single limit<br>\$4,000,000 aggregate   |
| Professional Liability (Errors & Omissions)  | \$2,000,000 combined single limit<br>\$4,000,000 aggregate   |
| Pollution Liability Insurance  | \$2,000,000 combined single limit<br>\$4,000,000 aggregate   |
| Umbrella Liability Policy  | \$5,000,000 each occurrence  |
| c. Automobile Liability Insurance (owned, hired & non-owned):<br>Bodily Injury & Property Damage                      \$1,000,000 combined single limit  |  |
| d. The CONTRACTOR shall provide a waiver of any rights of subrogation which the CONTRACTOR may have against the OWNER, its agents or its employees.  |  |
| e. Before any of the work is started under this CONTRACT, the CONTRACTOR shall file with the Purchasing Department a certificate of insurance containing the following information in respect to all insurance carried:<br><br>(1) Name of insurance company, policy number and expiration date;<br><br>(2) The coverage required and the limits on each, including the amount of deductible or self-insured retentions (which shall be for the account of the CONTRACTOR);<br><br>(3) A statement indicating that the OWNER shall receive thirty (30) days notice of cancellation or significant modification of any of the policies which may affect the OWNER's interest; and<br><br>(4) The OWNER as an additional insured (except Workers' Compensation Insurance). |  |
| f. If any of the work performed under this CONTRACT includes blasting, excavating, pile driving or caisson work; moving, shoring, underpinning, razing or demolition of any structure or removal or rebuilding of any structural support thereof, or any subsurface or underground work, the Comprehensive General Liability Insurance policy shall include coverage for the explosion, collapse and underground hazards.  |  |

## **Article 12: Termination:**

Termination for Convenience: The CITY may terminate this AGREEMENT, in whole or in part, whenever the CITY determines that such termination is in the best interest of the CITY, without showing cause, upon giving 30 days written notice to the CONTRACTOR. The CONTRACTOR will not be reimbursed for any profits that may have been anticipated but have not been earned up to the date of termination.

Termination for Default: When the CONTRACTOR has not performed or has unsatisfactorily performed the AGREEMENT, the CITY may terminate this AGREEMENT for default. Upon termination for default, payment may be withheld at the discretion of the CITY. Failure on the part of a CONTRACTOR to fulfill contractual obligations shall be considered just cause for termination of the AGREEMENT.

## **Article 13: No Assignment:**

CONTRACTOR shall not assign, sublet, sell, transfer or otherwise dispose of its interest in this AGREEMENT without the prior written approval of the CITY which shall not be unreasonably withheld.

This AGREEMENT shall be binding upon and inure to the benefit of the parties hereto, their successors and permitted assigns.

## **Article 14: Nonwaiver:**

Except as expressly provided in this AGREEMENT, the failure or waiver, or successive failures or waivers on the part of either party hereto, in the enforcement of any Condition, Covenant, or Section shall not render the same invalid, nor impair the right of either party hereto, their successors or permitted assigns, to enforce the same in the event of any subsequent breach thereof.

## **Article 15: Notices:**

All notices required or permitted under this AGREEMENT shall be in writing and shall be deemed sufficiently served if sent by First Class Mail addressed as follows, or such other address as they may designate in writing from time to time:

### **To City:**

John Theriault  
City Engineer  
City of Bangor  
73 Harlow Street  
Bangor, Me 04401

### **To CONTRACTOR:**

Notice given in any other manner shall be deemed effective only when the written notice is actually received.

#### **Article 16: Disputes:**

Any disputes arising out of or in the course of this AGREEMENT which are not settled by mutual agreement of the parties must be settled by mediation or submitted to arbitration in accordance with the rules of the American Arbitration Association. This AGREEMENT shall be governed by and construed in accordance with the laws of the State of Maine.

#### **Article 17: Compliance with Law:**

CONTRACTOR shall comply with all applicable Federal, State and local statutes, ordinances and regulations in its performance hereunder. CONTRACTOR agrees to amend this AGREEMENT, if necessary, to comply with such law or regulations.

#### **Article 18: Extent of Agreement:**

This AGREEMENT, with its Exhibits, represents the entire and integrated AGREEMENT between the CITY and CONTRACTOR and supersedes and replaces all terms and conditions of any prior AGREEMENTS, arrangements, negotiations, or representatives, written or oral with respect to this AGREEMENT. This AGREEMENT may only be modified by written agreement of both parties.

#### **Article 19: Changes:**

The CITY may order changes in writing in the specifications within the general scope of the Order. If the changes involve an increase or decrease in the cost of or time required for performing the work, the CONTRACTOR shall so advise the CITY in writing and an equitable adjustment in costs or schedule will be negotiated. As a condition to any increase in the cost of the work, the CONTRACTOR shall submit in writing adequately documented costs incurred for any authorized change for review, evaluation and approval by the CITY.

#### **Article 20: Cost Records and Accounting for Additional Services:**

CONTRACTOR shall keep accounts, books and other records of all its billable charges incurred in performing services to the CITY and shall itemize and submit its billings to the CITY in such a manner as the CITY may reasonably direct.

If no such direction is given, CONTRACTOR shall maintain books and accounts of chargeable costs in accordance with generally accepted accounting practices consistently applied, and in such a manner as to permit verification of all entries made. For three years from final payment under this AGREEMENT, CONTRACTOR shall preserve all such books and records, and shall upon three day's written notice make such records available to the CITY for purposes of verifying the costs chargeable under the AGREEMENT.

**Article 21: Compensation:**

The CONTRACTOR will submit invoices for payment after work is performed. Payment for services will be due within thirty (30) days of the billing date and will be made in accordance with the CITY's normal invoice payment. All work will be billed at the amount listed in the CONTRACTOR's proposal form, as referenced in Article 1.

**Article 22: Liquidated Damages**

In case the CONTRACTOR fails to satisfactorily complete the entire work, or any phase of the work, contemplated and provided for under this AGREEMENT on or before the date of completion determined as described elsewhere herein, the City shall deduct from the payments otherwise due the CONTRACTOR each month the sum of five hundred dollars (\$500.00) for each calendar day, excluding only Sundays and legal holidays, of delay, which sum is agreed upon not as penalty but as fixed and liquidated damages for each day of such delay to be paid in full and subject to no deduction. If the payments otherwise due the CONTRACTOR are less than the amount of such liquidated damages, said damages shall be deducted from any other moneys due or to become due the CONTRACTOR, and in case such damages shall exceed the amount of all moneys due or become due the CONTRACTOR, then the CONTRACTOR or his/her surety shall pay the balance to the CITY as appropriate.

**Article 23: Authority to Execute:**

This AGREEMENT contains all the terms, conditions and provisions pertaining to the work, there being no other understandings, agreements, warranties either express or implied, relative to the AGREEMENT that are not fully expressed herein.

**IN WITNESS WHEREOF**, the parties hereto have caused this AGREEMENT to be executed on the day and year first above written.

Witness:

City of Bangor (CITY)

\_\_\_\_\_

\_\_\_\_\_  
David Little, Finance Director

Witness:

CONTRACTOR (CONTRACTOR)

\_\_\_\_\_

\_\_\_\_\_

## **Appendix A**

### BID FORM

#### PICKERING SQUARE IMPROVEMENTS

### **BID FORM – PICKERING SQUARE IMPROVEMENTS**

To the City of Bangor, Maine, herein called the Owner, acting through its City Manager for the construction of the **Pickering Square Improvements**, together with all related work specified in the specifications, and any other work necessary or incidental thereto.

The undersigned, as Bidder, herein referred to as singular and masculine, declares that the only parties interested in the bid as principals are named herein; that this bid is made without collusion with any other person, firm, or corporation; that no officer or agent of the Owner is directly or indirectly interested in this bid; that he has carefully examined the location of the proposed work, the annexed form of contract, and the plans and specifications therein referred to and he proposes and agrees that if this bid is accepted he will contract with the Owner, in the form of the copy of the Contract Agreement deposited in the office of the Engineer and attached hereto, to provide all necessary machinery, tools, apparatus, and other means of construction and to do all the work and furnish all the materials specified in this contract in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth and that he will take in full payment for the work thereof the following unit prices.

#### **I. BASE BID**

<b>Item No.</b>	<b>Estimated Quantity</b>	<b>Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures</b>	<b>Total Price In Figures</b>
1.	<b>1</b> LS	Traffic Control the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) / LS	   <b>\$</b> _____
2.	<b>1</b> LS	Mobilization (3% of Total Cost) the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) / LS	   <b>\$</b> _____



Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
3.	1 LS	Site Demolition the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) / LS	\$ _____
4.	550 CY	Common Excavation unit price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
5.	300 CY	Common Borrow unit price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
6.	350 CY	Aggregate Base Course – Type A Gravel unit price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
7.	142 LF	12" Ø Type 'C' Under Drain Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) / LF	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
8.	1 EA	4' Dia. Catch Basin Unit Price per vertical foot of  _____ Dollars  per vertical foot (\$_____) / VF	\$ _____
9.	559 LF	2" Ø Sch. 40 PVC Electrical Conduit & Wire Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) / LF	\$ _____
10.	200 LF	4" Ø Sch. 40 PVC Electrical Conduit & Wire Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) / LF	\$ _____
11.	1 LS	Three Phase Electrical Panel Cabinet & Accessories the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) / LS	\$ _____
12.	2 EA	Electrical Handhole Unit Price per each of  _____ Dollars  per each (\$_____) / EA	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
13.	<b>2</b> EA	GFCI Outlet and Weatherproof Enclosure Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
14.	<b>252</b> LF	Fortacast Drive-Over Inground Lighting Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) /LF	\$ _____
15.	<b>10</b> EA	New Decorative Acorn Style Light Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
16.	<b>7,130</b> SF	Genest Hollandstone Concrete Unit Pavers on Bit. Base Unit Price per square foot of  _____ Dollars  per square foot (\$_____) /SF	\$ _____
17.	<b>2,365</b> SF	Genest XXL Portland Plaza Concrete Unit Pavers on Bit. Base Unit Price per square foot of  _____ Dollars  per square foot (\$_____) /SF	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
18.	250 SF	8" x 8" Blue Unit Pavers on Bit. Base Unit Price per square foot of  _____ Dollars  per square foot (\$_____) / SF	\$ _____
19.	120 LF	Remove & Reset Granite Curb Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) / LF	\$ _____
20.	86 LF	Installation of Granite Seating Blocks (provided by City) Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) / LF	\$ _____
21.	2 EA	ADA Concrete Curb Ramp w/ Detectable Warning Field Unit Price per each of  _____ Dollars  per each (\$_____) / EA	\$ _____
22.	2 CY	4,000 PSI Concrete Pad Unit Price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
23.	125 TONS	H.M.A. Pavement Unit Price per ton of  _____ Dollars  per ton (\$_____) / TON	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
24.	1 LS	Pavement Markings the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) / LS	\$ _____
25.	150 CY	Loam Unit Price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
26.	50 CY	Landscaping Bark Mulch Unit Price per cubic yard of  _____ Dollars  per cubic yard (\$_____) / CY	\$ _____
27.	23 EA	Deciduous or Evergreen Tree Unit Price per each of  _____ Dollars  per each (\$_____) / EA	\$ _____
28.	40 EA	Deciduous or Evergreen Shrub Unit Price per each of  _____ Dollars  per each (\$_____) / EA	\$ _____
29.	1 EA	New Bench – Black Powdercoated Unit Price per each of  _____ Dollars  per each (\$_____) / EA	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
30.	1 EA	Bike Repair Station Model 567-1002 Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
31.	1 EA	Dumor Bike Rack Model 125-20 Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
32.	2 EA	New Trash Receptacle – Black Powdercoated Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
33.	1 EA	Freestanding One-sided Kiosk Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
34.	4 EA	Freestanding Two-sided Kiosk Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
35.	1 EA	9'x16' Millennium Trellis w/ (2) 4' Gliders Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____

Item No.	Estimated Quantity	Brief Description; Unit or Lump Sum Price Bid In Both Words and Figures	Total Price In Figures
36.	1 EA	35' Aluminum Flag Pole Model EC35 Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
37.	205 LF	New Rail – Black Powdercoated Unit Price per linear foot of  _____ Dollars  per linear foot (\$_____) /LF	\$ _____
38.	4 EA	Remove & Reset Exist. Traffic Sign Unit Price per each of  _____ Dollars  per each (\$_____) /EA	\$ _____
39.	1 LS	Erosion and Sediment Control the Lump Sum Price of  _____ Dollars  per lump sum (\$_____) /EA	\$ _____

**TOTAL PICKERING SQUARE IMPROVEMENTS BID (IN FIGURES):** \$ \_\_\_\_\_

**TOTAL BID (IN WORDS):** \_\_\_\_\_

\_\_\_\_\_ Dollars

and \_\_\_\_\_ Cents

**Amounts must be shown in both words and figures. In case of discrepancy, the amount in words will govern.**

\*I hereby acknowledge by my signature receipt of each numbered addendum:

Addendum Number 1. \_\_\_\_\_  
Contractor's Signature

Addendum Number 2. \_\_\_\_\_  
Contractor's Signature

\*(Signature required to acknowledge receipt of each addendum as may be issued. Sign only upon receipt of written addendum.)

The foregoing prices shall include all labor, materials, equipment, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

If this Bid is accepted by the Owner and the undersigned fails to contract as aforesaid and to give a bond in the sum of the full amount of the Bid, with surety satisfactory to the Owner, within 10 days (not including Sundays or legal holidays) to an address given herewith that the Contract is ready for signature, then the Owner may by option determine that the Bidder has abandoned the Contract and therefore the Bid and Acceptance shall be null and void, and the bid bond shall be forfeited to the Owner.

---

\_\_\_\_\_  
Business Name

\_\_\_\_\_  
Street Address

\_\_\_\_\_  
City, State, Zip Code Telephone

By: \_\_\_\_\_  
Name (Printed or typed) Title

\_\_\_\_\_  
Residence Address

\_\_\_\_\_  
Signature Date



## **Appendix B**

GENERAL SPECIFICATIONS

PICKERING SQUARE IMPROVEMENTS

## SUBMITTALS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Product Data.
- D. Shop Drawings.
- E. Design data.
- F. Test reports.
- G. Certificates.
- H. Manufacturer's instructions.
- I. Erection drawings.

#### 1.2 RELATED SECTIONS

- A. Section - Quality Control: Manufacturers' field services and reports.
- B. Section - Contract Closeout: Contract warranties, manufacturers' certificates, and closeout submittals.

#### 1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- F. For each submittal for review, allow 14 days excluding delivery time to and from the contractor.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Engineer review stamps.
- I. When revised for resubmission, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.

#### 1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedule in duplicate within 14 days after date of Owner-Contractor Agreement.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major portion of Work or operation, identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.

- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

## 1.5 PRODUCT DATA

### A. Product Data For Review:

1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
2. After review, provide copies and distribute in accordance with this Section and for record documents purposes described in Section - Contract Closeout.

### B. Product Data For Information:

1. Submitted for the Engineer's knowledge as contract administrator or for the Owner.

### C. Product Data For Project Close-out:

1. Submitted for the Owner's benefit during and after project completion.

### D. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer.

### E. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

### F. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

### G. After review distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Contract Closeout.

## 1.6 SHOP DRAWINGS

### A. Shop Drawings For Review:

1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

2. After review, produce copies and distribute in accordance with Submittal Procedures article above and for record documents purposes described in Section - Contract Closeout.
- B. Shop Drawings For Information:
1. Submitted for the Engineer's knowledge as contract administrator or for the Owner.
- C. Shop Drawings For Project Close-out:
1. Submitted for the Owner's benefit during and after project completion.
- D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. Submit the number of opaque reproductions which Contractor requires, plus two copies which will be retained by Engineer.

#### 1.9 DESIGN DATA

- A. Submit for the Engineer's knowledge as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

#### 1.10 TEST REPORTS

- A. Submit for the Engineer's knowledge as contract administrator or for the Owner.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

#### 1.11 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- D. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

#### 1.12 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- C. Refer to Section - Quality Control, Manufacturers' Field Services article.

#### 1.13 ERECTION DRAWINGS

- A. Submit drawings for the Engineer's benefit as contract administrator or for the Owner.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by the Engineer or Owner.

#### PART 2 - PRODUCTS

Not Used.

#### PART 3 - EXECUTION

Not Used.

END OF SECTION

SUBMITTALS

## QUALITY CONTROL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Inspection and testing laboratory services.

#### 1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Comply fully with manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. 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.
- E. Perform Work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

#### 1.3 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or interference otherwise in any reference documents.

#### 1.4 INSPECTION AND TESTING LABORATORY SERVICES

- A. Owner will appoint, employ, and pay for services of an independent firm to perform inspection and testing if required.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by the Engineer.
- C. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
  - 1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
  - 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be the Contractor's responsibility.

END OF SECTION



## TRAFFIC CONTROL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Construction Parking Control.
- B. Flag Persons.
- C. Police Detail
- D. Flares and Lights.
- E. Haul Routes.
- F. Traffic Signs and Signals.
- G. Removal.

#### 1.2 RELATED SECTIONS

- A. Manual on Uniform Traffic Control Devices (MUTCD).
- B. Maine Department of Transportation, Standard Details, Highways and Bridges.

### PART 2 - PRODUCTS

#### 2.1 SIGNS, SIGNALS, AND DEVICES

- A. Traffic Control Signals: As approved by local jurisdictions.
- B. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdiction.
- C. Flag Person Equipment: As required by local jurisdiction.

### PART 3 - EXECUTION

#### 3.1 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with pedestrians, public vehicular traffic, public parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.

- C. Prevent parking on or adjacent to access roads or in non- designated areas.

### 3.2 FLAG PERSONS

- A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

### 3.3 POLICE DETAIL

- A. Work on Water Street and Merchant's Plaza may require uniformed City of Bangor Police Officers at the discretion of the Project Engineer or Resident Inspector.

### 3.4 LIGHTS

- A. Use lights during hours of low visibility to delineate traffic lanes and to guide traffic.

### 3.5 HAUL ROUTES

- A. Consult with authority having jurisdiction in establishing public thoroughfares to be used for haul routes and site access.

### 3.6 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic. Signage shall conform with MUTCD as related to work zones.
- B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations in accordance with MUTCD.
- C. Relocate as Work progresses, to maintain effective traffic control.

### 3.7 MDOT REQUIREMENTS

- A. Meet all applicable requirements of the Maine Department of Transportation.

#### 3.8.1 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.

END OF SECTION

## MATERIAL AND EQUIPMENT

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

#### 1.2 RELATED SECTIONS

- A. Section - Quality Control: Product quality monitoring.

#### 1.3 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

#### 1.4 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturers' instructions.
- B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

#### 1.5 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible. Store sensitive Products in weathertight, climate controlled enclosures.

- B. For exterior storage of fabricated Products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit onsite storage or protection.
- D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.
- F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.

#### 1.6 PRODUCT OPTIONS

- A. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

#### 1.7 SUBSTITUTIONS

- A. Engineer will consider requests for Substitutions only within 14 days after date established in Notice to Proceed.
- B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that the Contractor:
  - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
  - 2. Will provide the same warranty for the Substitution as for the specified Product.
  - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
  1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
  2. Submit shop drawings, Product data, and certified test results attesting to the proposed Product equivalence.
  3. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

END OF SECTION

## CONTRACT CLOSEOUT

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Closeout Procedures.
- B. Final Cleaning.

#### 1.2 RELATED SECTIONS

- A. None.

#### 1.3 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Submit final As-Built Plans. Plans shall show all surface and sub-surface features and utilities.

#### 1.4 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances.
- C. Clean site; sweep paved areas, rake clean landscaped surfaces.
- D. Remove waste and surplus materials, rubbish, and construction facilities from the site.

END OF SECTION

## **SPECIAL PROVISIONS**

### **Customer, Driveway, and Street Access**

The Contractor shall maintain customer access to adjacent property at all times. The Contractor shall make every effort to plan his work so that adjacent property owners shall have driveway access to their properties at all times during non-working hours, and as much as possible during working hours. The Contractor shall use every effort to cooperate with adjacent property owners on their need to access their property. The Contractor shall notify the Bangor Police and Fire Departments at least four hours in advance of any necessary cutting off of access by emergency vehicles. Every effort shall be made to keep streets open to emergency vehicles at all times.

### **Working Hours**

Normal working hours shall be from 7:00 A.M. until sunset. The Contractor shall cease all activity within 1/2 hour of sunset unless otherwise directed. It is intended that the Contractor stop work promptly at sunset; however, it is recognized that occasionally work may proceed a few minutes after sunset. If work proceeds later than 1/2 hour after sunset without permission of the Resident Engineer, then the Contractor shall be notified in writing that any additional violation of the working hours provision of the Contract shall be grounds for dismissing the Contractor and / or revoking his privilege to bid future projects. Note it is anticipated that night work may be necessary to complete the utility work in Main Street.

### **Traffic Control**

The Contractor shall provide all traffic control signs, lights, etc. in conformance of the latest edition of the Manual on "Uniform Traffic Control Devices" by the U. S. Department of Transportation and Federal Highway Administration.

### **Time and Material Payment**

If, at any time during the construction of the project, a situation occurs where payment for work performed cannot be paid for under pay items in the Contract, then the Contractor may request payment on a time and materials basis. All labor and equipment rates, crew sizes, equipment and materials used, and other factors affecting the work shall be approved by the Resident Engineer before work commences. The Contractor and Engineer shall agree to and record hours worked, crew and equipment used, and all materials used at the end of each working day. Requests for time and materials payment after the fact may not be considered for payment if the Resident Engineer was not properly notified.

### **Notification of Property Owners**

Every effort shall be made to keep adjacent property owners fully informed of pending interruptions to access or service. The Contractor shall be responsible for notifying the Resident Engineer in advance of any pending operations which may affect adjacent property, including but not limited to the cutting off of driveway access, the disconnection of sewer service laterals, or blasting operations. It will be the Resident Engineer's responsibility to communicate with the property owner or tenants; if such interruptions are to take place during the absence of the Resident Engineer, then the Contractor shall communicate directly with the property owner.

### **References**

The apparent low Bidder shall furnish the City Engineer with references from at least three similar projects within three working days of the bid opening date. References must be for projects in neighborhoods similar in dollar value and scope of work to the project proposed herein. If, in the opinion of the City Engineer, the Contractor does not have prior work experience in successfully completing projects of this scope, then the City Engineer may recommend rejection of the bid and recommend award of the contract to the next qualified Bidder.

### **Housekeeping**

At the conclusion of each working day, the contractor shall take necessary measures to leave the site in suitable condition, including but not limited to, sweeping, dust control, and removal of equipment or large construction debris that block normal access ways. At the conclusion of each working week, temporary pavement shall be **rolled** in place on open trenches to provide a **minimum of 2" compacted thickness** using an **approved** roller.

### **Trees to Remain**

Existing trees that are to remain, as shown on the plans. The contractor shall make every effort to protect existing trees that are to remain, as shown on the plans, from damage during construction activities. Trees that have been damaged to the point where they will not survive will be replaced with a tree of similar species, size, and branching habit at no cost to the Owner.

### **Layout**

The contractor shall retain the services of a licensed professional surveyor for the purposes of staking out proposed site features and preparing final as-built drawings.

### **As-Built Drawings**

The Contractor shall keep a set of "As-Built" drawings on the job site for the Resident Inspector's review that shall show all work up to one week prior to the date of inspection. The Resident Inspector may examine the drawings on a weekly or monthly basis at his own discretion. Final "As Built" drawings shall be submitted to the City one substantial completion has occurred.



## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- A. Scope: This section describes the measurement and payment for the work to be completed under each bid item in the Proposal. The descriptions may not reference all of the associated Work. Work specified, but not specifically designated as a bid item, is considered incidental to all bid items.
- B. Payment procedures are described in the Agreement, General Conditions, and related documents.
- C. Work Covered: The total price for the Contract shall cover all work shown on the Contract Drawings and required by the Specifications and other Contract Documents. All costs in connection with the Work, including furnishing all materials, equipment, supplies and appurtenances; providing all construction, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the lump sum price bid or the unit prices specified on the bid sheets. No item that is required for the proper and successful completion of the Work will be paid for outside of, or in addition to, the prices submitted in the bid. All Work not specifically identified within this section shall be considered incidental to the project and a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices.

## PART 2 - PRODUCTS (not applicable)

## PART 3 - EXECUTION

### 3.01 MEASUREMENT

- A. Notify Engineer when necessary measurements must be taken. Do not proceed until measurements have been taken.

### 3.02 SCHEDULE OF PAYMENT ITEMS

#### I. Bid Items

##### 1. Traffic Control:

- a. Payment: Lump sum price as stated in the Proposal.
- b. Measurement: Paid in proportion to percentage of work completed at time of requisition.
- c. Includes all costs associated with traffic control including labor, equipment, signage, police detail if required, and incidentals.

## 2. Mobilization

- a. Payment: Lump sum price as stated in the Proposal.
- b. Measurement: Lump sum upon completion of first full thirty-day pay period of work.
- c. Includes: The cost of initiating the Contract, general contract administration costs, procuring insurance and bonds, moving equipment, supplies, and materials to the site, and all other incidental start-up costs.
- d. Explanation: Payment for Mobilization will be made on the first payment requisition covering a full thirty-day pay period. Payment for mobilization will not be made prior to the completion of the first full thirty-day pay period of work performed by the Contractor.

## 3. Site Demolition

- a. Payment: Lump sum price as stated in the Proposal.
- b. Measurement: Paid in proportion to the percentage of work complete at time of requisition.
- c. Includes: All labor, equipment, disposal costs, and incidentals to provide demolition work including, but not limited to, removal of trees, surface material, precast structures, and miscellaneous site features.

## 4. Common Excavation

- a. Payment: Unit price per each cubic yard as stated in Proposal.
- b. Measurement: Per unit completed
- c. Includes: All labor, materials, tools, and equipment necessary to excavate material as necessary to install new work within the project limits, and all incidentals.

## 5. Common Borrow

- a. Payment: Unit price per each cubic yard as stated in Proposal.
- b. Measurement: Per unit completed
- c. Includes: All labor, materials, tools, and equipment necessary to place material as necessary to install new work within the project limits, and all incidentals.

## 6. Aggregate Base Course – Type A Gravel

- a. Payment: Unit price per each cubic yard as stated in Proposal.
- b. Measurement: Per unit completed
- c. Includes: All labor, materials, tools, and equipment necessary to place material as necessary to install new work within the project limits, and all incidentals.

## 7. 12"Ø Type 'C' Under Drain

- a. Payment: Unit price per each linear foot as stated in Proposal

Measurement and Payment

- b. Measurement: Linear feet as measured along the horizontal projection of the centerline of the pipe; measured from and to inside face of structure.
- c. Includes: clearing, excavation, compaction, stone bedding, backfill, roadway base and subbase, fittings, flowable fill backfill where required, shoring, and bracing, dewatering, cleaning, pipe, fittings and incidentals as shown on the Drawings or as required.

8. 4' Dia. Catch Basin

- a. Payment: Unit price per vertical foot as stated in Proposal.
- b. Measurement: Vertical linear feet as measured from the rim to the sump.
- c. Includes: Furnishing all materials, equipment and labor necessary to install the structure to the required grade, testing, and all piping, traps, fittings, and supports within the catch basin as specified to form a complete unit, and frame and grate.

9. 2" Ø Sch. 40 PVC Electrical Conduit & Wire

- a. Payment: Unit price per linear foot as stated in the Proposal.
- b. Measurement: Linear feet as measured along the horizontal projection of the centerline of the trench between each connection point.
- c. Includes clearing, excavation, stone bedding, backfill, compaction, roadway base and subbase, shoring and bracing, dewatering, conduit, fittings and incidentals, all wires, and flowable fill in case of shallow depth, as shown on the Drawings or as required to provide complete installation.
- d. Explanation: In areas where twin conduits are installed, pay length is based on the horizontal projection of the centerline of the trench. Payment is not based on the length of conduit doubled.

10. 4" Ø Sch. 40 PVC Electrical Conduit & Wire

- a. Payment: Unit price per linear foot as stated in the Proposal.
- b. Measurement: Linear feet as measured along the horizontal projection of the centerline of the trench between each connection point.
- c. Includes: clearing, excavation, stone bedding, backfill, compaction, roadway base and subbase, shoring and bracing, dewatering, conduit, fittings and incidentals, all wires, and flowable fill in case of shallow depth, as shown on the Drawings or as required to provide complete installation.
- d. Explanation: In areas where twin conduits are installed, pay length is based on the horizontal projection of the centerline of the trench. Payment is not based on the length of conduit doubled.

11. Three Phase Electrical Panel Cabinet & Accessories

- a. Payment: Lump sum price as stated in the Proposal.
- b. Measurement: Paid in proportion to the percentage of work complete at time of requisition.
- c. Includes: Furnishing all materials, equipment and labor necessary to install electrical panel and accessories, reinforced concrete pad, stainless steel padlockable handle, conduit, fittings and incidentals, as shown on the Drawings or as required to provide complete installation.

12. Electrical Handhole

- a. Payment: Unit price per each unit as stated in the Proposal
- b. Measurement: Per Unit Completed
- c. Includes: Furnishing all materials, equipment and labor necessary to install the handhole, and all piping, and fittings within the manholes to form a complete unit, and cover.

13. GFCI Outlet & Weatherproof Enclosure

- a. Payment: Unit price per each unit as stated in the Proposal
- b. Measurement: Per Unit Completed
- c. Includes: Furnishing all materials, equipment and labor necessary to install the duplex outlet and enclosure, all fixtures and fittings as required to form a weatherproof unit, and cover, and other incidentals as required to form a complete unit.

14. Fortacast Drive-Over Inground Lighting

- a. Payment: Unit price per linear foot unit as stated in Proposal.
- b. Measurement: Per linear foot completed.
- c. Includes: all supervision, labor, materials, and equipment necessary to install new lighting, and to examine existing features to determine correct color temperature and wattage of lamp, including excavation, compaction, furnishing and installing lights, wiring connections, grounding, and other incidentals as shown on the Drawings or as required to provide complete installation.

15. New Decorative Acorn Style Light

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment necessary to install new light post and lamp, and to examine existing features to determine correct color temperature and wattage of lamp, including excavation, compaction, concrete footing, furnishing and installing lights, wiring connections, grounding, and other incidentals as shown on the Drawings or as required to provide complete installation.

16. Genest Hollandstone Concrete Unit Pavers on Bit. Base

- a. Payment: Unit price per square foot as stated in the Proposal.
- b. Measurement: Square feet as measured in place.
- c. Includes: all supervision, labor, materials, and equipment necessary, including excavation, grading, compaction, setting bed, pavers, sealant, metal edging, and other incidentals as shown on the Drawings or as required to provide complete installation.

17. Genest XXL Portland Plaza Concrete Unit Pavers on Bit. Base

- a. Payment: Unit price per square foot as stated in the Proposal.
- b. Measurement: Square feet as measured in place.
- c. Includes: all supervision, labor, materials, and equipment necessary, including excavation, grading, compaction, setting bed, pavers, sealant, metal edging, and other incidentals as shown on the Drawings or as required to provide complete installation.

18. 8" x 8" Blue Unit Pavers on Bit. Base

- a. Payment: Unit price per square foot as stated in the Proposal.
- b. Measurement: Square feet as measured in place.
- c. Includes: all supervision, labor, materials, and equipment necessary, including excavation, grading, compaction, setting bed, pavers, sealant, metal edging, and other incidentals as shown on the Drawings or as required to provide complete installation.

19. Remove & Reset Granite Curb

- a. Payment: Unit price per linear foot as stated in the Proposal.
- b. Measurement: Linear feet as measured along the horizontal projection of the centerline of the curb between each connection point.
- c. Includes: all supervision, labor, materials, and equipment necessary, including removal and stockpiling of granite curb during demolition, providing concrete bed and base gravel, and reinstallation during surface restoration and other incidentals as shown on the Drawings or as required to provide complete installation.

20. Installation of Granite Seating Blocks (provided by City)

- a. Payment: Unit price per linear foot as stated in the Proposal.
- b. Measurement: Linear feet as measured along the horizontal projection of the centerline of the blocks between each connection point.
- c. Includes: all supervision, labor, materials, and equipment necessary, including loading and transporting granite blocks from City stockpile, providing concrete bed and base gravel, and installation during surface restoration and other incidentals as shown on the Drawings or as required to provide complete installation.

21. ADA Concrete Curb Ramp w/ Detectable Warning Field

- a. Payment: Unit price per each as stated in the Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment necessary, including excavation, grading, compaction, furnishing and installing the aggregate base and subbase materials, concrete base, setting bed, truncated dome panel, sealant, finishing, and other incidentals as shown on the Drawings or as required to provide complete installation.

22. 4,000 PSI Concrete Pad

- a. Payment: Unit price per as stated in the Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment necessary, including excavation, grading, compaction, furnishing and installing the aggregate base, reinforcement and concrete, construction and isolation joints, sealant, finishing, and other incidentals as shown on the Drawings or as required to provide complete installation.

