

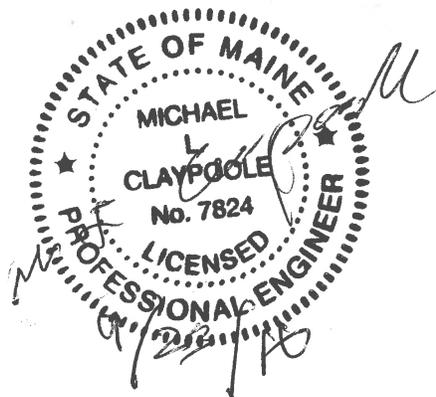
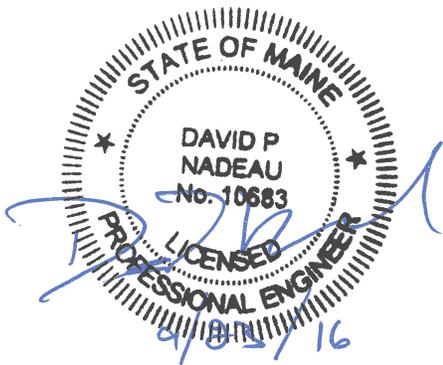
STATE OF MAINE
Bureau of General Services

PROPOSAL AND CONTRACT
DOCUMENTS

Construction Contract 'A'

Infrastructure Improvements at the
East Campus - Augusta, Maine

Prepared for:
Maine Bureau of General Services
Department of Administrative and Financial Services
4th Floor, Cross State Office Building, 111 Sewall Street
77 State House Station
Augusta, Maine 04333-0077



FOR BID

September ♦ 2016



Specifications and Contract Documents

for

STATE OF MAINE
Bureau of General Services

Project to Include:

Construction Contract 'A'
Infrastructure Improvements
At the East Campus - Augusta, Maine

Prepared By:

Stantec Consulting Services Inc.
482 Payne Road
Scarborough, Maine 04074



September 2016

Construction Contract 'A'
East Campus Infrastructure Improvements

00 00 00
Table of Contents

Section	Title
Proposal and Contract Documents	
00 11 13	Notice to Contractors
00 21 13	Instructions to Bidders
00 41 13	Contractor Bid Form
00 43 13	Contractor Bid Bond
00 52 13	Specimen Contract Agreement
00 61 13.13	Contractor Performance Bond
00 61 13.16	Contractor Payment Bond
00 71 00	Definitions
00 72 13	General Conditions
1.	Preconstruction Conference
2.	Intent and Correlation of Contract Documents
3.	Additional Drawings and Specifications
4.	Record of Documents
5.	Ownership of Contract Documents
6.	Shop Drawings
7.	Samples
8.	Substitutions
9.	Patents and Royalties
10.	Surveys, Layout of Work
11.	Permits, Laws, and Regulations
12.	Taxes
13.	Labor and Wages
14.	Insurance Requirements
15.	Contract Bonds
16.	Allowances
17.	Assignment of Contract
18.	Separate Contracts
19.	Subcontracts
20.	Contractor-Subcontractor Relationship
21.	Supervision of the Work
22.	Inspection of the Work
23.	Architect's Status

Construction Contract 'A'
East Campus Infrastructure Improvements

00 00 00

Table of Contents

Section	Title
24.	Management of the Premises
25.	Safety and Security of the Premises
26.	Changes in the Work
27.	Correction of the Work
28.	Owner's Right to do Work
29.	Termination of Contract and Stop Work Action
30.	Delays and Extension of Time
31.	Payments to the Contractor
32.	Payments Withheld
33.	Liens
34.	Indemnification
35.	Workmanship
36.	Close-out of the Work
37.	Date of Completion and Liquidated Damages
38.	Dispute Resolution

State Wage Rates

HI-117-2016 Maine DOL Wage Determination

Technical Specifications

Site Specifications

202	Demolition
203	Excavation, Embankment and Restoration
304	Aggregate Base and Subbase Course
401	Hot Mix Asphalt Pavement
603	Storm Drains, Catch Basins and Drain Manholes
608	Sidewalks and Ramps
609	Curb
610	Riprap Aprons, Channels and Level Spreaders
625	Water Service and Hydrant Assembly
627	Pavement Markings, Signs and Bike Racks
642	Reinforced Concrete Steps
656	Temporary Soil Erosion and Water Pollution Control
659	Mobilization

Construction Contract 'A'
East Campus Infrastructure Improvements

00 00 00
Table of Contents

Section	Title
<u>Electrical Specifications</u>	
26 05 19	Building Wire and Cable
26 05 26	Secondary Grounding
26 05 33	Conduit
26 05 53	Electrical Identification
26 05 70	General Electrical Requirements
26 51 19	Site Lighting
<u>Landscape Specifications</u>	
32 90 00	Planting
32 92 00	Turf and Grasses

Construction Contract 'A'
East Campus Infrastructure Improvements

00 00 00
Table of Contents

(This Page Intentionally Left Blank)

00 11 13
Notice to Contractors

Construction Contract 'A'
East Campus Infrastructure Improvements

The proposed work is located at the State of Maine owned East Campus on Hospital Street in Augusta, Maine (former AMHI Facility). The work consists of constructing new parking lots, driveways and sidewalks including: pavement removal; common excavation; aggregate base and subbase construction; HMA pavement construction; stormdrain and stormwater management structure construction; site lighting and miscellaneous electrical work; granite and bituminous curbing; concrete ramps and truncated domes; pavement markings; temporary erosion control; plantings; and site restoration including topsoil, seed and mulch.

The cost of the work is approximately \$1,000,000 - \$1,500,000. The work to be performed under this contract shall be completed *within 75 calendar days of the Notice to Proceed issued by the Owner.*

1. Sealed Contractor bids for the project noted above, in envelopes plainly marked "Bid for Construction Contract 'A' - Infrastructure Improvements at the East Campus" and addressed to:
Jill Instasi
Bureau of General Services
4th Floor, Cross State Office Building, 111 Sewall Street
77 State House Station
Augusta, Maine 04333-0077
will be opened and read aloud at *the address shown above* at **2:00 p.m.** on **October 11, 2016**. Bids submitted after the noted time will not be considered and will be returned unopened.
2. The bid shall be submitted on the Contractor Bid Form (section 00 41 13) provided in the Bid Documents. The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
3. Bid security *is required* on this project.
The Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with the completed bid form submitted to the Owner.
4. Performance and Payment Bonds *are required* on this project.
The selected Contractor shall furnish a 100% contract Performance Bond (section 00 61 13.13) and a 100% contract Payment Bond (section 00 61 13.16) in the contract amount to cover the execution of the Work.
5. Filed Sub-bids *are not required* on this project.
6. An on-site pre-bid conference *will* be conducted for this project.
The pre-bid conference is *mandatory* for General Contractors and optional for Subcontractors and suppliers. Contractors who arrive late or leave the meeting early may be prohibited from participating in this meeting and bidding. *Bidders interested in attending the pre-bid conference shall meet in the Public Meeting Room of the Marquardt Building, 32 Blossom Lane, Augusta, Maine on Wednesday, September 28, 2016 at 2:00 P.M.*
7. Bid Documents - electronic sets only - will be available for download on-or-about *September 21, 2016*. Interested bidders must send an email to Stantec Consulting Services Inc.

00 11 13
Notice to Contractors

at bid@stantec.com requesting access to the project ftp site where the documents can be downloaded free of charge. The email must contain the bidding firm's name, contact person, phone number, mailing address and email address. A return email will be sent from Stantec containing credentials to access the ftp site.

8. Questions concerning this bid must be submitted in writing to Stantec Consulting Services Inc. at bid@stantec.com. All questions must be received by 4:00 P.M. on October 4, 2016. Responses will be posted to the project ftp site in the form of addenda. Bidders will be notified via email when addenda are posted.

9. Bid Documents may be examined at:

*Bureau of General Services (BGS)
4th Floor, Cross State Office Building, 111 Sewall Street
77 State House Station, Augusta, Maine 04333-0077
Phone 207-624-7341 / Fax 207-287-4039*

*Stantec Consulting Services Inc.
482 Payne Road
Scarborough, Maine 04074
Phone 207-883-3355 / Fax 207-887-3376*

00 21 13
Instructions to Bidders

1. Bidder Requirements

- 1.1 A bidder is a Contractor who is qualified, or has been specifically pre-qualified by the Bureau of General Services, to bid on the proposed project described in the Bid Documents.
- 1.2 Contractors and Subcontractors bidding on projects that utilize Filed Sub-bids shall follow the requirements outlined in these Bid Documents for such projects. See Section 00 22 13 for additional information.
- 1.3 Contractors are not eligible to bid on the project when their access to project design documents prior to the bid period distribution of documents creates an unfair bidding advantage. Prohibited access includes consultation with the Owner or with design professionals engaged by the Owner regarding cost estimating, constructability review, or project scheduling. This prohibition to bid applies to open, competitive bidding or pre-qualified contractor bidding or Filed Sub-bidding. The Bureau may require additional information to determine if the activities of a Contractor constitute an unfair bidding advantage.
- 1.4 Each bidder is responsible for becoming thoroughly familiar with the Bid Documents prior to submitting a bid. The failure of a bidder to review evident site conditions, to attend available pre-bid conferences, or to receive, examine, or act on addenda to the Bid Documents shall not relieve that bidder from any obligation with respect to their bid or the execution of the work as a Contractor.
- 1.5 Prior to the award of the contract, General Contractor bidders or Filed Sub-bidders may be required to provide documented evidence to the Owner or the Bureau showing compliance with the provisions of this section, their business experience, financial capability, or performance on previous projects.
- 1.6 The selected General Contractor bidder will be required to provide proof of insurance before a contract can be executed.
- 1.7 Contracts developed from this bid shall not be assigned, sublet or transferred without the written consent of the Owner.

2. Authority of Owner

- 2.1 The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
- 2.2 Subject to the Owner's stated right to accept or reject any or all bids, the Contractor shall be selected on the basis of the sum of the lowest acceptable bid plus any Alternate Bids the Owner elects to include.
- 2.3 The Owner is exempt from the payment of Federal Excise Taxes and Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes on items "...physically incorporated in real property ...". The bidder shall not include these taxes in their bid. See Section 00 72 13 for additional information.

00 21 13
Instructions to Bidders

3. Submitting Bids and Bid Requirements

- 3.1 Each bid shall be submitted on the forms provided in the Bid Documents.
- 3.2 Each bid shall be valid for a period of thirty calendar days following the Project bid opening date and time.
- 3.3 A bid that contains an escalation clause is considered invalid.
- 3.4 Bidders shall include a Bid Bond or other approved bid security with the bid form submitted to the Owner when the bid form indicates such bid security is required. The bond value shall be 5% of the bid amount. The form of bond is shown in section 00 43 13.
- 3.5 Bidders shall include the cost of Performance and Payment Bonds in the bid amount if the bid amount will result in a construction contract value over \$125,000, inclusive of alternate bids that may be awarded in the contract. Pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3, the selected Contractor is required to provide these bonds before a contract can be executed. The form of bonds are shown in section 00 61 13.13 and 00 61 13.16.
- 3.6 Bidders may modify bids in writing prior to the bid closing time. Such written amendments shall not disclose the amount of the initial bid. If so disclosed, the entire bid is considered invalid.
- 3.7 Bidders shall acknowledge on the bid form all Addenda issued in a timely manner. The Architect shall not issue Addenda affecting bidders less than 72 hours prior to the bid closing time. Addenda shall be issued to all companies who are registered holders of Bid Documents.
- 3.8 A bid may be withdrawn without penalty if a written request by the bidder is presented to the Owner prior to the bid closing time. Such written withdrawal requests are subject to verification as required by the Bureau. After the bid closing time, such written withdrawal requests may be allowed in consideration of the bid bond or, without utilizing a bid bond, if the Contractor provides documented evidence to the satisfaction of the Bureau that factual errors had been made on the bid form.
- 3.9 Projects which require a State of Maine wage determination will include that schedule as part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.10 Projects which require compliance with the Davis-Bacon Act are subject to the regulations contained the Code for Federal Regulations and the federal wage determination which is made a part of the Bid Documents. See section 00 73 46, if such rates are required.

**00 41 13
Contractor Bid Form**

**CONSTRUCTION CONTRACT 'A'
EAST CAMPUS INFRASTRUCTURE IMPROVEMENTS**

To: *Jill Instasi, Director of Special Projects*
Bureau of General Services
4th Floor, Cross State Office Building, 111 Sewall Street
77 State House Station
Augusta, Maine 04333-0077

The undersigned, or "Bidder", having carefully examined the form of contract, general conditions, specifications and drawings dated September 2016, prepared by Stantec Consulting Services Inc. for Construction Contract 'A' - Infrastructure Improvements at the East Campus, as well as the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the Base Bid amount of:

_____ Dollars
(written in words)

\$ _____
(written in numerals)

This amount shall match the Total of Pay Items included in Section 00 41 13A Schedule of Prices. The bidder is hereby advised that all spaces on the Schedule of Prices must be filled in. Any omission may result in a disqualification of the proposal.