23. H.M.A. Pavement

- a. Payment: Unit price per ton of pavement as stated in the Proposal.
- b. Measurement: As measured in place within the pay limits and to the thickness shown on the Drawings and as directed by the Engineer.
- c. Includes: preparation and placement of specified thickness of binder and final surface course pavement in trench areas including shimming prior to pavement as necessary and saw cutting all edges before paving as noted on the Drawings and as directed by the Engineer, bituminous tack coat, and cutting in butt joints as required to match into existing pavement.

24. Pavement Markings

- a. Payment: Lump sum as stated in the Proposal.
- b. Measurement: Lump sum upon completion of work.
- c. Includes: Painting of pavement markings as shown on the Drawings or as directed by the Engineer.

25. Loam

- a. Payment: Unit price per cubic yard as stated in the Proposal.
- b. Measurement: Cubic yard, complete in place to full depth as shown.
- c. Includes: All labor and materials required for furnishing, placing, grading, and all other incidental work.

26. Landscaping Bark Mulch

- a. Payment: Unit price per cubic yard as stated in Proposal.
- b. Measurement: Cubic yard, complete in place to full depth as shown.
- c. Includes: All labor and materials required for furnishing, placing, grading, and all other incidental work.

27. Deciduous or Evergreen Tree

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all materials and appurtenances required to furnish and install each complete plant, including but not limited to, excavation, watering, stakes, wires, wrap, maintenance after installation, and guarantee, and all other incidental work.

28. Deciduous or Evergreen Shrub

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all materials and appurtenances required to furnish and install each complete plant, including but not limited to, excavation, watering, stakes, wires, wrap, maintenance after installation, and guarantee, and all other incidental work.

29. New Bench – Black Powdercoated

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each bench and center armrest, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete pad, anchoring hardware, and all other incidental work.

30. Bike Repair Station Model 567-1002

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install unit, and all other incidental work.

31. Dumor Bike Rack Model 125-20

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install unit, and all other incidental work.

32. New Trash Receptacle – Black Powdercoated

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each receptacle, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete pad, anchoring hardware, and all other incidental work.

33. Freestanding One-sided Kiosk

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each unit, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete pad, anchoring hardware, and all other incidental work.

34. Freestanding Two-sided Kiosk

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each unit, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete pad, anchoring hardware, and all other incidental work.

35. 9'x16' Millennium Trellis w/ (2) 4' Gliders

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each unit, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete foundation, anchoring hardware, and all other incidental work.

36. 35' Aluminum Flag Pole Model EC35

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install each unit, including but not limited to, excavation, grading, compaction, backfill, and base materials, concrete foundation, anchoring hardware, and all other incidental work.

37. New Rail – Black Powdercoated

- a. Payment: Unit price per linear feet as stated in Proposal.
- b. Measurement: Per linear feet completed.
- c. Includes: all supervision, labor, materials, and equipment required to furnish and install rail, and all other incidental work.



38. Remove & Reset Exist. Traffic Sign

- a. Payment: Unit price per each unit as stated in Proposal.
- b. Measurement: Per unit completed.
- c. Includes: all supervision, labor, materials, and equipment necessary to remove sign during demolition, protect, store, and reset during restoration work including excavation, compaction, and CIP concrete, as shown on the Drawings or as required to provide complete installation.

39. Erosion and Sediment Control

- a. Payment: Lump sum price as stated in the Proposal.
- b. Measurement: Paid in proportion to percentage of work completed at time of requisition.
- c. Includes: The cost of installing, maintaining, and dismantling sedimentation and erosion control structures, including but not limited to, silt fence, hay bales, and silt sacks for protection of surrounding catch basins, as needed throughout the project.

**BID BOND**

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name and Address of Principal Place of Business*):

OWNER (*Name and Address*):

The City of Bangor  
73 Harlow Street  
Bangor, ME 04401

BID

Bid Due Date:

Description (*Project Name and Include Location*):

**Pickering Square Improvements, Bangor, ME**

BOND

Bond Number:

Date (*Not earlier than Bid due date*):

Penal sum

(Words)

\$

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER**

**SURETY**

\_\_\_\_\_  
Bidder's Name and Corporate Seal

(Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal

(Seal)

By:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

Attest:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

By:

\_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

Attest:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2 All Bids are rejected by Owner, or
  - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

# Notice of Award

Date: \_\_\_\_\_, 2024

Project: **Pickering Square Improvements**

Owner: The City of Bangor, Maine

Owner's Contract No.:

Contract:

Engineer's Project No.:

Bidder:

Bidder's Address:

You are notified that your Bid dated \_\_\_\_\_ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for Pickering Square Improvements

The Contract Price of your Contract is \_\_\_\_\_ Dollars and \_\_\_\_ Cents (\$\_\_\_\_\_).

\_\_ copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

1 sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within [15] days of the date you receive this Notice of Award.

1. Deliver to the Owner [4] fully executed counterparts of the Contract Documents.
2. Other conditions precedent:

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

\_\_\_\_\_  
City of Bangor, Maine

Owner

By:\_\_\_\_\_

Authorized Signature

\_\_\_\_\_  
City Manager

Title

Copy to Engineer

# Notice to Proceed

Date: \_\_\_\_\_

Project: PICKERING SQUARE IMPROVEMENTS

Owner: The City of Bangor

Owner's Contract No.:

Contract:

Engineer's Project No.:

Contractor:

Contractor's Address:

You are notified that the Contract Times under the above Contract will commence to run on \_\_\_\_\_. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement, the project must be completed on or before **September 13, 2024.**

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must:

\_\_\_\_\_.

Owner: **City of Bangor**

Given by:

Authorized Signature

City Engineer

Title

Date

Copy to Engineer

Copy to Contractor

## PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

City of Bangor  
73 Harlow Street  
Bangor, Maine 04401

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):      **Pickering Square Improvements, Bangor, ME**

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
Contractor's Name and Corporate Seal                      (Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal                      (Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### 11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:



## PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

### CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):     Pickering Square Improvements

### BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

### CONTRACTOR AS PRINCIPAL

### SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
  - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

#### 15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner’s Representative (*Engineer or other*):

# Certificate of Substantial Completion

Project: **Pickering Square Improvements**

Owner:

Owner's Contract No.:

Contract:

Engineer's Project No.:

**This [tentative] [definitive] Certificate of Substantial Completion applies to:**

☐ All Work under the Contract Documents:      ☐ The following specified portions of the Work:

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\_\_\_\_\_  
Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:**

☐ Amended Responsibilities

☐ Not Amended

Owner's Amended Responsibilities:

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Contractor's Amended Responsibilities:

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The following documents are attached to and made part of this Certificate:

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This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

_____ Executed by Engineer	_____ Date
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_____ Accepted by Contractor	_____ Date
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_____ Accepted by Owner	_____ Date
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## **Appendix B**

### SITEWORK SPECIFICATIONS

### PICKERING SQUARE IMPROVEMENTS

## SITE PREP

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of GENERAL SPECIFICATIONS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

#### 1.02 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to prepare the site, complete, as indicated on the Contract Documents, as specified, and as follows:
  - 1. Clearing of existing vegetation
  - 2. Protection of existing structures and utilities
  - 3. Removal and disposal of pavement
  - 4. Removal and resetting of granite curb
  - 5. Removal of manholes and catch basins
  - 6. Adjustment of utilities
  - 7. Abandonment of utilities
  - 8. Salvage and stockpile onsite materials
  - 9. Salvage materials and stockpile off site
  - 10. Removal and disposal of materials

#### 1.03 RELATED WORK UNDER OTHER SECTIONS

- A. The following items of related work are specified and included in other Sections of the Specifications:
  - 1. EARTHWORK
  - 2. PLANTING SOILS
  - 3. SANITARY PRECAST STRUCTURES
  - 4. STORM PRECAST STRUCTURES
  - 5. ELECTRICAL – GENERAL

#### 1.04 REFERENCES

- A. The following standards shall apply to the work of this Section:
  - 1. State of Maine Department of Transportation (MDOT)

#### 1.05 SUBMITTALS

- A. The following shall be submitted:

1. Permit for transport and legal disposal of debris
2. Location plan of staging areas and schedule for moving staging equipment into those areas shall be submitted for Engineer's approval prior to mobilization and related site preparation operations.

#### 1.06 PROTECTION

- A. Do not interfere with use of adjacent buildings or facilities. Maintain free and safe passage to and from adjacent buildings and facilities or both and between them and the public way.
- B. Cease operations and notify owner immediately if safety of adjacent structures, workers, or the general public appears to be endangered. Take precautions to properly support structures and protect workers and general public. Do not resume operations until safety is restored.
- C. Prevent movement, settlement, or collapse of adjacent services, sidewalks, driveways, and trees. Assume liability for such movement, settlement, or collapse. Promptly repair damage at no additional cost to Owner.

#### 1.07 EXISTING SERVICES

- A. Arrange and pay for disconnecting, removing, capping, and plugging utility services as indicated on the Drawings.
- B. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents as specified in Division 1.

### PART 2 PRODUCTS

#### 2.01 CONSTRUCTION FENCE

- A. Construction fence shall be plastic "construction safety fence" per MDOT specifications.

### PART 3 EXECUTION

#### 3.01 CLEARING

- A. Trees, shrubs, stumps, brush, downed timber, rubbish, organic matter, vegetation or extraneous debris not indicated on the Contract Documents or designated in the field by the Engineer to remain shall be cleared.
- B. Clearing shall include the felling, cutting, and satisfactory disposal of all trees, stumps, and vegetative debris produced through the clearing operations.
- C. Fell trees in such a way as to not injure trees to be saved. Excavation or grading within the branch spread of trees to be saved shall be performed only under the direction of the Engineer unless otherwise directed.
- D. Stumps shall be removed to their full depth. Roots 3 inches and larger shall be removed to a depth of 2 feet below finished grade. Stumps shall be legally disposed of off-site.

#### 3.02 PROTECTION OF EXISTING STRUCTURES AND UTILITIES



A. Existing structures and utilities shall be suitably protected from damage, including but not limited to existing lighting, traffic signal poles, signs, fencing, underground vaults, access grates, manholes, and utility lines.

B. Temporary and permanent erosion control shall be installed in accordance with the current Maine DEP Best Management Practices Manual for Erosion and Sedimentation Control prior to disturbing any earth.

### 3.03 PROTECTION OF CONSTRUCTION SITE

A. It is the contractor's responsibility to secure the construction site, both for the protection of the ongoing work and the protection of the public. The location of construction fencing used for this purpose shall be approved by the Engineer. There will be no additional compensation for repair of site improvements due to vandalism prior to Final Acceptance.

### 3.04 EXISTING SURFACE REMOVAL

A. Where indicated on the drawings, and as directed by the Engineer, existing asphalt pavement, brick sidewalk, and concrete pavers shall be removed and legally disposed of off-site to the full depth of the pavement section. Existing curb shall be removed and stockpiled as directed by the Engineer.

1. Where pavement and curb to be removed abuts pavement and curb to remain, a neat, straight saw cut shall be made.

2. Cobblestones encountered during surface removal shall be stockpiled for reuse as planting borders under the base bid.

### 3.05 ADJUST EXISTING MANHOLES, CATCH BASINS, AND GRATES

A. Existing structures to remain shall be adjusted to grade as indicated on the Contract Documents in accordance with MDOT Specifications Section 604 and applicable City of Bangor standards.

B. Materials, equipment, and labor necessary to make adjustments shall be paid for as described in Measurement and Payment.

### 3.06 ABANDONMENT OF EXISTING UTILITIES

A. Existing utility structure indicated on the Contract Documents shall be abandoned as specified and paid for under the work of this section.

### 3.07 SALVAGE, STOCKPILE, AND REUSE MATERIALS

A. Materials indicated on the Contract Documents or designated by the Engineer in the field to be salvaged shall be carefully removed, protected from damage, and placed in temporary storage as follows:

1. Salvaged material shall be stockpiled on-site in an area designated by the Engineer or loaded on City trucks as indicated.

B. Salvage material shall include the following: Granite curbing, cobblestones.

### 3.08 REMOVAL AND RELOCATION

A. Materials indicated on the Contract Documents or designated by the Engineer in the field to be removed and relocated shall be carefully removed, protected from damage, and put in the new location as indicated on the Drawings.

### 3.09 REMOVAL AND DISPOSAL OF MATERIALS

A. Materials indicated on the Contract Documents or designated by the Engineer in the field to be removed shall be dismantled, removed, and legally disposed of off-site, performed and paid for under the work of this section. Removals include but are not limited to the following: Benches, trash receptacles and cigarette receptacles.

B. Material resulting from the site preparation work and not scheduled to be salvaged and which is unsuitable for reuse on the project, shall become the property of the Contractor and shall be legally disposed of off-site.

C. Debris, rubbish, and other material shall be disposed of promptly and shall not be left until final cleanup of site.

D. Existing site structures indicated on the Contract Documents to be removed, shall be completely dismantled and removed from the site.

END OF SECTION

## EXCAVATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes excavating for site structures.
- B. Related Sections:
  - 1. SITE PREP
  - 2. EARTHWORK
  - 3. TRENCHING
  - 4. SANITARY PRECAST STRUCTURES
  - 5. STORM PRECAST STRUCTURES

#### 1.2 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

### PART 2 - EXECUTION

#### 2.1 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known underground, above ground and aerial utilities. Stake and flag locations.
- C. Erect sheeting, shoring, and bracing as necessary for protection of persons, improvements, and excavations and as indicated on the Drawings.
- D. Provide dewatering and drainage as required to accomplish work of this section.
- E. Protect new construction, existing structures, existing utilities, plants, trees, etc., at all times. Report any damages immediately to Engineer and proper authorities.
- F. Use extreme caution when excavating near underground utilities. Employ manual excavation where necessary.
- G. Inform appropriate utility or agency of all actions in vicinity of underground pipes, mains, conduits, wires, etc. Coordinate all work with appropriate utility or agency and comply with all requirements. Dig Safe must be contacted.

#### 2.2 EXCAVATING

- A. Underpin adjacent structures, which may be damaged by excavation work, including utilities and pipe chases.

- B. Excavate subsoil required to accommodate paving and site structures.
- C. Machine slope banks to angle of repose or less, until shored.
- D. Excavate all materials regardless of nature of elevations and dimensions indicated plus sufficient space for forming, shoring, draining, inspection, etc. Excavate using open cut method unless otherwise indicated or permitted.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Hand trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock up to 2 cubic yards measured by volume. Larger material will be removed under Section – Rock Excavation.
- H. Allow Engineer to inspect bottom of excavation for suitability of base material.
- I. Remove unsuitable base material to a depth of at least 12 inches below any pipe or structure or to a depth directed by the Engineer and replace with compacted screened gravel or crushed stone or provide proper base as otherwise directed by Engineer. Place no footing, wall, structure, pipe, etc., on unsuitable material.
- J. Place no structure, pipe, etc., partially on earth and partially on rock. Remove rock and replace with compacted screened gravel or crushed stone.
- K. Protect excavation bottoms from frost and weathering. Place no structure, pipe, etc., on frozen or weathered ground.
- L. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume Work.
- M. Correct unauthorized excavation at no extra cost to Owner.
- N. Correct areas over-excavated by error in accordance with Section - Backfilling.
- O. Stockpile excavated material remains City property. This material shall be disposed of as directed by the City Engineer.

## 2.3 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section Quality Control.
- B. Provide for visual inspection of bearing surfaces.

END OF SECTION

## EARTHWORK

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of GENERAL SPECIFICATIONS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

#### 1.02 SUMMARY

- A. Earthwork includes the following:

- 1. Excavation of soils, rock, debris, fill, and miscellaneous as required.
- 2. Excavation and sawcutting of paved areas.
- 3. Dewatering, drainage, and moisture control in excavated areas as required.
- 4. Sheet piling, bracing, and shoring as required.
- 5. Aggregates for fill, backfill, base, subbase restoration of surface, bedding, drainage, riprap and miscellaneous as required.
- 6. Backfilling of trench and structural excavation.
- 7. Compaction of trench and structural excavation.
- 8. Grading of areas prior to surface restoration.
- 9. Disposal of excess material.
- 10. Test pits as required.
- 11. Filter fabric and jute mat where required.
- 12. Trench marking tape where required.
- 13. Excavation, filling, and grading around trees to remain.
- 14. Frost Protection.
- 15. Preparation of subgrade for slabs, brickwork, pavements, and landscaping.
- 16. Temporary Erosion Control and Dust Control measures as required or as directed onsite by the Engineer.
- 17. Flowable fill as required in areas where rapid backfilling is needed or where adjacent slabs or structures have been undermined by excavation.

#### 1.03 RELATED WORK UNDER OTHER SECTIONS:

- 1. EXCAVATION
- 2. TRENCHING
- 3. ROCK REMOVAL
- 4. SANITARY SEWER SYSTEMS
- 5. STORMDRAIN SYSTEMS
- 6. INSULATION

#### 1.04 PAY LIMITS

- A. Excavation Measurement: Volume of excavation actually removed, measured in original position, but not to exceed the following unless specifically shown otherwise on Drawings.
  - 1. 24 inches outside of concrete forms other than at footings.
  - 2. 12 inches outside of concrete forms at footings.
  - 3. 6 inches outside of minimum required dimensions of concrete cast against grade.
  - 5. 24 inches outside of precast manhole or wet well walls measured as square.
  - 6. As shown or stated on Drawings or Contract Documents.
- B. Unit prices for rock excavation include replacement with approved materials.

#### 1.05 DEFINITIONS

- A. Base Course: The layer placed above the subbase.
- B. Common Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavation.
- C. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- D. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- E. Subbase Course: The layer placed between the subgrade and base course.
- F. Subgrade: The uppermost surface of an excavation or the top surface of a fill on backfill at elevations defined on the Drawings.
- G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions or pay limits without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.
- H. Utilities include on-site underground pipes, conduits and cables.

#### 1.05 SUBMITTALS

- A. Submit the following according to the Conditions of the Contract and Division 1 Specification Sections:
  - 1. Product data for the following:
    - a) Each type of warning tape.

2. Soil Samples: a 10 lb. sample of each off-site material proposed for use, and of any on-site material when so requested by the Engineer or testing laboratory, shall be submitted for approval.
  - a) Samples shall be delivered to office of Owner's testing laboratory, as directed.
  - b) Samples required in connection with compaction tests will be transported by Contractor to testing laboratory.
3. Test Reports: Submit the following:
  - a) Grain size analysis of each soil material proposed for incorporation into work with one test provided for every 1000 CY of material placed or at other frequency determined by Engineer.
  - b) One optimum moisture-maximum density curve for each soil material incorporated into work or at other frequency as determined by Engineer.

#### 1.06 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Testing and Inspection Service: Owner will employ a qualified independent geotechnical engineering testing agency to verify that soils comply with specified requirements and to perform required field and laboratory testing.

#### 1.07 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided.
  1. Provide a minimum 72 hours notice to the Engineer and receive written notice to proceed before interrupting any utility.
- B. Demolish and abandon existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.
- C. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data is made available for convenience of Contractor who may make additional subsurface explorations at his/her own cost to obtain additional data on subsurface conditions.

- D. Test pits: Excavate test pits to gain additional information on project conditions where shown on the Drawings or as directed by Engineer. Comply with earthwork requirements of this Section.
- E. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under Earthwork. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- F. Information in the Contract Documents relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the contractor, and the accuracy or completeness of this information is not guaranteed.

#### 1.08 PROTECTION, CODES, AND SAFETY REQUIREMENTS

- A. Protection of surfaces: Do not operate equipment on surfaces beyond the work area as much as practicable. Surfaces which are outside the specified limits of Work which become damaged shall be repaired by the Contractor at no additional cost to the Owner.
- B. Maintain excavations with approved barricades, lights, and signs to protect life and property until excavation is filled and graded to a condition acceptable to the Engineer.
- C. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- D. Comply with all rules, regulations, laws, and ordinances of the City and State and all other authorities having jurisdiction over the project site. All labor, materials, equipment, and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Owner.
- E. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein.
- F. The Contractor shall not close or obstruct any street, sidewalk, or passageway without written permission from authorities having jurisdiction. The Contractor shall so conduct operations as to interfere as little as possible with the use ordinarily made of roads, driveways, or neighboring facilities.
- G. Contractor shall contact all utility companies whose utilities might be affected by the Work and notify them of excavation work. This notification shall be made 72 hours, but no more than 60 days, prior to the work. Blasting and explosive work shall be performed in accordance with City of Bangor Blasting Ordinances. Contractor shall not commence work until all utility companies have responded and provided the necessary receipts. Contractor shall perform work in such a manner as to avoid damage to utilities in the area of the Work.



- H. When an active utility line is exposed during construction, its location and elevation shall be plotted on the Record Drawings by the Contractor and the Engineer notified.
- I. Provide barricades, fences, lights, signs, and all other safety devices required for the protection of the public.

#### 1.09 LAYOUT AND GRADES

- A. Benchmarks: The Contractor shall maintain and/or reestablish benchmarks and/or survey monuments necessary for the Work as shown on the Contract Documents or found to exist on the site to provide a base reference for the construction. The Contractor shall replace, at his own cost, any which have become destroyed or disturbed.

#### 1.10 COORDINATION

- A. Prior to start of earthwork, the Contractor shall arrange an onsite meeting with Engineer to establish schedule of operations and inspection procedures and requirements.
- B. As construction proceeds, the Contractor shall be responsible for notifying the Engineer prior to the start of earthwork operations requiring inspection and/or testing.

#### 1.11 RECORD DRAWINGS

- A. The Contractor shall submit to the Owner a set of as-built drawings for work covered under these specifications. As-built drawings shall record all changes made during construction with respect to materials, layout, grading, contours, and spot elevations. Record drawings shall meet all requirements as specified.

#### 1.12 BLASTING

- A. Explosives: The Contractor shall keep explosives on the job only in such quantity as may be needed for the work underway and only during such time as they are being used. The contractor shall notify the Engineer in advance of intentions to use and store explosives. Caps or detonators shall be stored at least 100 feet from the explosives. When the need for explosives had ended, all such materials remaining on the job site shall be promptly removed. In addition to observing all municipal ordinances, and State and Federal laws relating to the transportation, storage, handling, and use of explosives, the Contractor shall also conform to any further regulations which the Engineer may deem necessary.
- B. Blasting Precautions: No charges shall be set until cross sections or profiles of the exposed ledge surface have been obtained for the computation of quantities. Blasting shall be done only with explosives of such power and in such quantities and positions as will not make the excavation unduly large, unnecessarily crack or shatter the rock upon or against which any structure is to be built, or damage existing utilities, structures, or property. Suitable timber mats or wire rope mats or other approved covering shall be provided to confine all materials lifted by blasting within the limits of the trench. Sufficient warning shall be given to all

persons in the vicinity of the work before a charge is exploded. The Contractor shall be liable for all damage to persons or property as a result of blasting operations.

The Contractor shall perform a pre-blast survey of all structures within 500 feet of all blasts to determine pre-blast conditions. Seismic monitoring shall be done during each blast and the results recorded in a log book. Information recorded shall include the date, time of blast, location of blast, personnel involved in blasting operations, number of charges and timing, magnitude of blast, weather, temperature, underground frost conditions, and all other pertinent data that may be required in determining whether or not vibration caused by blasting exceeds levels which may cause damage to surrounding structures.

The Contractor shall provide the Engineer with a copy of the daily blasting log book within one working day at the end of each working week for each week during which blasting is undertaken.

All work shall be done in accordance with all applicable, federal, state, and local laws, regulations, and ordinances for this type of blasting, (structural and trench blasting). All blasting shall comply with the minimum standards set forth in the Maine Department of Environmental Protection **Rules Regarding Blasting Operations, CNR 379**. The City Engineer reserves the right to impose more stringent requirements if, in the opinion of the City Engineer, conditions warrant such action.

## PART 2 - PRODUCTS

### 2.01 SOIL MATERIALS

- A. Provide approved soil materials complying with this specification.
- B. Suitable materials: As indicated on Drawings or that meet these specifications.
- C. Unsuitable materials: Material containing excessive clay, vegetation, organic matter; toxic elements; debris; pavement over four inches in greatest dimension; stones or boulders over four inches in greatest dimension; frozen material and material which, in the opinion of the Engineer, will not provide a suitable foundation or subgrade, or does not meet these specifications.
- D. On-Site Suitable Excess Excavated Material: Any suitable material from on-site excavation which, in the opinion of Engineer, is acceptable for subgrade construction.
- E. Inspection: The Engineer may inspect off-site sources of materials and order tests of these materials to verify compliance with these specifications.
- F. Testing: All materials shall be tested for gradation analysis at the rate of one test per 1000 cubic yards or, in the opinion of the Engineer, if approved material appears to have significantly changed quality since last test.

- 2.02 Gravel/Select Backfill: Well graded granular material free of organic material. Sieve analysis by weight:

Sieve size	% Passing By Weight	
4"	100	
3"	90	- 100
1/4"	25	- 90
No. 40	0	- 30
No. 200	0	- 5

- 2.03 Sand: Well graded durable particles free from organic matter. Sieve analysis by weight:

Sieve Size	% Passing by Weight	
3/8"	100	
No. 4	95	- 100
No. 16	50	- 85
No. 100	2	- 10
No. 200	0	- 5

- 2.04 3/4" Crushed Stone: Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight:

Sieve Size	% Passing by Weight	
1"	100	
3/4"	75	- 100
1/2"	35	- 70
3/8"	0	- 25
No. 200	0	- 2

- 2.05 Flowable Fill:
- A. Type II Portland: Cement, 75 lbs per cubic yard.
  - B. Sand: 2350 lbs per cubic yard.
  - C. Air content: -25%.

- 2.06 AGGREGATE BASE – TYPE A

Aggregate Base shall be screened or crushed gravel consisting of hard durable particles, which are free from vegetable matter, lumps or balls of clay, and other deleterious substances. The gradation of the part that passes a 3-inch sieve shall meet the grading requirements of the following table.

<u>Sieve Size</u>	<u>Weight Passing (%)</u>	
	<u>Screened</u>	<u>Crushed</u>
1/2"	35-75	45-70
1/4"	25-60	30-55
No. 40	0-25	0-20
No. 200	0-6	0-6

- a. Screened gravel base shall not contain particles or rock, which will not pass the 4-inch square mesh sieve. Crushed gravel base shall not contain particles or rock, which will not pass the 2-inch mesh sieve.

2.07 AGGREGATE SUBBASE – TYPE D

Aggregate subbase shall be sand or gravel consisting of hard durable particles, which are free from vegetable matter, lumps, or balls of clay, and other deleterious substances. The gradation of the portion which will pass a 3-inch sieve shall meet the grading requirements of the following table:

Sieve Size	Weight Passing (%)
1/2"	35-80
1/4"	25-65
No. 40	0-30
No. 200	0-7

- b. Granular subbase and gravel subbase shall not contain particles of rock, which will not pass the 6-inch square mesh sieve.
- c. Gradation tests shall conform to ASTM C136 except that the material may be separated on the 1/2-inch sieve.

2.08 Leveling course and untreated surface course: Shall be screened or crushed gravel of hard durable particles free from organic materials. Sieve analysis by weight:

Sieve Size	% Passing by Weight
1"	95 - 100
3/4"	90 - 100
No. 4	40 - 65
No. 10	10 - 45
No. 200	0 - 5

2.09 2" Minus Base Gravel

Sieve Size	% Passing by Weight
2"	100
1/2"	35 - 75
1/4"	25 - 60
No. 40	0 - 25
No. 200	0 - 5

2.10 Common Borrow: Earth suitable for embankment or subgrade construction shall be free of frozen material, rubbish, debris, peat and other unsuitable material. Soils meeting Soil Classifications MH, CH, OH, and Pt will not be accepted. Moisture content shall be sufficient

to provide required compaction and stable embankment. In no case shall the moisture content exceed 4 percent above optimum. The optimum moisture content shall be determined in accordance with ASTM 1557. All common borrow material shall be approved by Engineer. Sieve analysis by weight:

Sieve Size	% Passing by Weight
8"	100
No. 200	0 - 50

## 2.11 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 3 inches wide and 5 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 2'-6" deep.
- B. Tape Colors: Provide tape colors to utilities as follows:
  - 1. Red: Electric.
  - 2. Orange: Telephone and other communications.
  - 3. Blue: Water systems.
  - 4. Green: Sewer and Storm systems.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. Protect structure, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- D. Provide tree protection as required.
- E. Obtain copies of all applicable permits governing excavation.

### 3.02 EXCAVATION CLASSIFICATIONS

- A. Excavation is classified as follows and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation on land and as submerged excavation or submerged rock excavation below mean low water of tidal areas as follows:
1. Earth excavation includes roadway excavation of pavements, bases, subbases and subgrades, and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation.
    - a) Intermittent drilling, blasting, or ripping to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
  2. Rock excavation includes removal and disposal of rock material and obstructions encountered that cannot be removed by the following heavy-duty rock excavating equipment without systematic drilling, blasting, or ripping.
    - a) Rock material includes boulders 2.0 cubic yards or more in volume and rock in beds, ledges, unstratified masses, and conglomerate deposits.
    - b) Rock excavation will be paid by unit prices included in the Contract Documents.
    - c) Do not excavate rock until it has been classified and cross-sectioned by Engineer.

### 3.03 STABILITY OF EXCAVATIONS

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

### 3.04 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. Do not disturb bottom of excavation intended for bearing surface. Extend excavations a sufficient distance from structures for installing piping and other construction, and for inspections.

### 3.05 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- B. Excavate uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit or as indicated on Drawings.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit or appropriate space for bedding where bedding is required as indicated on Drawings.
- D. Remove all sharp items and objects from trench.
- E. Where encountering rock or another unyielding bearing surface, carry trench excavation 6 inches below invert elevation to receive bedding course.
- F. Maximum excavated length of utility trench that may be left open and not backfilled to grade shall at end of day be 200 LF.

### 3.06 EXCAVATION OF PAVED AREAS

- A. Sawcut pavement prior to excavation and again prior to paving to provide a clean, uniform edge.
- B. Minimize disturbance of remaining pavement.
- C. Cut and remove the minimum amount of pavement required to do the Work.
- D. Use shoring and bracing where sides of excavation will not stand without undermining pavement.

### 3.07 EXCESS EXCAVATION WASTE AREAS

- A. If material is suitable as approved by Engineer, use excess excavated material for subgrade construction. Comply with all compaction requirements defined herein.
- B. If material is deemed unsuitable for reuse by Engineer, or if excess suitable material exists, it shall be the responsibility of the Contractor to obtain necessary permits and approvals from all pertinent State and Federal agencies and from the local municipality prior to the establishment of waste areas off the project.
  1. Written permission of the property owners shall be obtained by the Contractor, including permission to dispose of waste in the area.
  2. Copies of all required permits shall be given to the Engineer.
  3. Provisions shall be made for temporary and permanent erosion controls at waste areas which shall include, but not necessarily be limited to, grading the surface to drain, covering the surface with loam or other earthy material that will support growth and seeding and mulching.

- C. No additional payment shall be made for disposal of either excess suitable fill or excess unsuitable fill on waste areas beyond payment made under roadway excavation pay item. No additional payment beyond excavation pay item shall be made for suitable material used as roadway subgrade.

### 3.09 TEST PITS

- A. Excavate test pits in locations as directed by Engineer.
- B. Utilize smallest equipment required for excavation and appropriately tracked or wheeled equipment to minimize damage to ground surfaces and vegetation in areas not otherwise to be disturbed by Contractor's activities.
- C. To the extent possible, restore surface conditions to existing prior to excavation.

### 3.10 APPROVAL OF SUBGRADE

- A. Notify Engineer when excavations have reached required subgrade. Allow time for verification of subgrade elevations prior to proceeding with placement of subbase material.
- B. When Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer.

### 3.11 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Flowable concrete fill may be used to bring elevations to proper position when acceptable to the Engineer.
- B. Fill unauthorized excavations under other construction as directed by Engineer.
- C. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Engineer.

### 3.12 STORAGE OF SOIL MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.



- B. Stockpile soil materials away from edge of excavation. Do not store within drip line of remaining trees.
- C. Stockpiling excavated soils along roadway is prohibited.