The estimated quantities given in the Schedule of Prices will be used:

- as the basis for determining the estimated maximum amount due under this Contract Agreement,
- as the basis for comparison of the various proposals received by bidders,
- and for establishing the value of the required Contract Performance and Payment Bonds.

The actual amount paid to the Contractor shall be based on the actual quantities of unit price work items completed, measured and paid for at the unit prices given in the Schedule of Prices.

Allowances *are not included* on this project.

1. Alternate bids *are not included* on this project.

**00 41 13
Contractor Bid Form**

2. The Bidder acknowledges receipt of the following addenda to the specifications and drawings:

Addendum No. _____ Dated: _____

00 41 13
Contractor Bid Form

CONSTRUCTION CONTRACT 'A'
EAST CAMPUS INFRASTRUCTURE IMPROVEMENTS

3. Bid security *is required* on this project.
The Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with this completed bid form submitted to the Owner.

4. Filed Sub-bids *are not required* on this project.

5. The Bidder agrees, if this bid is accepted by the Owner, to sign the designated Owner-Contractor contract and deliver it, with any and all bonds and affidavits of insurance specified in the Bid Documents, within twelve calendar days after the date of notification of such acceptance, except if the twelfth day falls on a State of Maine government holiday or other closure day, a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the day following the holiday or other closure day, Saturday or Sunday.

As a guarantee thereof, the Bidder submits, together with this bid, a bid bond or other acceptable instrument as and if required by the Bid Documents.

**00 41 13
Contractor Bid Form**

**CONSTRUCTION CONTRACT 'A'
EAST CAMPUS INFRASTRUCTURE IMPROVEMENTS**

6. This bid is hereby submitted by:

Signature: _____

Printed name and title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of incorporation,
if a corporation: _____

List of all partners,
if a partnership: _____

SCHEDULE OF PRICES

EAST CAMPUS INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION CONTRACT 'A'
Augusta, Maine

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
202.1	Demolition Spell Out Unit Price _____ _____ _____ per Lump Sum	1	L.S.	\$ _____	\$ _____
203.1	Common Excavation Spell Out Unit Price _____ _____ _____ per Cubic Yard	7,500	C.Y.	\$ _____	\$ _____
203.2	Rock Excavation Spell Out Unit Price _____ _____ _____ per Cubic Yard	300	C.Y.	\$ _____	\$ _____
304.1	Reinforcement Geotextile Spell Out Unit Price _____ _____ _____ per Square Yard	5,700	S.Y.	\$ _____	\$ _____
304.2	Aggregate Base Course - Type A Spell Out Unit Price _____ _____ _____ per Cubic Yard	1,500	C.Y.	\$ _____	\$ _____
304.3	Aggregate Subbase Course - Type D Spell Out Unit Price _____ _____ _____ per Cubic Yard	4,500	C.Y.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
401.1	HMA 19.0 mm Binder Course Spell Out Unit Price _____ _____ per Ton	1,200	Ton	\$ _____	\$ _____
401.2	HMA 9.5 mm Wearing Course Spell Out Unit Price _____ _____ per Ton	700	Ton	\$ _____	\$ _____
401.3	HMA 9.5 mm Sidewalks and Islands Spell Out Unit Price _____ _____ per Ton	300	Ton	\$ _____	\$ _____
603.1	6-Inch HDPE Culvert Spell Out Unit Price _____ _____ per Linear Foot	30	L.F.	\$ _____	\$ _____
603.2	12-Inch HDPE Culvert Spell Out Unit Price _____ _____ per Linear Foot	190	L.F.	\$ _____	\$ _____
603.3	15-Inch HDPE Culvert Spell Out Unit Price _____ _____ per Linear Foot	420	L.F.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
603.4	18-Inch HDPE Culvert Spell Out Unit Price _____ _____ per Linear Foot	1,050	L.F.	\$ _____	\$ _____
603.6	French Drain with 6-Inch HDPE Perforated Pipe Spell Out Unit Price _____ _____ per Linear Foot	30	L.F.	\$ _____	\$ _____
603.7	Precast Catch Basin, 4-Ft Dia. Spell Out Unit Price _____ _____ per Linear Foot	8	L.F.	\$ _____	\$ _____
603.8	Precast Drain Manhole, 5-Ft Dia. Spell Out Unit Price _____ _____ per Linear Foot	4	L.F.	\$ _____	\$ _____
608.1	Concrete Curb Ramps Spell Out Unit Price _____ _____ per Square Yard	150	S.Y.	\$ _____	\$ _____
608.2	Regrading Sidewalks Spell Out Unit Price _____ _____ per Square Yard	350	S.Y.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
609.1	Vertical Granite Curb, Type 1 Spell Out Unit Price _____ _____ per Linear Foot	1,200	L.F.	\$ _____	\$ _____
609.2	Bituminous Curb, Mold 1 Spell Out Unit Price _____ _____ per Linear Foot	1,200	L.F.	\$ _____	\$ _____
609.3	Re-Set Stone Curb Spell Out Unit Price _____ _____ per Linear Foot	50	L.F.	\$ _____	\$ _____
610.1	Riprap Spell Out Unit Price _____ _____ per Square Yard	300	S.Y.	\$ _____	\$ _____
610.2	Stone Bermed Level Spreader Spell Out Unit Price _____ _____ per Lump Sum	1	L.S.	\$ _____	\$ _____
625.1	Yard Hydrant Assembly Spell Out Unit Price _____ _____ per Lump Sum	1	L.S.	\$ _____	\$ _____
627.1	Permanent Pavement Marking Lines Spell Out Unit Price _____ _____ per Square Foot	1,800	S.F.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
627.2	Striped Islands Spell Out Unit Price _____ _____ per Square Yard	100	S.Y.	\$ _____	\$ _____
627.3	Pavement Symbols and Words Spell Out Unit Price _____ _____ per Square Foot	300	S.F.	\$ _____	\$ _____
627.4	Reflectorized Curb Marking Spell Out Unit Price _____ _____ per Linear Foot	500	L.F.	\$ _____	\$ _____
627.5	Temporary Pavement Markings Spell Out Unit Price _____ _____ per Square Foot	500	S.F.	\$ _____	\$ _____
627.6	Pavement Marking Removal Spell Out Unit Price _____ _____ per Square Foot	500	S.F.	\$ _____	\$ _____
627.7	New Traffic Sign and Post, U-Channel Spell Out Unit Price _____ _____ per Each	1	Each	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
627.8	New Traffic Sign and Post, Barrier Free Spell Out Unit Price _____ _____ per Each	6	Each	\$ _____ \$ _____
627.9	Relocate Existing Traffic Sign on New Post Spell Out Unit Price _____ _____ per Each	10	Each	\$ _____ \$ _____
627.10	Relocate Existing Guidance Sign on Relocated Posts Spell Out Unit Price _____ _____ per Each	10	Each	\$ _____ \$ _____
627.11	Bike Rack, Installed on Concrete Pad Spell Out Unit Price _____ _____ per Each	2	Each	\$ _____ \$ _____
627.12	Pipe Bollard, 6-Inch Diameter Spell Out Unit Price _____ _____ per Each	2	Each	\$ _____ \$ _____
642.1	5-Step Concrete Unit Spell Out Unit Price _____ _____ per Each	2	Each	\$ _____ \$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
642.2	6-Step Concrete Unit Spell Out Unit Price _____ _____ per Each	2	Each	\$ _____	\$ _____
656.1	Temporary Seed and Mulch Spell Out Unit Price _____ _____ per 1,000 Square Feet	20	MSF	\$ _____	\$ _____
656.2	Winter Mulch Spell Out Unit Price _____ _____ per 1,000 Square Feet	25	MSF	\$ _____	\$ _____
656.3	Inlet Sediment Filter Spell Out Unit Price _____ _____ per Each	25	Each	\$ _____	\$ _____
656.4	Silt Fence Barrier Spell Out Unit Price _____ _____ per Linear Foot	1,500	L.F.	\$ _____	\$ _____
656.5	Hay Bales Spell Out Unit Price _____ _____ per Each	200	Each	\$ _____	\$ _____
656.6	Erosion Control Blanket Spell Out Unit Price _____ _____ per Square Yard	400	S.Y.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
656.7	Stabilized Construction Exit Spell Out Unit Price _____ _____ per Each	3	Each	\$ _____	\$ _____
659.1	Mobilization Spell Out Unit Price _____ _____ per Lump Sum	1	L.S.	\$ _____	\$ _____
260519.1	No. 10 AWG THWN CU Spell Out Unit Price _____ _____ per Linear Foot	4,000	L.F.	\$ _____	\$ _____
260519.2	No. 10 AWG THWN CU Ground Spell Out Unit Price _____ _____ per Linear Foot	2,000	L.F.	\$ _____	\$ _____
260519.3	No. 8 AWG THWN CU Spell Out Unit Price _____ _____ per Linear Foot	800	L.F.	\$ _____	\$ _____
260519.4	No. 8 AWG THWN CU Ground Spell Out Unit Price _____ _____ per Linear Foot	300	L.F.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
260519.5	No. 6 AWG THWN CU Spell Out Unit Price _____ _____ per Linear Foot	800	L.F.	\$ _____	\$ _____
260519.6	No. 6 AWG THWN CU Ground Spell Out Unit Price _____ _____ per Linear Foot	300	L.F.	\$ _____	\$ _____
260519.7	No. 4 AWG THWN CU Spell Out Unit Price _____ _____ per Linear Foot	500	L.F.	\$ _____	\$ _____
260519.8	No. 4 AWG THWN CU Ground Spell Out Unit Price _____ _____ per Linear Foot	800	L.F.	\$ _____	\$ _____
260533.1	2 Inch PVC Schedule 40, Sand Encased Conduit Spell Out Unit Price _____ _____ per Linear Foot	2,800	L.F.	\$ _____	\$ _____
260533.2	1-1/2 Inch PVC Schedule 40, Sand Encased Conduit Spell Out Unit Price _____ _____ per Linear Foot	800	L.F.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
260533.3	Concrete Encasement of Existing 6x4-Inch Duct Bank Spell Out Unit Price _____ _____ per Linear Foot	150	L.F.	\$ _____	\$ _____
260533.4	Reaming of Existing Duct Spell Out Unit Price _____ _____ per Linear Foot	500	L.F.	\$ _____	\$ _____
265119.1	Type S1 New Light Fixture Spell Out Unit Price _____ _____ per Each	16	Each	\$ _____	\$ _____
265119.2	Type S2 Relocated Light Fixture on New Base Spell Out Unit Price _____ _____ per Each	8	Each	\$ _____	\$ _____
265119.3	Type S2A New Light Fixture Spell Out Unit Price _____ _____ per Each	5	Each	\$ _____	\$ _____
265119.4	Electrical Panel Modifications and New Pull Box Spell Out Unit Price _____ _____ per Lump Sum	1	L.S.	\$ _____	\$ _____

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
329000.2	Black Gum Spell Out Unit Price	6	Each	\$ _____	\$ _____

	per Each				
329000.3	Pin Oak Spell Out Unit Price	3	Each	\$ _____	\$ _____

	per Each				
329000.4	Red Oak Spell Out Unit Price	7	Each	\$ _____	\$ _____

	per Each				
329000.5	Linden Spell Out Unit Price	9	Each	\$ _____	\$ _____

	per Each				
329000.8	Higan Cherry Spell Out Unit Price	12	Each	\$ _____	\$ _____

	per Each				
329000.9	Balsam Fir Spell Out Unit Price	2	Each	\$ _____	\$ _____

	per Each				

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>		<u>UNIT PRICE</u>	<u>AMOUNT</u>
329000.10	White Spruce Spell Out Unit Price _____	3	Each	\$ _____	\$ _____

	per Each				
329000.13	Purple Filbert Spell Out Unit Price _____	18	Each	\$ _____	\$ _____

	per Each				
329000.14	Meserveae Holly Spell Out Unit Price _____	14	Each	\$ _____	\$ _____

	per Each				
329200.1	Topsoil, Obtained from On-Site Spell Out Unit Price _____	850	C.Y.	\$ _____	\$ _____

	per Cubic Yard				
329200.2	Topsoil, Obtained from Off-Site Spell Out Unit Price _____	150	C.Y.	\$ _____	\$ _____

	per Cubic Yard				

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>EST. QTY.</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
329200.3	Seeding and Mulching Spell Out Unit Price	50 MSF	\$ _____	\$ _____

	per Thousand Square Feet			

Total of Pay Items:
(Shall be transferred to
the Contractors Bid Form
Section 00 41 13)

\$ _____
 (in figures)

Notes:

1. In the event of a bidder's mathematical error in tabulating any bid prices, *the unit prices written in words* shall govern, unless they are obviously incorrect in the opinion of the Owner. The Contract will be awarded to the responsive and responsible bidder offering the lowest total price, based on the calculated total of all items actually awarded. The Owner may award the Base Bid, or the Base Bid and any combination of Additive Bid Items (if provided) depending on available funding. The lowest bidder will be determined by calculating the total of the Base Bid, and any Additive Bid Items actually awarded.