### 3.13 DEWATERING

- A. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- C. Do not allow water to accumulate in excavations. Provide and maintain pumps, dewatering system components necessary to convey water away from excavations.
- D. Convey water removed from excavations and rain water to collection or run-off areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

### 3.14 BACKFILL AND FILL

- A. Place acceptable soil material in layers to required elevations as shown on the Drawings and as listed below.
- B. Fill, backfill, and compact to produce minimum subsequent settlement of the material and provide adequate support for the surface treatment or structure to be placed on the material.
- C. Place material in approximately horizontal layers of beginning at lowest area to be filled. Do not impair drainage.
- D. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Scarify surfaces so that fill material will bond with existing surface.
- E. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- F. Place backfill and fill materials in layers not more than 12" in loose depth for material compacted by heavy compaction equipment, and not more than 6" in loose depth for material compacted by hand-operated tampers. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

- G. Place backfill and fill materials evenly adjacent to structures, to required elevations. Prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift. No backfill shall be placed around new concrete structures until concrete has reached 75% of its design strength.
- H. Do not allow heavy machinery within five feet of structures during backfilling and compaction.
- I. Backfill excavations as promptly as Work permits, but not until completion of the following:
  - 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for record documents.
  - 3. Testing, inspecting, and approval of underground utilities.
  - 4. Concrete formwork removal.
  - 5. Removal of trash and debris from excavation.
  - 6. Removal of temporary shoring and bracing, and sheeting.
  - 7. Where sheeting is to remain, cut off temporary piling drain below bottom of structures and remove in a manner to prevent settlement of structure or utility, or leave in place.
- J. Use care in backfilling to avoid damage or displacement of underground structures and pipe.
- K. Backfill under all existing utility pipes crossed by sewer construction with 3/4" crushed stone or flowable fill. The crushed stone backfill will extend continuously from the bedding of the new sewer to the utility pipe crossed, including a 6" thick envelope of crushed stone all around the existing utility pipes. The 3/4" crushed stone backfill shall stand at its own angle of repose. No "haunching" or "forming" with common fill will be allowed.

### 3.15 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Bed pipe in crushed stone to limits of bedding and requirements for remaining trench backfill.
- C. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.

- D. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- E. Coordinate backfilling with utilities testing.
- F. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- G. Place and compact final backfill of satisfactory soil material to final subgrade.
- H. Install warning tape directly above utilities as indicated on Drawings.

### 3.16 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within two percent of optimum moisture content.
- B. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- C. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
- D. Stockpile or spread and dry removed wet satisfactory soil material.

### 3.17 COMPACTION

- A. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Compact to the following minimum densities:

FILL AND BACKFILL LOCATION	DENSITY
Top 2 feet under gravel roadway	95%
Top 2 feet under pavement	95%
Below top 2 feet under pavement	92%
Trenches through unpaved areas	90%
Pipe Bedding	92%
Under structure foundations	95%
Around street manholes	92%

Maximum density: ASTM D1557, method D.

- D. Determine actual in place densities using field tests as directed by the Engineer. Tests will be made by an independent laboratory. Costs for initial tests will be paid by Owner or by testing allowance bid item. Subsequent retests will be paid by Contractor.
- E. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.
- F. In each compacted initial and final trench backfill layer, perform at least one field in-place density test for each 200 feet or less of trench, and at every 2' vertical layer, but no fewer than two tests.
- G. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact, and retest until required density is obtained.

### 3.18 GRADING

- A. Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Provide a smooth transition between existing adjacent grades and new grades.
- C. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- D. Slope grades to direct water away from buildings and to prevent ponding.
- E. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 0.10 foot.
  - 2. Walks: Plus or minus 0.10 foot.
  - 3. Pavements: Plus or minus 1/2 inch when tested with 10 foot straightedge.
- F. After grading, compact subgrade surfaces to the percentage of maximum density for each area classification.
- G. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- H. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

- I. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

### 3.19 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course material on prepared subgrades. Place base course material over subbases to pavements.
- B. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D 1557 modified.
- C. Shape subbase and base to required crown elevations and cross-slope grades.
- D. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
- E. When thickness of compacted subbase or base course exceeds 12 inches, place materials in equal layers, with no layer more than 12 inches thick or less than 6 inches thick when compacted.
- F. Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders at least 12 inches wide of acceptable soil materials and compact simultaneously with each subbase and base layer.

### 3.20 FINAL DISPOSAL OF EXCESS MATERIALS

- A. Remove excess excavated material not wanted by the Owner and dispose of it off Owner's property.
- B. Grade material to the satisfaction of the Owner of the property on which the material is deposited. Keep roads free of debris. Use suitable watertight vehicles for hauling wet materials over roads and streets.
- C. Clean up materials dropped from or spread by vehicles promptly or when directed by the Engineer.
- D. Dispose of materials in accordance with all applicable regulations.

### 3.21 DUST CONTROL

- A. During the construction period, the Contractor shall take special measures including, but not limited to, wetting down to control dust on site, in order to prevent annoyance and/or damage to adjacent property, whether public or private. Calcium chloride or any other chemical material may not be used on subgrades of areas to be seeded or planted.

- B. The Contractor shall take all necessary measures to keep roads and sidewalks clean and free from dirt, dust, mud, and debris resulting from construction operations.

### 3.21 CLEANUP

- A. At the end of all excavation, filling and grading operations and before acceptance of the work, the Contractor shall remove all debris, rubbish, garbage, trash, and discarded material, from the site. Contractor shall dispose of them in a manner satisfactory to the Engineer. The premises shall be left clean, presentable, and satisfactory.

END OF SECTION

## UNIT PAVERS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

A. The General Documents, as listed on the Table of Contents, and applicable parts of GENERAL SPECIFICATIONS, shall be included in and made a part of this Section.

B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

#### 1.02 SUMMARY

A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install the concrete unit pavers and metal edging, as indicated on the Contract Documents and as specified.

#### 1.03 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

##### 1. EARTHWORK

#### 1.04 REFERENCES

- A. American Society for Testing and Materials (ASTM)
  - 1. C 33, Specification for Concrete Aggregates.
  - 2. C 67, Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8 – Freezing and Thawing.
  - 3. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - 4. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
  - 5. C 144, Standard Specification for Aggregate for Masonry Mortar.
  - 6. C 920, Specification for Elastomeric Joint Sealants.
  - 7. C 979, Standard Specification for Pigments for Integrally Colored Concrete.
  - 8. D 977, Standard Specification for Emulsified Asphalt.
  - 9. D 3381, Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.

#### 1.03 SUBMITTALS

- A. In accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

- B. Manufacturer's drawings and details: Indicate perimeter conditions, relationship to adjoining materials and assemblies, expansion and control joints, concrete paver layout, and installation details.
- C. Neoprene modified asphalt adhesive product catalog sheets with specifications.
- D. Bituminous setting bed: asphalt cement mix design to be used in the bituminous setting bed conforming to ASTM D 3381.
- E. Sieve analysis per C 136 for sand mixed with bitumen and sand for joints between concrete pavers.
- F. Concrete pavers:
  - 1. Two representative full-size samples of each paver type, thickness, color, finish that indicate the range of color variation and texture expected in the finished installation. Color(s) selected by Landscape Architect from manufacturer's available colors.
  - 2. Accepted samples become the standard of acceptance for the work.
  - 3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
  - 4. Manufacturer's certification of concrete pavers by ICPI as having met applicable ASTM standards.
  - 5. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
  - 1. Paver manufacturer shall be an Interlocking Concrete Pavement Institute Certified Producer.
  - 2. Paver manufacturer shall be a member in good standing with the National Concrete Masonry Association.
  - 3. Paver manufacturer shall provide systematic testing of concrete pavers during production by a National Concrete Masonry Association Certified Masonry Testing Technician.
  - 4. Paver manufacturer shall provide independent quality assurance test results for concrete pavers manufactured and tested within a calendar year.



B. Paving Subcontractor Qualifications:

1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.

D. Mock-Ups:

1. Install a 7 ft x 7 ft (2 x 2 m) paver area.
2. Use this area to determine surcharge of the bitumen-sand layer and adhesive, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
3. This area will be used as the standard by which the work will be judged.
4. Subject to acceptance by owner, mock-up may be retained as part of finished work.
5. If mock-up is not retained, remove and properly dispose of mock-up.

1.05 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirement Section.

B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.

1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
3. Unload pavers at job site in such a manner that no damage occurs to the product.

D. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials. [Store concrete paver cleaners and sealers per manufacturer's instructions.]

1. Cover joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

## 1.06 PROJECT/SITE CONDITIONS

### A. Environmental Requirements:

1. Do not install bitumen setting bed or pavers during heavy rain or snowfall.
2. Do not install bitumen setting bed and pavers over frozen base materials.
3. Do not install frozen bitumen setting bed materials.
4. Do not install concrete pavers on frozen bitumen setting bed materials.

## 1.07 PROTECTION OF ADJACENT SURFACES

A. Finished surfaces adjacent to the concrete unit paving shall be adequately protected from soiling, staining, and other damage during construction.

## PART 2 PRODUCTS

### 2.01 CONCRETE PAVERS

A. 8" x 8" "Custom Blue Band" shall be Hanover Traditional Prest Concrete Brick, Hydraulically precast concrete pavers, manufactured by Hanover Architectural Products, Inc., Hanover, PA, 17331, (717) 637-0500, or approved equal.

1. Paver size shall be 8" x 8", "Traditional" style.
2. Paver thickness shall be 2 3/8 inches.
3. Finish of paver shall be "Natural".
4. Color shall be Matrix # B92527, Custom Mix as approved by the Engineer from the manufacturer's full range of standard and blended colors.

B. 4" x 8" Sidewalk Paver shall be Hollandstone, Hydraulically precast concrete pavers, manufactured by Genest Concrete Works, 36 Wilson Street, Sanford, ME, 207-324-3250 or approved equal.

1. Paver size shall be (60 mm) 4" x 8".
2. Paver thickness shall be 2 3/8 inches.
3. Color shall be New England Blend, Traditional Finish.

C. 16" x 16" Plaza Paver shall be XXL Portland Plaza Paver, Hydraulically precast concrete pavers, manufactured by Genest Concrete Works, 36 Wilson Street, Sanford, ME, 207-324-3250 or approved equal.

1. Paver size shall be (400 mm) 16" x 16".

2. Paver thickness shall be 4 3/4 inches.

3. Color shall be Summer Blend, Traditional Finish.

D. Average Compressive Strength (ASTM C 140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa). Average Water Absorption (ASTM C 140): 5% with no unit greater than 7%. Freeze/Thaw Resistance (ASTM C 67): Resistant to 50 freeze/thaw cycles with no greater than 1% loss of material. Freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

## 2.02 AGGREGATE BASE COURSE

A. Material for aggregate base course shall be as specified under the EARTHWORK and paid for under this UNIT PAVERS.

## 2.03 AGGREGATE SUBBASE COURSE

A. Material for aggregate subbase course shall be as specified under EARTHWORK and paid for under UNIT PAVERS.

## 2.04 BITUMINOUS BASE COURSE

A. Bituminous Concrete shall be as specified under H.M.A. PAVEMENT and paid for under UNIT PAVERS of this Specification.

## 2.07 SAND FOR JOINT FILLER

A. Polymeric Joint Sand: Super Sand, or Gator Maxx Sand manufactured by Alliance Designer Products Inc., Laval, Quebec 866-212-1611, Supplied by Genest Concrete Works, Inc.

a. Material Type and Description: Dry mix containing a polymeric binding agent, activated with water.

b. Color: Slate Grey.

c. Installation: Install polymeric joint sand per manufacturer's instructions, and paid for under this Section UNIT PAVERS of this Specification.

## 2.08 METAL EDGING

A. Metal Edging shall be PermaLoc AsphaltEdge aluminum edging, manufactured by PermaLoc, Holland, MI, 49424, or approved equal. Aluminum edging shall be shop fabricated from aluminum alloy 6063-T6, 3/16 inch thick x 2 1/2 inch wall by 2 1/4 inch base, with standard black baked-on acrylic paint finish. Edging shall be furnished in 8-foot lengths.

1. Adjacent sections shall be adjoined using a 4" siding, locking connector of aluminum alloy 6063-T6, maintaining 3/8" expansion joint between sections.

2. Stakes shall be spiral steel spikes with insulating plastic washers 10" x 3/8".

## 2.09 WATER

A. Water shall be potable and shall be free of injurious contaminants.

## 2.10 SURFACE SEALANT FOR PAVERS

A. Surface sealant for all concrete paver pavement shall be Sure Klean Weatherseal SLX 100 Water and Oil Repellent, manufactured by ProSoCo Company, Inc., or approved equal.

1. Provide five (5) year labor and materials warranty.

## PART 3 EXECUTION

### 3.01 METAL EDGING

A. Metal edging shall be installed at locations indicated on the Contract Documents. Install aluminum edging with the base resting on the concrete or bituminous binder base and facing toward the brick surface. Bituminous setting bed and tack coat shall be applied on top of edging. Set edging to the required alignment, straight and true and to the required elevation to ensure full paver restraint. Core drill holes in concrete base as necessary. Thread spike through insulating washer. Drive spikes into base until spike head firmly wedges washer against flange of aluminum edging.

1. Aluminum edging shall be securely staked in required position. Stakes shall be driven every 12" in straight runs and into every support section in curved sections.
2. Adjacent lengths shall be attached using manufacturer's standard connections according to manufacturer's published instructions.
3. Edging shall be set plumb and vertical at required line and grade. Straight sections shall not be wavy; curved sections shall be smooth and shall have no kinks or sharp bends.

### 3.02 ACCEPTABILITY OF BITUMINOUS BASE

A. Contractor shall examine the bituminous concrete base as specified under HOT MIX ASPHALT PAVING and provided, installed, and paid for under this UNIT PAVERS Specification, to determine its adequacy to receive concrete pavers and setting bed. Bituminous concrete shall have fully set prior to the work of installing concrete pavers. Evidence of inadequate base shall be brought to the immediate attention of the Engineer and shall be corrected by the Contractor as directed by the Engineer at no additional cost to the Owner.

B. Start of work of this Division 2 CONCRETE PAVERS shall constitute acceptance of bituminous concrete base.

### 3.03 AGGREGATE BASE COURSE

A. Aggregate subbase and base materials shall be to the depth indicated on the Contract Documents. Bases shall be as specified under EARTHWORK and paid for under UNIT PAVERS of this Specification.

### 3.04 BITUMINOUS SETTING BED

A. The surface of the bituminous base shall receive an asphalt prime coat before laying bituminous setting bed. Prime coat shall be applied at rate that will leave bituminous residue of 5 to 7 gallons per 100 SY after evaporation of vehicle. Base surface shall be dry and clean when prime coat is applied. Bituminous setting bed shall not be placed until vehicle has completely evaporated from prime coat.

B. Bituminous setting bed shall be installed over the bituminous base. Control bars  $\frac{3}{4}$ " deep shall be placed directly over the base. If grades must be adjusted, wood chocks under depth control bars shall be set to proper grade. Set two bars parallel to each other to serve as guides for the striking board. The depth control bars must be set carefully to bring the pavers, when laid, to proper grade.

C. While still hot (not less than 250 degrees F) some of the bituminous bed material shall not be placed between the parallel depth control bars. This bed shall be pulled with the striking board over the control bars several times. After each passage, low porous spots shall be showered with fresh bituminous material to produce a smooth, firm, and even setting bed. As soon as this initial panel is completed, advance the first bar to the next position in readiness for striking the next panel. After the depth control bars and wood chocks have been removed, carefully fill any depressions that remain.

D. The setting bed shall be rolled with a power roller to a nominal depth of 2" still hot. The setting bed thickness shall be adjusted so that when the concrete pavers are placed and rolled, the top surface of the pavers will be at the required finish grade.

E. A coating of neoprene-modified asphalt adhesive shall be applied by mopping or troweling over the top surface of the bituminous setting bed so as to provide continuous bond under the pavers.

1. If adhesive is trowel-applied trowel shall be serrated type with serrations not to exceed  $\frac{1}{16}$ ".

### 3.05 SETTING CONCRETE PAVERS

A. Concrete pavers shall be set on a bituminous setting bed over a prepared concrete or bituminous concrete base. Setting bed shall be protected from damage prior to setting pavers.

B. Concrete pavers with chips, cracks, stains, or other structural or aesthetic defects shall not be used.

C. Only competent workmen under adequate supervision shall perform the work of setting concrete pavers. Set pavers in accordance with manufacturer's recommendations. Concrete pavers shall be set true to the required lines and grades in the pattern detailed on the Contract Documents.

D. After the modified asphalt adhesive is applied, pavers shall be carefully placed by hand, set true to the required lines and grades, in the pattern shown on the Contract Documents. Accurate alignment shall be maintained. The Engineer will approve the start of paving layouts. Paving layouts shall always begin at building entries.

E. Pavers shall be neatly cut and fitted at all perimeters and closures to fit neatly and closely. Pavers shall be tightly butted. Joints between pavers shall be uniform and shall not exceed  $\frac{1}{8}$ " in width. Joints greater than  $\frac{1}{8}$ " in width will not be accepted. Surface edge of one paver shall be level with the next adjacent pavers so that no voids, rocking motions, or tripping hazards are encountered. There shall

be no deviation from a true grade greater than ¼ inch in 10 feet. All finish paved areas shall slope to drain at a minimum of 1/8" in one foot.

F. All cutting and patching required to complete the work shall be done (including the filling and closing of all openings) with water-cooled radial cut-off type masonry saws with diamond-tipped blade for a sharp, straight edge. Cut edges shall be plumb and straight. Scoring and breaking will not be acceptable.

1. After cutting of pavers, grind all cut edges of top surfaces of pavers to create a beveled, 45 degree angle equal to the manufacturers bevel. Ground bevels shall be straight and true and shall be accomplished using a sufficiently fine grinding wheel or blade to prevent apparent grind marks on the bevels.

G. After a sufficient area of pavers has been installed, joints of pavers shall be filled by sweeping sand into the joints, as specified, performed and paid for under UNIT PAVERS.

H. Completed surface shall be compacted by running a medium plate vibrator across the top of the pavers. Additional joint filler material shall be swept in the joints during vibration to completely fill joint space.

I. Newly laid pavers shall be protected at all times by panels of plywood. These panels may be advanced as work progresses; however, the plywood protection shall be kept in areas which will be subjected to continued movement of materials and equipment. All necessary precautions shall be taken in order to avoid depressions and protect paver alignment.

### 3.06 JOINT TREATMENT

A. Joint filler shall be swept dry into the joints between pavers until the joints are completely filled. Surface shall be swept clean. Swept surface shall then be thoroughly dampened with a low-volume fine spray of water.

1. Sweep sand into paver joints until joints are filled solid. Fog lightly with water and repeat a minimum of three times or until joints are compacted and full.
2. Prior to acceptance, the paved area shall be flooded with water to assure that there are no depressions. Pavers with top surfaces greater than 1/16" above or below adjacent pavers shall be removed and reset. Remove and reset pavers as required until surface is true to line and grade. Refill sand joints as necessary until all joints are filled to finish grade.

### 3.07 CLEANING OF UNIT PAVER SURFACES

A. After completion of concrete paving, surfaces shall be carefully cleaned, removing all dirt, excess filler, and stains.

B. Clean pavers using an approved masonry cleaner and soft bristle brush.

### 3.09 APPLICATION OF SURFACE SEALANT OF CONCRETE PAVER SURFACES

A. Seal pavement surface as follows:

1. Apply surface sealer to installed, thoroughly cleaned paved areas using a low pressure airless sprayer, brush, or roller in compliance with manufacturer's recommendations. Apply material in quantities sufficient to saturate the surface pavement and not less than one gallon per 450 square feet.
2. Contractor shall take safety precautions in order to avoid all skin contact with the sealer, keep the sealer away from all heat sources or flame, and maintain adequate ventilation to avoid any concentration of sealer vapors in the work area. Vapors may ignite explosively and may travel along the ground by ventilation to ignition sources far from the product.
3. Sealed, paved, surfaces shall display no color difference from the unsealed surface and no surface sheen. Paved areas that do exhibit these qualities after sealant installation shall be removed and replaced at no additional cost to the Owner.

END OF SECTION

## LANDSCAPE GRADING - TOPSOIL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Final grade topsoil for finish landscaping.
- B. Related Sections:
  - 1. Lawns
  - 2. Plantings

#### 1.2 REFERENCES

- A. ASTM C 602 - Specification for Agricultural Liming Materials.
- B. FS O-F-241 - Fertilizers, Mixed Commercial.

### PART 2 - PRODUCTS

#### 2.1 MATERIAL

- A. Imported topsoil, friable loam; free of subsoil, roots, grass, excessive amount of weeds, stone, and foreign matter; acidity range (pH) of 5.5 of 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter, maximum soluble salt content of 500 ppm, maximum of 5 percent by volume of extraneous material exceeding 2 inches in diameter.

### PART 2 - EXECUTION

#### 2.2 EXAMINATION

- A. Verify site and trench backfilling has been inspected.
- B. Verify substrate base has been contoured and compacted.

#### 2.3 SUBSTRATE PREPARATION

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove subsoil contaminated with petroleum products.
- C. Scarify surface to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.



## 2.4 PLACING TOPSOIL

- A. Place topsoil in areas where seeding, sodding, and/or planting, is scheduled. Place topsoil during dry weather.
- B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
- C. Remove roots, weeds, rocks, and foreign material while spreading.
- D. Manually spread topsoil close to trees, plants, building and structures to prevent damage.
- E. Roll placed topsoil.
- F. Remove surplus subsoil and topsoil from site.
- G. Leave stockpile area and site clean and raked, ready to receive landscaping.

## 2.5 TOLERANCES

- A. Top of Topsoil: Plus or minus 1/2 inch.

## 2.6 PROTECTION

- A. Protect landscaping and other features remaining as final work.
- B. Protect existing structures, fences, sidewalks, utilities, paving and curbs.

## 2.7 SCHEDULES

- A. Topsoil placed compacted to thickness as shown on details.

END OF SECTION

## LAWNS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Seeding and over-seeding.
  - 2. Temporary protective coverings.
  - 3. Temporary protective fencing.
  - 4. Protecting and maintaining lawn areas until Final Acceptance.
  - 5. Cleaning up.
- B. Related Sections:
  - 1. Topsoil – Landscape Grading
  - 2. Planting

#### 1.3 DEFINITIONS

- A. Applicable specifications and publications, referred to herein, form a part of these Specifications:
  - 1. Standard Specification: The State of Maine Department of Transportation, Standard Specification for Highways Bridges, latest edition.
  - 2. ASTM: American Society of Testing Materials
  - 3. AASHTO: American Association of State Highway and Transportation Officials
  - 4. AAN: American Association of Nurserymen
  - 5. AOAC: Association of Official Agricultural Chemists

#### 1.4 SUBMITTALS

- A. Prior to ordering the below listed materials, submit representative samples to Owners Representative for selection and approval as follows. Do not order material until Owners Representative's approval has been obtained. Delivered materials shall match the approved samples.
  - 1. Protective fencing materials: Provide three 12 inch square samples for approval.
- B. Submit material specifications and installation instructions where applicable attesting that the following materials meet the requirements specified:
  - 1. Fertilizer
  - 2. Seed
  - 3. Lime
- C. Certificates
  - 1. A manufacturer's Certificate of Compliance to the specifications shall be submitted by the manufacturers with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.
  - 2. Contractor: Submit certification from the seed supplier that all seed is true to the variety indicated on the packaging.
  - 3. Furnish the Owners Representative with duplicate signed copies of a statement from the vendor certifying that the seed mix is of the specified grass varieties, free of weeds, disease or other visual imperfections.
- D. Submittal Schedule
  - 1. Before installation:
    - a. Manufacturer's Product data
    - b. Test Reports
    - c. Seed Certification
    - d. Protective Fencing

#### 1.5 QUALITY ASSURANCE

- A. Work under this section will be performed by workmen experienced in meadow turf grass installation under the full time supervision of a qualified foreman.
- B. Seed during recommended planting period or as approved by the Owners Representative.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material to the site in original unopened packages, showing weight, manufacturer's name and guaranteed analysis.
- B. Store materials in such a manner that effectiveness and usability will not be diminished or destroyed and shall be uniform in composition, dry, unfrozen and free flowing. The Owners Representative reserves the right to reject any material which has become caked or otherwise damaged or does not meet specified requirements.

## 1.7 COORDINATION

- A. Contractor: Submit to the Owners Representative for approval a progress schedule as specified herein.
- B. Contractor: Coordinate the Work with other trades so as not to interfere with the progress of the Work.

## 1.8 WARRANTY

- A. Contractor: agrees to repair or replace any or all meadow turf grass and lawn area(s) that fail(s) in materials or workmanship within a period of one year from date of substantial completion or completion thereafter on punch-out list.

## PART 2 - PRODUCTS

### 2.1 TOPSOIL

- A. Contractor: Make all amendments to the on-site topsoil as described herein.

### 2.2 TOPSOIL ADDITIVES

- A. Commercial Fertilizer for Meadows: Complete fertilizer and be a standard product complying with state and federal fertilizer laws. Deliver Fertilizer to the site in the original unopened containers which bear the manufacturer's name and guaranteed statement of analysis. Fertilizer for meadow turf grass areas: Contain not less than 5 percent nitrogen, 10 percent phosphorus, and 5 percent potash by weight of ingredients or as otherwise indicated by topsoil test results. Do not apply fertilizer on meadow surfaces within 100 feet of a stream, shore land or open water body. Supply in unopened bags with the weight, contents, and guaranteed analysis shown thereon or on a securely attached tag.

- B. Commercial Fertilizer for Lawns: CID A-A-1909, Type I, class 2, with 50 percent of the nitrogen in slowly available form, containing at least 10 percent nitrogen, 0 percent phosphoric acid, and 10 percent total available potash in conformity with the Standards of the Association of Official Agricultural Chemists. Do not apply fertilizer on lawn surfaces within 100 feet of a stream, shore land or open water body. Supply in unopened bags with the weight, contents, and guaranteed analysis shown thereon or on a securely attached tag.
- B. Limestone: Dolomitic limestone and contain not less than 85 percent of total carbonates and magnesium and shall be ground to such fineness that 50 percent will pass a 100 mesh sieve and 90 percent will pass through a 20 mesh sieve. Coarser material will be accepted provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.
- C. Water: The Owner will furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owners Representative's water supply is not available or not functioning, the Contractor will be held responsible to furnish adequate supplies at his own cost. All injured or damaged plant material due to the lack of water, or the use of too much water, to be the Contractor's responsibility to correct. Water to be free from impurities injurious to vegetation. Contractor to supply their own hoses and sprinklers.

## 2.3 SEED

- E. Lawn Seed Mixture: **Park Mix** as mixed and supplied by Allen, Sterling & Lothrop, 191 US Route 1, Falmouth, ME 04105, 207-781-4142. Broadcast seed at a rate of 1 lbs. per 200 S.F. minimum.
- F. Temporary Seeding: From October 1 to November 15, all disturbed areas to be seeded with dormant Winter Rye at the rate of 1.5 lbs. of seed per 1000 square feet. Conform to requirements as specified herein and on the Drawings.

## 2.4 PROTECTIVE FENCING

- C. Seeded areas adjacent to walks shall be protected by snow fencing or other temporary fencing material.

## 2.5 TEMPORARY PROTECTIVE COVERINGS

- D. As temporary protective coverings on ground areas subject to erosion, provide one of the following protective measures, as directed by the Owners Representative:

## 1. Mulch Materials

- |          |                          |
|----------|--------------------------|
|          | <u>Rate per 1,000 SF</u> |
| a. Straw | 50 lbs.                  |
2. Mesh or Blanket Matting: Matting for erosion control on seeded or hydroseeded slopes, on planted surfaces, drainage swales and on temporary or permanently finished slopes of 3:1 or steeper shall be:
    - a. Heavy jute mesh shall be of a uniform open plain weave of unbleached single jute yarn. The yarn shall be of a loosely twisted construction having an average twist of not less than 1.6 turns per inch and shall not vary in thickness by more than one half its normal diameter. The jute mesh shall be furnished in approximately 90 pound rolled strips and shall meet the following requirements:
      1. Length – approximately 75 yards. Width – 48" plus or minus 1". .78 warp ends per width of cloth. 41 weft ends per yard. Weight of cloth to average 1.22 pounds per linear yard with a tolerance of plus or minus 5%.
      - b. Staples shall be of a #11 gauge steel wire formed into a "U" shape 6" long.
      - c. Erosion control matting shall be "Soil Saver" as manufactured by Jim Walls Co., Dallas, TX or "Heavy Duty Jute Mesh" as manufactured by Lewis International Corp., Springfield, NJ, or approved equal.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine site conditions and other conditions affecting performance of the Work. Insure the sub-grade is properly graded and at correct levels prior to spreading of topsoil.
- B. Examine specified materials before installation. Reject materials that are damaged or otherwise not as specified and shown on the Drawings. Reject soil amendments that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Owners Representative.
- D. The Contractor shall be responsible for maintenance work on the installed meadow turf grass until an acceptable meadow turf grass is established and accepted in writing.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- B. Topsoil:

1. Ensure that Topsoil has been installed as specified in Section Landscape Grading-Topsoil.
  2. After topsoil has been spread, apply dolomitic limestone at a rate of 138 lbs. per 1,000 s.f., (if required by testing results) and  $P_2O_5$  at a rate of 10 pounds per 1,000 s.f. in the form of a 0-46-0 fertilizer. Cultivate to a 3" - 4" depth by use of a rotovator or a disk harrow. Remove all stiff clods, lumps, brush, roots, stumps, litter and other foreign material and stones over one inch (1") in diameter and dispose of legally off the site. Topsoiled areas shall also be free of smaller stones in excessive quantities as determined by the Owners Representative. Do not overwork the soil.
  3. Roll the entire surface with a roller weighing approximately one hundred pounds per foot of width. During the rolling, fill all depressions caused by settlement with additional topsoil and then regrade and roll until the surface presents a smooth, even and uniform finish at the required grade. Obtain Owners Representative's approval of finish grading and rolling of the topsoil prior to seeding.
  4. All placing, tilling, rolling and finish grading of topsoil shall be performed with agricultural machinery designed for that purpose to prevent over-compaction of the seed bed. No heavy construction equipment shall be allowed to be used for these purposes.
  5. No subsoil or topsoil shall be handled in any way if it is in a wet or frozen condition.
  6. If seeding areas that have been previously seeded with temporary winter rye, thoroughly till the area and remove any clumps of grass. Bring the surface of the soil to a condition suitable for seeding as specified herein and seed as per the Drawings.
- C. Application of fertilizers:
1. Prior to seeding meadow areas, apply a 5-10-5 fertilizer at a rate of 2 pounds per 1,000 s.f. Work into the soil with seed application as described below.
  2. On slopes in excess of 3:1, fertilizer and limestone may be applied with a hydroseeder. Submit material specifications or proposed hydroseeder mix to Owners Representative for approval. If this option is chosen, the surface of the topsoil must be dragged or otherwise scarified to incorporate the limestone/fertilizer mixture into the top one inch (1") of topsoil. Submit method to Owners Representative for review and approval.
- D. The dates for seeding shall be as follows unless otherwise stated by the Owners Representative:
1. Spring - April 15 to June 1
  2. Autumn - September 1 to October 1.
- E. Seeding at any time other than within the above seasons shall be allowed only when ordered by the Owners Representative or when the Contractor submits a written request for

permission to do so and permission is granted. Newly seeded areas, if seeded out of season, must be continuously watered according to good practice if seeding is done between June 1 and September 1. Seeding done outside the dates established above shall be solely at the Contractor's risk.

### 3.3 SOWING OF SEED

- A. Seeding: Seeding shall consist of soil preparation, seeding, raking, rolling, weeding, watering and otherwise providing all labor and materials necessary to secure the establishment of acceptable turf.
- B. Sowing of Seed: Immediately before any seed is sown, the ground shall be scarified, or raked lightly until the surface is smooth, friable, and of uniformly fine texture. No seeding shall be done during windy weather. Sow seed in two directions at right angles to each other. Sow seed evenly by use of a cultipacker or approved seeding device in the proportions and at the rate per unit of area heretofore specified. If a cultipacker is not used, cover seed with a thin layer of topsoil by dragging, light raking or other approved method. Roll in both directions with a hand roller weighing approximately one hundred pounds per foot of width and water with a fine spray. Provide protective fencing where required to keep the area undisturbed until the grass is established.
- C. Hydro-Seeding For Meadow and Lawn Areas: Mix seed with lime, fertilizer and cellulose wood fiber mulch for hydro-seeding in conformance with Section 618.07 of MDOT Standard Specifications for Highways and Bridges.

### 3.4 WATERING

- A. Watering of Seeded Areas:
  - 1. First Week: The contractor shall provide all labor and arrange for all watering necessary to establish an acceptable meadow turf grass. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least 2 inches.
  - 2. Second and Subsequent Weeks: The Contractor shall water the meadow turf grass and lawn as required to maintain adequate moisture in the upper 5 inches of soil, necessary for the promotion of deep root growth.
  - 3. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. Contractor: Furnish sufficient watering equipment to apply one complete coverage to the seeded areas in an eight-hour period.



### 3.5 TEMPORARY PROTECTIVE FENCING

- A. Place temporary protective fencing in locations as directed by the Owners Representative.

### 3.6 MAINTENANCE

- A. Maintenance shall begin immediately after each portion of meadow turf grass and lawn areas are installed and shall continue in accordance with the following requirements:
  - 1. Meadow turf grasses and lawn area: Maintain as long as is required to establish a uniform, thick, well-developed stand of grass until final acceptance.
  - 2. Mowing for Turf Grasses: Mowing is not required for the first year. Mow only during the month of November or as otherwise directed by the Owners Representative to a height of 2 inches.
  - 3. Mowing for Lawn Areas: Mow with sharp mower blades. Mow lawn areas so as to maintain a minimum height of 2 inches and a maximum of 4 inches.
  - 4. All areas which fail to show a uniform, thick, well-developed stand of grass, for any reason, shall be re-seeded repeatedly until all areas are covered with a satisfactory growth of grass as determined by the Owners Representative.
  - 5. All damage from erosion, gullies, washouts, or other causes shall be repaired immediately by filling with topsoil, tamping, re-fertilizing and reseeding at no additional cost to the Owners Representative.
- B. Protection:
  - 1. Meadow turf grass and lawn areas shall be protected against damage with the type fencing specified herein. Any protective devices remaining on the site shall be removed at Substantial Completion of the Contract or as directed by the Owners Representative.

### 3.7 STANDARDS FOR COMPLETION

- A. Conditions for Completion:
  - 1. Completion of meadow turf grasses and lawn areas is for the entire area. No partial completion will be given unless otherwise approved by the Owners Representative.
  - 2. Meadow turf grasses and lawn areas: Exhibit a uniform, thick, well- developed stand of grass. Meadow turf grass areas shall have no bare spots in excess of four inches in

diameter and bare spots shall comprise no more than two percent of the total area of that meadow turf grass and lawn area.

3. No meadow turf grass or lawn areas shall exhibit signs of damage from erosion, washouts, gullies, or other causes.
4. Pavement surfaces and site improvements adjacent to meadow turf grass and lawn areas shall be clean and free of spills or over-spray from placing or handling of topsoil and seeding operations.

B. Inspection and Completion:

1. Upon written request of the Contractor, the Owners Representative to inspect all meadow turf grass areas to determine completion of Contract work. This request must be submitted at least 10 days prior to the anticipated inspection date.
2. Upon written request of the Contractor, the Owners Representative to inspect all grass areas to determine completion of Contract work. This request must be submitted at least five days prior to the anticipated inspection date.
3. If the meadow turf grass and lawn areas are deemed complete to the Owners Representative, a meeting will be arranged with Contractor and Owners Representative to review the meadow turf grass and lawn work. A final inspection is a part of this meeting to insure completion and any punch list items.
4. Contractor: Following the completion of meadow turf grasses and lawn areas, provide the Owners Representative with access to all grass areas as required for the Owners Representative's maintenance work.

C. Cleanup:

1. Contractor: Following the completion of meadow turf grasses and lawn areas, immediately remove from the site all materials and equipment not required for any other planting or maintenance work. Store materials and equipment remaining on site locations which do not interfere with the Owners Representative's maintenance of completed meadow turf grasses, lawn areas or other construction operations.
2. The Contractor is responsible for keeping all paving, building surfaces, signs, posts, and all site improvements clean during placement of topsoil and seeding operations. Clean up spills and over-sprays immediately. Completion shall not be granted until this condition is met.

END OF SECTION

## PLANTINGS

### PART 1 GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of GENERAL SPECIFICATIONS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

#### 1.2 SUMMARY

A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all planting work and related items as indicated on the Contract Documents and as specified in this Section and includes, but is not limited to, the following:

- 1. Preservation of existing trees as shown on the plans
- 2. Planting perennial and groundcover
- 3. Providing and placing backfill mix
- 4. Planting maintenance
- 5. One year guarantee period for all plants

#### 1.3 RELATED WORK UNDER OTHER SECTIONS

A. The following items of related work are specified and included in other Sections of the Specifications:

- 1. SITE PREP
- 2. EARTHWORK
- 3. SITE IMPROVEMENTS
- 4. PLANTING SOILS

#### 1.4 DEFINITIONS

Applicable specifications and publications, referred to herein, form a part of these Specifications:

- 1. Standard Specification: The State of Maine Department of Transportation, Standard Specification for Highways Bridges, latest edition.
- 2. ASTM: American Society of Testing Materials
- 3. AASHTO: American Association of State Highway and Transportation Officials
- 4. AAN: American Association of Nurserymen

## 5. AOAC: Association of Official Agricultural Chemists

All work shall conform to the Drawings and Specifications and comply with applicable codes and regulations.

All areas to be planted to be inspected by the Contractor before starting work and any defects such as incorrect grading, etc., to be reported to the Owners Representative prior to beginning this work and subsequently corrected to the satisfaction of the Owners Representative. The commencement of Work by the Contractor indicates his acceptance of the areas to be planted, and he is to assume full responsibility for the work of this section.

Contractor: Remove from site all waste material resulting from planting.

### 1.5 SUBMITTALS QUALITY ASSURANCE

Prior to ordering the below listed materials, submit representative samples to Owners Representative for selection and approval as follows. Do not order material until Owners Representative's approval has been obtained. Delivered materials to match the approved samples.

1. Pine Bark Mulch: Submit one (1) cubic foot sample.
2. Peat: Submit one (1) cubic foot sample.
3. Compost: Submit Certificate of Compliance listing analysis.
4. Anti-dessicant: Submit manufacturer.
5. Fertilizer: Submit Certificate of Compliance listing analysis.
6. Tree Stakes and Webbing: 1 Stake with approved stain (if applicable) and 3 foot length of webbing.
7. Tree Stakes and Webbing: Product label and manufacturers certificate(s).

### 1.7 QUALITY ASSURANCE

- A. Plant names shall comply with nomenclature of Hortus, latest edition. Sizing and grading shall be in accordance with ANSI Z60.1-86.

- B. Notify Owners Representative in writing at least 15 days before plant delivery. All plant materials shall be available for inspection at the nursery or collection source before plants are dug. Approval at plant source shall not be considered final acceptance.

## 1.8 PRODUCT HANDLING

### A. Delivery:

1. Packaged Materials: Deliver in original, unopened containers showing weight, analysis, and manufacturer.
2. Plant Material: Before digging deciduous trees and shrubs in leaf and evergreen trees for shipping, apply anti-desiccant. Carefully pack plants to prevent breaking, damage to bark, branches, and root systems, and root ball cracking. Provide adequate ventilation. Protect roots and balls from sun, drying wind, and frost. Do not drop plants from vehicles. Legibly label plants with correct botanical name and common name.
3. Storage: Place plants not planted on the day of arrival in shaded storage, protected from wind and freezing. Open bundles and separate plants. Heel in bare root plants immediately on delivery and protect roots by puddling or other means to prevent drying. Cover root balls with moist sawdust, wood chips, shredded bark, peat moss, or other approved mulching material. Leave container grown plants in containers until planting. Keep all plants moist.
4. Store packaged materials in dry locations away from contaminants. Separate anti-desiccants and pesticides from other landscape materials.

## 1.9 COORDINATION

- A. Contractor: Submit to the Owners Representative for approval a progress schedule as specified herein.
- B. Contractor: Coordinate the Work with other trades so as not to interfere with the progress of the Work.

## 1.9 WARRANTY

- A. Plants to be guaranteed for a period of one year after inspection from the date of substantial completion or completion thereafter on punch-out list and to be alive and in satisfactory growth at the end of the guarantee period.
- B. At the end of the guarantee period, inspection will be made. Any plant required under this contract that is dead or unsatisfactory to be removed from the site.

- C. All replacements to be plants of the same kind and size specified in the PLANT LIST. The cost to be borne by the CONTRACTOR, except for possible replacements due to vandalism or neglect on the part of others. Furnish plants, stake and wrapped if necessary, and mulch as required.
- D. Contractor: Provide a physical handbook or maintenance instructions for all plant material under his direction. This handbook to contain all necessary maintenance information, which will enable the OWNER to maintain new plantings in a vigorous condition. Before planting work is completed, one handbook copy is to be submitted to the Owners Representative for approval. Upon the approved completion of the punch-out list of the planting work, one handbook copy to be furnished to the Owner for future reference. The Owners Representative may require re-submittals to the Owner for maintenance instructions if it is determined that the information provided is not sufficient to allow for proper maintenance.

## PRODUCTS

### SOIL ADDITIVES

Commercial fertilizer, peat, humus or other additives to be used to counteract soil deficiencies as recommended by the soil analysis and as directed by the Owners Representative.

1. Commercial fertilizer to be a product complying with the State and United States Fertilizer Laws. Deliver to the site in the original unopened containers which to bear the manufacturer's Certificate of Compliance covering analysis which shall be furnished to the Owners Representative. At least 50% by weight of the nitrogen content will be derived from organic materials. A minimum of 35% of the nitrogen will be water insoluble. Fertilizer to contain not less than percentage of weight of ingredients as follows or as recommended by soil analysis:

	Nitrogen	Phosphorus	Potash
For deciduous (dry)	10%	6%	4%
trees & shrubs (water soluble)	16%	19%	16%
For evergreen (dry)	7%	7%	7%
trees & shrubs (water soluble)	21%	7%	7%

- B. Humus will be natural humus, reed peat, or sedge peat. It to be free from excessive amounts of zinc, low in wood content, free from hard lumps and in a shredded or granular form and to pass through a 1/2 inch mesh screen. According to the methods of testing of A.O.A.C., latest edition, the acidity range to be approximately 5.5 pH to 7.6 pH and the organic content to be not less than 60% as determined by drying at 105 degrees C. The minimum water absorbing ability to be 200% by weight on an oven-dry basis.

## PLANTINGS

- C. Peat Moss to be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. It is to be free from wood, decomposed colloidal residue, and other foreign matter. It is to have an acidity range of 3.5 ph to 5.5 pH as determined in accordance with the methods of testing of A.O.A.C., latest edition. Its water absorbing ability to be a minimum of 1,100% by weight on an oven-dry basis.
- D. Compost to be well-rotted, unleached, stable manure not less than eight months and not more than two years old. It to be free from sawdust, shavings, or refuse of any kind and to not contain over 25% straw. The CONTRACTOR to furnish information as to kind of disinfectant or chemicals, if any, that may have been used in storage of the manure.
- E. Bone meal to be fine ground, steam-cooked, packing house bone with a minimum analysis of 23% phosphoric acid and 1.0% of nitrogen.
- F. Leaf mold to be a highly organic dark brown to black spongy residue resulting from the well aerated composting of deciduous tree parts, free of plants and their roots, debris and other extraneous matter and to be uncontaminated by foreign matter and substances harmful to plant growth. The organic matter to not be less than 85% by weight as determined by the loss on ignition of oven-dried samples. Test samples to be oven-dried to a constant weight at a temperature of 16 degrees C. The inorganic residue after ignition to not be finer textured than 4% by weight passing the number 200 sieve with washing.
- G. Sulfur for adjustment of loam pH to be commercial or flour sulfur, unadulterated, and to be delivered in containers with the name of the manufacturer, material, analysis, and net weight appearing on each container.
- H. Dolomitic limestone for adjustment of loam pH to contain not less than 85% of total carbonates and to be ground to such fineness that 40% will pass through 100-mesh sieve and 95% will pass through a 20-mesh sieve. Coarser materials will be accepted provided the specified rates of application are increased proportionately on the basis of quantities passing the 100-mesh sieve.

#### PLANT MATERIALS

- The CONTRACTOR will furnish and install all plants shown on the Drawings, as specified, and in quantities listed on the Plant List. No substitutions will be permitted without the written approval of Owners Representative. In case of conflict between the Planting Plan and the Plant List, Contractor to supply the plant material necessary to complete the Work as shown on the Drawings. All plants to be nursery grown unless specifically authorized to be collected.
- B. Plants to be in accordance with the U.S.A. Standard for Nursery Stock of the American Association of Nurserymen, Latest edition.
  - C. All trees and shrubs to conform to the trade classification of "heavy specimen" and will exhibit distinctive character and form.

- D. All Plants to be typical of their species or variety and to have a normal habit of growth and be legibly tagged with the proper name. Only plant stock within the hardiness Zone 1 through 5, as established by the Arnold Arboretum, Jamaica Plain, Massachusetts, will be accepted. The CONTRACTOR's suppliers must certify in writing that the stock has actually been grown under Zone 5 or harder conditions. Plants not so certified will not be accepted.
- E. The root system of each shall be well provided with fibrous roots. All parts to be moist and show active green cambium when cut. They to be sound, healthy and vigorous, well branched, and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae.
- F. All plants must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated eight-ounce burlap, firmly held in place by a stout cord or wire. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous and root feeding system necessary for the healthy development of the plant. No plant to be accepted when the ball of earth surrounding its roots has been badly cracked or broken prior to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and rootballs to remain intact during all operations. All plants that cannot be planted at once must be heeled in by setting in the ground and covering the rootballs with soil and then watering them.
- G. Take caliper measurement six inches above ground for deciduous trees. Evergreen trees to be of specified height with spread in proportion to height, as designated in A.A.II. U.S.A. STANDARD FOR NURSERY STOCK, latest edition, and to be well branched to the ground. The trunk of each tree to be a single trunk, unless listed as multi-stemmed in the plant list, growing from a single crown of roots. No part of the trunk to be conspicuously crooked as compared with normal trees of the same variety. The trunk to be free from sun scald, frost cracks, or wounds resulting from abrasions, fire, or other causes. No pruning wounds to be present having a diameter exceeding two inches and such wounds must show vigorous bark on all edges. Plants shall not be pruned prior to delivery. Pruning wounds over 3/4" in diameter must be completely callused over. Evergreen trees shall be branched to within one foot of the ground.
- H. At least 50% of the plants furnished for each size range shown on the plants to be at or above the average between the maximum and minimum size specified. If a nursery supplies material at a specific size (not a range), then the larger size of the specified range to be furnished.
- I. Plants delivered by truck and plants requiring storage on site to be properly wrapped and covered to prevent wind-drying and desiccation of branches, leaves or buds. Plant balls should be firmly bound, unbroken and reasonably moist to indicate watering prior to delivery and during storage. Tree trunks should be free from fresh scars and damage in handling. No trees with double-leaders or twin-heads to be accepted without the written approval of the Owners Representative. The CONTRACTOR to reject such plants at time of delivery by the nursery/supplier unless such plants were selected by the Owners Representative as indicated by tags and seals. No plant material from cold storage will be accepted unless pre-selected by the Owners Representative.



- J. Plant material which is to be planted after the specified seasons for planting shall be dug during the normal season for digging of the particular plant material and be stored and maintained in good health until planting. The CONTRACTOR shall assume all costs for maintaining plant material while it is being stored.
- K. All plants to be free from plant diseases and insect pests, and to comply with all applicable State and Federal laws with respect to inspection for plant diseases and infestations.
- L. All plant materials shall be available for inspection in the nursery or collecting fields before it is dug. The CONTRACTOR to provide a list of suppliers in sufficient time to allow the Owners Representative to inspect nurseries on a timely basis. Approval to move nursery Materials shall not be considered as final acceptance.
- M. All planting stock to conform to the laws of The State of Maine and to be inspected before removal from the nursery, by authorized Federal, State or other authorities as may be required in the area where the nursery is located. The invoice or order for each shipment of plants to contain the project name and quantity and variety of plant material delivered. An inspection certificate to certify that the plants are free of disease and insect pests of all kinds shall accompany each shipment. Disease certificates and delivery slips to be given to the Owners Representative upon arrival of the plant material at the point of delivery.
- N. Plants to be dug with care and skill. Special precautions to be taken to avoid any unnecessary injury to or removal of fibrous roots. Each species or variety to be handled and packed in the approved manner for that particular plant. All precautions to be taken to insure the arrival of plants at the project site in good condition for successful growth.
- O. Balled and Burlapped Plants Rootball: Firm and composed of the original, undisturbed soil in which the plant has been grown. The plant shall be handled in such a manner that the soil in the ball will not drop away from the roots and will not cause stripping of the small, fibrous roots. The ball shall be wrapped with burlap or other approved material and tightly laced to hold the desired shape. No balled plants will be accepted if the ball is cracked or broken. A substitute for burlap may be approved provided it can be demonstrated that the material is tight enough to retain the soil ball securely. Any synthetic material used to wrap the rootball, which will not readily disintegrate in the ground, shall be removed or extensively cut to allow the roots to grow through freely.
- P. Container Grown Plants: Well established in the container in which they are sold, and shall have sufficient roots to hold earth intact after removal, without being in a root bound condition. Plant shall remain in container until planted.
- Q. Shrubs and Small Plants: All shrubs and small plants, unless otherwise designated, shall be well-formed and bushy with well-spaced side branches, and shall have a crown and stem(s) typical of the species and variety.
- R. All soil in rootballs, containers, bare root stock and native sods shall be free from weeds, non native seeds and non native or noxious insects.

- S. Requests for plant substitutions shall be made at least 14 days before the plants are to be delivered and such requests shall list at least 5 major nursery sources contacted for confirmation of unavailability.
- T. The CONTRACTOR to notify the Owners Representative not less than 5 days in advance of delivery of plants.

## 2.3 TREE STAKING

- A. Stakes: Sound cedar, fir or other suitable wood 2" x 2" or 2" x 4", as required, pointed at one end and stained at the discretion of the Owners Representative. Tree anchors, if required, to be malleable iron, "Universal Ground Anchor" or approved equal.
- B. Tree-stake webbing: Consist of ¾" wide polypropylene with a 900 lb. Breaking strength. Color: olive drab or black as manufactured by Eaton Brothers Corporation, PO Box 68, Hamburg NY 14875. or "ADJ-A-TYE" heavy-duty poly chain lock, color: olive drab or black, as distributed by A.M. Leonard Inc, 241 Fox Drive, Piqua OH 45356-0816. or approved equal.

## 2.4 WATERING

- A. The Owner will furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owner's water supply is not available or not functioning, the Contractor will be held responsible to furnish adequate supplies at his own cost. All injured or damaged plant material due to the lack of water, or the use of too much water, to be the Contractor's responsibility to correct. Water to be free from impurities injurious to vegetation. Contractor to supply their own hoses and sprinklers.

## 2.5 ANTI-DESICCANT

- A. Anti-desiccant: Provide a natural product for the purpose of preventing desiccation to plant material derived from the resin of the pine tree which is called a polyterpene polymer or more specifically a beta-pinene polymer which is a film forming short chain of polymer component. Anti-desiccant to contain two sub-units in the polymer for a molecular weight of 275. Anti-desiccant to be non-toxic and suitable for food crops. Potential manufacturer:
  1. "Wilt-Pruf", available from Nursery Specialty Products, Inc., New York, NY, or approved equal, delivered in the manufacturer's container and used according to the manufacturer's instructions and per Owners Representative's approval.

## 2.6 MULCH

- A. Mulch: Consist of the outer bark of evergreen trees and a minimum of hardwood bark, and shall be aged for a period of at least 6 months, and not longer than 2 years. The bark must be

partially decomposed and dark brown in color, free of dirt and materials deleterious to plant life. No chunks 3 inches or more in size, and thicker than 1/4 inch shall be left on the site.

## 2.7 TREE WOUND DRESSING

- A. Tree Wound Dressing: Non-toxic product for aesthetic purposes only specifically designed for tree wounds.

## 2.8 METAL WIRE FENCING FOR PLANT PROTECTION

- A. Metal wire fencing for plant protection: 14 ga. Galvanized 1 inch by 1 inch square openings Wire fencing. Fencing to be 24" above ground (minimum) with 4 inches buried into the ground. Provide a 12" tall by 1 inch by 1 inch square openings fencing firmly secured to the top of the 24" ht. Fence at a 60 degree angle to the outside of the fenced area. Secure fence with hardwood stakes 4 feet O.C. as approved by the Owners Representative. Exact layout of fencing to be determined on site immediately after planting to protect material from porcupine damage.

## EXECUTION

### EXAMINATION

Examine site conditions and other conditions affecting performance of the Work. Insure the sub-grade is properly graded and at correct levels prior to spreading of topsoil, or if the topsoil has been spread, is at the proper depths and finish grades.

Examine specified materials before installation. Reject plant materials that are damaged or otherwise not as specified and shown on the Drawings. Reject soil amendments that are wet, moisture damaged, or mold damaged.

Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Owners Representative.

### PLANTING

Planting of any plant material includes: Coordination with the nursery, shipment from the nursery, the digging of the holes, provision of the soil additives and loam, furnishing the plants of specified size with roots in the specified manner, the labor of planting and mulching and guying and staking where called for, and the removal of all excess or debris material created as a result of the work.

- B. Coordination with Existing Conditions: Prior to excavating for any plants, and before installation of location stakes, the CONTRACTOR shall review all existing conditions below grade. Underground obstructions may exist in the form of project-installed improvements and/or pre-existing conditions. The CONTRACTOR to be liable for any damages resulting from his failure to ascertain subsurface conditions before proceeding with the work.

### PLANTINGS

C. Planting:

1. Location for all plants to be staked on the ground by the CONTRACTOR for approval by the Owners Representative before any plant pits are dug. The CONTRACTOR shall move stakes as necessary to obtain the Owners Representative's approval. Once the staking is approved and all the trees have arrived, the CONTRACTOR to place all the trees at the staked locations for the Owners Representative's secondary approval. The CONTRACTOR shall move trees as required by the Owners Representative. Then each plant location to be marked by outlining the rootball with a light application of lime. At this point the CONTRACTOR to begin excavating the planting pits. Once all the trees are placed in the planting pits, the Owners Representative to make a final inspection of the pits. Before beginning any backfilling, the CONTRACTOR shall, if necessary, rotate plants and/or correct plant pits as required by the Owners Representative. Once final approval has been given by the Owners Representative, the CONTRACTOR can proceed with the backfilling.
2. At least ten (10) days prior to the expected planting date, the CONTRACTOR shall request, in writing, that the Owners Representative provide a representative to select and tag stock to be planted under this Section. The CONTRACTOR shall pay for transportation and overnight accommodations, if necessary, for the Owners Representative's representative during the period of time required to select and tag the plant material.
3. Plants to be selected by the Owners Representative's representative at the place of growth for conformity to specification requirements as to quality, size, and variety. Such approval to not impair the right of inspection and rejection upon delivery at the site or during the progress of the work. Cost of replacement to be borne by the CONTRACTOR.
4. Delivery and Temporary Storage: Plants shall be delivered in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries. Insofar as is practical, plant material shall be planted on the day of delivery. All unplanted material shall be protected at all times from sun and drying winds. Plants that are not planted immediately shall have their root balls well watered and covered with approved mulching materials. No plants shall remain unplanted for longer than 3 days. Plants shall not be bound with wire or rope at any time so as to damage bark, break branches, or cause any injury.
5. Planting Dates: Unless otherwise specified, planting shall be done after the frost leaves the ground until July 1, and from September 15 to November 1.
6. Maintain at all times during the planting operations one or more stockpiles of approved planting mix.
5. Plant pits to be excavated with vertical sides. Holes for trees to be at least two feet greater in diameter than the ball and one foot deeper than the ball.

6. Loam, organic material and fertilizer mix for use as planting mix shall be thoroughly premixed in the following proportions unless directed otherwise:
    - a. one cubic yard of accepted loam
    - b. 2 to 3 cubic feet of well rotted cow manure
    - c. 4 cubic feet of sphagnum peat moss
    - d. 10 pounds of fertilizer (minimum 35% water insoluble (WIN))
    - e. 12 pounds of dolomitic limestone.
  7. All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation and through final planting. The plants shall be planted in the center of the holes and at the same depth as they previously grew. Remove burlap, rope, from sides and tops of root balls. Do not pull burlap out from under root balls. If a wire basket is present, cut and remove all wire keeping the rootball intact. Cleanly cut off broken or frayed roots. Backfill topsoil in layers of not more than 6 inches and water each layer sufficiently before the next layer is placed. Use enough backfill material to bring the surface to finished grade when settled. Form a saucer around each tree to a height of 4 inches.
  8. Shrub, perennial and groundcover beds: Score and spread roots on container grown plants on 4 equal areas on sides of roots/soil, scarify and spread roots on bottom of plant. Dig to a depth of one foot (1') below final grade or as shown on the drawings. Supply sufficient planting soil mix to provide one foot (1') deep beds. Water thoroughly after planting.
- D. All plants to be flooded with water twice within the first 24 hours of the time of planting and all plants during the maintenance period to be watered at least once per day. At each watering the soil around each tree or shrub to be thoroughly saturated. If sufficient moisture is retained in the soil, as determined by the Owners Representative, the required watering may be reduced. Trees will require a minimum of ten gallons of water each.
  - E. Mulch material to be placed over entire saucer areas of individual trees to a depth of two inches, not later than one week after planting. No mulch shall be placed within 2" of the trunk. No mulch to be applied prior to the first watering of plant materials.
  - F. Pruning: Prune plant material after the plant has been completely planted. Make all large pruning cuts, 1/2 inch diameter and larger on the trunk and main stem, so as not to interfere with the branch collar. Make all pruning cuts less than 1/4 inch diameter with a sharp pair of hand pruners as close to the main stem as possible without damaging the cambium or bud. Remove all sucker growth, water sprouts, crossing or rubbing branches, dead or dying limbs and tips, broken branches, diseased or insect infested limbs and crotches to prevent storm damage. Questionable weak limb and branch removal that may disfigure the tree or shrub should be left for final approval by the Owners Representative. Pinaceae species transplanted during the candle stage should have candles reduced from 1/2 to 2/3 inch. Treatment of all cuts and wounds with a non-toxic tree wound dressing is optional. Never cut a leader.

- G. Apply Anti-desiccant to all plants prior to being dug at the nursery and/or as directed by the Owners Representative once the plants have been delivered to the site.
- H. If planting is done after lawn preparation or installation, proper protection of lawn areas shall be provided and any damage resulting from planting operations shall be repaired immediately at no cost to the OWNER.
- I. In the event that underground construction work, rock or obstructions are encountered in any plant pit or bed excavation work to be done under this Contract, alternate locations may be selected by the Owners Representative.
- J. Absolutely no debris may be left on site. Excavated material shall be removed as directed by the Owners Representative. Repair any damage to the site or structures to restore them to their original condition as directed by the Owners Representative, at no cost to the OWNER.

#### FERTILIZATION

- Initial fertilization to consist of the use of dry fertilizer, water-soluble fertilizer or a combination of both.
- B. When not included in the planting mix, dry fertilizer, including fertilizer for acid-loving plants, shall be uniformly spread about the plants at the following rate:
    - 1. Trees: 1-1/2 pounds per inch of caliper.
  - C. Water-soluble fertilizer to be dissolved in water at 2 times the rate recommended by the manufacturer. The thoroughly mixed solution to be applied at the time of initial planting after the water used for back fill soaking has leached away. Care to be taken to prevent any water from washing plant saucers away either during the original watering or while applying water-soluble fertilizer.
  - D. The fertilizer solution to be applied at the following rates:
    - 1. Plants above 6 feet and up to 12 feet to receive 12 quarts
    - 2. Plants above 12 feet to receive 16 quarts.
  - E. Unless otherwise approved, re-fertilization to be by a water-soluble fertilizer applied in conjunction with watering or by itself. No re-fertilization will be allowed between September 20 and plant dormancy and between frozen ground and March 21.
  - F. All plants to be fertilized at least once between April 1 and October 15 with water-soluble fertilizer mixed and applied as herein specified or as directed when applied with a watering.

- G. When the CONTRACTOR's guarantee period extends Spring to Spring, all plants shall receive an additional application of fertilizer in the spring prior to final acceptance.

## MAINTENANCE

Maintenance shall begin immediately after each plant is planted and shall continue in accordance with the following requirements:

- All plants shall be watered at least once per day during the maintenance period. At each watering, the soil around each tree or shrub shall be thoroughly saturated. If sufficient moisture is retained in the soil, as directed by the Owners Representative, the required watering may be reduced. Trees will require a minimum of ten gallons of water each.
2. All plants shall remain plumb. Any plants that settle out of plumb shall be promptly reset.
  3. Individual plant pits shall be kept free of weeds and mulch and shall be replaced as required to maintain a 2" layer of mulch. Individual pits to be neat in appearance and maintained to the lines originally laid out.
  4. Contractor: Replace all plants that die during the maintenance period as directed by the Owners Representative.
  5. Acts of vandalism, vehicle accidents or fire, if unrelated to construction operations and which cause damage in excess of five trees in one location, will be reasons for consideration of extra payment for approved replacement. Excessive damage due to heavy insect infestations, if all reasonable precautions are taken by the CONTRACTOR, will also be reason for consideration of extra payment for approved replacements.
  6. Spraying for both insect pests and diseases shall be included during the maintenance period as required and as directed by the Owners Representative.
  7. The Owners Representative may order or the CONTRACTOR may request the use of a suitable insecticide or fungicide when it is determined that infestations of insects or plant disease require the use of such material. No pesticides, insecticides or fungicides may be used without the expressed written permission of the Owners Representative.
- B. All herbicides, insecticides, and fungicides to be applied as prescribed by their manufacturer and in accordance with National Park Service, State of Maine, and any local laws. The CONTRACTOR to either possess from the State of Maine the proper registrations and permits for application of such materials or have the applications made by an approved, qualified firm holding such registrations and permits. Copies of all permits in connection with such materials to be furnished to the Owner. No pesticides, insecticides or fungicides may be used without the expressed written permission of the Owners Representative.

- C. Keep clean sidewalks and other paved areas during the planting and maintenance operations.

Maintenance shall consist of keeping the plants in a healthy growing condition, including watering, weeding, cultivating, re-mulching, removal of dead material, resetting plants plumb and to proper grades and maintaining the planting saucer.

If a substantial number of plants are sickly and dead at the time of inspection for punch-out list items, acceptance will not be granted, and it is the contractor's responsibility for maintenance of all the plants to be extended until replacements are made. All dead and unsatisfactory plants to be promptly removed from the project. Replacements to conform in all respects to the specifications for new plants and to be planted in the same manner.

### 3.5 STANDARDS FOR COMPLETION

#### A. Conditions for Completion:

1. Each plant to show at least 90% healthy growth and to have the natural character of a plant of its species in accordance with the American Nurseryman's Association Standards. The plants will be replaced live during the normal planting season, until the plants live through one year. Contractor: Promptly notify the Owners Representative of any removals and/or replacements.

#### B. Inspection and Completion:

1. Upon request of the Contractor in writing, The Owners Representative to inspect the plant material to determine completion of Contract work. The request must be submitted at least 10 days prior to the anticipated inspection date.
2. If the planting are deemed complete to the Owners Representative, a meeting will be arranged with Contractor and Owner to review the planting work. A final inspection is a part of this meeting to insure completion and any punch list items.

#### C. Cleanup:

1. Contractor: Following the completion of planting operations, immediately remove from the site all materials and equipment not required for any other planting or maintenance work. Store materials and equipment remaining on site in locations which do not interfere with the Owner's maintenance of completed planting or other construction operations.
2. The Contractor is responsible for keeping all paving, building surfaces, signs, posts, and all site improvements clean during planting operations. Clean up spills etc. immediately. Completion of the Work shall not be granted until this condition is met.

END OF SECTION

PLANTINGS



## CAST-IN-PLACE CONCRETE

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts GENERAL SPECIFICATIONS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.

#### 1.02 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to furnish and install cast-inplace concrete as indicated on the Contract Documents and as specified, including but not limited to the following:
  - 1. Furnishing, placing, curing and finishing of all cast-in-place concrete work for footings.
  - 2. Furnishing and placing of reinforcing steel and related accessories.
  - 3. Furnishing, erection and removal of formwork and shoring.
  - 4. Concrete mix design.
  - 5. Coordination with all other trades for location of all electrical boxes and conduits and other devices required by other trades.
  - 6. Finishing of exposed concrete surfaces as herein specified.
  - 7. Installation of anchor bolts, keys, dowels, inserts, etc. furnished by other trades.

#### 1.03 RELATED REQUIREMENTS

- A. The following items of related work are specified and included in other Sections of the Specifications:
  - 1. SITE IMPROVEMENTS

#### 1.04 REFERENCE SPECIFICATIONS

- 1 American Society for Testing and Materials (ASTM): Listed Standards.
- 2 American Concrete Institute (ACI): Listed Standards.