2. The Contract will be awarded within thirty (30) calendar days after the bid opening. The time for award may be extended for up to 30 additional days by mutual agreement between the owner and the apparent lowest responding and responsible bidder.

3. Award of this Contract includes a contract performance period for the project of 75 calendar days.

00 43 13
Contractor Bid Bond

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto Treasurer of the State of Maine in the penal sum of **five percent of the bid amount**, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns, signed this insert day, i.e.: **8th** day of select month, select year, which is the same date as that of the bid due date.

The condition of the above obligation is such that whereas the principal has submitted to the Owner, or State of Maine, to a certain bid, attached hereto and hereby made a part hereof, to enter into a contract in writing, for the construction of Construction Contract 'A' - Infrastructure Improvements at the East Campus, Augusta, Maine

Now therefore:

If said bid shall be rejected, or, in the alternate,

If said bid shall be accepted and the principal shall execute and deliver a contract in the form of contract attached hereto, properly completed in accordance with said bid, and shall furnish a bond for the faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid and said Surety does hereby waive notice of any such extension.

**00 43 13
Contractor Bid Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this insert day, i.e.: 8th day of select month, select year, which is the same date as that of the bid due date.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

00 52 13
Contract Agreement

AdvantageME No.:

Funding: _____

State of Maine
CONSTRUCTION CONTRACT

Agreement entered into the date of month in the year 2016 by and between the State of Maine through the Bureau of General Services hereinafter called the *Owner* and insert Contractor company name, hereinafter called the *Contractor*, for service from not sooner than 10/1/2016 to 6/30/2017.

BGS Project No.: insert number assigned by BGS (not the PIP number)

Other Project No.: _____

The *Owner* and the *Contractor* agree as follows:

ARTICLE 1 SCOPE OF WORK

1.1 The *Contractor* shall furnish all of the materials and perform all the work described in the Specifications and shown on the Drawings for the project entitled: Construction Contract 'A' - Infrastructure Improvements at the East Campus.

1.2 The Specifications and the Drawings have been prepared by Stantec Consulting Services Inc., acting as Designer and named in the documents as the Architect or Engineer. This firm has responsibilities for defining the scope of work governed by their agreement with the *Owner*, the Specifications and the Drawings, and the General Conditions and Special Provisions of the contract.

ARTICLE 2 COMPLETION DATE

2.1 The work to be performed under this contract shall be completed on or before 6/30/2017 and within 75 calendar days of the issuance of the Notice to Proceed by the Owner. For each calendar day the project remains uncompleted \$750.00 shall be charged as liquidated damages, as defined in 00 72 13 General Conditions.

ARTICLE 3 CONTRACT SUM

3.1 The *Owner* shall pay the *Contractor* for the performance of the contract, subject to additions and deductions provided by approved Change Orders in current funds as follows: amount in words dollars and 00cents, \$0.00

ARTICLE 4 CONTRACT BONDS

4.1 Contract bonds are not required if the contract amount is less than \$125,000 unless bonds are specifically mandated by the contract documents.

4.2 On this project, the *Contractor* shall furnish the *Owner* the appropriate contract bonds in the amount of 100% of the contract amount.

00 52 13
Contract Agreement

ARTICLE 5 PROGRESS PAYMENTS

5.1 The *Owner* shall make payments on account of the contract as provided therein as follows: Each month 95% of the value, based on contract prices of labor and materials incorporated in the work and of materials suitably stored at the site thereof up to the first day of that month, as certified by the Architect or Engineer.

5.2 The *Owner* may cause the *Contractor* to be paid such portion of the amount retained hereunder as he deems advisable.

ARTICLE 6 FINAL PAYMENT

6.1 Final payment shall be due 30 days after completion and acceptance of the work, provided the *Contractor* has submitted evidence satisfactory to the *Owner* that all payrolls, material bills and other indebtedness connected with the work has been paid.

ARTICLE 7 CONTRACT DOCUMENTS

7.1 The General Conditions of the contract, instructions to bidders, bid form, Special Provisions, the written specifications and the drawings, and any Addenda, together with this agreement, form the contract; they are as fully a part of the contract as if hereto attached or herein repeated.

7.2 Specifications: *September 2016*

7.3 Drawings: *September 2016*

7.4 Addenda: *as shown on 00 41 13*

ARTICLE 8 OTHER PROVISIONS

8.1 *No other provisions.*

00 52 13
Contract Agreement

The *Owner* and the *Contractor* hereby agree to the full performance of the covenants herein.

IN WITNESS WHEREOF the parties hereby execute this agreement the day and year first above written.

OWNER

CONTRACTOR

<hr/> <i>(Signature)</i>	<hr/> <i>(Signature)</i>
<hr/> <i>(Date)</i>	<hr/> <i>(Date)</i>
<hr/> <i>(Printed name and title)</i>	<hr/> <i>(Printed name and title)</i>
<hr/> <i>(Department name)</i>	<hr/> <i>(Contractor company name)</i>

BUREAU OF GENERAL SERVICES	
Contract Reviewed by:	Contract Approved by:
<hr/> <i>(Signature)</i>	<hr/> <i>(Signature)</i>
<hr/> <i>(Date)</i>	<hr/> <i>(Date)</i>
<hr/> <i>Project Manager/ Contract Administrator</i>	<hr/> <i>Joseph H. Ostwald</i>
	<hr/> <i>Director, Planning, Design & Construction</i>

00 61 13.13
Contractor Performance Bond

Bond No.: **insert bond number**

We, the undersigned, **insert company name of Contractor**, **select type of entity** of **insert name of municipality** in the State of **insert name of state** as principal, and **insert name of surety** as Surety, are hereby held and firmly bound unto **Treasurer of the State of Maine** in the penal sum of the Contract Price \$ **insert the Contract Price in numbers** for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this **insert day, i.e.: 8th** day of **select month**, **select year**, which is the same date as that of the construction contract, for the construction of **Construction Contract 'A' - Infrastructure Improvements at the East Campus**, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

**00 61 13.13
Contractor Performance Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert day, i.e.: 8th* day of *select month, select year*, which is the same date as that of the construction contract.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

00 61 13.16
Contractor Payment Bond

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto Treasurer of the State of Maine in the penal sum of the Contract Price \$ insert the Contract Price in numbers for the use and benefit of claimants, defined as an entity having a contract with the principal or with a subcontractor of the principal for labor, materials, or both labor and materials, used or reasonably required for use in the performance of the contract, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this insert day, i.e.: 8th day of select month, select year, which is the same date as that of the construction contract, for the construction of Construction Contract 'A' - Infrastructure Improvements at the East Campus, and shall fully reimburse the obligee for all outlay and expense with said obligee may incur in making good any default of said principal, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

**00 61 13.16
Contractor Payment Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert day, i.e.: 8th* day of *select month, select year*, which is the same date as that of the construction contract.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

00 71 00
Definitions

1. Definitions

- 1.1 *Addendum*: A document issued by the Architect that amends the Bid Documents. Addenda shall not be issued less than seventy-two hours prior to the specified bid opening time.
- 1.2 *Allowance*: A specified dollar amount for a particular scope of work or service included in the Work that is identified in the Bid Documents and included in each Bidder's Bid. The Contractor shall document expenditures for an Allowance during the Project. Any unused balance shall be credited to the Owner. The Contractor is responsible for notifying the Owner of anticipated expenses greater than the specified amount and the Owner is responsible for those additional expenses.
- 1.3 *Alternate Bid*: The Contractor's written offer of a specified dollar amount, submitted on the Bid Form, for the performance of a particular scope of work described in the Bid Documents. The Owner determines the low bidder based on the sum of the base Bid and any combination of Alternate Bids that the Owner selects.
- 1.4 *Architect*: The Architect or Engineer acting as Professional-of-Record for the project. The Architect is responsible for the design of the Project.
- 1.5 *Architectural Supplemental Instruction (ASI)*: A written instruction from the Architect for the purpose of clarification of the Contract Documents. An ASI does not alter the Contract Price or Contract Time. ASIs may be responses to RFIs and shall be issued by the Architect in a timely manner to avoid any negative impact on the Schedule of Work.
- 1.6 *Bid*: The Contractor's written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of the Work. A Bid may include bonds or other requirements. A base Bid is separate and distinct from Alternate Bids, being the only cost component necessary for the award of the contract, and representing the minimum amount of Work that is essential for the functioning of the project.
- 1.7 *Bid Bond*: The security designated in the Bid Documents, furnished by Bidders as a guaranty of good faith to enter into a contract with the Owner, should a contract be awarded to that Bidder.
- 1.8 *Bidder*: Any business entity, individual or corporation that submits a bid for the performance of the work described in the Bid Documents, acting directly or through a duly authorized representative.
- 1.9 *Bid Documents*: The drawings, procurement and contracting requirements, general requirements, and the written specifications -including all addenda, that a bidder is required to reference in the submission of a bid.
- 1.10 *Bureau*: The State of Maine Bureau of General Services in the Department of Administrative and Financial Services.
- 1.11 *Calendar days*: Consecutive days, as occurring on a calendar, taking into account each day of the week, month, year, and any religious, national or local holidays.
- 1.12 *Certificate of Substantial Completion*: A document developed by the Architect that describes the final status of the Work and establishes the date that the Owner may use the facility for its intended

00 71 00
Definitions

purpose. The Certificate of Substantial Completion also include a provisional list of items (a "punch list") remaining to be corrected by the Contractor, if any, and identifies a date from which the project warranty period commences.

- 1.13 *Certificate of Occupancy*: A document developed by a local jurisdiction such as the Code Enforcement Officer that grants permission to the Owner to occupy a building.
- 1.14 *Change Order (CO)*: A document that modifies the contract and establishes the basis of a specific adjustment to the Contract Price or the Contract Time, or both. Change Orders may address correction of omissions, errors, and document discrepancies, or additional requirements. Change Orders should include all labor, materials and incidentals required to complete the work described. A Change Order is not valid until signed by the Contractor, Owner and Architect and approved by the Bureau.
- 1.15 *Change Order Proposal (COP)*: Change proposed by the Contractor in the contract amount, requirements, or time, which becomes a Change Order when approved by the Owner.
- 1.16 *Clerk of the Works*: The authorized representative of the Architect on the job site. Clerk of the Works is also called Architect's representative.
- 1.17 *Construction Change Directive (CCD)*: A written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to final agreement with the Contractor on adjustment, if any, in the Contract Price or Contract Time, or both.
- 1.18 *Contract*: A written agreement between the Owner and the successful bidder which obligates the Contractor to perform the work specified in the Contract Documents and obligates the Owner to compensate the Contractor at the mutually accepted sum, rates or prices.
- 1.19 *Contract Bonds (also known as Payment and Performance Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.20 *Contract Documents*: The drawings and written specifications (including all addenda), Standard General Conditions, and the contract (including all Change Orders subsequently incorporated in the documents).
- 1.21 *Contract Price*: The dollar amount of the construction contract, also called *Contract Sum*.
- 1.22 *Contract Time*: The designated duration of time to execute the Work of the contract, with a specific date for completion.
- 1.23 *Contractor*: Also called the "General Contractor" or "GC" the individual or entity undertaking the execution of the general contract work under the terms of the contract with the Owner, acting directly or through a duly authorized representative. The Contractor is responsible for the means, methods and materials utilized in the execution and completion of the Work.

00 71 00
Definitions

- 1.24 *Drawings*: The graphic and pictorial portion of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 1.25 *Filed Sub-bid*: The designated major Subcontractor's (or, in some cases, Contractor's) written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of a particular portion of the Work. A Filed Sub-bid may include bonds or other requirements.
- 1.26 *Final Completion*: Project status indicating when the Work is fully completed in compliance with the Contract Documents. Final Completion is documented by a date on which the Contractor's obligations under the contract are complete and accepted by the Owner and final payment becomes due and payable.
- 1.27 *General Requirements*: The on-site overhead expense items the Contractor provides for the Project, typically including, but not limited to, building permits, construction supervision, Contract Bonds, insurance, field office, temporary utilities, rubbish removal, and site fencing. Overhead expenses of the Contractor's general operation are not included. Sometimes referred to as the Contractor's General Conditions.
- 1.28 *Owner*: The State agency which is represented by duly authorized individuals. The Owner is responsible for defining the scope of the Project and compensation to the Architect and Contractor.
- 1.29 *Owner's Representative*: The individual or entity contracted by the Owner to be an advisor and information conduit regarding the Project.
- 1.30 *Overhead*: General and administrative expenses of the Contractor's principal and branch offices, including payroll costs and other compensation of Contractor employees, deductibles paid on any insurance policy, charges against the Contractor for delinquent payments, and costs related to the correction of defective work, and the Contractor's capital expenses, including interest on capital used for the work.
- 1.31 *Performance and Payment Bonds (also known as Contract Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.32 *Post-Bid Addendum*: Document issued by the Architect that defines a potential Change Order prior to signing of the construction contract. The Post-Bid Addendum allows the Owner to negotiate contract changes with the Bidder submitting the lowest valid bid, only if the negotiated changes to the Bid Documents result in no change or no increase in the bid price.