ACI 211.1 Recommended Practice for Selecting Proportions for Normal and Heavyweights  
 ACI 214 Recommended Practice for Evaluation of Compression Test Results  
 of Field Concrete ACI 301 Specifications for Structural Concrete for Buildings  
 ACI 304 Recommended Practice for Measuring, Mixing, Transporting and  
 Placing Concrete ACI 305 Recommended Practice for Hot Weather  
 Concreting ACI 306 Recommended Practice for Cold Weather Concreting ACI 309  
 Consolidation of Concrete ACI 311 Recommended Practice for Concrete Inspection ACI  
 315 Recommended Practice for Detailing Reinforced Concrete  
 Structures ACI 318 Building Code Requirements for Reinforced Concrete ACI  
 247 Recommended Practice for Concrete Formwork CRSI Reinforced Concrete -A Manual  
 of Standard Practice CRSI Recommended Practice for Placing Reinforcing Bars CRSI  
 Recommended Practice for Placing Bar Supports AWS D1.4 Structural Welding Code -  
 Reinforcing Steel

#### 1.05 SUBMITTALS

- A. Submit shop and erection drawings for reinforcing steel and manufacturer's data for other products for Engineer's approval.
- B. Provide shop drawings for fabricating and placing reinforcing steel. Show all required information for cutting, bending and placing reinforcing bars, and show all accessories and support bars on placing drawings. Indicate suitable marks for placing bars.
- C. Fabrication of any material or performing of any work prior to the final approval of the shop drawings will be entirely at the risk of the Contractor.
- D. The Contractor is responsible for furnishing and installing materials called for in the Contract Documents, even though these materials may have been omitted from approved shop drawings.
- E. Before being submitted to the Engineer, all shop drawings shall be properly checked and coordinated by the Fabricator and by the Contractor and shall be stamped and signed accordingly. Drawings not complying with these requirements will be returned unchecked and stamped, "Not Accepted."

#### 1.06 TESTING, CONTROL AND INSPECTION

- A. The Contractor shall retain the services of a qualified independent testing agency, approved by the Engineer, to test aggregate and to prepare a mix design for each strength of concrete specified; and shall submit such mix designs and test results to the Engineer for approval. Mix designs may also be based on proven current designs accompanied by test results. The costs of all such preliminary services shall be borne by the Contractor. All other testing and inspection will be performed by the Owner's testing agency.

- B. A qualified testing agency approved by the Engineer for other testing and inspection will be selected by and be paid by the Owner.
1. Concrete test cylinder sets shall be taken for each 150 cubic yards of concrete placed, but at least one set for each day of concrete placements.
  2. Reinforcing steel shall be inspected by grade, condition and positioning prior to each concrete placement.
  3. Any non-conformance with these Specifications shall be brought to the attention of the Contractor for correction prior to concrete placement.
- C. Cooperate fully with the testing agency's work in taking and storing samples. Provide storage facilities for concrete cylinders at the site. Facilities must protect cylinders from effects of low or high temperatures.
- D. Accept as final results of tests made by the qualified professional testing organization engaged by the Owner.
- E. Testing required because of changes requested by the Contractor in materials, sources of materials, or mix proportions; and extra testing of concrete or materials because of failure to meet the Specification requirements are to be paid for by the Contractor.
- F. Advise the Testing Agency of intent to place concrete by notification at least 24 hours prior to time of placement.
- G. All materials, measuring, mixing, transportation, placing and curing shall be subject to inspection by the Engineer or by the Testing Agency. However, such inspection, wherever conducted, shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements, nor shall inspector's acceptance of material or workmanship prevent later rejection of same by the Owner or Engineer if defects are discovered. Structural tests and inspections shall comply with Chapter 17 of the 1999 BOCA Code.

#### 1.07 NOTIFICATION OF RELATED TRADES

- A. Notify all other trades responsible for installing chases, inserts, sleeves, anchors, etc., when ready for such installation, and for final checking immediately before concrete is placed.
- B. Cooperate with such trades to obtain proper installation.
- C. Leave openings in walls for pipes, ducts, etc., for mechanical and electrical work as shown on Drawings or as required by layout of mechanical systems. Layout and reinforcing of openings not specifically shown on the Structural Drawings shall be submitted to the Engineer for review prior to execution.

## 1.08 EXAMINATION OF SITE AND DOCUMENTS

A. The Contractor shall carefully examine the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions as indicated in the Contract Documents, or obvious from observations from the site.

B. Examine Contract Documents, surveys, measurements and dimensions during the bid period. Any discrepancies, errors or omissions shall be brought to the attention of the Engineer prior to submission of a bid.

## 1.09 PERMITS AND CODES

A. Comply with the local, state and federal rules, regulations, laws and ordinances, and of all other authorities having jurisdiction. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

## PART 2 MATERIALS

### 2.01 CONCRETE

A. Portland Cement: Low alkali ASTM C-150 Type I at all exposed concrete. Type I and II elsewhere. All cement of each type shall be from a single source.

B. Natural Aggregates:

1. Fine Aggregates for Concrete: Shall be natural sand consisting of clean, hard, durable, uncoated particles, conforming to ASTM C33. Organic content shall be determined according to ASTM C40, and supernatant liquid above test sample shall show color no darker than reference standard color solution prepared at same time. Allow no frozen or partially frozen aggregate in the mix.
2. Coarse Aggregate for Concrete: For regular weight concrete use crushed stone or gravel from approved source conforming to ASTM C33. Coarse aggregate shall not contain greater amounts of deleterious materials than specified in Table III, ASTM C33.

C. Water from approved source, potable, clean, and free of oils, salt, alkali, organic matter and other deleterious material.

D. Admixtures:

1. Water Reducing Agent ASTM C494, Type A: "WRDA" by W.R. Grace Co., or equal approved by the Engineer. Water-reducing agent must be by same manufacturer as air-entraining agent.
2. Air-entraining agent ASTM C260: "Darex" by W.R. Grace Co., or equal approved by the Engineer. Air-entraining agent must be by same manufacturer as water-reducing agent.
3. Other admixtures may be used, but only with the written approval of the Engineer.

E. Concrete Reinforcement:

1. All reinforcing steel shall conform to ASTM Specification A-615 Grade 60, deformed bars.
2. Bar supports, metal accessories and other devices necessary for proper assembly of concrete reinforcing shall be of standardized factory-made wire bar supports. All bar supports in exposed concrete shall have plastic tips to prevent rust spots on exposed surfaces. Wire for tying shall be 18 gauge black annealed wire conforming to ASTM Specification A-82.
3. Welded wire fabric shall conform to the requirements of ASTM A185.
4. Reinforcing Mesh shall be new deformed wire fabric conforming to ASTM A 496 and A 497.

F. Formwork:

1. Forms: Except for exposed surfaces, formwork material shall be exterior "plyform" Class 1, B-B or as approved by the Engineer, not less than 5/8 in. thick. For all exposed surfaces plywood forms shall be plastic coated. Provide suitable form inserts for reglets, rustication joints and champhers as required on the Engineer's Drawings.
2. Form Oil: Oil shall be of a non-staining type, specifically manufactured for concrete forms.
3. Form Ties: Except for exposed surfaces, factory-fabricated, removable or snap back, of approved design. Wire shall be at least 1-1/2 in. back from surfaces. For all exposed concrete work forms shall be tied in such a way that no evidence of ties is visible on the finished surfaces.

- G. Non-Shrink Grout: Shall be "Embeco 153" by Master Builders, "SonogROUT" by Sonneborn Building Products, "Five Star Grout" by U.S. Grout Corporation, or equal approved by the Engineer.

H. Patching Compound: Shall be "SIKATOP 122" by Sika Corporation, "DARAWELD-C" by W.R. Grace., or equal approved by the Engineer.

I. Chemical surface sealer/hardener for concrete shall be Horne Clear Seal by A.C. Horn Company, Kure-N-Seal by Sonneborn Building Products, Division of Contech Inc., or approved equal chlorinated rubber base material at 22% solids. The material shall be applied both in accordance with the Manufacturer's recommendations for a curing compound on the wet concrete and as a hardener on fully cured concrete just prior to the occupancy.

J. Concrete curing membranes shall be:

1. White polyethylene sheeting 4 mils thick, ASTM C171; or
2. Waterproof paper, Sisalkraft Type, ASTM C171-69; or
3. Moisture curing shall be performed as specified in ACI 301 paragraph 12.2.1.1

12.2.1.4. Liquid membrane curing compounds may be used, but only with the approval of the Engineer.

K. Concrete inserts shall be as required on the Drawings.

## 2.02 STORAGE OF MATERIALS

A. All materials shall be stored to prevent damage from the elements and other causes.

B. Cement and aggregates shall be stored in such a manner as to prevent deterioration or intrusion of foreign mater. Any materials which have deteriorated, or which have been damaged, shall not be used for concrete.

C. Store reinforcement steel on wood skids to protect it from weather, oil, earth and damage from trucking or other construction operations. Reinforcement shall be free from loose mill scale, rust, form oil, concrete splatter and other extraneous coatings at the time it is embedded in the concrete.

## 2.03 CONCRETE MIXES FOR CAST-IN-PLACE CONCRETE

A. Strength, cement and water requirements

Design Min.

4000 psi

This is total water in mix at time of placement, including free water of aggregates and liquid mixtures.

B. Air-entraining and water-reducing agents shall be used in all concrete in strict accordance with the manufacturer's printed instructions. Total air entrained in freshly-mixed concrete shall be 5.0% plus or minus 1.0% of volume of concrete, except slabs with metallic floor hardener shall contain 2.0% maximum, with required strengths maintained.

C. Slump of concrete: 4" +/-.

D. Premix admixtures in solution form and dispense as recommended by the manufacturer. Include the water in the solution in the design water content of the mixtures.

### PART 3 EXECUTION

#### 3.01 FORMING FOR CAST-IN-PLACE CONCRETE

A. ACI 301, latest edition, "Specifications for Structural Concrete for Buildings", Chapter 4 -Formwork, is hereby made a part of this Specification.

B. Forms shall be constructed to conform to shapes, lines, and dimensions shown, plumb and straight, and shall be maintained sufficiently rigid to prevent deformation under load. Forms shall be sufficiently tight to prevent the leakage of grout. Securely brace and shore forms to prevent the leakage of grout. Securely brace and shore forms to prevent their displacement and to safely support the construction loads.

C. Treat forms with a form release agent applied according to the manufacturer's instructions, by roller, brush or spray to produce a uniform thin film without bubbles or streaks. Apply the release agent in two coats for the first use of the form and in one coat for each additional use.

D. ACI-301, latest edition, Section 13.3 -Forms, is also hereby made a part of this Specification.

E. Openings for Items Passing Through Concrete: Contractor shall establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections. Contractor shall be held responsible for proper coordination of all work of this nature in order that there will be no unnecessary cutting and patching of concrete. Any cutting and repairing to concrete required as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

#### 3.02 MIXING PROCESS FOR CAST-IN-PLACE CONCRETE

A. Ready-mixed concrete shall be mixed and transported in accordance with Specification for Ready Mixed Concrete" ASTM C94, Alt No. 3 and ACI STANDARD 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".

### 3.03 REINFORCING FOR CAST-IN-PLACE CONCRETE

A. ACI 301, latest edition, "Specification for Structural Concrete for Buildings," Chapter 5 Reinforcement, is hereby made a part of this Section.

### 3.04 EMBEDDED ITEMS FOR CAST-IN-PLACE CONCRETE

A. Coordinate the installation of all inserts required by other trades. Such inserts normally are to be in place prior to the placing of reinforcing steel.

B. Place all required anchor bolts, anchor plates and dowels.

C. ACI 301, latest edition, "Specification for Structural Concrete for Buildings", Sections 6.4 and 6.5, are hereby made a part of this Specification.

### 3.05 JOINTS FOR CAST-IN-PLACE CONCRETE

A. ACI 301, latest edition, "Specifications for Structural Concrete for Buildings", Sections 6.1, 6.2 and 6.3 are hereby made a part of this Specification.

B. Construction joints shall be formed with keyed bulkheads.

C. Control joints shall be as shown on the Drawings.

D. Construction Joints

1. Construction joints shall be placed a maximum of 40 feet apart, except in concrete edge for wet play surfacing where construction joints shall be placed a maximum of 5 feet apart. The Contractor shall prepare a placing plan for location of construction joints and submit it to the Engineer for approval. Locate and install construction joints so they do not impair strength or appearance of the structure. 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, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete. Place construction joints perpendicular to main reinforcement or face of edging. Continue reinforcement across construction joints except as indicated otherwise. Forms shall be re-tightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.

### 3.06 PLACING OF CAST-IN-PLACE CONCRETE

A. Notify the Engineer at least 48 hours prior to each placement.

B. Do not place concrete until reinforcing steel, inserts, sleeves and other work to be built into the concrete have been inspected and approved by the Engineer or the Engineer and by all other trades concerned.



C. In hot weather, all concreting shall be done in accordance with ACI 305, "Recommended Practice for Hot Weather Concreting".

1. When temperature rises above 70 degrees Fahrenheit, all surfaces of concrete shall be protected against rapid drying.
2. Concrete delivered to the forms shall have a temperature of not over 90 degrees Fahrenheit.
3. The temperature of the forms shall be not over 90 degrees Fahrenheit.

D. In cold weather, all concreting shall be done in accordance with ACI 306, "Recommended Practice for Cold Weather Concreting".

1. When the average daily temperature falls below 40 degrees Fahrenheit, all surfaces of concrete shall be maintained at a temperature of at least 50 degrees Fahrenheit, and not over 90 degrees Fahrenheit, for seven (7) days.
2. Concrete delivered to the forms shall have a temperature of at least 60 degrees Fahrenheit, and not over 90 degrees Fahrenheit.
3. The temperature of the forms shall be at least 40 degrees Fahrenheit.
4. The Contractor shall maintain a record of temperature of the concrete at the most exposed surfaces of each placement at the beginning and at the end of each day of the curing period, which record shall be available to the Engineer.

E. Conveying: Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is retained.

F. Depositing: Delivery and placement of concrete shall be programmed so that the time lapse between batching and placement shall not exceed 1-1/2 hours. Concrete shall not be allowed a free fall of over 4 feet. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing.

G. Concrete shall be deposited continuously, in horizontal layers of such thickness (not deeper than 18 inches) that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. Placing shall be carried out at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or which has been contaminated by foreign materials shall not be deposited.

H. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.

1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
3. Maintain reinforcing in proper position on chairs during concrete placement.

I. Concrete shall be compacted thoroughly by vibrating to produce a dense, homogeneous mass without voids or pockets. Vibrators should be placed in concrete so as to penetrate approximately 3 inches to 4 inches into the preceding lift so as to blend the two layers. Vibrating Techniques must assure that, when the coarse aggregate reaches the form, it stops and the matrix fills the voids.

J. The Contractor shall become familiar with ACI-303R-04, regarding Placing and Consolidation of Concrete. All applicable recommendations shall be followed.

K. Patching: Areas to be patched shall not exceed 1.5 square feet for each 1000 squares of surface area. Surface preparation and application of the patching compound specified in item 2.I shall be in strict accordance with the manufacturer's written directions. Patches shall match in every respect the color and texture of the surrounding surfaces. Mix formulation shall be determined by trial to obtain a color match when both the patch and surrounding concrete are cured and dry. After initial set, surfaces of patches shall be textured manually to obtain a match with the surrounding surfaces. All patches are subject to Engineer's final acceptance as to appearance and quality. At holes formed by withdrawal of ends of steel snap-ties, wet and pack solid with patching mortar. Smooth out projections and fins with wet carborundum stones or power grinders. All voids, honeycombs and air pockets shall be patched. The Contractor shall make every reasonable effort to avoid voids, honeycombs and air pockets.

L. Concrete surfaces exposed to view and as directed by the Engineer shall receive a smooth rubbed finish. Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

### 3.07 FINISHING FORMED SURFACES

#### A. Concrete Finish Schedule

##### 1. Exposed Horizontal Surfaces

- a. Exposed horizontal concrete surfaces subject to pedestrian foot traffic shall receive a non-slip broom finish after troweling.

## 2. Hidden Vertical Surfaces

- a. Hidden vertical surfaces shall be rough-formed.

### B. Definitions

1. Non-slip Broom Finish: Apply a non-slip broom finish to concrete edging at wet play surfacing subject to pedestrian traffic and elsewhere as indicated.
  - a. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route  
Coordinate required final finish with the Engineer before application.
- C. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 0.25 inch (6 mm) in height rubbed down or chipped off. Clean and dampen tie-holes and fill solid with patching material immediately after form removal

## 3.08 CURING AND PROTECTION

- A. Protect newly placed concrete against low and high temperature effects and against rapid loss of moisture. Moist cure all concrete for at least seven days at a temperature of at least 50 degrees F. by curing methods approved by the Engineer.
- B. For vertical or near-vertical surfaces, moist cure by keeping the form in contact with the concrete, or by other effective means approved by the Engineer. Intermittent wetting and drying does not provide acceptable curing.
- C. Cure slabs by covering with sisal or other waterproof curing paper conforming to ASTM Specifications C 171, lapped 4 inches at edges and sealed with tape at least 3 inches wide. The paper shall be weighted to prevent displacement, and holes or tears shall be immediately repaired.
- D. The Contractor may submit for the approval of the Engineer alternative methods of curing non-exposed concrete surfaces. Approval of alternatives shall not relieve the Contractor of his responsibility for the proper curing of all concrete.
- E. In hot weather, be adequately prepared to protect the concrete from the adverse influence of heat before the placement of any concrete. Take special precautions to avoid cracking of the concrete from rapid drying during placement of concrete when air temperature exceeds 70 degrees F., particularly when the work is exposed to direct sunlight.
  1. Cool forms by fog sprayed with water or by protecting them from the direct rays of the sun.

2. If requested by the Contractor, and approved by the Engineer, a retardant may be used to delay the initial set of the mix. In cold weather, be adequately prepared to protect the concrete from the adverse influence of cold before placement of any concrete.
3. When the average daily temperature falls below 50 degrees Fahrenheit, take special precautions to assure adequate strength gain of the concrete.
4. When the average daily temperature falls below 40 degrees Fahrenheit, prepare concrete with heated materials such that the concrete delivered to the forms shall have a temperature of at least 60 degrees Fahrenheit, and not over 90 degrees Fahrenheit. Pre-warm the forms to at least 40 degrees Fahrenheit, to prevent the rapid cooling of the concrete by their contact; keep forms free of all ice and snow. When heated materials are being used, combine the water with the aggregate in the mixer and keep the resulting temperature below 90 degrees Fahrenheit before cement is added to the mix. Protect all concrete by the use of heated enclosures which must be sufficiently strong and windproof and within which adequate heaters are properly distributed to maintain all concrete at the required temperatures.

### 3.09 ACCEPTANCE

A. When the tests on control specimens of concrete fall below the required strength, the Engineer shall have the right to require, at the Contractor's expense, mix redesign, load tests and/or strengthening as directed, and/or removal and replacement of those parts of the structure in which such concrete was used.

### 3.10 CUTTING OF HOLES

A. Cut holes as required by other trades or due to renovation requirements in any cast-in-place, new or existing concrete which did not receive sleeves. Use a core drilling process or sawing process which produces clean sharp edges and the minimum hole size which accommodates the piping, conduit, or equipment requiring the opening. Locations of holes and payment for this work will be by other trades. Obtain approval of Engineer before cutting any holes for any trades.

### 3.11 EPOXY BONDING

A. Where required, new concrete shall be bonded to hardened new concrete or existing concrete with Sika Armatex 110, or similar bonding agent, in accordance with the adhesive manufacturer's instructions.

### 3.12 CLEANING

A. The exposed faces of the cast-in-place concrete shall be cleaned of all stains, water marks, and leaked fines.

END OF SECTION

CAST IN PLACE CONCRETE

## STORM DRAINAGE STRUCTURES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Catch Basins
  - 2. Frames and Grates
- B. Related Sections
  - 1. Excavation
  - 2. Sanitary Sewer and Storm Drain Systems

#### 1.2 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM).
  - 1. ASTM A48-83 - Specification for Gray Iron Castings.
  - 2. ASTM C478-84 - Precast Reinforced Concrete Manhole Sections.
  - 3. ASTM C923-84 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

#### 1.3 SUBMITALS

- A. Manufacturer's Literature: Supply copies of descriptive literature and recommendations for installation.
- B. Certificates: Supply copies of manufacturer's certification that supplied products comply with specification requirements.

#### 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver products on manufacturer's original skids, or in original unopened protective packaging.
- B. Store materials to prevent physical damage.
- C. Protect material during transportation and installation to avoid physical damage.

#### 1.5 PROJECT RECORD DRAWINGS

- A. Submit documents under provisions of Section – Contract Close-out.
- B. Accurately record location of manholes, rim, and invert elevations of all incoming and outgoing pipes.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. PreCast Structures
  - 1. Precast concrete, conforming to ASTM Specification C478.
    - a. Minimum 28-day compressive strength of 4,000 psi, rated for H-20 loading.
  - 2. Eccentric cone section.
  - 3. Base and barrel sections: Circular components of minimum one (1) foot and maximum four (4) foot deep segments.
- B. Manhole Steps
  - 1. Copolymer polypropylene plastic coated steel or forged aluminum conforming to applicable safety requirements.
    - a. Steel: 1/2 inch diameter grade 60, minimum.
    - b. Aluminum: ALCOA No. 12653B or equal.
- C. Pipe-to-Manhole Joints
  - 1. Molded neoprene compound boot, conforming to ASTM Specification C923.
- D. Frames and Covers or Grates
  - 1. Gray iron conforming to ASTM Specification A48-83, Class 30B.
  - 2. Catch basins
    - a. Gray iron conforming to ASTM Specification A48-83, Class 30B.
    - b. Model 62057 with 62540 grate cascade style as distributed by E.J. Prescott or approved equal.
    - c. Rated for H-20 wheel loading.
  - 3. Catch basins
    - a. "Pedestrian friendly", longitudinal slope openings no wider than 1/2".
    - b. Model R-3210-Q as manufactured by Neenah Foundry, or equal.
- E. All iron and steel components, including reinforcing in precast structures must be in compliance with the American Iron and Steel Act of 2014.
- F. Sump
  - 1. Provide 2' sump in all drain manholes and catchbasins.
- G. Trap
  - 1. Provide a trap in all satellite catch basins as noted on plans or as directed by Engineer.

2. It is not necessary to install traps on large trunk drain lines if diameter of structure and pipe does not allow for installation provided traps are installed on all satellite structures.

3. Trap shall be "The Eliminator" as manufactured by Ground Water Rescue, Inc., or approved equal.

### PART 3 – EXECUTION

#### 3.1 EXAMINATION

A. Verify site conditions noting irregularities affecting work of this section.

B. Beginning of Work means acceptance of existing conditions.

#### 3.2 INSTALLATION

##### A. Structures

1. Establish pipe invert elevations for all incoming and outgoing pipes as indicated on Contract Drawings.

2. Place structures on compacted foundation of 3/4 inch crushed stone of not less than twelve (12) inches depth and not less than 8 inches wider than manhole base.

2. Install precast barrel sections to minimize use of precast rings for shimming frames and covers to finish grade.

a. In no case shall precast ring shimming exceed one foot in height.

3. Excavation Drainage:

a. Provide temporary channels as required for water flowing along or across work site.

b. Pumped or drained water: Suitably disposed, causing no damage to adjacent property or interference with work.

c. In no case is drainage to be allowed through pipes being installed.

END OF SECTION

## SANITARY SEWER AND STORM DRAIN SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Sanitary Gravity Sewer Piping.
  - 2. Service Laterals and connection to existing lateral piping.
  - 3. Fittings
  - 4. Cleanouts
  - 5. Testing
  - 6. Abandoning Existing Sewer Mains in Place
- B. Related Sections:
  - 1. Excavation
  - 2. Sanitary Sewer and Storm Drain Systems

#### 1.2 REFERENCE STANDARDS

- A. ANSI/ASTM D3034 and/or ASTM F2736, ASTM F2764 - Sewer Pipe and Fittings.
- B. ASTM D3212 and/or ASTM F2736, ASTM F2764 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- C. ASTM 477 – Standard Specifications for Elastomeric Seals for joining plastic pipe.

#### 1.3 SUBMITTALS

- A. Product data for pipe, pipe accessories including documentation that products comply with specification requirements.
- B. Manufacturer's recommendations and instructions for installation.

#### 1.4 PROJECT RECORD DOCUMENTS

- 1. Documents for requirements of Contract Closeout including, but not limited to, warranties, testing, adjusting, spare parts, etc.
- 2. Accurately record location of pipe runs, connections, structures, and invert elevations.
- 3. Field measurements for locating ends of unconnected service laterals.
- 4. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.



## 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver products on manufacturer's original skids, or in original unopened protective packaging.
- B. Store materials to prevent physical damage.
- C. Protect material during transportation and installation to avoid physical damage.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. PVC Pipe - John Mansville, Extrusion Technologies, Inc. or approved equal.
- B. Gravity Couplings - Fernco. Inc., or manufacturer's recommendation, or approved equal.
- C. RCP – Old Castle Precast, or approved equal.
- D. HDPE Pipe - Hancor, ADS or approved equal.

### 2.2 GRAVITY SEWER PIPE MATERIALS

- A. Polyvinyl Chloride (PVC) Non-pressure Sewer Pipe, conforming to ASTM Specification D3034.
  - 1. Class: SDR 35.
  - 2. Joints: Flexible Elastomeric Seals conforming to ASTM Specifications D3212.
    - a. All joints to be an integral part of pipe bell.
  - 3. Polyvinyl Chloride Resin Compound: Conforming to ASTM 1784.
  - 4. Rubber gaskets for use with PVC pipe; ASTM D1869, all joints to be an integral part of pipe bell.
  - 5. Elastomeric polyvinyl chloride fittings and reducers with stainless steel straps; meeting the requirements of ASTM C443, C425, C564, and D1869.
- B. Reinforced Concrete (RCP) Non-pressure Sewer Pipe, conforming to ASTM Specification C-76, ASTM C-443, AASHTO M170.
  - 1. Wall thickness: 5.5"
  - 2. Joints: seamless watertight construction, interconnecting.

### 2.3 STORM DRAIN PIPE MATERIALS

- A. High Density Polyethylene (HDPE) Non-pressure drainage pipe, conforming to ASTM Specification D3350.
  - 1. Class: HDPE (Smoothbore)
  - 2. Design: SICPE (Smooth Interior Corrugated Polyethylene Pipe).

3. Joints: Pipe shall consist of a bell and spigot joint conforming to ASTM Specifications AASHTO M252 Type S, AASHTO M294 Type S. Joints shall be silt tight.
  4. Gaskets: Gaskets shall meet ASTM F477, and be an integral part of the pipe bell.
- B. High Density Polyethylene (HDPE) Non-pressure drainage pipe, conforming to Maine Department of Transportation Standard Specifications, latest edition Section 605-UNDERDRAINS.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Excavate test pits as necessary to verify locations and grades of existing utilities prior to beginning installation of sanitary sewer system.
- B. Verify that trench cut is ready to receive work, and excavations, locations, dimensions and elevations are as indicated on Drawings.
- C. Beginning of installation means acceptance of existing conditions.

#### 3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with 3/4" crushed stone.
- B. Remove large stones, debris, or other hard matter which could damage pipes or impede consistent bedding, backfilling or compaction.

#### 3.3 GRAVITY PIPE INSTALLATION

- A. Install pipes, fittings and accessories according to manufacturer's instructions.
- B. Place pipe on bedding in accordance with Section - Backfilling.
- C. Lay pipe to alignment, slope gradient and elevations noted on Drawings.
- D. Joints and joint material conforming to manufacturer's recommendations.
- E. Lay pipe without break, upgrade from structure to structure with bell end upstream.
- F. Install bedding at bottom, sides, and over top of pipe, to depths shown on Drawings.
- G. Install and bed pipe up to spring line; do not cover pipe without the presence of the Owner's representative.

1. Work backfilled without presence of Engineer shall be uncovered at Contractor's expense.
- H. Manually "chink" bedding around pipe haunches for lateral support.
  1. Do not mechanically compact crushed stone over flexible pipe.
- I. Cover pipe with bedding to depth shown on drawings.
- J. Place excavated material or select granular backfill over pipe, as directed by Engineer.
  1. Place material in maximum 12-inch lifts.
  2. Increase compaction of each successive lift.
  3. Do not displace or damage pipe during compaction.
- K. Backfill and secure each pipe length prior to installing next length.
- L. Continue backfill placement to finish grade level.
- M. Protect pipes against impact shocks and free falls.
  1. Remove and replace damaged pipe.
  2. Place and tamper sufficient bedding material over and around pipe to prevent damage and movement.
- N. Install a water tight plug in open pipe ends when pipe laying not in progress.

#### 3.4 SERVICE LATERALS

- A. Maintain sewer service laterals to buildings connected to existing sewer at all times during conduct of Work, unless otherwise instructed by Engineer.
  1. Make all necessary arrangements with property owners to assure no unnecessary disturbance or inconvenience of service resulting from Work.
- B. New sewer service laterals to consists of: wye, inserta-tee or approved equal where applicable, appropriate adapters, and sufficient pipe length to connect existing building laterals to new sewer.
  1. New piping to extend from sewer main to existing sewer service as shown on the plans, or as directed by the Engineer.
  2. Location of existing service laterals shown on plans are approximate. Contractor responsible for field verification of actual lateral locations.
- C. Prior to connecting new lateral pipe to existing services notify Engineer.
  1. Engineer to visually inspect condition of existing pipes.
  2. Engineer may stop construction on connections to dye test each service if existing pipe integrity or source is questionable.
- D. Cap, mark with witness stake, and take tie measurements to any service laterals not immediately connected to an existing pipe.

### 3.5 FIELD QUALITY CONTROL

- A. Examine pipes for defects, weak structural components, and deviations within allowable tolerances.
- B. Remove rejected materials from job site.
- C. Obtain Engineer Certification and installation conformance to specifications prior to backfilling.
- D. Install pipe to lines and grades shown on contract Drawings.
- E. Allowable Tolerances:
  - 1. Pipe elevation: +/- 0.02 feet/100 feet.
  - 2. Horizontal layout: +/- 0.03 feet/100 feet.

### 3.6 PIPE LEAKAGE TESTING

- A. General
  - 1. Test all lines after backfilling.
  - 2. Lines to meet infiltration limit of 100 gallons/day/inch/mile.
    - a. Limit inferred by air exfiltration test.
- B. Low Pressure Air Test
  - 1. Perform test according to stated procedures in presence of Engineer.
  - 2. Equipment used, a minimum:
    - a. Pneumatic plugs with sealing length greater than or equal to pipe diameter.
    - b. Plugs to resist test pressures requiring no external bracing.
    - c. Air used passing through single control panel.
    - d. Use three (3) individual hoses for following connections:
      - 1) From control panel to pneumatic plugs for inflation.
      - 2) From control panel to sealed line for introducing pressure air.
  - 3. From sealed line to control panel for continually monitoring air pressure rise in sealed line.
  - 4. Seal test plugs prior to actual test as follows:
    - a. Seal both ends of a length of pipe laid on ground.
    - b. Introduce air to plugs to 30 psig.
    - c. Pressurize pipe to 5 psig.
    - d. Plugs must hold without movement to pass.
  - 5. Areas of known groundwater:
    - a. Install 1/2 inch diameter capped pipe nipple, 10-inches long, through manhole wall above an inlet line.
    - b. Prior to performing air test determine groundwater level as follows:

- 1) Remove nipple cap.
  - 2) Blow air through nipple to clear.
  - 3) Connect clear plastic tube to nipple.
  - 4) Hold hose vertically and measure height of water.
  - 5) Divide height by 2.3 to obtain groundwater back pressure in psig.
6. After backfilling manhole to manhole segment:
- a. After the sewer pipe has been cleaned and the pneumatic plugs checked, place the plugs in the sewer line at each manhole and inflate them.
  - b. Introduce low pressure air into the sealed sewer pipeline until the air pressure reaches 4 psig greater than the average groundwater pressure.
  - c. Allow a minimum of 2 minutes for the air pressure to stabilize to a minimum of 3.5 psig greater than the groundwater pressure. Groundwater is assumed to be at ground surface unless the Contractor can prove by otherwise by test pitting.
  - d. After the stabilization period, disconnect the air hose from the control panel to the air supply.
  - e. The pipeline will be acceptable if the pressure decrease is not greater than 1/2 psig in the time stated in the following table for the length of pipe being tested:

<u>Pipe Diameter</u> <u>(inches)</u>	<u>Time (Min.) for Length of Pipe</u>			
	<u>0-100 ft</u>	<u>101-200 ft</u>	<u>201-300 ft</u>	<u>301-400 ft</u>
4	2.0	2.0	2.0	2.0
6	3.0	3.0	3.0	3.0
8	4.0	4.0	4.0	5.0
10	5.0	5.0	6.0	8.0
12	5.5	5.5	8.5	11.5
15	7.0	8.5	13.0	17.0
18	8.5	12.0	19.0	25.0
21	10.0	17.5	26.0	35.0
24	11.5	23.0	34.0	45.5
27 and larger		(not recommended)		

7. If pipe segment fails air test:
  - a. Perform necessary work to meet these requirements.
8. Provide, as necessary, proper plugs, weirs and necessary equipment to perform tests.
9. Testing of pipe sections to include service connection portions installed under this Contract.
10. Provide, as necessary, equipment to bypass flow around test segments.

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- a. Maintain service to services temporarily disconnected, capped or plugged for test.
- 11. Test each day's work.
  - a. Pipe laying may be stopped by Engineer if testing procedures or results are unacceptable.