A Post-Bid Addendum may also be issued after a competitive construction Bid opening to those Bidders who submitted a Bid initially, for the purpose of rebidding the Project work without re-advertising.

- 1.33 *Project*: The construction project proposed by the Owner to be constructed according to the Contract Documents. The entire public improvement project may also include separate construction and other

00 71 00
Definitions

activities conducted by the Owner or other contractors. The Owner shall inform all contractors of the scope of the entire public improvement project relative to each individual contract.

- 1.34 *Proposal*: The Contractor's written offer submitted to the Owner for consideration containing a specified dollar amount or rate, for a specific scope of work, and including a schedule impact, if any. A proposal shall include all costs for overhead and profit. After acceptance by all parties a proposal amends the contract and is implemented by the Contractor.
- 1.35 *Proposal Request (PR)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.36 *Punch List*: A document that identifies the items of work remaining to be done by the Contractor at the Close Out of a Project. The Punch List is created as a result of a final inspection of the work only after the Contractor attests that all of the Work is in its complete and permanent status.
- 1.37 *Request For Information (RFI)*: A Contractor's written request to the Architect for clarification, definition or description of the Work. RFIs shall be presented by the Contractor in a timely manner to avoid any negative impact on the Schedule of Work.
- 1.38 *Request For Proposal (RFP)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.39 *Requisition for Payment*: The document in which the Contractor certifies that the Work described is, to the best of the Contractor's knowledge, information and belief, complete and that all previous payments have been paid by the Contractor to Subcontractors and suppliers, and that the current requested payment is now due. See *Schedule of Values*.
- 1.40 *Retainage*: The amount, calculated at five percent (5%) of the contract value or a scheduled value, that the Owner shall withhold from the Contractor until the work or portion of work is declared substantially complete or otherwise accepted by the Owner. The Owner may, if requested, reduce the amount withheld if the Owner deems it desirable and prudent to do so. (See Title 5 M.R.S.A., Section 1746.)
- 1.41 *Sample*: A physical example provided by the Contractor which illustrates materials, equipment or workmanship and establishes standards by which the Work will be judged.
- 1.42 *Schedule of the Work*: The document prepared by the Contractor and approved by the Owner that specifies the dates on which the Contractor plans to begin and complete various parts of the Work, including dates on which information and approvals are required from the Owner.
- 1.43 *Schedule of Values*: The document prepared by the Contractor and approved by the Owner before the commencement of the Work that specifies the dollar values of discrete portions of the Work equal in sum to the contract amount. The Schedule of Values is used to document progress payments of the Work in regular (usually monthly) requisitions for payment. See *Requisition for Payment*.
- 1.44 *Shop Drawings*: The drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

00 71 00
Definitions

- 1.45 *Specifications*: The portion of the Contract Documents consisting of the written requirements of the Work for materials, equipment, systems, standards, workmanship, and performance of related services.
- 1.46 *Subcontractor*: An individual or entity undertaking the execution of any part of the Work by virtue of a written agreement with the Contractor or any other Subcontractor. Also, an individual or entity retained by the Contractor or any other Subcontractor as an independent contractor to provide the labor, materials, equipment or services necessary to complete a specific portion of the Work.
- 1.47 *Substantial Completion*: Project status indicating when the Work or a designated portion of the Work is sufficiently complete in compliance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose without unscheduled disruption. Substantial Completion is documented by the date of the Certificate of Substantial Completion signed by the Owner and the Contractor.
- 1.48 *Superintendent*: The representative of the Contractor on the job site, authorized by the Contractor to receive and fulfill instructions from the Architect.
- 1.49 *Surety*: The individual or entity that is legally bound with the Contractor and Subcontractor to insure the faithful performance of the contract and for the payment of the bills for labor, materials and equipment by the Contractor and Subcontractors.
- 1.50 *Work*: The construction and services, whether completed or partially completed, including all labor, materials, equipment and services provided or to be provided by the Contractor and Subcontractors to fulfill the requirements of the Project as described in the Contract Documents.

00 72 13
General Conditions

Table of Contents of this General Conditions Section

1. Preconstruction Conference
2. Intent and Correlation of Contract Documents
3. Additional Drawings and Specifications
4. Record of Documents
5. Ownership of Contract Documents
6. Shop Drawings
7. Samples
8. Substitutions
9. Patents and Royalties
10. Surveys, Layout of Work
11. Permits, Laws, and Regulations
12. Taxes
13. Labor and Wages
14. Insurance Requirements
15. Contract Bonds
16. Allowances
17. Assignment of Contract
18. Separate Contracts
19. Subcontracts
20. Contractor-Subcontractor Relationship
21. Supervision of the Work
22. Inspection of the Work
23. Architect's Status
24. Management of the Premises
25. Safety and Security of the Premises
26. Changes in the Work
27. Correction of the Work
28. Owner's Right to do Work
29. Termination of Contract and Stop Work Action
30. Delays and Extension of Time
31. Payments to the Contractor
32. Payments Withheld
33. Liens
34. Indemnification
35. Workmanship
36. Close-out of the Work
37. Date of Completion and Liquidated Damages
38. Dispute Resolution

00 72 13
General Conditions

1. Preconstruction Conference

- 1.1 The Contractor shall, upon acceptance of a contract and prior to commencing work, schedule a preconstruction conference with the Owner and Architect. The purpose of this conference is to:
- a) introduce all parties who have a significant role in the Project, including:
 - Owner (State Agency)
 - Bureau of General Services (BGS)
 - Architect
 - Consultants
 - Clerk-of-the-works
 - Contractor (GC)
 - Superintendent
 - Subcontractors
 - Other State agencies
 - Owner's Representative
 - Construction testing company
 - Commissioning agent
 - Special Inspections agent;
 - b) review the responsibilities of each party;
 - c) review any previously-identified special provisions of the Project;
 - d) review the Schedule of the Work calendar submitted by the Contractor to be approved by the Owner and Architect;
 - e) review the Schedule of Values form submitted by the Contractor to be approved by the Owner and Architect;
 - f) establish routines for Shop Drawing approval, contract changes, requisitions, et cetera;
 - g) discuss jobsite issues;
 - h) discuss Project close-out procedures;
 - i) provide an opportunity for clarification of Contract Documents before work begins;
 - j) schedule regular meetings at appropriate intervals for the review of the progress of the Work.

2. Intent and Correlation of Contract Documents

- 2.1 The intent of the Contract Documents is to describe the complete Project. The Contract Documents consist of various components; each component complements the others. What is shown as a requirement by any one component shall be inferred as a requirement on all corresponding components.
- 2.2 The Contractor shall furnish all labor, equipment and materials, tools, transportation, insurance, services, supplies, operations and methods necessary for, and reasonably incidental to, the construction and completion of the Project. Any work that deviates from the Contract Documents which appears to be required by the exigencies of construction or by inconsistencies in the Contract Documents, will be determined by the Architect and authorized in writing by the Architect, Owner and the Bureau prior to execution. The Contractor shall be responsible for requesting clarifying information where the intent of the Contract Documents is uncertain.
- 2.3 The Contractor shall not utilize any apparent error or omission in the Contract Documents to the disadvantage of the Owner. The Contractor shall promptly notify the Architect in writing of such errors or omissions. The Architect shall make any corrections or clarifications necessary in such a situation to document the true intent of the Contract Documents.

00 72 13
General Conditions

3. Additional Drawings and Specifications

- 3.1 The Owner shall provide to the Contractor, at no additional expense to the Contractor, a reasonable quantity of additional Drawings and Specifications for the execution of the Work.
- 3.2 The Architect shall promptly furnish additional revised Drawings and Specifications that are created due to corrections or clarifications made by the Architect. All such information shall be consistent with, and reasonably inferred from, the Contract Documents. The Contractor shall do no work without the proper Drawings and Specifications.

4. Record of Documents

- 4.1 The Contractor shall maintain one complete set of Contract Documents on the jobsite, in good order and current status, for access by the Owner and Architect.
- 4.2 The Contractor shall maintain, continuously updated, complete records of Requests for Information, Architectural Supplemental Instructions, Information Bulletins, supplemental sketches, Change Order Proposals, Change Orders, Shop Drawings, testing reports, et cetera, for access by the Owner and Architect.

5. Ownership of Contract Documents

- 5.1 The designs represented on the Contract Documents are the property of the Architect. The Drawings and Specifications shall not be used on other work without consent of the Architect.

6. Shop Drawings

- 6.1 The Contractor shall administer Shop Drawings prepared by the Contractor, Subcontractors, suppliers or others to conform to the approved Schedule of the Work. The Contractor shall verify all field measurements, check and authorize all Shop Drawings and schedules required by the Work. The Contractor is the responsible party and contact for the Contractor's work as well as that of Subcontractors, suppliers or others who provide Shop Drawings.
- 6.2 The Architect shall review and acknowledge Shop Drawings, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents.
- 6.3 The Contractor shall provide monthly updated logs containing: requests for information, information bulletins, supplemental instructions, supplemental sketches, change order proposals, change orders, submittals, testing and deficiencies.
- 6.4 The Contractor shall make any corrections required by the Architect, and shall submit a quantity of corrected copies as may be needed. The acceptance of Shop Drawings or schedules by the Architect shall not relieve the Contractor from responsibility for deviations from Drawings and Specifications, unless the Contractor has called such deviations to the attention of the Architect at the time of submission and secured the Architect's written approval. The acceptance of Shop Drawings or schedules by the Architect does not relieve the Contractor from responsibility for errors in Shop Drawings or schedules.

00 72 13
General Conditions

7. Samples

- 7.1 The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the Architect. The Architect shall review and approve such samples, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents. The subsequent work shall be in accord with the approved samples.

8. Substitutions

- 8.1 The Contractor shall furnish items and materials described in the Contract Documents. If the item or material specified describes a proprietary product, or uses the name of a manufacturer, the term "or approved equal" shall be implied, if it is not included in the text. The specific item or material specified establishes a minimum standard for the general design, level of quality, type, function, durability, efficiency, reliability, compatibility, warranty coverage, installation factors and required maintenance. The Drawing or written Specification shall not be construed to exclude other manufacturers products of comparable design, quality, and efficiency.
- 8.2 The Contractor may submit detailed information about a proposed substitution to the Architect for consideration. Particular models of items and particular materials which the Contractor asserts to be equal to the items and materials identified in the Contract Documents shall be allowed only with written approval by the Architect. The request for substitution shall include a cost comparison and a reason or reasons for the substitution.
- 8.3 The Architect may request additional information about the proposed substitution. The approval or rejection of a proposed substitution may be based on timeliness of the request, source of the information, the considerations of minimum standards described above, or other considerations. The Architect should briefly state the rationale for the decision. The decision shall be considered final.
- 8.4 The duration of a substitution review process can not be the basis for a claim for delay in the Schedule of the Work.

9. Patents and Royalties

- 9.1 The Contractor shall, for all time, secure for the Owner the free and undisputed right to the use of any patented articles or methods used in the Work. The expense of defending any suits for infringement or alleged infringement of such patents shall be borne by the Contractor. Awards made regarding patent suits shall be paid by the Contractor. The Contractor shall hold the Owner harmless regarding patent suits that may arise due to installations made by the Contractor, and to any awards made as a result of such suits.
- 9.2 Any royalty payments related to the work done by the Contractor for the Project shall be borne by the Contractor. The Contractor shall hold the Owner harmless regarding any royalty payments that may arise due to installations made by the Contractor.

10. Surveys, Layout of Work

- 10.1 The Owner shall furnish all property surveys unless otherwise specified.
- 10.2 The Contractor is responsible for correctly staking out the Work on the site. The Contractor shall employ a competent surveyor to position all construction on the site. The surveyor shall run the

00 72 13
General Conditions

- axis lines, establish correct datum points and check each line and point on the site to insure their accuracy. All such lines and points shall be carefully preserved throughout the construction.
- 10.3 The Contractor shall lay out all work from dimensions given on the Drawings. The Contractor shall take measurements and verify dimensions of any existing work that affects the Work or to which the Work is to be fitted. The Contractor is solely responsible for the accuracy of all measurements. The Contractor shall verify all grades, lines, levels, elevations and dimensions shown on the Drawings and report any errors or inconsistencies to the Architect prior to commencing work.
11. Permits, Laws, and Regulations
- 11.1 The Owner is responsible for obtaining any zoning approvals or other similar local project approvals necessary to complete the Work, unless otherwise specified in the Contract Documents.
- 11.2 The Owner is responsible for obtaining Maine Department of Environmental Protection, Maine Department of Transportation, or other similar state government project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 11.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 11.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.
- 11.5 The Contractor is responsible for obtaining and paying for all permits and licenses necessary for the implementation of the Work. The Contractor shall notify the Owner of any delays, variance or restrictions that may result from the issuing of permits and licenses.
- 11.6 The Contractor shall comply with all ordinances, laws, rules and regulations and make all required notices bearing on the implementation of the Work. In the event the Contractor observes disagreement between the Drawings and Specifications and any ordinances, laws, rules and regulations, the Contractor shall promptly notify the Architect in writing. Any necessary changes shall be made as provided in the contract for changes in the work. The Contractor shall not perform any work knowing it to be contrary to such ordinances, laws, rules and regulations.
- 11.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.
12. Taxes
- 12.1 The Owner is exempt from the payment of Federal Excise Taxes on articles not for resale and from the Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes. Pricing in all Change Order Proposals from the Contractor and Subcontractors shall not include these taxes.
- 12.2 Maine statute (36 M.R.S.A. §1760) allows "...an exemption from sales and use tax on items which will be physically incorporated in real property of an exempt organization. This exemption only applies to lumber, hardware, doors and windows, nails, insulation and other building materials actually affixed to realty. Tools, wearing apparel, consumable supplies, machinery and equipment used by the Contractor are taxable even if purchased specifically for the exempt job."
- 12.3 The Contractor may contact Maine Revenue Services, 24 State House Station, Augusta, Maine 04333 for guidance on tax exempt regulations authorized by 36 M.R.S.A. §1760 and detailed in Rule 302 (18-125 CMR 302).

00 72 13
General Conditions

13. Labor and Wages

- 13.1 The Contractor shall conform to the labor laws of the State of Maine, and all other laws, ordinances, and legal requirements affecting the work in Maine.
- 13.2 The Architect shall include a wage determination document prepared by the Maine Department of Labor in the Contract Documents for state-funded contracts in excess of \$50,000. The document shows the minimum wages required to be paid to each category of labor employed on the project.
- 13.3 On projects requiring a Maine wage determination, the Contractor shall submit monthly payroll records to the Owner ("the contracting agency") showing the name and occupation of all workers and all independent contractors employed on the project. The monthly submission must also include the Contractor's company name, the title of the project, hours worked, hourly rate or other method of remuneration, and the actual wages or other compensation paid to each person.
- 13.4 The Contractor shall not reveal, in the payroll records submitted to the Owner, personal information regarding workers and independent contractors, other than the information described above. Such information shall not include Social Security number, employee identification number, or employee address or phone number, for example.
- 13.5 The Contractor shall conform to Maine statute by providing to the Owner a list of all subcontractors and independent contractors on the job site and a record of the entity to whom that subcontractor or independent contractor is directly contracted and by whom that subcontractor or independent contractor is insured for workers' compensation purposes.
- 13.6 The Contractor shall enforce strict discipline and good order among their employees at all times, and shall not employ any person unfit or unskilled to do the work assigned to them.
- 13.7 The Contractor shall promptly pay all employees when their compensation is due, shall promptly pay all others who have billed and are due for materials, supplies and services used in the Work, and shall promptly pay all others who have billed and are due for insurance, workers compensation coverage, federal and state unemployment compensation, and Social Security charges pertaining to this Project. Before final payments are made, the Contractor shall furnish to the Owner affidavits that all such payments described above have been made.
- 13.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.

14. Insurance Requirements

- 14.1 The Contractor shall not commence work under this contract until the Contractor has obtained all insurance required under this article and such insurance has been approved by the Owner. The Contractor shall not allow any Subcontractor to commence work on a subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.
- 14.2 The Owner does not warrant or represent that the insurance required under this article constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor and Subcontractors of every tier shall satisfy themselves as to the existence, extent and adequacy of insurance prior to commencement of work.
- 14.3 The Contractor and any Subcontractor shall procure and maintain for the duration of the Project insurance of the types and limits set forth under this article and such insurance as will protect themselves from claims which may arise out of or result from the Contractor's or Subcontractor's execution of the work, whether such execution be by themselves or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The insurance coverage provided by the Contractor and any Subcontractor will be primary coverage.

00 72 13
General Conditions

14.4 Workers' Compensation Insurance

Worker's Compensation insurance for all employees on site in accordance with the requirements of the Workers' Compensation law of the State of Maine.

Minimum acceptable limits for Employer's Liability are:

Bodily Injury by Accident.....	\$500,000
Bodily Injury by Disease.....	\$500,000 Each Employee
Bodily Injury by Disease.....	\$500,000 Policy Limit

14.5 Liability Insurance

a) General Liability Insurance

General liability insurance for bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. It shall include collapse and underground coverage - as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a per location or project basis.

Minimum acceptable limits are:

General aggregate limit.....	\$2,000,000
Products and completed operations aggregate.....	\$1,000,000
Each occurrence limit.....	\$1,000,000
Personal injury aggregate.....	\$1,000,000

b) Automobile Liability Insurance

Automobile liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, ownership or use of all owned, non-owned and hired automobiles, trucks and trailers.

Minimum acceptable limit is:

Any one accident or loss.....	\$1,000,000
-------------------------------	-------------

c) Owners Protective Liability Insurance

For Contracts exceeding \$50,000 in total Contract amount, Contractor shall secure an Owners Protective Liability policy naming the Owner as the Named Insured.

Minimum acceptable limits are:

General aggregate limit.....	\$2,000,000
Each occurrence limit.....	\$1,000,000

d) Pollution Liability Insurance

In the event that any disruption, handling, abatement, remediation, encapsulation, removal, transport, or disposal of contaminated or hazardous material is required, the Contractor or its Subcontractor shall secure a pollution liability policy in addition to any other coverages contained in this section. The insurance shall be provided on an occurrence based policy and shall remain in effect for the duration of the Project.

Minimum acceptable limit is:

Each occurrence limit.....	\$1,000,000
----------------------------	-------------

00 72 13
General Conditions

14.6 Property Insurance

a) New Construction Only

The Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor and all Subcontractors as insureds as their interest may appear. The covered cause of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Coverage shall be on a replacement cost and a completed value basis. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner.

b) Renovations within and Additions to Existing Buildings Insured by State of Maine Risk Management Division

Insurance shall be provided by the Owner. The Owner shall provide the following Project information to the State of Maine Risk Management Division prior to commencement of the Work in order to initiate the insurance coverage: building name, street address and municipality, brief project description, project start date and completion date, contract dollar value, and Contractor name and address. Said insurance shall name the Contractor and all Subcontractors as insureds as their interest may appear. The covered causes of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Theft coverage is not included and exclusions common to commercial property policies are applicable. The Contractor shall be responsible for a \$500 deductible per occurrence. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner. Verification of insurance will be furnished to the Contractor upon request. The Contractor may independently acquire, at the Contractor's expense, coverage in excess of that maintained by the State of Maine.

- 14.7 The Contractor shall provide four original copies of all certificates of insurance in a form, and issued by, companies acceptable to the Owner prior to commencement of work. The certificates shall name the Owner as certificate holder and, shall identify the project name and BGS project number. The certificates shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least thirty (30) calendar days prior written notice by registered letter has been given to the Owner.

15. Contract Bonds

- 15.1 When noted as required in the Bid Documents, the Contractor shall provide to the Owner a Performance Bond and a Payment Bond, or "contract bonds", upon execution of the contract. Each bond value shall be for the full amount of the contract and issued by a surety company authorized to do business in the State of Maine as approved by the Owner. The bonds shall be executed on the forms furnished in the Bid Documents. The bonds shall allow for any addition or deductions of the contract.
- 15.2 The contract bonds shall continue in effect for one year after final acceptance of the contract to protect the Owner's interest in connection with the one year guarantee of workmanship and materials and to assure settlement of claims for the payment of all bills for labor, materials and equipment by the Contractor.

00 72 13
General Conditions

16. Allowances

- 16.1 The Contract Price shall include all allowances described in the Contract Documents. The Contractor shall include all overhead and profit necessary to implement each allowance in their Contract Price.
- 16.2 The Contractor shall not be required to employ parties for allowance work against whom the Contractor has a reasonable objection. In such a case, the Contractor shall notify the Owner in writing of their position and shall propose an alternative party to complete the work of the allowance.

17. Assignment of Contract

- 17.1 The Contractor shall not assign or sublet the contract as a whole without the written consent of the Owner. The Contractor shall not assign any money due to the Contractor without the written consent of the Owner.

18. Separate Contracts

- 18.1 The Owner reserves the right to create other contracts in connection with this Project using similar General Conditions. The Contractor shall allow the Owner's other contractors reasonable opportunity for the delivery and storage of materials and the execution of their work. The Contractor shall coordinate and properly connect the Work of all contractors.
- 18.2 The Contractor shall promptly report to the Architect and Owner any apparent deficiencies in work of the Owner's other contractors that impacts the proper execution or results of the Contractor. The Contractor's failure to observe or report any deficiencies constitutes an acceptance of the Owner's other contractors work as suitable for the interface of the Contractor's work, except for latent deficiencies in the Owner's other contractors work.
- 18.3 Similarly, the Contractor shall promptly report to the Architect and Owner any apparent deficiencies in their own work that would impact the proper execution or results of the Owner's other contractors.
- 18.4 The Contractor shall report to the Architect and Owner any conflicts or claims for damages with the Owner's other contractors and settle such conflicts or claims for damages by mutual agreement or arbitration, if necessary, at no expense to the Owner.
- 18.5 In the event the Owner's other contractors sue the Owner regarding any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense. The Contractor shall pay or satisfy any judgment that may arise against the Owner, and pay all other costs incurred.

19. Subcontracts

- 19.1 The Contractor shall not subcontract any part of this contract without the written permission of the Owner.
- 19.2 The Contractor shall submit a complete list of named Subcontractors and material suppliers to the Architect and Owner for approval by the Owner prior to commencing work. The Subcontractors named shall be reputable companies of recognized standing with a record of satisfactory work.

00 72 13
General Conditions

- 19.3 The Contractor shall not employ any Subcontractor or use any material until they have been approved, or where there is reason to believe the resulting work will not comply with the Contract Documents.
- 19.4 The Contractor, not the Owner, is as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as the Contractor is for the acts and omissions of persons directly or indirectly employed by the Contractor.
- 19.5 Neither the Contract Documents nor any Contractor-Subcontractor contract shall indicate, infer or create any direct contractual relationship between any Subcontractor and the Owner.

20. Contractor-Subcontractor Relationship

- 20.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.
- 20.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed by the Subcontractor, the dollar amount allowed to the Contractor at the time each Contractor's Requisition for Payment is approved by the Owner.
- 20.3 The Contractor shall pay the Subcontractor accordingly if the Contract Documents or the subcontract provide for earlier or larger payments than described in the provision above.
- 20.4 The Contractor shall pay the Subcontractor on demand for subcontract work or materials as far as executed and fixed in place, less retainage, at the time the Contractor's Requisition for Payment is approved by the Owner, even if the Architect fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.
- 20.5 The Contractor shall not make a claim for liquidated damages or penalty for delay in any amount in excess of amounts that are specified by the subcontract.
- 20.6 The Contractor shall not make a claim for services rendered or materials furnished by the Subcontractor unless written notice is given by the Contractor to the Subcontractor within ten calendar days of the day in which the claim originated.
- 20.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.
- 20.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.
- 20.9 The Subcontractor shall be bound to the Contractor by the terms of the Contract Documents and assumes toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- 20.10 The Subcontractor shall submit applications for payment to the Contractor in such reasonable time as to enable the Contractor to apply for payment as specified.
- 20.11 The Subcontractor shall make any claims for extra cost, extensions of time or damages, to the Contractor in the manner provided in these General Conditions for like claims by the Contractor to the Owner, except that the time for the Subcontractor to make claims for extra cost is seven calendar days after the receipt of Architect's instructions.

21. Supervision of the Work

- 21.1 During all stages of the Work the Contractor shall have a competent superintendent, with any necessary assistant superintendents, overseeing the project. The superintendent shall not be reassigned without the consent of the Owner unless a superintendent ceases to be employed by the Contractor due to unsatisfactory performance.

00 72 13
General Conditions

- 21.2 The superintendent represents the Contractor on the jobsite. Directives given by the Architect or Owner to the superintendent shall be as binding as if given directly to the Contractor's main office. All important directives shall be confirmed in writing to the Contractor. The Architect and Owner are not responsible for the acts or omissions of the superintendent or assistant superintendents.
- 21.3 The Contractor shall provide supervision of the Work equal to the industry's highest standard of care. The superintendent shall carefully study and compare all Contract Documents and promptly report any error, inconsistency or omission discovered to the Architect. The Contractor may not necessarily be held liable for damages resulting directly from any error, inconsistency or omission in the Contract Documents or other instructions by the Architect that was not revealed by the superintendent in a timely way.

22. Observation of the Work

- 22.1 The Contractor shall allow the Owner, the Architect and the Bureau continuous access to the site for the purpose of observation of the progress of the work. All necessary safeguards and accommodations for such observations shall be provided by the Contractor.
- 22.2 The Contractor shall coordinate all required testing, approval or demonstration of the Work. The Contractor shall give sufficient notice to the appropriate parties of readiness for testing, inspection or examination.
- 22.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Architect.
- 22.4 The Architect shall make all scheduled observations promptly, prior to the work being concealed or buried by the Contractor. If approval of the Work is required of the Architect, the Contractor shall notify the Architect of the construction schedule in this regard. Work concealed or buried prior to the Architect's approval may need to be uncovered at the Contractor's expense.
- 22.5 The Architect may order reexamination of questioned work, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to conform to the Contract Documents, the Owner shall pay the expense of the reexamination and remedial work. If the work is found to not conform to the Contract Documents, the Contractor shall pay the expense, unless the defect in the work was caused by the Owner's Contractor, whose responsibility the reexamination expense becomes.
- 22.6 The Bureau shall periodically observe the Work during the course of construction and make recommendations to the Contractor or Architect as necessary. Such recommendations shall be considered and implemented through the usual means for changes to the Work.