### 3.7 VIDEO INSPECTION

A. General: Contractor shall contact City of Bangor Sewer Maintenance Department when the main has been completed to schedule CCTV inspection of new mains.

B. Any defects found during the video inspection shall be repaired to the satisfaction of the Engineer. The cost shall be incidental to the project.

END OF SECTION

## HOT MIX ASPHALT PAVING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Hot Mix Asphalt Paving.
- B. Related Sections:
  - 1. Grading
  - 2. Backfilling
  - 3. Landscape Grading

#### 1.2 REFERENCES

- A. Maine Department of Transportation Standard Specifications Highways and Bridges, latest edition and supplemental materials.

#### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Maine Department of Transportation Standard Specification - Highway and Bridges.
- B. Mixing Plant: Conform to State of Maine Department of Transportation Standards.
- C. Obtain materials from same source throughout.

#### 1.4 ENVIRONMENTAL REQUIREMENTS.

- A. Do not place asphalt when aggregate base surface temperature is less than 35 degrees F for Bituminous Concrete Binder and 50 degrees F for Bituminous Concrete Surface, or when surface is wet or frozen.
- B. Apply bituminous prime and tack coats prior to placing all asphalt.
- C. Do not place surface pavement when the binder surface is wet or contains an excess of moisture, which would prevent uniform distribution and the required penetration.
- D. Conform to applicable standards for paving work.

### PART 2 - PRODUCTS

#### 2.1 AGGREGATE SUBBASE

- A. As specified in Backfilling.

2.2 AGGREGATE BASE

- A. As specified in Backfilling.

2.3 BITUMINOUS CONCRETE BASE COURSE

- A. MDOT Specification, Section 401.
- B. As shown on plans.

2.4 BITUMINOUS TACK COAT

- A. MDOT Specification, Section 409.
- B. Type MS-2, Emulsified Asphalt, Mixing.

2.5 BITUMINOUS CONCRETE SURFACE COURSE

- A. MDOT Specification, Section 401.
- B. As shown on plans.

2.6 SIDEWALKS, DRIVES AND SHIM

- A. MDOT Specification, Section 401.
- B. As shown on plans.

2.7 TEMPORARY PATCHING

- A. Hot or cold, as approved by Engineer.

2.8 ACCESSORIES

- A. Tack Coat: Homogeneous, medium curing, liquid asphalt, in accordance with Maine Department of Transportation Specifications.

PART 3 - EXECUTION

3.1 AGGREGATE SUBBASE

- A. As specified in Backfilling.

3.2 AGGREGATE BASE

- A. As specified in Backfilling.



### 3.3 BITUMINOUS CONCRETE BASE COURSE

- A. MDOT Specification, Section 401.

### 3.4 BITUMINOUS TACK COAT

- A. Apply emulsified asphalt tack coat to gutters and pavement if required by Engineer to promote adequate bond.
- B. Apply at a rate of 0.03 to 0.05 gallons/square yard; excess coating and/or fat spots will not be permitted.

### 3.5 BITUMINOUS CONCRETE SURFACE COURSE

- A. MDOT Specification, Section 401.

### 3.6 SIDEWALKS, DRIVES AND SHIM

- A. MDOT Specification, Section 401.

### 3.7 COMPACTION

- A. Bituminous compaction shall take place at as high a temperature as possible without the mix bulging excessively in front of the rolls. For most dense graded mix this is between 260 degrees F and 285 degrees F. At no time shall the pavement be allowed to fall below 185 degrees F without compaction.
- B. Pavement compacted at temperatures below 185 degrees may be removed if deemed unsatisfactory by the Engineer.

### 3.8 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation from True Elevation: Within 1/2 inch.

### 3.9 FIELD QUALITY CONTROL

- A. Field quality control testing shall be performed by the Contractor.

### 3.10 FIELD QUALITY ASSURANCE

- A. Field quality assurance testing shall be performed by an independent testing agency provided by the Engineer.

### 3.10 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 3 days.

### 3.11 SCHEDULES

#### A. Roadways

1. Thicknesses and Widths as shown on drawings and details.

END OF SECTION

## **ELECTRICAL -GENERAL**

### **PART 1 GENERAL**

#### **1.01 DESCRIPTION**

A. Provide all labor, materials, equipment, operations, methods and procedures as indicated in the Contract Documents, together with all items necessary for or incidental to the completion of the work.

B. All systems or additions to existing systems indicated in the Contract Documents shall mean all necessary supervision, labor, equipment and materials required to provide complete, properly functioning systems.

C. References:

1. Refer to Drawings to coordinate material and equipment locations and electrical requirements.
2. Installation shall be performed in accordance with their respective utility company requirements.

D. Work Specified Herein:

1. Visit and examine the project site and become familiar with all existing conditions pertinent to the work to be performed thereon. No additional compensation will be allowed for failure to be so informed.
2. The following scope of work is a brief generalization of the type and extent of the work specified. Detailed requirements are indicated on the Drawings and in related sections of the Specifications. The work specified includes, but is not necessarily limited to the following:
  - a. Provide all demolition and relocations as indicated on the related Drawings and as specified herein.
  - b. Provide Electrical Distribution System as indicated on the related drawings, and as specified herein.
  - c. Provide complete lighting system, including all necessary fixture wiring, connections, controls, lamps, and handholes.
  - d. Provide complete branch circuit wiring systems including all raceways, conductors, cables, outlet and junction boxes, wiring devices and device connections.

e. Provide all required 240 volt and 120 volt power and control wiring and connections and provide all required lighting contactor and control devices.

f. Coordination of anchor bolt patterns for light poles, and kiosk.

g. Coordinate the work of other trades as required to accomplish all necessary cutting, patching, excavation, trenching, backfill, and concrete work necessary for the completion of the work.

h. Provide complete system as indicated on the Drawings, including concrete, reinforcing, conduits and manholes, etc.

i. Provide a complete grounding/bonding system conforming to Article 250 of the National Electrical Code.

j. Coordinate work with City of Bangor Electrical Department and Emera Maine Electric as indicated on the Drawings and as necessary during the Work.

**E. Work Specified Elsewhere:**

1. The materials and methods used for all Electrical Work indicated in the Contract Documents shall meet the requirements specified.

**F. Removals, Relocations and Rearrangements:**

1. Examine the existing site, structure(s) and installation(s) for the work of all trades which will influence the cost of the work. This work shall include removals, relocations and rearrangements relating to the work of all trades which may interfere with, disturb or complicate the performance of the work; and relating to the work involving systems, equipment and related service lines which shall continue to be utilized as part of the finished project.

2. Removals shall include all existing light fixtures, poles, conduit and wiring, mounting structures and the relocation of existing utility meters, switches, panel boards, conduit, and wiring, as indicated.

**G. Codes and Fees:**

1. Comply with the following codes, standards, regulations and specifications:

a. National Electrical Code (N.F.P.A. No. 70 -most recent edition)

b. Life Safety Code (N.F.P.A. No. 101 -most recent edition)

c. Occupational Safety and Health Act (O.S.H.A.) -regarding construction practices.

d. Utility Company standards, specifications and requirements.

e. State and local electrical codes, building codes and fire codes for the locale where the work is to be performed.

f. Telephone and cable company standards, specifications and requirements.

2. Compliance with the above codes, standards, etc., does not relieve the Contractor from the requirements of the Contract Documents which may exceed these codes, standards, etc. but which are not contrary to them.

3. If it is observed that the Contract Documents are at variance with any of the above codes, standards, etc., promptly notify the Engineer in writing, and necessary changes shall be adjusted by appropriate modification. If any work is performed which is contrary to such codes, standards, etc., the Contractor shall assume full responsibility therefore and shall bear all costs in correcting such work in order to comply with such codes, standards, etc.

4. Secure and pay for all permits, fees and licenses necessary for the proper execution of the work under Division 16.

#### H. Tests and Procedures Prior To Start-up:

1. All equipment shall be properly identified as indicated in this Section.

2. All equipment and materials shall be clean, dry and free of foreign materials. All screw and bolt connections shall be checked for tightness.

3. Conductor connections and terminations shall be checked for proper tightness and continuity.

4. Test the grounding system to assure continuity and that resistance to ground does not exceed specified limits.

#### I. Demonstration of Complete Electrical Systems

1. The Owner will assume no liability or responsibility for any portions of the installation under this Contract until they are demonstrated and accepted in writing. Final demonstration shall be made only after the Engineer is satisfied that the work has been completed in accordance with the intent of the Contract Documents.

2. After the Electrical system is completed, and when directed by the Engineer, demonstrate the total system operation and make final adjustments to the system. If any system or piece of equipment within a system fails to function properly, rectify such defects or inadequacies and make a final demonstration as directed by the Engineer.

3. Provide the services of authorized manufacturer's representatives to instruct the Engineer in proper operation of each partial or complete system installed under this Contract.

4. Pay all charges or fees including the cost of any special test equipment, factory Engineer, etc. necessary for the proper performance of the specified tests, demonstrations, and instructions

J. Identification:

1. All overcurrent devices, contactors, disconnect switches, control devices, etc. shall be provided with engraved tags indicating the equipment which they serve in accordance with OSHA requirements.

2. Power conductors shall be continuously polarized and color coded throughout the following scheme.

a. White or gray – neutral conductors, 240/120v systems.

b. Green – all ground conductors

c. For conductors No. 6 and smaller, color coding shall correspond to the color of the conductor insulation. For color coding of wire larger than No. 6, use self-adhesive wrap around type markers. These markers shall be used at all panelboards, junction boxes, disconnect switches, circuit breakers, etc.

3. Control conductors shall be identified using numerical tags corresponding to conductor designations indicated on approved shop drawings of schematic diagrams, and as required for clarification of system and equipment connection and junction. Tags and labels shall be pre-manufactured for intended purpose.

K. All electrical equipment shall be suitable for areas where mounted. Contractor shall ensure that the proper type enclosure, mounting and catalog numbers are provided during the submittal phase.

## 1.02 QUALITY ASSURANCE

A. Supply all new materials, devices and equipment in conformance with:

1. Underwriter's Laboratory, Inc.

2. National Electrical Manufacturers Association.

3. American National Standards Institute.

4. National Electrical Code.

5. Local power company.

B. All materials provided under this Contract shall be equal in quality, appearance and performance to that specified herein and shall be subject to the review of the Engineer. Verify the availability of all materials proposed to be used in the execution of the work prior to submitting same for the Engineer review. The discontinuance of production of any material or product after the Engineer review has been made shall not relieve the Contractor from furnishing an alternate of equal quality and design without additional cost.

C. Materials and equipment furnished under this Contract shall be standard products of manufacturers regularly engaged in manufacture of such products and shall be manufacturer's latest standard design that complies with Specification requirements. Products shall essentially duplicate material and equipment that have been in satisfactory local use at least three years.

D. The Contractor shall have supplied comparable systems to those specified herein and shall maintain engineering and service departments capable of designing and maintaining these systems. For a period of 12 months from the date of acceptance of the work, provide all necessary supervision, labor, materials, and equipment in order to correct any defects in any system due to faulty materials, equipment, installation methods, or workmanship and consequent damage resulting from such defects. This work shall be scheduled during normal working hours and at the convenience of the Owner.

#### 1.03 SUBMITTALS

##### A. Substitutions

1. Certain new equipment and systems have been specified with one or more make(s) followed by the phrase "or equal". In such cases, the Contractor may submit a proposed substitution for review by the Engineer. The decision of equality of a proposed substitution rests fully with the Engineer.

2. Certain new equipment and systems have been specified with one or more make(s) WITHOUT the phrase "or equal". In such cases, only one of the manufactured products listed will be allowed.

3. Where substitutions are allowed as "equal" it shall be the Contractor's responsibility to make any and all necessary modifications required to accommodate the installation of the substituted item(s).

##### B. Shop Drawings and Samples:

1. Submit Shop Drawings on all items of equipment and systems as indicated in related sections of Electrical Specifications.

C. At the completion of the installation, provide reproducible Record Drawings indicating the final configuration of all Electrical Systems as they were installed. Symbols, equipment designations, etc. shall be consistent with the Contract Documents. Provide exact locations of all work which has been concealed in concrete, masonry or underground.

#### 1.04 DELIVERY, STORAGE AND HANDLING

A. Coordinate material and equipment delivery with the project schedule. Notify the Engineer immediately, in writing, if material or equipment delivery will adversely affect the project schedule, include documentation from equipment suppliers indicating the revised delivery dates and the reason for the delay.

B. Exercise care during loading, transporting, unloading and handling of materials to prevent damage.

C. Check for defective or damaged materials, and for incomplete equipment shipments within seven (7) days after equipment delivery to the project site.

D. Store materials and equipment on the construction site in enclosures or under protective covering in order to assure that materials and equipment are kept undamaged, clean and dry.

E. Replace or repair, to the satisfaction of the Engineer, all materials and equipment that are defective or that have been damaged during installation, at no additional cost to the Owner.

#### 1.05 GUARANTEE

A. Guarantee all equipment, materials and workmanship in accordance with the Contract Agreement, Section D.

B. Warrant all material furnished and work executed is in accordance with all applicable laws and regulations.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

A. Materials shall be as specified in the appropriate Sections of Specifications.

B. Approval of materials shall be as indicated in this Section.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

A. Installation shall be as specified in the appropriate Sections of Specifications.



### 3.02 TESTS

A. Provide testing as indicated in the appropriate Sections of Specifications.

### 3.03 CLEANING

A. Do not allow refuse and surplus materials to accumulate on the project site during the course of the work.

B. Upon completion of the work, remove all refuse and surplus materials and leave the premises neat and clean.

C. Clean all equipment surfaces and touch up all damaged surfaces to the satisfaction of the Engineer.

D. Clean all lighting fixture reflector assemblies, lenses, louvers and lamps upon completion of the installation.

END OF SECTION

## BASIC MATERIALS AND METHODS

### PART 1 GENERAL

#### 1.01 DESCRIPTION

A. The Drawings are basically diagrammatic, unless detailed dimensioned Drawings are included, and show only approximate locations of equipment and fixtures. Exact locations shall be subject to the approval of the Engineer.

B. While the general run of electrical feeders, branch circuits, conduits, etc. is indicated on the Drawings, it is not intended that exact routing be determined therefrom. Circuit designations on Plans and Electrical Schematics indicate the designation of the branch circuit, the size and quantity of branch circuit conductors, the branch circuit overcurrent device rating and the control panel from which the branch circuit is served. These designations may be modified subject to field conditions and review of the Engineer.

C. Prior to submission for review any item of equipment, determine whether or not it will fit in the space provided. Any changes in the size or location of the material or equipment supplied, which may be necessary in order to meet field conditions or in order to avoid conflicts between trades, shall be brought to the immediate attention of the Engineer and no exceptions taken before such alterations are made.

D. All equipment and accessories and its interconnecting conduit, etc., shall be installed in such a manner that ample maintenance and Code-required space/access will be provided.

#### 1.02 QUALITY ASSURANCE

A. In General, the workmanship of the electrical installation shall be as described in the N.E.C.A. Electrical Design Guidelines. All methods of construction, details of workmanship, etc. that are not specifically described therein or indicated in the Contract Documents, shall be subject to the control and approval of the Engineer.

B. Equipment and materials shall be of the quality and manufacture indicated in their respective sections of these Specifications.

#### 1.03 SUBMITTALS

A. Submit shop drawings for the following equipment, materials, products, etc.:

1. Conduit, Raceway and Tubing.

2. Conductors and Cable

- 3.Outlet Boxes
- 4.Pull and Junction Boxes
- 5.Wiring Devices
- 6.Control Devices and Equipment
- 7.Safety Disconnect Switches
- 8.Enclosed Circuit Breakers
- 9.Ground Rods
- 10.Contactors
- 11.Photo Cells
- 12.Electrical Handholes
- 13.Cable Termination Kits/Splice Kits
- 14.Below-Grade Conduit Wall Seals 15.Expansion Fittings

B. Submit Shop Drawings per ELECTRICAL - GENERAL.

## PART 2 PRODUCTS

### 2.01 MATERIALS

#### A. Conduit, Raceway and Tubing

- 1. Rigid Heavy Wall Steel Conduit (RSC or RGS) shall be constructed of hot dipped galvanized or electro-galvanized steel. Acceptable Manufacturers: Allied, Wheatland, or equivalent.
- 2. Non-Metallic (P.V.C.) Conduit to be direct buried (not encased in concrete) shall be Schedule 80, extra heavy wall and UL Listed for the use intended under roadway areas or Schedule 40 otherwise. Acceptable Manufacturers: Carlon, Rob-Roy, or equivalent.
  - a. The galvanized metallic conduit, prior to plastic coating, shall conform to Federal Specifications WW-C-581d, ANSI Standard C80.1, UL Standard #6 and NEMA RN1-1980.
  - b. The coated conduit shall conform to NEMA Standard No. RNI-1980 (Type 40).

### 3. Fittings and Accessories:

- a. All fittings and accessories shall be of PVC, coated with the same specifications as the conduit.
- b. U-bolts will be sized to snugly fit the nominal 40 mil coated conduit.
- c. All coated conduit must be installed wherever possible using a tool available from the manufacturer for the use intended. The interior coating shall be applied in such a manner so as to allow field bending without cracking or flaking of the interior coating. Installation of the system is to be performed in accordance with the manufacturer's instructions. Approved manufacturer: ROBROY INDUSTRIES, Verona, Pennsylvania.

4. All fittings shall be of the same material as the respective raceway system.

5. Expansion fittings shall be watertight combination expansion and deflection type designed to compensate for movement in any direction. Fittings shall have flexible copper braid bonding jumpers, neoprene sleeve and stainless steel bands. Acceptable Manufacturer: O.Z./Gedney Type DX or approved equivalent.

6. Conduit wall seals for cored holes and sleeved openings shall be Type CSM series as manufactured by O.Z./Gedney Co., or equivalent.

7. Conduit sealing bushings to seal the ends of conduits entering enclosures from below grade shall be O.Z./Gedney Co. Type CSB series, or equivalent.

### B. Conductors and Cable

1. All power wiring conductors shall be insulated for 600 volts, unless otherwise noted, and shall be standard AWG sizes. Conductors shall be 98 percent copper, stranded, heat and moisture resistant and thermal plastic insulated for all sizes No. 12 AWG and larger. Smaller sizes shall not be used except special systems. For lighting and receptacle circuits, solid wire may be used in lieu of stranded wire, for No. 12 and No. 10 AWG only. Conductors shall be labeled with U.L. approval and be marked with the manufacturer's name, wire size and insulation type. Insulation for all 600 volt conductors shall be Type THWN unless noted otherwise on the Drawings. Acceptable Manufacturers: Okonite, Southwire, Pirelli, or equivalent.

### C. Outlet Boxes

1. Standard outlet boxes and covers shall be galvanized steel not less than 1-1/2 inches deep, 4 inches square or octagonal, with knockouts. Acceptable Manufacturers: Steel City, Appleton, Raco or equivalent.

2. Outlet boxes exposed to moisture shall be cadmium cast alloy complete with hubs and gasketed screw fastened covers. Acceptable Manufacturers: Steel City, Appleton, Crouse-Hinds, Raco or equivalent.
3. In no case shall boxes be sized smaller than as indicated in Article 370 of the National Electrical Code for the conductor sizes installed.

#### D. Pull Boxes

1. Boxes shall be constructed as specified on details with trim for flush or surface mounting in accordance with the location to be installed. Provide screw-on type covers. Boxes installed in damp locations shall be of watertight construction with gasketed cover and conduit hubs.
2. In no case shall boxes be sized smaller than as indicated in Article 370 of the National Electrical Code for Conduit and Conductor sizes installed.

#### E. Wiring Devices

1. Wiring devices shall be specification grade as described herein. Switch handles, receptacles, etc. shall have a brown finish. Provide device cover plates of satin finish stainless steel in finished areas and cadmium finished sheet steel in unfinished areas. Although only one manufacturer has been noted, acceptable manufacturers are: Hubbell, General Electric, Arrow-Hart, Pass and Seymour, Bryant, or as noted. Provide devices as indicated by Contract Documents.

##### 2. Receptacles

- a. 20 Ampere, 125 Volt, Duplex G.F.I. Receptacle: Hubbell GF-5362

##### 3. Photoelectric Control:

- a. 120 Volt, SPST, 2000 Watt: Tork Model 2101

##### 4. Lighting and Control Contactors:

- a. Contactors shall be electrically operated, electrically held and shall switch a load at 277 volts, 60 hertz. Minimum number of contacts shall be 5 N.O. and 1 N.C. contact. The contactor shall be continuously rated 30 amperes per pole for all types of ballast and tungsten lighting and resistance loads, and shall not be de-rated for use on high-inrush loads. The coil should be continuously rated and encapsulated.

The contactor shall have double-break, silver-cadmium-oxide power contacts. Auxiliary arcing contacts are not acceptable. All power contacts shall be

convertible from N.O. to N.C. or vice-versa. All contacts shall have clearly visible N.O. and N.C. contact-status indicators.

The contactor shall be approved per UL 508 and CSA.

The contactor shall be designed in accordance with NEMA ICS2-211B. They shall be industrial-duty rated for applications to 600 volts maximum.

5. Generator Receptacle shall be turnlok SGL 4W 30A.

#### F. Enclosed Circuit Breakers

1. Circuit breakers shall be molded case, thermal-magnetic type, ratings as noted, with overcenter, trip-free, toggle-type operating mechanism, quick-make, quick-break action and positive handle indication. Multiple pole breakers shall be common trip type. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Breakers shall be calibrated for operation in ambient temperature up to 40°C and shall be suitable for mounting and operating in any position. Breakers shall have removable lugs, U. L. listed for copper and aluminum conductors.

2. Acceptable Manufacturers: Square-D, Cutler-Hammer, General Electric, or Siemens.

#### G. Ground Rods

1. Ground Rods shall be copper-clad steel at least 3/4-inch in diameter and 10 feet long. Die-stamp each near the top with the name or trademark of the manufacturer and the length of the rod in feet. The rods shall have a hard, clean, smooth, continuous, surface throughout the length of the rod.

H. Electrical handholes shall be Composolite as manufactured by Quazite Corporation or equivalent. Precast concrete handholes shall also be acceptable. Handholes shall be sized per the N.E.C. according to number and sizes of entering conduits. All handholes shall be rated for H2O wheel loading.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

A. Unless otherwise noted, wiring for all systems indicated in the Contract Documents shall consist of insulated conductors installed in raceways. Raceways shall be continuous from outlet box to outlet box and from outlet box to cabinet, junction or pull box or from light pole to light pole. Secure and bond raceways to all boxes and cabinets such that each system of raceways will be electrically continuous throughout.

B. Raceways Shall Be:

1. Sized per the National Electrical Code in accordance with the quantity, size, type and insulation of conductors to be installed.
2. Installed to provide adequate grounding between all outlets and the established electrical system ground. Bond conduit systems per NEC.
3. Cut square, free of burrs due to field cutting or manufacture, and bushed where necessary.
4. Installed with exterior surfaces not less than six inches (6") from any surface with a temperature of 200 degrees F or higher.
5. Plugged at the ends of each roughed-in raceway with an approved cap or disc to prevent the entrance of foreign materials during construction.
6. Concealed throughout except where exposure is permitted by the Engineer.
7. Installed parallel or perpendicular to structures.
8. Installed with a minimum of bends and offsets. All bends shall be made without kinking or destroying the cross section contour of the raceway. Factory made bends shall be used for raceways one-inch (1") trade size and larger.
9. Installed with U. L. approved raintight and concrete-tight couplings and connectors.
10. Firmly fastened within three feet of each outlet box, junction box, cabinet or fitting. Raceways shall not be attached to or supported by wooden plug anchors or supported from Mechanical Work such as ductwork, piping, etc.
11. Installed with a #14 AWG fish wire in all telephone, intercommunication, "Spare" or "Empty" conduit runs to facilitate future installation of conductors.
12. Installed with expansion fittings at all building expansion joints such that no undue stress is placed on any electrical raceway due to the proper functioning of expansion joints.
13. Arranged in a neat manner for access and allow for access to work installed by other trades.
14. Support adequately by malleable iron pipe clamps or other approved methods. In exterior or wet locations supports shall allow not less than 1/4 inch air space between raceway and wall. Firmly fasten raceway within 3 feet of each outlet box, junction box, cabinet or fitting. The following table lists maximum spacing between supports.

Additional supports may be required due to field conditions, strength of supporting members, etc. Furnish and install such supports at no additional cost to Owner.

15. Provide a bushing at each conduit termination unless fitting at box where conduit terminates has hubs designed in such a manner to afford equivalent protection to conductors. Provide grounding type insulated bushings on all conduit sizes one and one-quarter inch (1-1/4") trade size and larger, and on all feeder raceways regardless of size. Provide standard bushings for conduits one inch (1") and smaller unless otherwise stated. Provide sealing bushings for all conduits entering from below grade.

#### E. Wiring Methods

1. In general, conductors shall be the same size from the last protective device to the load.
2. All wiring systems shall be properly grounded and continuously polarized throughout, following the color coding specified.
3. All feeder connections shall be made to bus and other equipment using solderless, pressure type terminal lugs, as manufactured by Burndy, National, O.Z., T. & B., or equivalent.
4. For splices and taps, No. 10 AWG and smaller, use solderless "Thread-On" connectors having spiral steel spring and insulated with a vinyl cap and skirt, as manufactured by 3M Co. (pre-insulated "Scotch-Lock") or Ideal ("Wing-Nuts").
5. For splices and taps, No. 8 and larger, use solderless "Split Bolt" type connector as manufactured by Anderson, Burndy, Kearney, Thomas & Betts, or equivalent. Splices shall be made water tight using approved methods.
6. Use cast connections, Cadweld or Thermoweld, for ground conductors.
7. Make all splices and connections in accessible boxes and cabinets only.
8. Cover uninsulated splices, joints and free ends of conductor with rubber and friction tape or PVC electrical tape. Plastic insulating caps may serve as insulation.
9. On termination at branch circuit outlets, leave a minimum of eight inches (8") free conductor for installation of devices and fixtures.
10. Feeder conductors shall be continuous from point of origin to load termination without splice. If this is not practical, contact the Engineer and receive written approval for splicing prior to installation of feeder(s). Where feeder conductors pass through junction and pull boxes, bind and lace conductors of each feeder together. For parallel sets of conductors, match lengths of conductors as near equal as possible.



11. Branch circuit and control conductors installed in control cabinets and panels shall be neatly bound together using "Ty-Raps" or equivalent.

12. Lighting shall be as located on the Drawings, however, where conflicts exist, locate lights for best distribution.

#### I. Hangers and Supports

1. Provide steel angles, channels and other materials necessary for the proper support and erection of control cabinets.

2. Small electrical equipment, etc., as approved by Engineer, may be supported on walls. Racks for support of conduit and heavy electrical equipment shall be secured to building construction or as indicated on the Drawings by substantial structural supports.

### 3.02 TESTS

A. Branch circuits shall be tested during installation for continuity and identification and shall pass operational tests to determine that all circuits perform the function for which they are designed.

B. For all feeder wiring rated 600 volts or less, provide 1,000 volt "Megger" insulation test prior to energizing feeders. Use a motor driven megger for all tests. Test voltage shall be applied until readings reach a constant value, and until three (3) equal readings, each one (1) minute apart, are obtained. Minimum megger reading shall be 45 megohms for feeder conductors. Document test results and submit for approval prior to energizing conductors.

END OF SECTION

## CABINETS AND ENCLOSURES

### PART 1 GENERAL

#### 1.01 DESCRIPTION

A. The purpose of this specification is to provide details of cabinets and enclosures for non-hazardous outdoor locations which will protect internal equipment from environmental conditions existing in the areas in which the enclosures are to be installed.

#### 1.02 QUALITY ASSURANCE

A. Supply cabinets in accordance with the following:

1. Underwriters Laboratory Inc. listed.
2. National Electrical Manufacturers Association Standard 250-1991.
3. American National Standards Institute
4. National Electric Code.

#### 1.03 RELATED WORK

A. Miscellaneous Panel and enclosure auxiliary equipment is included in Basic Materials and Methods.

#### 1.04 SUBMITTALS

A. Submit shop drawings for cabinets.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of control cabinets and enclosures with the project schedule.

B. Exercise care during loading, transporting, unloading, and handling and storage of enclosures to prevent damage. Check for defects or damage to enclosures upon arrival at construction site.

C. Replace or repair any cabinets which are defective or have been damaged during installation.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

A. General:

1. NEMA classifications for panels and enclosures shall be as noted on Drawings.
2. Panels and enclosures shall be furnished factory wired and tested with all equipment and appurtenances mounted thereon.

3. Provide two doors.

#### B. Cabinet

1. NEMA Type 3R Rating.
2. Stainless steel padlockable handle with 3-point latching mechanism and nylon rollers at top and bottom.
3. 18" deep by 60" tall by 48" wide.
4. U.L. listed.
5. Finish shall be black powder coated.
6. Equal to Mass. Electrical Apparatus Catalog #MEAN12486018F.
7. Spare Parts/Materials – Provide one circuit breaker.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

- A. All interconnecting wires between panels, unless specifically detailed otherwise, shall be by the electrical trade regardless of the source of the panel itself.
- B. Install enclosures on locations as shown on the Drawings

#### 3.02 CLEANING

- A. Do not allow excess debris to accumulate inside enclosures during the course of construction.
- B. Upon completion of the work, remove all debris and surplus material from inside enclosures.
- C. Touch up any scratched or damaged areas as directed by Engineer.

END OF SECTION

## **GROUNDING**

### **PART 1 GENERAL**

#### **1.01 DESCRIPTION**

A. Work Included: Provide and install all grounding and appurtenances as shown on the Drawings and as specified herein.

#### **1.02 SUBMITTALS**

A. Shop drawings are not required under this Section.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

A. Provide equipment grounding as shown on the Drawings. Size of main grounding conductor shall be as noted on the Drawings.

B. Provide grounding conductors from ground electrodes to equipment as shown on the Drawings.

C. Use 3/4 inch x 10 foot copperweld ground rods for direct burial.

D. Do not use conduit as the ground and/or bonding conductor.

E. Bond ground terminal of receptacles to outlet boxes and panels with #12 AWG green insulated wire.

F. Ground conduit system and neutral conductor of wiring system with a connection at control panel.

H. The grounding network to be connected to metallic water piping system, at two or more locations, with stranded copper, #2/0 AWG, Green Insulated Conductor.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

A. Make connections to ground rods with an exothermic welding process. Mechanical connections may be made at equipment only.

B. Ensure that a ground loop is not formed between equipment ground in electrical conduit and grounding electrode conductors directly connected to ground electrodes.

C. Equip exposed "pigtails" or grounding electrode conductors with an armored sheath.

D. Group and bond ground wires to panel boxes, light fixtures, receptacles, etc., not to system neutral.

E. Ground exterior pole-mounted lighting fixtures as detailed on the Drawings.

F. Bond and ground all conduit systems.

### 3.02 TESTS

A. The entire grounding network resistance to be meggered and certified results provided. Resistance should not exceed 25 ohms.

END OF SECTION

## TESTING ELECTRICAL SYSTEMS AND START-UP

### PART 1 GENERAL

#### 1.01 DESCRIPTION

- A. Test and demonstrate, to the satisfaction of the Engineer, all electrical devices in accordance with the following requirements.
- B. Prior to energizing control panel, thoroughly vacuum clean the equipment with an industrial type vacuum cleaner.
- C. All contacts, relays and other electrical apparatus shall be cleaned and dried out if required and/or needed.
- D. Prior to applying voltage to any apparatus or circuit, make insulation resistance tests and, if necessary, dry the apparatus until resistance values conform to the standards of IEEE.
- E. In drying out, methods will be such that the insulation temperature of the apparatus does not exceed 90°C.
- F. In case of a low resistance circuit insulation, eliminate the problem before the circuit is energized.
- G. Make a recheck after apparatus is dry.
- H. A record of all insulation values shall be properly recorded and furnished to the Engineer for review.
- I. Prior to the start of check out and testing, insure that all equipment is properly and permanently identified according to specifications.
- J. Before energizing any electrical equipment or apparatus, check and verify that no tools, filings, foreign matter or other materials is left inside equipment or enclosures. All screw and bolt connections and terminal connections shall be checked for tightness prior to final tests and energization. During the checkout and startup period, provide sufficient personnel to aid with the start-up of all electrical equipment, to remove any faults, and to make the necessary adjustments for the proper operation of electrical equipment and installation, including sufficient personnel to aid the operating personnel in their checkout of the electrical equipment and service.
- K. A 1000 volt "megger" insulation test shall be available at all times during the testing of power feeders.
- L. All major equipment grounds shall be tested to remote earth or directly referenced to an extremely low resistance (approximately 1 ohm) reference ground bench mark. Ground testing

results shall be properly recorded, witnessed, and reported to the Engineer. Tests shall be made with ground testing ohm meter or "megger" approved by the Engineer for the purpose.

M. The ground resistance of the individual networks shall be measured at two points with the cables at all the test points disconnected.