23. Architect's Status

- 23.1 The Architect represents the Owner during the construction period, and observes the work in progress on behalf of the Owner. The Architect has authority to act on behalf of the Owner only to the extent expressly provided by the Contract Documents or otherwise demonstrated to the Contractor. The Architect has authority to stop the work whenever such an action is necessary, in the Architect's reasonable opinion, to ensure the proper execution of the contract.
- 23.2 The Architect is the interpreter of the conditions of the contract and the judge of its performance. The Architect shall favor neither the Owner nor the Contractor, but shall use the Architect's powers under the contract to enforce faithful performance by both parties.

00 72 13
General Conditions

23.3 In the event of the termination of the Architect's employment on the project prior to completion of the work, the Owner shall appoint a capable and reputable replacement. The status of the new Architect relative to this contract shall be that of the former Architect.

24. Management of the Premises

- 24.1 The Contractor shall place equipment and materials, and conduct activities on the premises in a manner that does not unreasonably hinder site circulation, environmental stability, or any long term effect. Likewise, the Architect's directions shall not cause the use of premises to be impeded for the Contractor or Owner.
- 24.2 The Contractor shall not use the premises for any purpose other than that which is directly related to the scope of work. The Owner shall not use the premises for any purpose incompatible with the proposed work simultaneous to the work of the Contractor.
- 24.3 The Contractor shall enforce the Architect's instructions regarding information posted on the premises such as signage and advertisements, as well as activities conducted on the premises such as fires, and smoking.
- 24.4 The Owner may occupy any part of the Project that is completed with the written consent of the Contractor, and without prejudice to any of the rights of the Owner or Contractor. Such use or occupancy shall not, in and of itself, be construed as a final acceptance of any work or materials.

25. Safety and Security of the Premises

- 25.1 The Contractor shall continuously maintain security on the premises and protect from unreasonable occasion of injury all people authorized to be on the job site. The Contractor shall also effectively protect the property and adjacent properties from damage or loss.
- 25.2 The Contractor shall take all necessary precautions to ensure the safety of workers and others on and adjacent to the site, abiding by applicable local, state and federal safety regulations. The Contractor shall erect and continuously maintain safeguards for the protection of workers and others, and shall post signs and other warnings regarding hazards associated with the construction process, such as protruding fasteners, moving equipment, trenches and holes, scaffolding, window, door or stair openings, and falling materials.
- 25.3 The Contractor shall designate, and make known to the Architect and the Owner, a safety officer whose duty is the prevention of accidents on the site.
- 25.4 The Contractor shall restore the premises to conditions that existed prior to the start of the project at areas not intended to be altered according to the Contract Documents.
- 25.5 The Contractor shall protect existing utilities and exercise care working in the vicinity of utilities shown in the Drawings and Specifications or otherwise located by the Contractor.
- 25.6 The Contractor shall protect from damage existing trees and other significant plantings and landscape features of the site which will remain a permanent part of the site. If necessary or indicated in the Contract Documents, tree trunks shall be boxed and barriers erected to prevent damage to tree branches or roots.
- 25.7 Damage to the Work, including that which is reasonably protected, shall be repaired or replaced at the expense of the party who caused the damage.
- 25.8 The Contractor shall not load, or allow to be loaded, any part of the Project with a force which imperils personal or structural safety. The Architect may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.

00 72 13
General Conditions

- 25.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Architect must approve altering any structural components of the project. The Contractor shall supervise all construction activities carried out by others on site to ensure that the work is neatly done and in a manner that will not endanger the structure or the component parts.
- 25.10 The Contractor may act with their sole discretion in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Contractor may negotiate with the Owner for compensation for expenses due to such emergency work.
- 25.11 The Contractor shall keep the premises free of any unsafe accumulation of waste materials caused by the work. The Contractor shall regularly keep the spaces “broom clean”. See the Close-out of the Work provisions of this section regarding cleaning at the completion of the project.

26. Changes in the Work

- 26.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.
- 26.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.
- 26.3 The Architect shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.
- 26.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Architect. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.
- 26.5 The method of determining the dollar value of extra work shall be by:
- a) an estimate of the Contractor accepted by Owner as a lump sum, or
 - b) unit prices named in the contract or subsequently agreed upon, or
 - c) cost plus a designated percentage, or
 - d) cost plus a fixed fee.
- 26.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods using the following rates. The rates include all overhead and profit expenses.
- a) Contractor - for any work performed by the Contractor's own forces, 20% of the cost;
 - b) Subcontractor - for work performed by Subcontractor's own forces, 20% of the cost;
 - c) Contractor - for work performed by Contractor's Subcontractor, 10% of the amount due the Subcontractor.
- 26.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Architect shall review and certify the appropriate amount which includes the Contractor's overhead and profit. The Owner shall make payments based on the Architect's certificate.

00 72 13
General Conditions

- 26.8 Cost reflected in Change Orders shall be limited to the following: cost of materials, cost of delivery, cost of labor (including Social Security, pension, Workers' Compensation insurance, and unemployment insurance), and cost of rental of power tools and equipment. Labor cost may include a pro-ratio share of a foreman's time only in the case of an extension of contract time granted due to the Change Order.
- 26.9 Overhead reflected in Change Orders shall be limited to the following: bond premium, supervision, wages of clerks, time keepers, and watchmen, small tools, incidental expenses, general office expenses, and all other overhead expenses directly related to the Change Order.
- 26.10 The Contractor shall provide credit to the Owner for labor, materials, equipment and other costs but not overhead and profit expenses for those Change Order items that result in a net value of credit to the contract.
- 26.11 The Owner may change the scope of work of the Project without invalidating the contract. The Owner shall notify the Contractor of a change of the scope of work for the Owner's Contractors, which may affect the work of this Contractor, without invalidating the contract. Change Orders for extension of the time caused by such changes shall be developed at the time of directing the change in scope of work.
- 26.12 The Architect may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.
- 26.13 The Contractor shall immediately give written notification to the Architect of latent conditions discovered at the site which materially differ from those represented in the Drawings or Specifications, and which may eventually result in a change in the scope of work. The Contractor shall suspend work until receiving direction from the Architect. The Architect shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the discovered conditions warrant a Change Order.
- 26.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Architect if the Contractor claims that instructions by the Architect will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Architect shall promptly respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the Contractor's claim warrants a Change Order.
27. Correction of the Work
- 27.1 The Contractor shall promptly remove from the premises all work the Architect declares is non-conforming to the contract. The Contractor shall replace the work properly at no expense to the Owner. The Contractor is also responsible for the expenses of others whose work was damaged or destroyed by such remedial work.
- 27.2 The Owner may elect to remove non-conforming work if it is not removed by the Contractor within a reasonable time, that time defined in a written notice from the Architect. The Owner may elect to store removed non-conforming work not removed by the Contractor at the Contractor's expense. The Owner may, with ten days written notice, dispose of materials which the Contractor does not remove. The Owner may sell the materials and apply the net proceeds, after deducting all expenses, to the costs that should have been borne by the Contractor.
- 27.3 The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any related damage to other work which appears within a period of one year from the date of substantial completion, and in accord with the terms of any guarantees provided in the contract.

00 72 13
General Conditions

The Owner shall promptly give notice of observed defects to the Contractor and Architect. The Architect shall determine the status of all claimed defects.

- 27.4 The Architect may authorize, after a reasonable notification to the Contractor, an equitable deduction from the contract amount in lieu of the Contractor correcting non-conforming or defective work.

28. Owner's Right to do Work

- 28.1 The Owner may, using other contractors, correct deficiencies attributable to the Contractor, or complete unfinished work. Such action shall take place only after giving the Contractor three days written notice, and provided the Architect approves of the proposed course of action as an appropriate remedy. The Owner may then deduct the cost of the remedial work from the amount due the Contractor.
- 28.2 The Owner may act with their sole discretion when the Contractor is unable to take action in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Owner shall inform the Contractor of the emergency work performed, particularly where it may affect the work of the Contractor.

29. Termination of Contract and Stop Work Action

- 29.1 The Owner may, owing to a certificate of the Architect indicating that sufficient cause exists to justify such action, without prejudice to any other right or remedy and after giving the Contractor and the Contractor's surety seven days written notice, terminate the employment of the Contractor. At that time the Owner may take possession of the premises and of all materials, tools and appliances on the premises and finish the work by whatever method the Owner may deem expedient. Cause for such action by the Owner includes: if the contractor is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or if a receiver is appointed due to the Contractor's insolvency, or if the Contractor persistently or repeatedly refuses or fails to provide enough properly skilled workers or proper materials, or if the Contractor fails to make prompt payment to Subcontractors or material or labor suppliers, or if the Contractor persistently disregards laws, ordinances or the instructions of the Architect, or is otherwise found guilty of a substantial violation of a provision of the Contract Documents.
- 29.2 The Contractor is not entitled, as a consequence of the termination of the employment of the Contractor as described above, to receive any further payment until the Work is finished. If the unpaid balance of the contract amount exceeds the expense of finishing the Work, including compensation for additional architectural, managerial and administrative services, such balance shall be paid to the Contractor. If the expense of finishing the Work exceeds the unpaid balance, the Contractor shall pay the difference to the Owner. The Architect shall certify the expense incurred by the Contractor's default. This obligation for payment shall continue to exist after termination of the contract.
- 29.3 The Contractor may, if the Work is stopped by order of any court or other public authority for a period of thirty consecutive days, and through no act or fault of the Contractor or of anyone employed by the Contractor, with seven days written notice to the Owner and the Architect, terminate this contract. The Contractor may then recover from the Owner payment for all work executed, any proven loss and reasonable profit and damage.

00 72 13
General Conditions

29.4 The Contractor may, if the Architect fails to issue a certificate for payment within seven days after the Contractor's formal request for payment, through no fault of the Contractor, or if the Owner fails to pay to the Contractor within 30 days after submission of any sum certified by the Architect, with seven days written notice to the Owner and the Architect, stop the Work or terminate this Contract.

30. Delays and Extension of Time

30.1 The completion date of the contract shall be extended if the work is delayed by changes ordered in the work which have approved time extensions, or by an act or neglect of the Owner, the Architect, or the Owner's Contractor, or by strikes, lockouts, fire, flooding, unusual delay in transportation, unavoidable casualties, or by other causes beyond the Contractor's control. The Architect shall determine the status of all claimed causes.

30.2 The contract shall not be extended for delay occurring more than seven calendar days before the Contractor's claim made in writing to the Architect. In case of a continuing cause of delay, only one claim is necessary.

30.3 The contract shall not be extended due to failure of the Architect to furnish drawings if no schedule or agreement is made between the Contractor and the Architect indicating the dates which drawings shall be furnished and fourteen calendar days has passed after said date for such drawings.

30.4 This article does not exclude the recovery of damages for delay by either party under other provisions in the Contract Document.

31. Payments to the Contractor

31.1 As noted under *Preconstruction Conference* in this section, the Contractor shall submit a Schedule of Values form, before the first application for payment, for approval by the Owner and Architect. The Architect may direct the Contractor to provide evidence that supports the correctness of the form. The approved Schedule of Values shall be used as a basis for payments.

31.2 The Contractor shall submit an application for each payment ("Requisition for Payment") on a form approved by the Owner and Architect. The Architect may require receipts or other documents showing the Contractor's payments for materials and labor, including payments to Subcontractors.

31.3 The Contractor shall submit Requisitions for Payment as the work progresses not more frequently than once each month, unless the Owner approves a more frequent interval due to unusual circumstances. The Requisition for Payment is based on the proportionate quantities of the various classes of work completed or incorporated in the Work, in agreement with the actual progress of the Work and the dollar value indicated in the Schedule of Values.

31.4 The Architect shall verify and certify each Requisition for Payment which appears to be complete and correct prior to payment being made by the Owner. The Architect may certify an appropriate amount for materials not incorporated in the Work which have been delivered and suitably stored at the site. The Contractor shall submit bills of sale, insurance certificates, or other such documents that will adequately protect the Owner's interests prior to payments being certified.

31.5 In the event any materials delivered but not yet incorporated in the Work have been included in a certified Requisition for Payment with payment made, and said materials thereafter are damaged, deteriorated or destroyed, or for any reason whatsoever become unsuitable or unavailable for use

00 72 13
General Conditions

- in the Work, the full amount previously allowed shall be deducted from subsequent payments unless the Contractor satisfactorily replaces said material.
- 31.6 The Contractor may request certification of an appropriate dollar amount for materials not incorporated in the Work which have been delivered and suitably stored away from the site. The Contractor shall submit bills of sale, insurance certificates, right-of-entry documents or other such documents that will adequately protect the Owner's interests. The Architect shall determine if the Contractor's documentation for the materials is complete and specifically designated for the Project. The Owner may allow certification of such payments.
- 31.7 Subcontractors may request, and shall receive from the Architect, copies of approved Requisitions for Payment showing the amounts certified in the Schedule of Values.
- 31.8 Certified Requisitions for Payment, payments made to the Contractor, or partial or entire occupancy of the project by the Owner shall not constitute an acceptance of any work that does not conform to the Contract Documents. The making and acceptance of the final payment constitutes a waiver of all claims by the Owner, other than those arising from unsettled liens, from faulty work or materials appearing within one year from final payment or from requirements of the Drawings and Specifications, and of all claims by the Contractor, except those previously made and still unsettled.
- 31.9 The Owner shall retain five percent of each payment due the Contractor as part security for the fulfillment of the contract by the Contractor. The Owner may make payment of a portion of this "retainage" to the Contractor temporarily or permanently during the progress of the Work. The Owner may thereafter withhold further payments until the full amount of the five percent is reestablished. The Contractor may deposit with the Maine State Treasurer certain securities in place of retainage amounts due according to Maine Statute (M.R.S.A. 5, Section 1746).

32. Payments Withheld

- 32.1 The Architect may withhold or nullify the whole or a portion of any Requisitions for Payment submitted by the Contractor in the amount that may be necessary, in his reasonable opinion, to protect the Owner from loss due to any of the following:
- a) defective work not remedied;
 - b) claims filed or reasonable evidence indicating probable filing of claims;
 - c) failure to make payments properly to Subcontractors or suppliers;
 - d) a reasonable doubt that the contract can be completed for the balance then unpaid;
 - e) liability for damage to another contractor.

The Owner shall make payment to the Contractor, in the amount withheld, when the above circumstances are removed.

33. Liens

- 33.1 The Contractor shall deliver to the Owner a complete release of all liens arising out of this contract before the final payment or any part of the retainage payment is released. The Contractor shall provide with the release of liens an affidavit asserting each release includes all labor and materials for which a lien could be filed. Alternately, the Contractor, in the event any Subcontractor or supplier refuses to furnish a release of lien in full, may furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien.

00 72 13
General Conditions

- 33.2 In the event any lien remains unsatisfied after all payments to the Contractor are made by the Owner, the Contractor shall refund to the Owner all money that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney's fees.

34. Indemnification

- 34.1 The Contractor shall indemnify and hold harmless the Owner, its officers, agents, and employees from and against any and all claims, liabilities and costs, including reasonable attorney's fees, for any or all injuries to persons, property or claims for money damages arising from the negligent acts or omissions of the Contractor, its employees or agents, officers or subcontractors in the performance of work under this Agreement.

35. Workmanship

- 35.1 The Contractor shall provide materials, equipment, and installed work equal to or better than the quality specified in the Contract Documents and approved in submittal and sample. The installation methods shall be of the highest standards, and the best obtainable from the respective trades. The Architect's decision on the quality of work shall be final.
- 35.2 The Contractor shall know local labor conditions for skilled and unskilled labor in order to apply the labor appropriately to the Work. All labor shall be performed by individuals well skilled in their respective trades.
- 35.3 The Contractor shall perform all cutting, fitting, patching and placing of work in such a manner to allow subsequent work to fit properly, whether that be by the Contractor, the Owner's Contractors or others. The Owner and Architect may advise the Contractor regarding such subsequent work. Notwithstanding the notification or knowledge of such subsequent work, the Contractor may be directed to comply with this standard of compatible construction by the Architect at the Contractor's expense.
- 35.4 The Contractor shall request clarification or revision of any design work by the Architect, prior to commencing that work, in a circumstance where the Contractor believes the work cannot feasibly be completed at the highest quality, or as indicated in the Contract Documents. The Architect shall respond to such requests in a timely way, providing clarifying information, a feasible revision, or instruction allowing a reduced quality of work. The Contractor shall follow the direction of the Architect regarding the required request for information.
- 35.5 The Contractor shall guarantee the Work against any defects in workmanship and materials for a period of one year commencing with the date of the Certificate of Substantial Completion, unless specified otherwise for specific elements of the project. The Work may also be subdivided in mutually agreed upon components, each defined by a Certificate of Substantial Completion.

36. Close-out of the Work

- 36.1 The Contractor shall remove from the premises all waste materials caused by the work. The Contractor shall make the spaces "broom clean" unless a more exactly cleaning is specified. The Contractor shall wash all windows and glass immediately prior to the final inspection, unless otherwise directed.

**00 72 13
General Conditions**

- 36.2 The Owner may conduct the cleaning of the premises where the Contractor, duly notified by the Architect, fails to adequately complete the task. The expense of this cleaning may be deducted from the sum due to the Contractor.
- 36.3 The Contractor shall participate in all final inspections and acknowledge the documentation of unsatisfactory work, generally called the "punch list", to be corrected by the Contractor. The Architect shall document the successful completion of the Work in a dated Certificate of Substantial Completion, to be signed by Owner, Architect, and Contractor.
- 36.4 The Contractor shall not call for final inspection of any portion of the Work that is not complete and permanent installed. The Contractor may be found liable for the expenses of individuals called to final inspection meetings prematurely.
- 36.5 The Contractor and all major Subcontractors shall participate in the end-of-warranty-period conference, typically scheduled close to one year after the Substantial Completion date.

37. Date of Completion and Liquidated Damages

- 37.1 The Contractor may make a written request to the Owner for an extension or reduction of time, if necessary. The request shall include the reasons the Contractor believes justifies the proposed completion date. The Owner may grant the revision of the contract completion date if the Work was delayed due to conditions beyond the control and the responsibility of the Contractor. The Contractor shall not conduct unauthorized accelerated work or file delay claims to recover alleged damages for unauthorized early completion.
- 37.2 The Contractor shall vigorously pursue the completion of the Work and notify the Owner of any factors that have, may, or will affect the approved Schedule of the Work. The Contractor may be found responsible for expenses of the Owner or Architect if the Contractor fails to make notification of project delays.
- 37.3 The Project is planned to be done in an orderly fashion which allows for an iterative submittal review process, construction administration including minor changes in the Work and some bad weather. The Contractor shall not file delay claims to recover alleged damages on work the Architect determines has followed the expected rate of progress.
- 37.4 The Architect shall prepare the Certificate of Substantial Completion which, when signed by the Owner and the Contractor, documents the date of Substantial Completion of the Work or a designated portion of the Work. The Owner shall not consider the issuance of a Certificate of Occupancy by an outside authority a prerequisite for Substantial Completion if the Certificate of Occupancy cannot be obtained due to factors beyond the Contractor's control.
- 37.5 Liquidated Damages may be deducted from the sum due to the Contractor for each calendar day that the Work remains uncompleted after the completion date specified in the Contract or an approved amended completion date. The dollar amount per day shall be calculated using the Schedule of Liquidated Damages table shown below.

<u>If the original contract amount is:</u>	<u>The per day Liquidated Damages shall be:</u>
More than \$100,000 and less than \$2,000,000	\$750
More than \$2,000,000 and less than \$10,000,000	\$1,500
More than \$10,000,000	\$1,500 plus \$250 for each \$2,000,000 over \$10,000,000

00 72 13
General Conditions

38. Dispute Resolution

38.1 Mediation

- a) In the event of a dispute between the parties which arises under this Agreement in which the dispute cannot be resolved through informal negotiation, the dispute shall be submitted to a neutral mediator jointly selected by the parties.
- b) Either party may file suit before or during mediation if the party, in good faith, deems it to be necessary to avoid losing the right to sue due to a statute of limitations. If suit is filed before good faith mediation efforts are completed, the party filing suit shall agree to stay all proceedings in the lawsuit pending completion of the mediation process, provided such stay is without prejudice.
- c) In any mediation between the Owner and the Architect, the Owner has the right to consolidate related claims between Owner and Contractor.

38.2 Arbitration

- a) If the dispute is not resolved through mediation, the dispute shall be settled by arbitration. The arbitration shall be conducted before a panel of three arbitrators. Each party shall select one arbitrator; the third arbitrator shall be appointed by the arbitrators selected by the parties. The arbitration shall be conducted in accordance with the Maine Uniform Arbitration Act (“MUAA”), except as otherwise provided in this section.
- b) The decision of the arbitrators shall be final and binding upon all parties. The decision may be entered in court as provided in the MUAA.
- c) The costs of the arbitration, including the arbitrators’ fees shall be borne equally by the parties to the arbitration, unless the arbitrator orders otherwise.
- d) In any arbitration between the Owner and the Architect, the Owner has the right to consolidate related claims between Owner and Contractor.

00 73 46
Wage Determination Schedule

PART 1- GENERAL

1.1 Related Documents

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

1.2 Summary

- A. This Section includes the wage determination requirements for Contractors as issued by the State of Maine Department of Labor Bureau of Labor Standards or the United States Department of Labor.

1.3 Requirements

- A. Conform to the wage determination schedule for this project which is shown on the following page.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

00 73 46
Wage Determination Schedule

End of Section 00 73 46

THIS DOCUMENT MUST BE CLEARLY POSTED AT THE PERTAINING STATE FUNDED PREVAILING WAGE CONSTRUCTION SITE

State of Maine
 Department of Labor
 Bureau of Labor Standards
 Wage and Hour Division
 Augusta, Maine 04333-0045
 Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project -----East Campus Site Infrastructure Improvements
 Location of Project --Augusta, Kennebec County

**2016 Fair Minimum Wage Rates
 Highway & Earthwork Kennebec County**

<u>Occupation Title</u>	Minimum Wage	Minimum Benefit	Total	<u>Occupation Title</u>	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	\$14.50	\$0.00	\$14.50	Ironworker - Structural	\$23.20	\$6.20	\$29.40
Backhoe Loader Operator	\$19.00	\$4.30	\$23.30	Laborers (Incl. Helpers & Tenders)	\$14.00	\$0.43	\$14.43
Blaster Ordinance Handling & Explosives	\$19.75	\$2.02	\$21.77	Laborer - Skilled	\$16.50	\$1.52	\$18.02
Boom Truck (Truck Crane) Operator	\$21.00	\$2.85	\$23.85	Line Erector - Power/Cable Splicer	\$25.88	\$5.88	\$31.76
Bulldozer Operator	\$18.00	\$5.10	\$23.10	Loader Operator - Front-End	\$17.21	\$2.38	\$19.59
Carpenter	\$20.00	\$1.63	\$21.63	Mechanic- Maintenance	\$18.05	\$1.90	\$19.95
Carpenter - Rough	\$18.00	\$1.15	\$19.15	Mechanic-Refrigeration	\$22.00	\$3.54	\$25.54
Concrete Mixing Plant Operator	\$20.00	\$4.46	\$24.46	Painter	\$16.98	\$3.73	\$20.71
Concrete Pump Operator	\$20.00	\$0.00	\$20.00	Paver Operator	\$18.00	\$1.03	\$19.03
Crane Operator <15 Tons	\$18.61	\$2.97	\$21.58	Pipe layer	\$19.33	\$2.37	\$21.70
Crane Operator =>15 Tons)	\$24.50	\$6.61	\$31.11	Pump Installer	\$25.00	\$4.67	\$29.67
Crusher Plant Operator	\$16.50	\$4.72	\$21.22	Reclaimer Operator	\$21.00	\$11.34	\$32.34
Driller - Rock	\$19.25	\$4.30	\$23.55	Roller Operator-Earth	\$11.75	\$0.30	\$12.05
Dry-Wall Applicator	\$21.50	\$2.63	\$24.13	Roller Operator - Pavement	\$17.75	\$1.60	\$19.35
Earth Auger Operator	\$23.00	\$0.00	\$23.00	Screed/Wheelman	\$19.00	\$3.23	\$22.23
Electrician - Licensed	\$26.00	\$13.87	\$39.87	Sider	\$23.00	\$1.77	\$24.77
Excavator Operator	\$19.00	\$2.47	\$21.47	Stone Mason	\$17.80	\$0.00	\$17.80
Fence Setter	\$15.25	\$1.32	\$16.57	Truck Driver - Light	\$13.50	\$0.00	\$13.50
Flagger	\$9.00	\$0.00	\$9.00	Truck Driver - Medium	\$16.00	\$0.55	\$16.55
Grader/Scraper Operator	\$18.00	\$0.90	\$18.90	Truck Driver - Heavy	\$15.25	\$1.38	\$16.63
Highway Worker/Guardrail Installer	\$15.00	\$1.16	\$16.16	Truck Driver - Tractor Trailer	\$18.68	\$4.63	\$23.31
Hot Top Plant Operator	\$23.60	\$9.48	\$33.08	Truck Driver - Mixer (Cement)	\$12.50	\$4.01	\$16.51

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

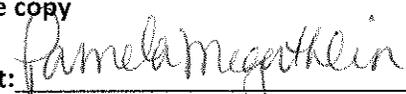
Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at \$50,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: HI-117-2016
 Filing Date: July 11, 2016
 Expiration Date: 12-31-2016

A true copy
 Attest: 
 Pamela Megathlin
 Director
 Bureau of Labor Standards

Contract A
East Campus Infrastructure Improvements

Technical Specifications
Table of Contents

Section Title

Site Specifications

202	Demolition
203	Excavation, Embankment and Restoration
304	Aggregate Base and Subbase Course
401	Hot Mix Asphalt Pavement
603	Storm Drains, Catch Basins and Drain Manholes
608	Sidewalks and Ramps
609	Curb
610	Riprap Aprons, Channels and Level Spreaders
625	Water Service and Hydrant Assembly
627	Pavement Markings, Signs and Bike Racks
642	Reinforced Concrete Steps
656	Temporary Soil Erosion and Water Pollution Control
659	Mobilization

Electrical Specifications

26 05 19	Building Wire and Cable
26 05 26	Secondary Grounding
26 05 33	Conduit
26 05 53	Electrical Identification
26 05 70	General Electrical Requirements
26 51 19	Site Lighting

Landscape Specifications

32 90 00	Planting
32 92 00	Turf and Grasses

Contract A
East Campus Infrastructure Improvements
Technical Specifications
Table of Contents

This page intentionally left blank.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

202.1 Description

This work shall consist of removing wholly or in part, and satisfactory disposing of all designated buildings, structures, bituminous pavement, Portland cement concrete pavement, manholes, catch basins, curbing and islands, site vegetation, utilities and conduits, and other obstructions which are required to be removed, except for the obstructions to be removed and disposed of that are specifically listed and paid for under other contract items. It shall include salvaging and stockpiling designated materials for re-use, and adjusting catch basin, manhole and handhole frames and covers to match proposed grades. It shall also include removal of abandoned sections of utility pipe found within the limits of excavation, and plugging watertight the ends of such utilities.