N. The cables shall then be reconnected at the test points and a duplicate set of ground resistance measurements shall be made.

O. The entire grounding network resistance to be meggered and certified results provided. Resistance shall not exceed 25 ohms. Drive additional ground rods if necessary.

P. All control circuits shall be functionally checked to see that their operation and sequence are correct. Any adjustable switches or controls shall be adjusted for proper operation.

Q. Maintain written and properly witnessed test and check-out reports and submit these to the Engineer for Owner prior to final acceptance of facilities. The written detailed documentation for all checkout and testing shall be provided to the Engineer prior to the Engineer's Substantial Completion review.

R. Just prior to acceptance of the lighting facilities, clean all lighting fixtures and relamp where required at no additional cost to the Owner.

S. All electrical equipment, wiring, switches and insulators found to be defective or to have failed due to poor workmanship shall be replaced promptly at no additional cost to the Owner.

## PART 2 PRODUCTS

Not applicable

## PART 3 EXECUTION

Not applicable

END OF SECTION

## SITE AMENITIES CUTSHEETS



## Deluxe Public Work Stand - 567-1002



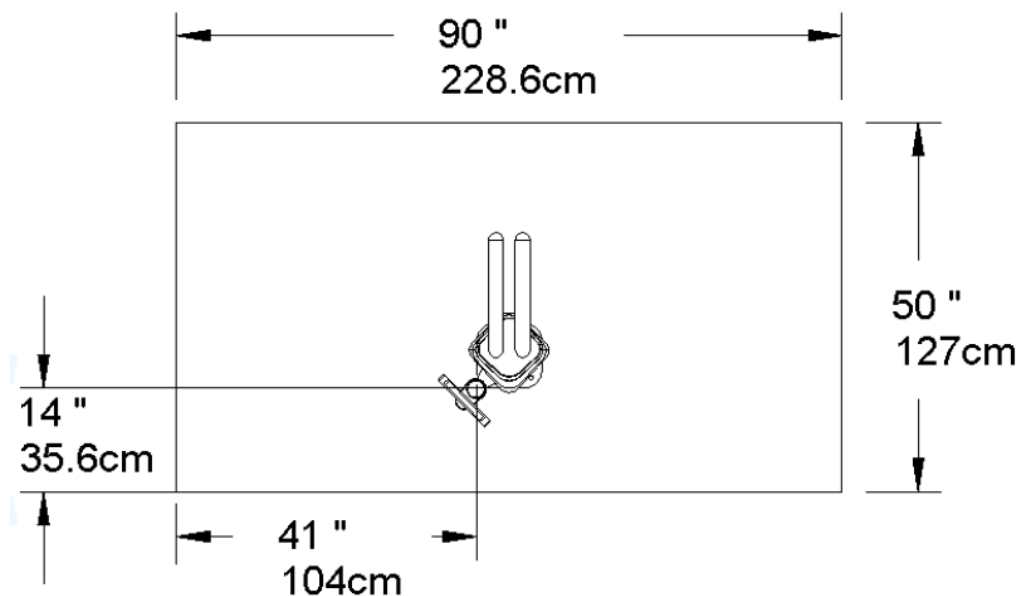
### Street/Trail Setback Minimum:

The setback for the Deluxe Public Work Stand is dependent on whether there is a Wheel Chock installed or not. See figure 1 and 2 for dimensions. If branding is part of the installation, the back of the repair stand should face the trail. If a Hoop Sign is installed, its location should be positioned based on each site.

## Site Layout for Deluxe Public Work Stand

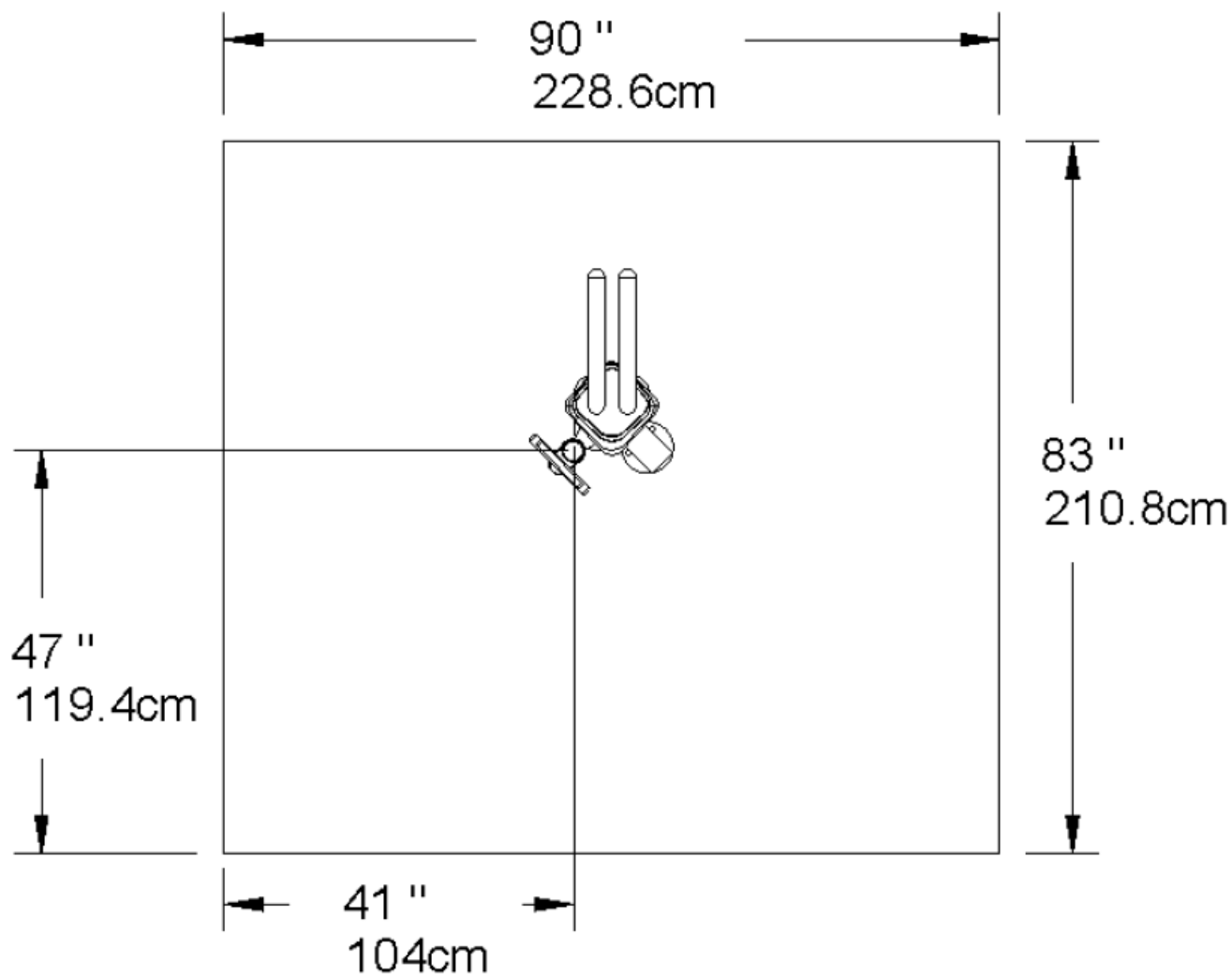
### Minimum Space Requirements

The minimum space requirements for the Deluxe Public Work Stand are dependent on whether there is a Wheel Chock installed or not. See figure 1 and 2 for minimum space requirement dimensions. If branding is part of the installation, the back of the repair stand should face the trail.



**Figure 1: Minimum space requirements (without Wheel Chock)**

Site Layout for Deluxe Public Work Stand



**Figure 2: Minimum space requirements (with Wheel Chock)**

### Setbacks

It is recommended that all equipment is spaced a minimum of 60" from an adjoining street or cycle path.

### Pad size

If you are pouring a new concrete pad, these are two recommended sizes. Option 1 is 36" x 36" x 4", option 2 is a 16" diameter cylinder that is 36" long.

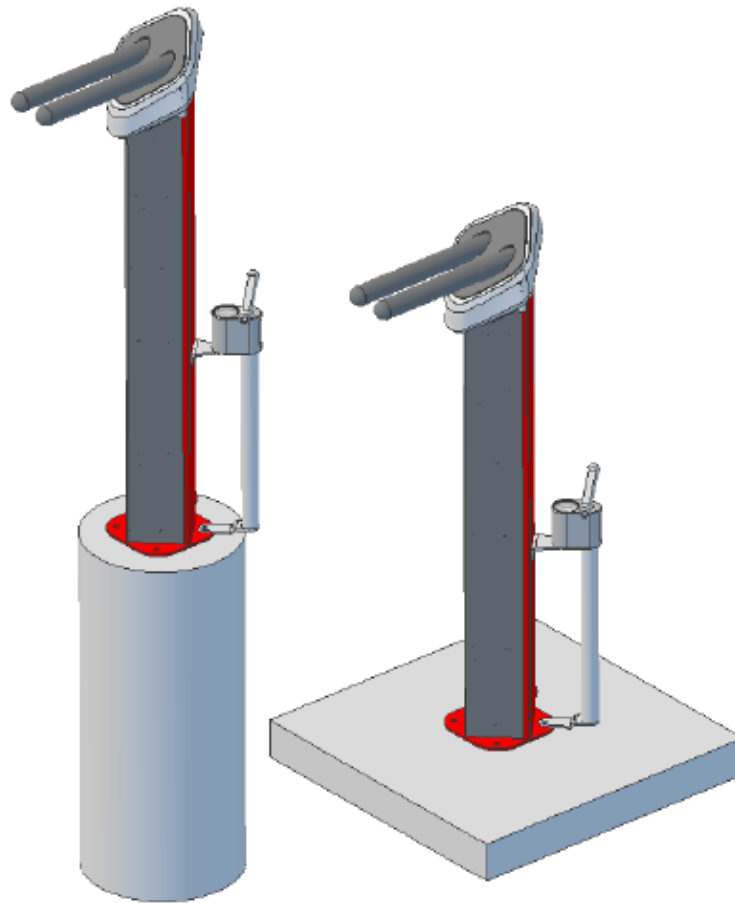
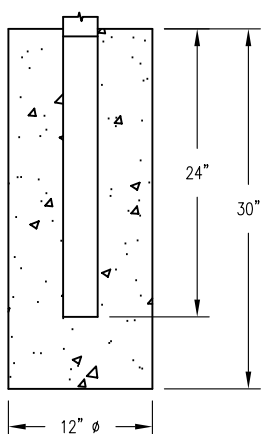
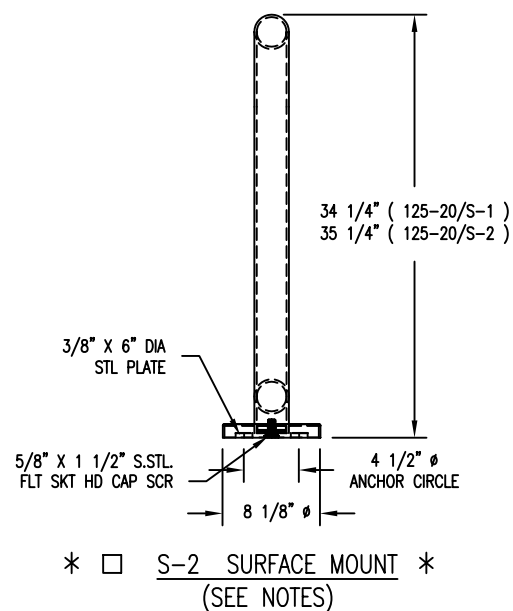
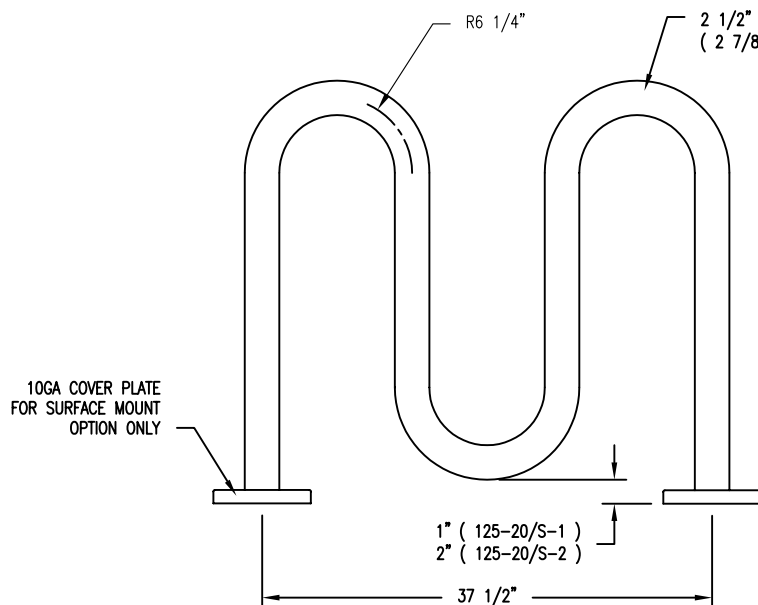


Figure 3: Recommended new pad configurations



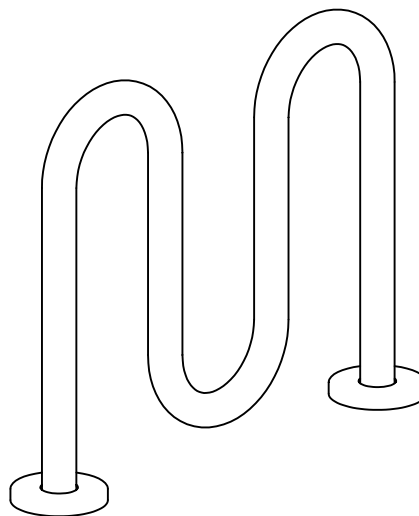
☐ S-1 EMBEDMENT

#### FINISH OPTIONS

- ☐ HOT DIPPED GALVANIZED ( VISIBLE VENT HOLES )
- ☐ COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.

#### NOTES:

- 1.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED FOR OPTION S-2.
  - 2.) PLUGS PROVIDED FOR VISIBLE VENT HOLES. ( HOT DIPPED GALV. ONLY )
- \* UPCHARGE APPLIES TO SUPPORT OPTION - CONSULT YOUR LOCAL REPRESENTATIVE.



**DuMor, inc.**  
P.O. Box 142 Mifflintown, PA 17059-0142

SCALE : NONE  
DATE DRAWN : 1/12/11  
DRAWN BY : JSB  
DATE REV. : 2/28/12  
REV. BY : JSB

TITLE :

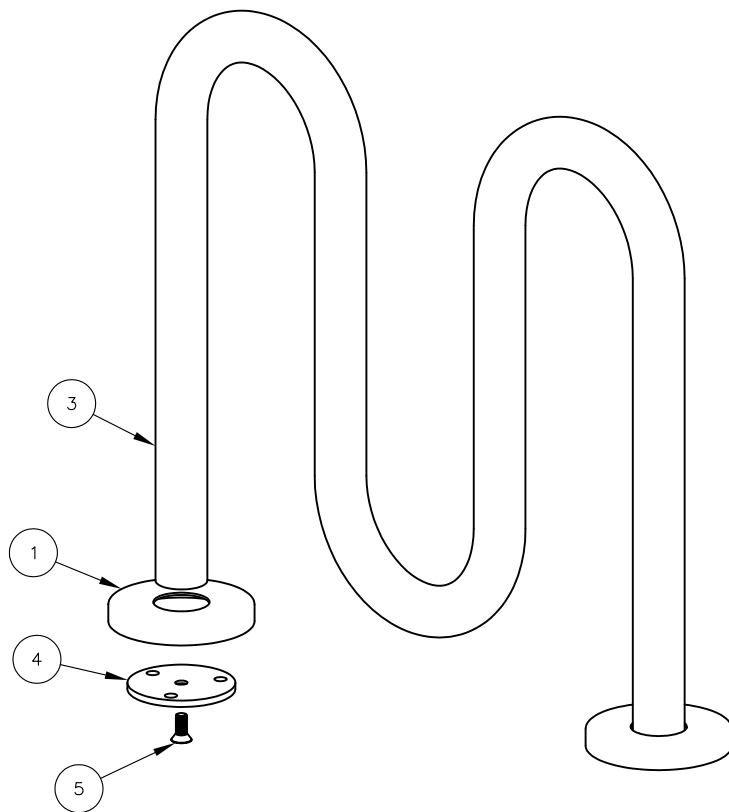
BIKE RACK

REV.  
B

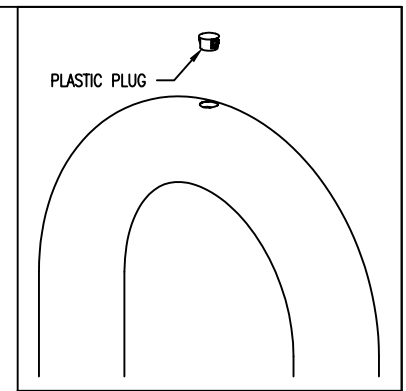
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NUMBER

125-20

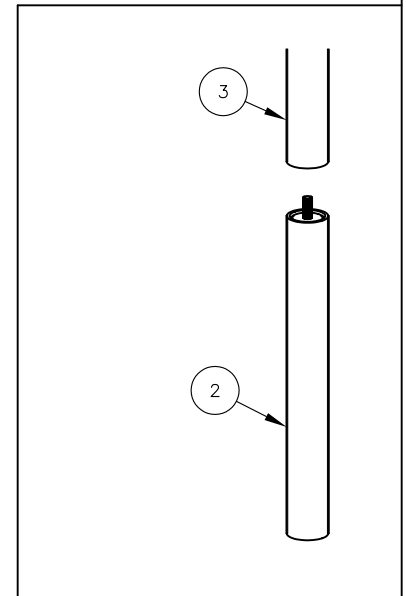
SHEET  
1 OF 2



S-2 SURFACE MOUNT OPTION



HOT-DIPPED GALV. BIKE RACK ONLY



S-1 EMBEDMENT OPTION

INSTALLATION FOR SURFACE MOUNT

STEP 1:

USE 1 - PC. BIKE LOOP, SURFACE MOUNT ( 3 )  
 2 - PCS. 3/8" THK SURFACE MOUNT PLATE ( 4 )  
 2 - PCS. 10 GA X 8" DIA ANCHOR PLATE COVER ( 1 )  
 2 - PCS. 5/8" X 1 1/2" SS FLT SKT HD CAP SCREW ( 5 )  
 SLIDE 10 GA X 8" DIA ANCHOR COVER ( 1 ) OVER BIKE LOOP,  
 SURFACE MOUNT ( 3 ) LEGS. ATTACH 3/8" THK. SURFACE  
 MOUNT PLATE ( 4 ) TO BIKE LOOP, SURFACE MOUNT ( 3 ) USING  
 HARDWARE ( 5 ).

STEP 2:

ANCHOR ACCORDINGLY.

INSTALLATION FOR PLASTIC PLUG HOT-DIPPED GALV ONLY

INSERT PLASTIC PLUG INTO HOLE ON TOP OF EACH LOOP

( S-2 OPTION )

( S-1 OPTION )

( S-2 OPTION )

( S-2 OPTION )

ITEM	QTY	PART NO	DESCRIPTION
1	2	0-125-04	10 GA X 8" DIA STL COVER W/ 3 1/8" DIA HOLE
2	2	0-125-09/S-1	EMBEDMENT EXTENSION
3	1	0-125-20/S-2	2-PEAK LOOP BIKE RACK FOR SURF MT
4	2	0-83-00-03	3/8" THK SURFACE MOUNT PLATE
5	2	1-12-102	5/8" X 1 1/2" SS FLT SKT HD CAP SCR

**DuMor, inc.**  
 P.O. Box 142 Mifflintown, PA 17059-0142

SCALE : NONE  
 DATE DRAWN : 1/12/11  
 DRAWN BY : JSB  
 DATE REV. : 2/28/12  
 REV. BY : JSB

TITLE : BIKE RACK ASSEMBLY

REV.  
B

DRAWING  
NUMBER

125-20

SHEET  
2 OF 2

# Model EC35

8" - 14 gauge spun aluminum ball  
gold anodized

Single sheave truck, cast aluminum  
revolving, non-fouling type

2 Bronze swivel snaps with covers  
per halyard

1 Set of halyard: #10 poly

1 - 9" Cast aluminum cleat

Aluminum flash collar

3000 PSI concrete

Hardwood wedges  
(supplied by others)

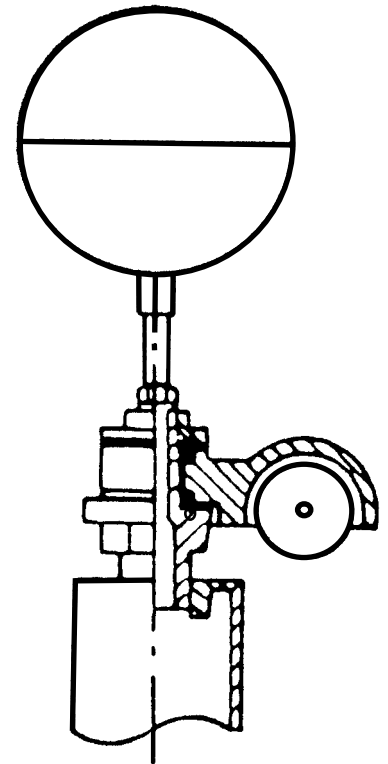
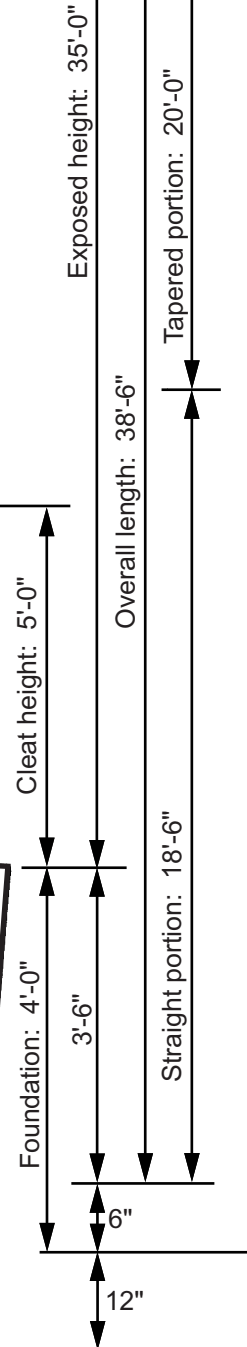
Dry sand tightly tamped  
after aligning pole

Foundation sleeve -16 ga  
hot dip galvanized steel

Steel centering wedges

1/4" Steel base plate

1/4" Steel support plate  
welded to grounding spike



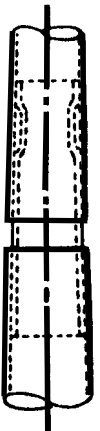
**Truck Detail**

Aluminum body  
Stainless steel ball bearings  
Aluminum sheave  
Cast aluminum spindle

All shafts with overall  
length of more than  
38'-6" are shipped in  
two sections.

Each section matched marked  
for field assembly. Exposed  
portion of jam sleeve must  
be **well lubricated** prior to  
assembly.

1-1/2" maximum shop  
gap allowed for field fitting  
(ram for tight joint)

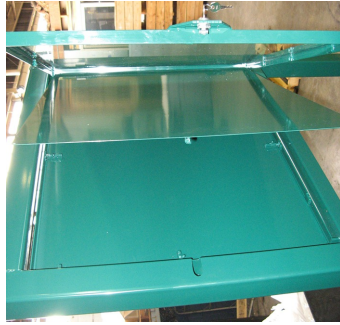


Filename: EC35 single sheave\_revolving truck.ai

Project:	Ground set tapered aluminum flagpole: ALLOY: 6063T6		EDER FLAG	Date:
Location:	Exposed height: 35'-0"	Overall height: 38'-6"	MANUFACTURING COMPANY	Revision:
Architect:	Ship in 1 section	Butt diameter: 7"	1000 W. Rawson Avenue	
Contractor:	Top diameter: 3-1/2"	Wall thickness: .188"	Oak Creek, WI 53154	
Customer:	Finish: 100 grit polish			Job:



2-Sided Kiosk



Kiosk Feet Detail

Kiosk Door Detail

## 2-Sided Information Kiosk Dimensions & Specifications

- Dimensions: 42" Wide x 3" thick x 78-1/2" tall (Overall Height)
- Door Frame: 28" Tall x 35-1/2" wide
- Door Back Panel: 16 Gauge Sheet Steel
- Sign Opening: 26-1/2" tall x 33-1/2" wide
- Top Cross Brace: 3" x 3" Tubular Steel
- Bottom Cross Brace: 2" x 2" Tubular Steel
- Legs: 3" x 3" x 73-1/2" Tubular Steel
- Feet: 1/2" x 4" x 9" Steel Plate with 4 mounting holes
- Mounting Hardware (Concrete Expansion Bolts) Included
- Finials: 2-7/8" x 2-7/8" x 4-1/2" Tall
- Heavy Duty Barrel Hinges - 2 per door
- 3 Slide Bolts: per door: 1 Top, 1 Bottom & Lock
- OCC Paint System - See Page 2 for colors available and Paint System Details. The OCCOutdoors "Zinc Advantage" painting system is among the very best in the industry.

WARRANTY: OCCOutdoors, Inc. guarantees all items for one full year to be free of defects in workmanship or materials when installed and maintained properly. We agree to repair or replace, any items determined to be defective. Items specifically not covered by this warranty include vandalism, manmade or natural disasters, lack of maintenance, normal weathering or wear and tear due to public abuse.

NOTES:  
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.  
2. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.  
3. DO NOT SCALE DRAWING.

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### OCC Outdoors Products

PH: 1-800-821-7670

EMAIL - [occontact@occoutdoors.com](mailto:occontact@occoutdoors.com) Fax: 1-317-862-9422

Kiosk -2633 2-Sided Kiosk  
Dimensions and Specifications

Part #: Kiosk-2633

Date: 10/19/2017

Page 1 of 2



## OCC Colors and Paint Details

Bench Colors: OCC offers hundreds of color including the standard RAL colors, Architectural series and custom mixed colors. Please contact us with you color requirements. For more details please go to: [www.occoutdoors.com/blog/understanding-nonstandard-colors-cost](http://www.occoutdoors.com/blog/understanding-nonstandard-colors-cost).

**Black (RAL 9005)**



**Bronze (C33)**



**Silver Gray (70049)**



**Green (RAL 6005)**



**Blue (RAL 5012)**



**Burgundy (RAL 3004)**



Color Matching Information: OCCOutdoors makes every effort to present the planter colors as accurately as possible. The planter colors have been produced electronically and are provided for general color information and illustration purposes only. Because of the differences in computer monitors, printers, other hardware and software combinations, the depicted results are intended to be used as approximations of color and not as definitive representations and should not be relied upon or used as such. We cannot guarantee you will achieve desired results without verifying an actual color sample of your actual color selection. For specific advice regarding your project, we recommend that you contact OCC Outdoors: Phone: 1-800-821-7670 email: [occcontact@occoutdoors.com](mailto:occcontact@occoutdoors.com)

## Zinc Advantage Process Details:

Zinc rich primer & Super TGIC powder coat Finishing operations.

1. Sand blasts each unit down to shiny metal.
2. Clean and hand inspects each unit.
3. Powder coat with 70 % zinc rich epoxy resin primer.
4. Partially bake the primmer.
5. Powder coat with SUPER TGIC Polyester finish coat.
6. Final bake, creating a molecular bond between the steel, primer and finish coat.
7. Each part is tested by a Xylene test to insure a complete cure.

## Advantages:

1. A very tough durable finish with 5 times the fade resistance of standard TGIC powder coatings with a 3H pencil hardness. (All test conducted in South Florida.)
2. If scratched through to the metal, the zinc rich primer greatly reduce rust and the potential for the migration of rust.
3. This system is cured and each unit test for cure so many types of paint used for graffiti can be clean with mild solvents.

**Our paint manufacturer's Zinc Rich Primer TGIC Polyester out lasts all major competitors on the 4000 hour salt spray test per ASTM B117. Detailed reports available by request.**

# poligon® Gliders

Poligon Gliders provide seating for your structures in a fun new way. Constructed from commercial grade steel, the gliders are both comfortable and modern with horizontal slat seating and clean simple lines.

- Bench length 48" or 72"
- Seat height 19"
- Seat is 18" from finish grade
- Seat is 7' 10.75" from bottom of Poligon steel beam
- Laser cut & welded end frames 3/8"
- Steel framework 1/4" x 1-1/2"
- Bench weight capacity 600lbs & 850lbs
- Stops limiting swing travel to 16 degrees fore and aft
- 3 year warranty



## Glider Frame Ideas

CWC  
(8x20)



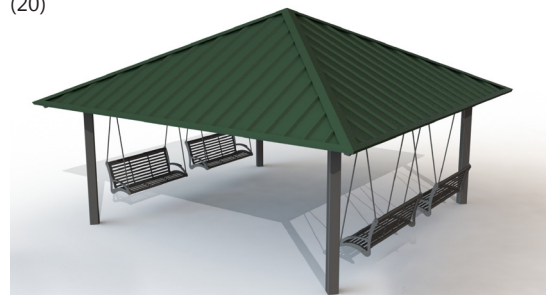
HXE  
(24)



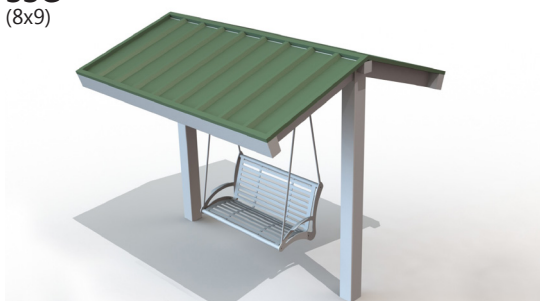
MIL  
(9x28)



SQR  
(20)



SSG  
(8x9)

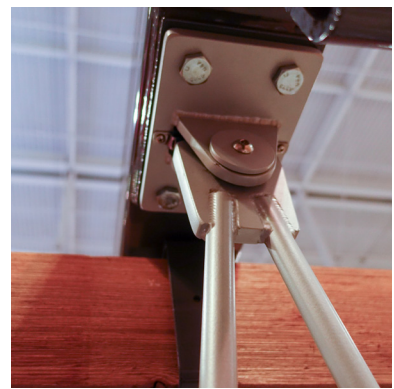


PRT  
(14)



## Glider Details & Options

### Connections

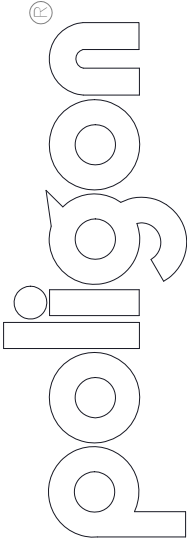


connection detail

The Glider is not considered playground equipment, therefore it does not meet the playground equipment standards.

### Standard Powder Coat Finishes (glider only - frame options separate)

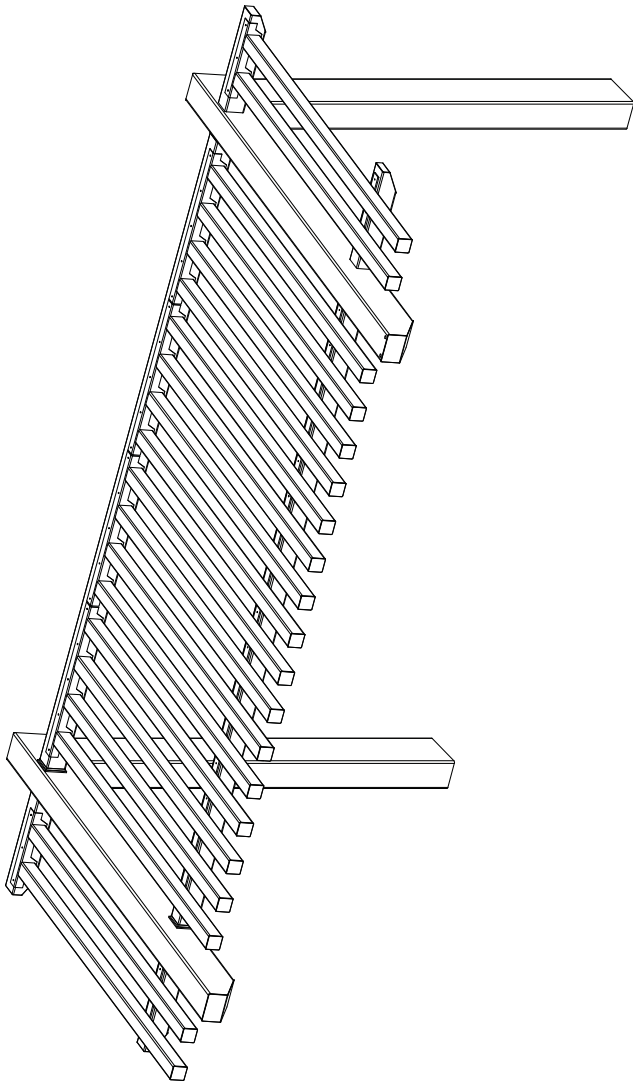




PROJECT: \_\_\_\_\_  
LOCATION: \_\_\_\_\_  
BUILDING TYPE: MIL-9X16  
ROOF TYPE: N/A

DRAWING LIST:

SHEET NUMBER	DRAWING DESCRIPTION
CS	COVER SHEET
1	ARCHITECTURAL ELEVATIONS
2	COLUMN LAYOUT



**FABRICATOR APPROVALS:**  
CITY OF PHOENIX, AZ APPROVED FABRICATOR #C08-2010  
CITY OF LOS ANGELES, CA APPROVED FABRICATOR #1596  
CITY OF LOS ANGELES, CA APPROVED FABRICATOR #506-0033  
CITY OF HOUSTON, TX APPROVED FABRICATOR #470  
CLARK COUNTY, NV APPROVED FABRICATOR #264  
STATE OF UTAH APPROVED FABRICATOR 02008-14

**CERTIFICATES:**  
MIAMI-DADE COUNTY CERTIFICATE OF COMPETENCY NO. 16-1025.01  
PCI (POWDER COATING INSTITUTE) 4000 CERTIFIED

**MATERIALS:**

DESCRIPTION	ASTM DESIGNATION
PIPE STEEL	A500 (GRADE B)
PIPE	A516
PIPE	A519
LIGHT GAGE COLD FORMED	A1003 (GRADE 50)
STRUCTURAL STEEL PLATE	A36
ROOF PANELS (STEEL)	A653

**GENERAL NOTES:**  
UNLESS NOTED OTHERWISE, THIS STRUCTURE WAS DESIGNED TO MEET THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS. THIS STRUCTURE IS TO BE ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION MANUAL. THE DESIGN OF THIS STRUCTURE CAN BE REVIEWED AND POSSIBLY REVISED.

UNLESS NOTED OTHERWISE, THIS STRUCTURE WAS DESIGNED ASSUMING A SEPARATION BETWEEN THE PRIMARY FRAME INSTALLER AND THE ROOF INSTALLER. THE ROOF INSTALLER SHALL BE RESPONSIBLE FOR THE SEPARATION OF THIS STRUCTURE. IF THAT SEPARATION DOES NOT EXIST, THE DESIGN OF THIS STRUCTURE CAN BE REVIEWED AND POSSIBLY REVISED.

STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION MANUAL.

ALL WELDING IS PERFORMED BY AMERICAN WELDING SOCIETY CERTIFIED WELDERS AND CONFORMS TO THE LATEST EDITION OF AWS D1.1 OR D1.3 AS REQUIRED.

PARTS SHOWN MAY BE UPGRADED DUE TO STANDARDIZED FABRICATION. REFER TO THE SHIPPING BILL OF MATERIALS FOR POSSIBLE SUBSTITUTIONS.

FOR PROPER FIELD INSTALLATION OF THE BUILDING IT IS RECOMMENDED THAT THE PRIMARY FRAME INSTALLER AND THE ROOF INSTALLER HAVE A MINIMUM FIVE (5) YEARS DOCUMENTED EXPERIENCE INSTALLING THIS TYPE OF PRODUCT.


FOR PROPER FIELD INSTALLATION OF THE BUILDING IT IS RECOMMENDED THAT ELECTRIC WELDING BE REQUIRED. BE RUN THROUGH THE STRUCTURAL MEMBERS BEFORE THE BUILDING IS ERECTED.

**STOP!!**  
**NOT FOR CONSTRUCTION**  
**USE FOR PRELIMINARY**  
**PLANNING AND ESTIMATING**  
**ONLY**

DRAWING: COVER SHEET

SCALE: 1:24

REV. LEVEL: A



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PORTER CORP. 4360 N. 135th AVE  
HOLLAND, MI 48424

www.poligon.com

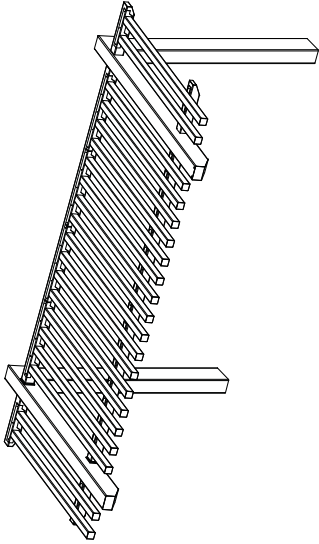
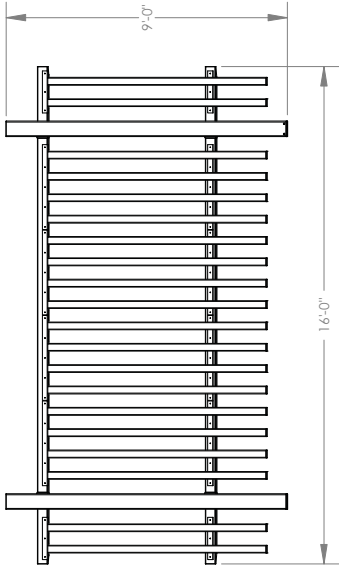
by PORTER CORP

CS

SHEET

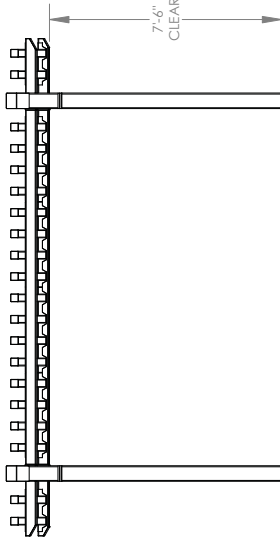
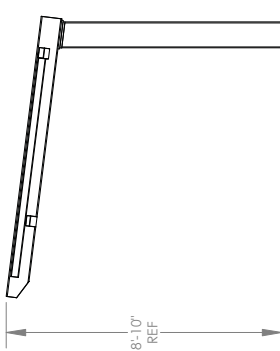
GENERAL ROOF NOTES:

1. METAL ROOFING:
  - 24 GAUGE
  - GALVALUME COATED
  - KYNAR 500 PAINTED
2. TRIM COLOR MATCHES ROOF
3. SEE POLIGON.COM FOR COLOR OPTIONS



12

1.5



FINISH GRADE  
MOUNTING VARIES  
BASED ON ENGINEERING  
REQUIREMENTS.

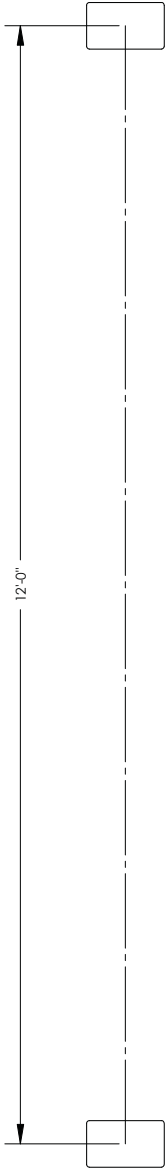
**STOPII**  
NOT FOR CONSTRUCTION

USE FOR PRELIMINARY  
PLANNING AND ESTIMATING  
ONLY

DRAWING: ARCHITECTURAL ELEVATIONS	
SCALE: 1:48	REV. LEVEL: A
<b>poligon</b> <sup>©</sup> (616)399-11963 www.poligon.com by <b>PORTERCORP</b> COPYRIGHT 2016 PATENTED OR PATENTS PENDING PORTERCORP 4240 N. 139th AVE HOLLAND, MI 48424	
SHEET 1	


**BASEPLATE NOTES:**

- 1. POLYGON ENGINEERING WILL DETERMINE REQUIRED BASEPLATE DESIGN AFTER ENGINEERING PACKAGE IS ORDERED.
- 2. CUSTOMER MAY SUGGEST PREFERRED BASEPLATE DESIGN.



**STOP!!**  
NOT FOR CONSTRUCTION

USE FOR PRELIMINARY  
PLANNING AND ESTIMATING  
ONLY

DRAWING: COLUMN LAYOUT		REV LEVEL: A
SCALE: 1:16		
 <small>copyright 2014 POLYMER CORP. 4200 N. 13th AVE HOLLAND, MI 49424</small>		<small>www.polygon.com</small> <b>by PORTERCORP</b>
		SHEET <b>2</b>

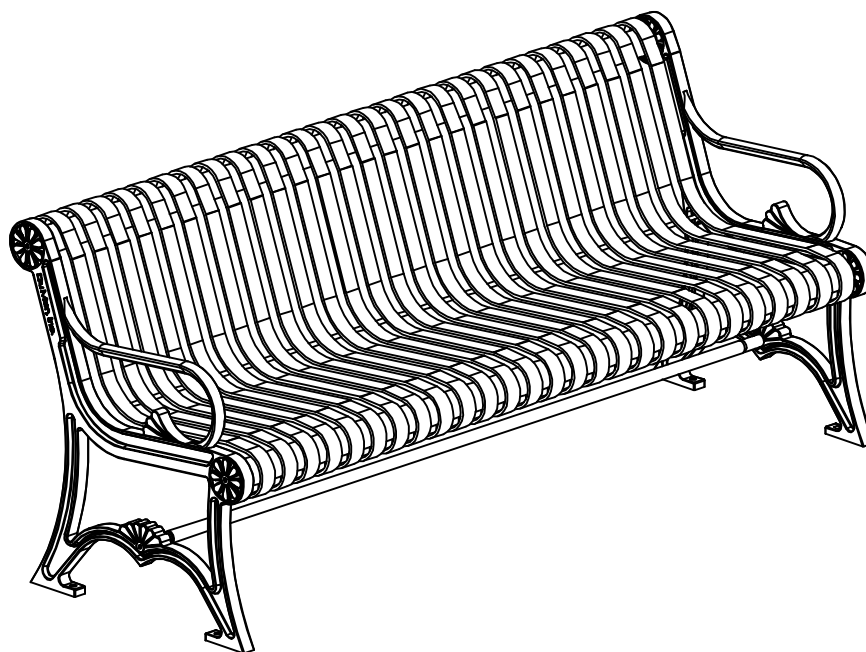
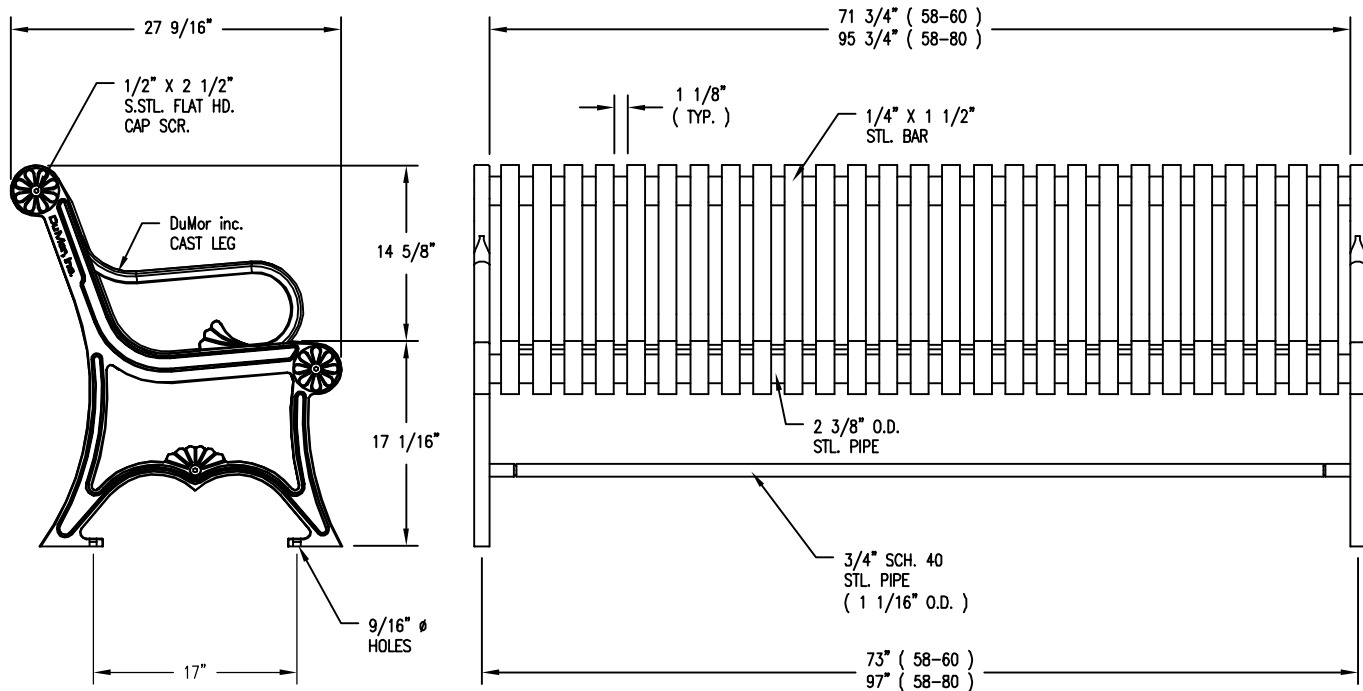


**poligon<sup>®</sup>**



**FRAME COLOR: SURREY BEIGE**  
COLORS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. FOR OTHER  
COLOR SELECTIONS, PLEASE SUBMIT AN ET DRAWING REQUEST.

MIL-9X16



#### NOTES

- 1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
- 2.)  $1/2" \times 3 \frac{3}{4}"$  EXPANSION ANCHOR BOLTS PROVIDED.
- 3.) CUSTOM LETTERING AVAILABLE FOR RECESSED SIDE PANELS ( TOTAL OF 37 SPACES )

☐ CUSTOM LETTERING ( 37 SPACES )

#### LENGTH OPTIONS

- ☐ 6' BENCH
- ☐ 8' BENCH



# NOTES:

- 1.) DURING ASSEMBLY PROCEDURE;  
DO NOT COMPLETELY TIGHTEN HARDWARE.
- 2.) THE ACTUAL PARTS WILL NOT BE NUMBERED.  
NUMBERS ONLY APPLY TO DRAWING.
- 3.) UPON COMPLETION OF ASSEMBLY SQUARE  
ALL COMPONENTS THEN TIGHTEN ALL HARDWARE.
- 4.) MOUNT AND ANCHOR AS SPECIFIED.

# TOOLS REQ'D

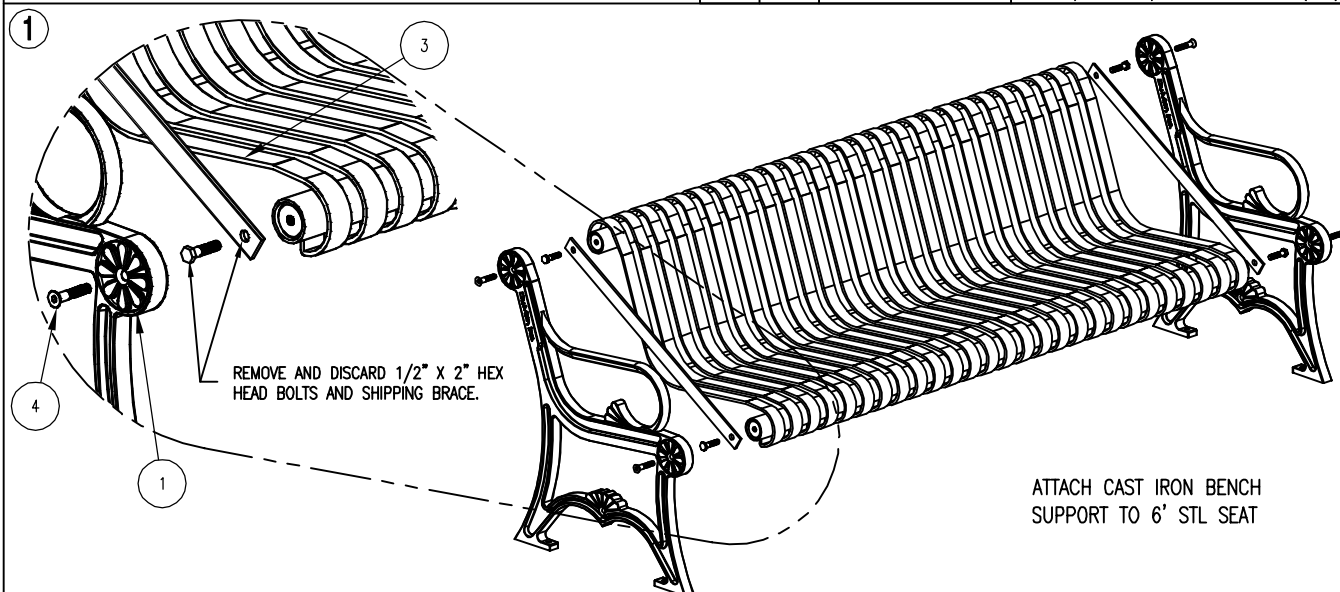
3/4" WRENCH  
5/16" ALLEN WRENCH  
1/2" MASONRY DRILL BIT  
DRILL  
RATCHET STRAP (PROVIDED)

# PARTS LIST

ITEM	QTY	PART NO	DESCRIPTION
1	2	0-57-00-02	CAST IRON BENCH SUPPORT
2	1	0-57-60-04	71 3/4" PIPE BRACE
3	1	0-58-60-01	6' STL SEAT
4	6	1-12-065	1/2" X 2 1/2" FLT SKT HD CAP SCR

# KITS PROVIDED

ITEM	QTY	PART NO	DESCRIPTION
5	1	K-FC0840-6	1/2" CAP HARDWARE KIT (6PC)
6	1	K-ANC0860-4	1/2" X 3 3/4" SS ANCHOR KIT (4PC)



ATTACH CAST IRON BENCH  
SUPPORT TO 6' STL SEAT

1A



PLACE SEAT ASSEMBLY ON WORK  
SURFACE ALLOWING ACCESS TO ENDS.  
PLACE RATCHET STRAP AROUND SEAT  
ASSEMBLY AS SHOWN ABOVE.

1B



TIGHTEN STRAP UNTIL SHIPPING BRACKET  
BECOMES LOOSE. THEN REMOVE AND DISCARD  
BOLTS & SHIPPING BRACKET.

1C



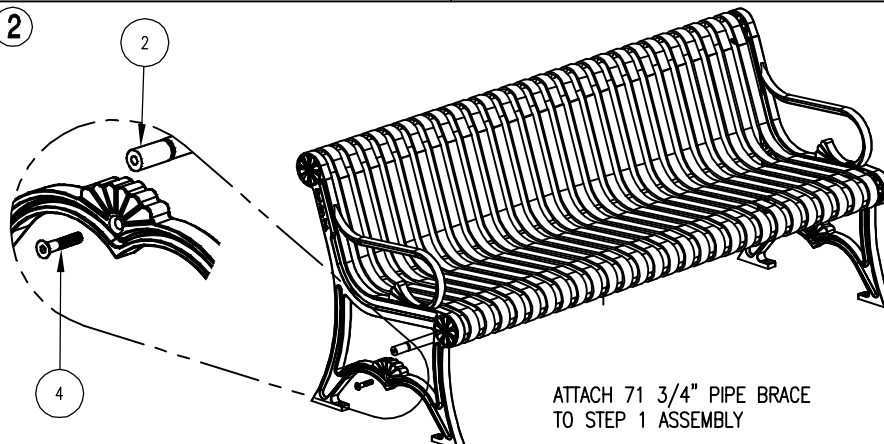
ATTACH CAST SUPPORT TO SEAT ASSEMBLY.  
IF HOLES IN CASTING DO NOT ALIGN WITH  
THE SEAT ASSEMBLY, ADJUST BY USING  
THE RATCHET STRAP.

1D

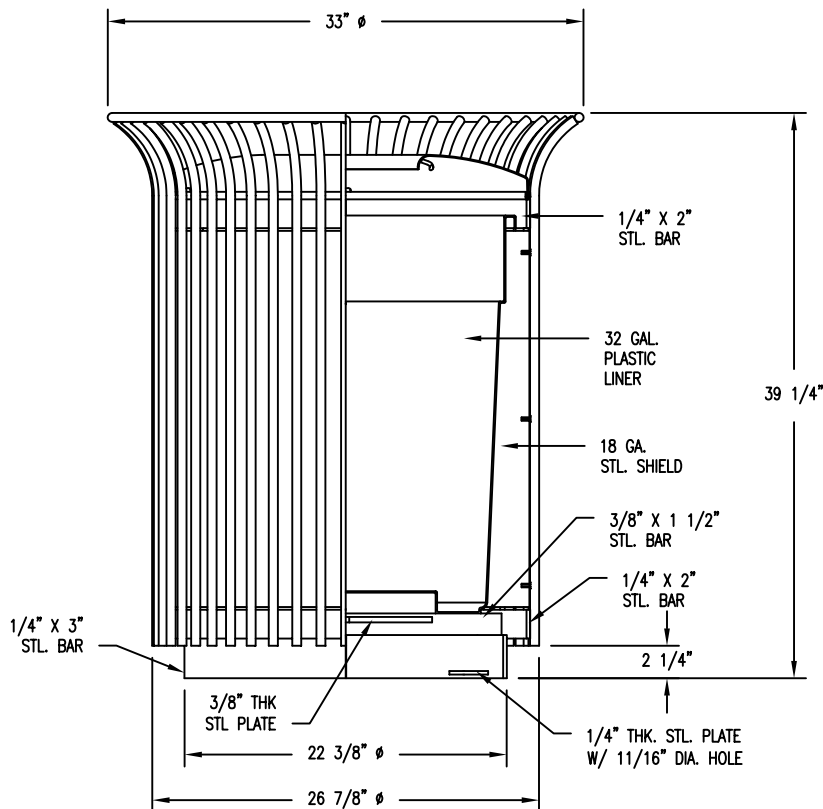
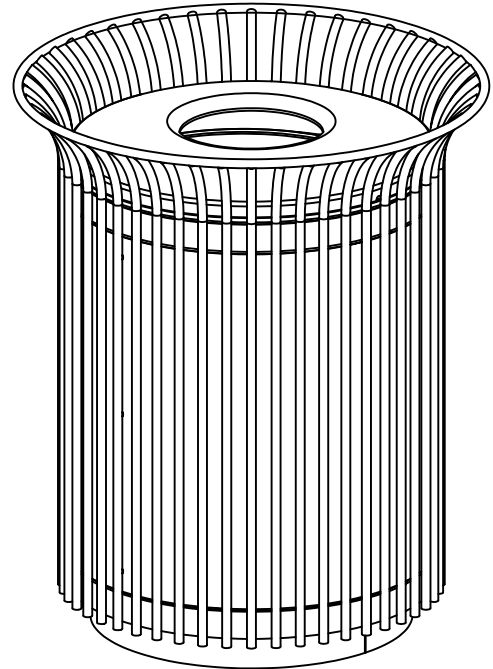
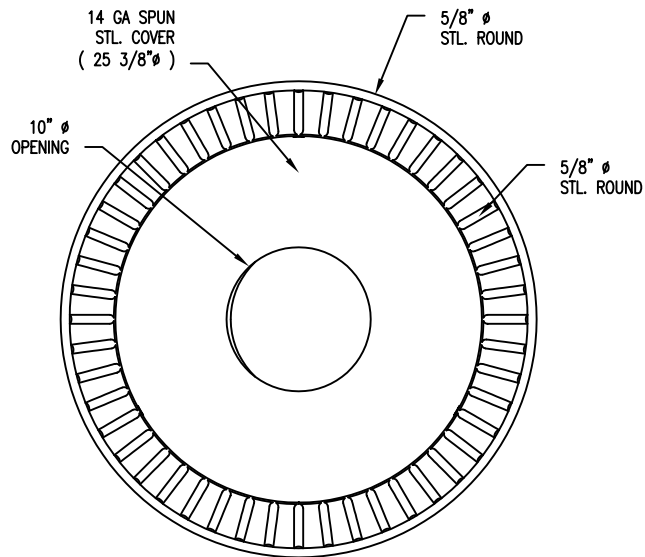


TIGHTEN HARDWARE THEN REMOVE  
RATCHET STRAP AND REPEAT THIS PROCEDURE  
ON THE OTHER END OF BENCH.

2



ATTACH 71 3/4" PIPE BRACE  
TO STEP 1 ASSEMBLY



#### NOTES:

- 1.) ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
- 2.) 1/2" X 3 3/4" EXPANSION ANCHOR BOLTS PROVIDED.
- 3.) ALL WELDS CONT. THEN GROUND SMOOTH.

**DuMor, inc.**  
P.O. Box 142 Mifflintown, PA 17059-0142

SCALE : NONE  
DATE DRAWN : 6/24/03  
DRAWN BY : CDC  
DATE REV. : 12/10/12  
REV. BY : JSB

TITLE :

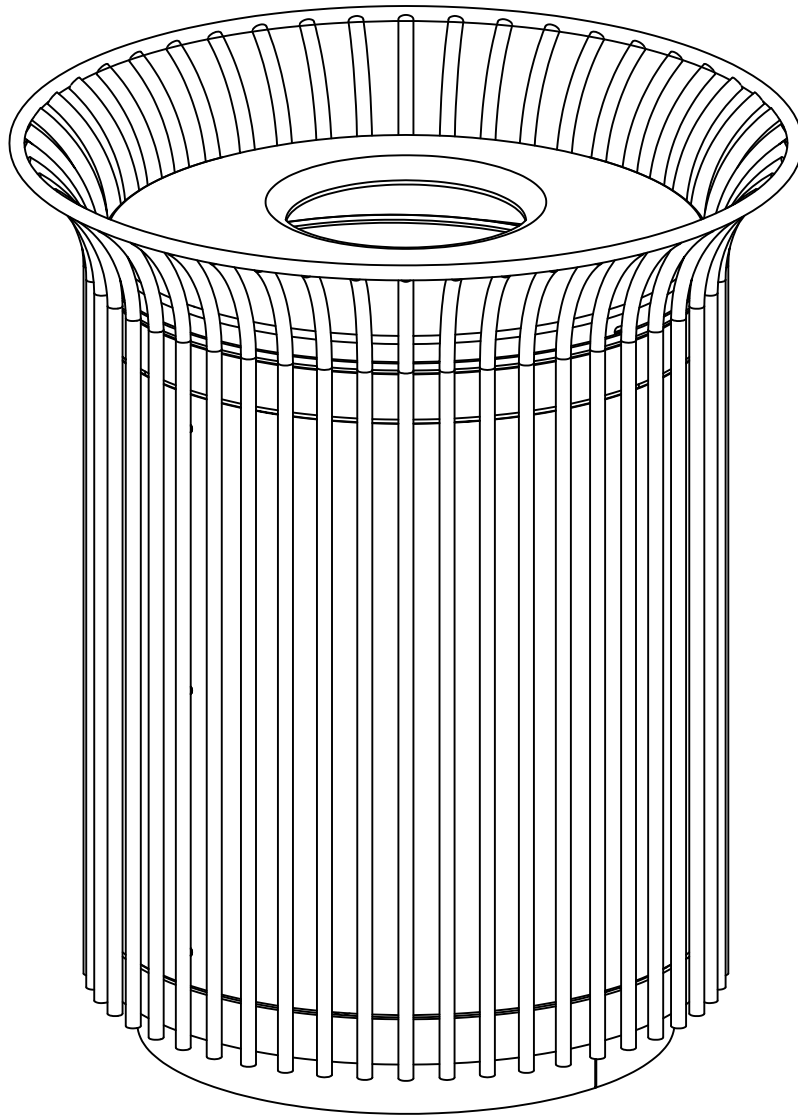
RECEPTACLE

REV.  
H

DRAWING  
NUMBER

158-32SH-FT0

SHEET  
1 OF 2



NOTE:

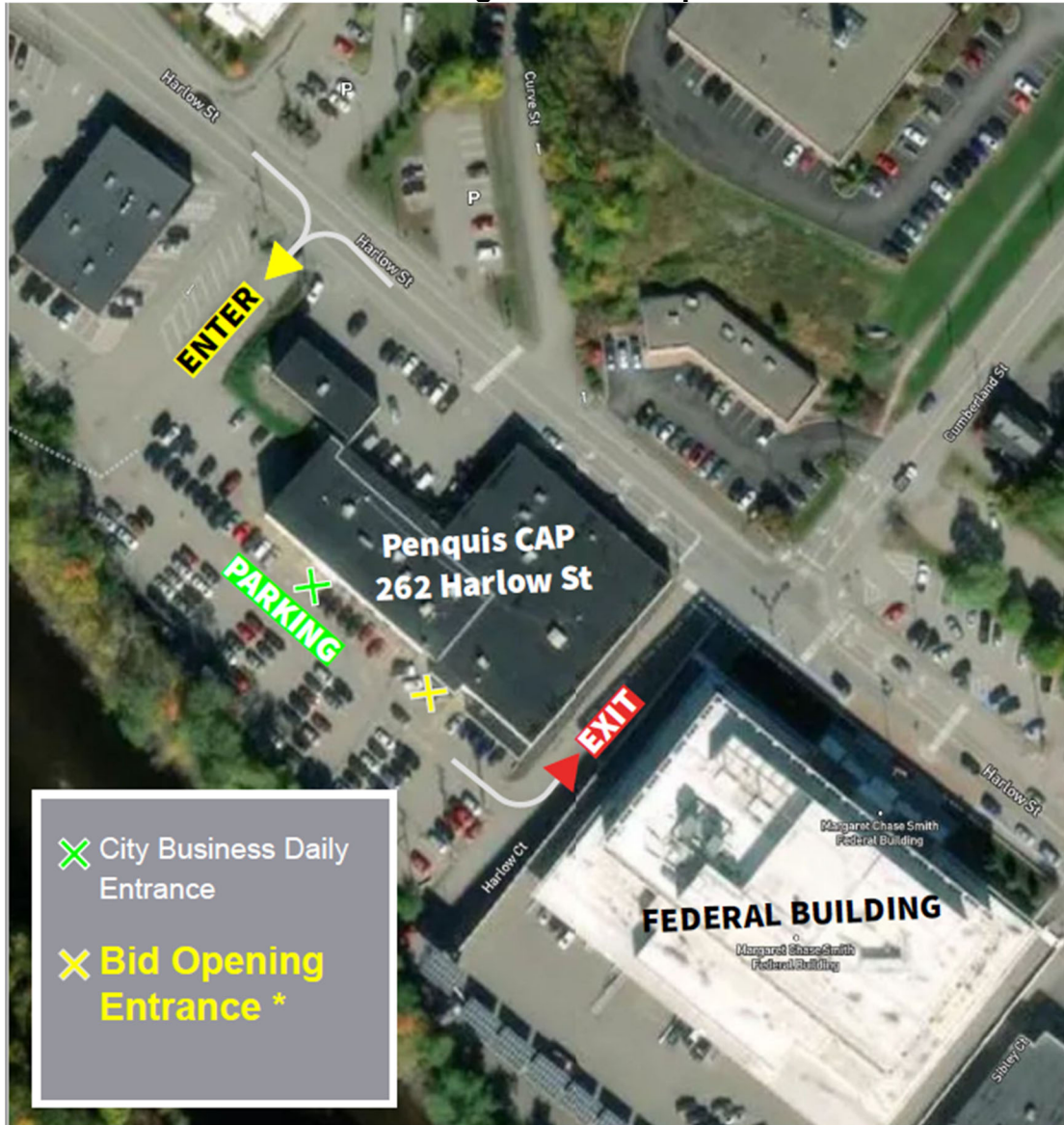
- 1.) RECEPTACLE SHIPPED FULLY ASSEMBLED.
- 2.) COVER ATTACHED W/ 1/8" VINYL COATED CABLE.
- 3.) MOUNT AND ANCHOR AS SPECIFIED.

  
**DuMor, inc.**  
 P.O. Box 142 Mifflintown, PA 17059-0142

SCALE :	NONE
DATE DRAWN :	6/24/03
DRAWN BY :	CDC
DATE REV. :	12/10/12
REV. BY :	JSB

TITLE : <div style="text-align: center; font-size: 1.2em;">RECEPTACLE</div>	
REV. <div style="text-align: center; font-size: 1.2em;">H</div>	DRAWING NUMBER <div style="text-align: center; font-size: 1.2em;">158-32SH-FT0</div>
SHEET 2 OF 2	

**APPENDIX D**  
**Meeting Location Map**



\* From Harlow Street, drive around to the back of the Penquis building (one-way traffic in parking lot). To the right, enter through glass vestibule door (yellow “X” on map above) and once in there, to the right, there is another glass door marked “Meeting Entrance”. Go to the end of that hallway and take a slight left. The room marked “Penobscot Conference Room” is the temporary Council Chambers location where Bid Opening meetings are held.

**“Meeting Entrance” door will be opened 10 minutes prior to the scheduled meeting time.**