202.2 General

When the material from the work is to be retained by the Owner, the Contractor shall carefully dismantle it and remove it, and all materials, except those that may be specified to be reused in the new work, shall be moved by the Contractor and carefully stored by the Contractor at a location determined by the Engineer on the campus. The use of any portion of the salvaged material in connection with new or temporary construction shall not be anticipated by the Contractor. The dismantling of metal structures or railings shall, when especially provided, include the removal of all bolts and rivets necessary to disconnect the members and the matchmarking of these members for future reassembling.

When the material from the work is designated to become the property of the Contractor, it shall be entirely removed and disposed of beyond the limits of the campus property. Such material shall not be deposited in rivers, streams, or other bodies of water. If the material is to be wasted then it shall be disposed of at an approved location.

When practical, any suitable material removed shall be used in backfilling or for the formation of embankments and no additional allowances for payment will be made. Unsuitable or surplus material shall be disposed of in an approved waste area.

Blasting or other operations necessary for the removal of an existing structure or obstruction, which might damage new construction, shall be completed before placing the new work. If this is not feasible, the work shall be done only when approved and entirely at the Contractor's risk.

202.3 Removing Buildings

The Contractor shall remove and dispose of all buildings and foundations indicated on plans or bid documents.

Cavities remaining as a result of foundation or structure removal shall be filled to the level of the surrounding ground and, if within the limits of embankment or below the subgrade in excavation areas, shall be compacted in accordance with applicable embankment construction requirements.

Written notice will be given the Contractor when any building becomes available before the date specified in the construction documents. On the above-specified date, or upon notice of



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

availability, ownership of the buildings shall transfer from the Owner to the Contractor who then shall proceed with the work required under this section. The buildings shall not be used or occupied for any purpose while in the right-of-way and the buildings shall be removed as soon as possible after the date available, unless otherwise authorized.

All debris and unusable materials shall be removed to an approved dump or waste area and buried. No material shall be disposed of by burning. For a related provision, see Department of Environmental Protection Maine Solid Waste Management Rules, 06-096 CMR Ch. 401, Landfill Siting, Design and Operation.

202.4 Remove Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges

Removing existing superstructures shall consist of removing and disposing of existing superstructure including fill, pavement, railing, and all other material on or over the superstructure unless otherwise specified.

Removing existing structural concrete shall be to the limits designated on the plans and shall be accomplished without damage to the portion of the structure to remain.

Removing existing bridge shall be to the limits shown on the plans.

Existing concrete curbs and concrete sidewalks shall be removed to the limits shown on the plans using a chipping hammer or pavement breaker of a size approved by the Engineer or any other method approved by the Engineer which will not damage the structural integrity of the concrete to remain.

Before removal of existing concrete curbs or sidewalks, the fascia removal line, as indicated on the plans, shall be saw cut to a depth of 1 inch minimum. Care shall be taken not to damage any reinforcing steel that is to remain in the bridge.

Existing granite curbs shall be removed to the limits shown on the plans in a method which will not damage the curb stone. Concrete supporting base (if used) shall be removed using a chipping hammer. Curb stone in good condition shall be stock-piled by the Contractor for re-use in the work.

202.5 Removing Existing Bituminous Pavement

The full depth of existing bituminous pavement shall be removed from curb to curb or to the limits shown on the drawings. The equipment for removing the bituminous pavement shall be capable of scarifying and loading the bituminous pavement without including any gravel, except that adhering to the pavement. The remaining gravel shall be graded to drain as approved by the Engineer, unless indicated to be excavated to construct a full depth pavement section.

202.6 Removing Existing Bituminous Pavement Surface

Where milling is indicated on the drawings, the equipment for removing the bituminous surface shall be a power operated milling machine or grinder capable of removing bituminous concrete

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

pavement to the required depth, transverse cross slope, and profile grade by the use of an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope, to compensate for surface irregularities in the existing pavement course. The equipment shall be capable of accurately establishing profile grades by referencing from a fixed reference such as a grade wire, or from the existing pavement surface using a 30 foot minimum contact ski (floating beam), or 24 foot non-contact grade control beam.

The Contractor shall locate and remove all objects in the pavement through the work area that would be detrimental to the planing or grinding machine.

The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding ½ inch under a 16 foot string line or straightedge placed parallel to the centerline will be corrected. Any deviations in the cross-slope that exceed ¾ inch under a 10 foot string line or straightedge placed transversely to centerline will be corrected. All corrections will be made with approved methods and materials. Any areas that require corrective measures will be subject to the same acceptance tolerances. Excess material that becomes bonded to the milled surface will be removed to the Engineer's satisfaction before the area is accepted.

202.7 Pavement Butt Joints

The equipment for removing the bituminous surface shall be a cold milling machine or a power operated planer capable of removing the existing pavement to the required depth, width, grade, and slope.

The milled surface shall have a uniform texture and provide acceptable rideability for vehicles. Should resurfacing be delayed, or the resulting milled surface is unsatisfactory for any reason, bituminous leveling course or temporary pavement may be required. The Contractor shall clean the milled surface and surrounding area of all loose material prior to use by traffic.

202.8 Removing Portland Cement Concrete Pavement

All Portland cement concrete pavement and Portland cement concrete base course designated for removal shall be broken into pieces and disposed of off-site.

202.9 Removing Manholes and Catch Basins

Under proposed pavement, manholes and catch basins shall be removed in their entirety, and the excavation shall be filled with suitable embankment and thoroughly compacted.

Under proposed turf, the sides of the manhole / catch basin shall be removed to a depth of at least 2 feet below subgrade. Floors of the structures shall be broken up or removed to permit drainage. The open cavity shall be filled with earth and thoroughly compacted.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

All pipes connecting to the structure within the limits of construction shall be completely removed. When the pipe extends beyond the limits of construction, said pipe: (1) if to be connected to new pipe, shall not be disturbed, or (2) if no connection is called for, the pipe shall be tightly plugged with high-strength non-shrink grout.

202.10 Adjusting Manhole and Catch Basin Frames and Covers

Manhole and catch basin frames and covers shall be lowered or raised to match proposed grade as shown on the drawings. High-strength concrete brick shall be added or removed as needed.

202.11 Removing Single Trees and Stumps

When called for on the plans or otherwise designated, complete removal and disposal of single trees and stumps shall be required and shall include the backfilling of stump holes. Trees, which have been uprooted, shall be removed by cutting the tree and removing the stump from the ground or, where approved, the stumps may be placed back in the hole to present a natural appearance. The area shall be graded to conform to the surrounding terrain

202.12 Method of Measurement

Demolition of all materials and obstructions shall be measured by the lump sum, complete and accepted.

202.13 Basis of Payment

The accepted quantity of Demolition will be paid for at the contract lump sum price, which price shall be full compensation for removing and disposing of all obstructions, structures and materials not otherwise specifically listed under other contract items, to the limits shown on the plans and as directed by the Engineer. The lump sum for Demolition will include all bituminous and Portland cement concrete removal, scarifying existing gravel surface for placement of supplemental gravel, all existing curbing and island removal, structure removal, utility removal, vegetation removal, adjusting manhole and catchbasin structures to proposed grade, removing existing sign posts and salvaging existing signs, removing existing light post foundations and salvaging existing lights and posts, and other items identified to be removed and/or demolished. Not included is:

- The excavation of existing subgrade soils, topsoil, and base gravels that are otherwise paid for under the excavation pay item.
- Trenching for the installation of utilities which are paid for under the respective electrical and stormdrain pay items.

This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
202.1	Demolition	Lump Sum

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 202
Demolition

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

203.1 Description

This work shall consist of removing, hauling, disposing and compacting, if required, of all material not being removed under some other item, encountered for the construction of the project in accordance with the specifications and in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans or established. Material from off-site that is needed to construct embankments, or backfill trenches and holes shall be classified as borrow.

Excavation and backfill for construction of utility trenches and foundations shall be performed in accordance with this section, although payment for such excavation and backfill shall be incidental to the respective utility / structure pay items provided in other specification sections.

This section shall also consist of excavating and salvaging topsoil from within the construction limits for re-use, or stockpiling as directed. Placement of topsoil over disturbed areas shall additionally be paid for in accordance with Section 32 92 00.

- a) Common Excavation shall consist of removing all material encountered in grading the project within the limits of construction which is not otherwise classified and paid for. Common Excavation shall include the removing and disposing of subgrade materials, boulders, solid mortared stone masonry and concrete masonry when each is less than 2 yd³ in volume and all soft and disintegrated rock which can be removed with ordinary excavating machinery. It shall include grubbing, which consists of the removing and disposing of all stumps, roots, bushes, grass, turf or other objectionable material and the striping and stockpiling of topsoil for re-use. Suitable excavated material that meets the requirements of paragraph 203.2 shall be used to construct embankments as needed.

Common Excavation shall include muck removal, which shall consist of excavating and disposing of saturated or unsaturated mixtures of soils and organic matter not suitable for embankment foundation material regardless of moisture content.

- b) Rock Excavation, if required, shall consist of removing hard igneous, metamorphic and sedimentary rock which cannot be excavated without drilling and splitting, and all boulders, solid mortared stone masonry, concrete masonry, each having a volume of 2 yd³ or more. No blasting is allowed.

203.2 Materials

- a) Embankment shall consist of approved material required for the construction of embankments or for other portions of the work as designated and shall be obtained from:
 - 1) Suitable excavated material obtained from within the limits of proposed excavation that meets the requirements of Section 703.18 of the Maine DOT Standard Specifications for Common Borrow;

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

- 2) Off-Site Borrow when the quantity of material needed to construct embankments exceeds what can be obtained from within the limits of proposed excavation, the Contractor shall obtain borrow from beyond the limits of the project property. The Contractor shall make their own arrangements for obtaining borrow and shall pay all costs involved. NOTE: Contractor shall exhaust all sources of on-site material from excavation activities prior to obtaining off-site borrow.

Borrow material shall meet the requirements of the following Sections of Division 700 - Materials of the Maine DOT Standard Specifications:

Common Borrow 703.18

Granular Borrow 703.19

- b) Topsoil shall consist of screened, loose friable loam in accordance with Section 615 of the Maine DOT Standard Specifications and Section 32 92 00 of these specifications.
- c) Aggregates for Base and Subbase construction shall be as specified in Section 304 of these specifications.
- d) Sand for use as bedding and blanket material in trench backfill shall meet the requirements of Section 703.05 of the Maine DOT Standard Specifications.

203.3 Unauthorized Use of Materials

No common excavation, rock excavation, unclassified excavation or borrow which is designated for use in embankments or backfill may be diverted for the Contractor's own use. Any unauthorized use of such material will be adjusted by deducting quantities, measured by the most appropriate method, as determined, and 115% of the quantity deducted from the total amount.

203.4 General

Prior to beginning excavating, grading, and embankment operations in any area, all topsoil shall be stripped and stockpiled for re-use.

Unsuitable material shall be disposed of as directed and no material shall be wasted without permission. Excavating operations shall be conducted so that material outside of the limits of construction will not be disturbed.

The Engineer may designate as unsuitable those soils which cannot be properly compacted in embankments and all such unsuitable material shall be disposed of in approved waste areas off-site.

Suitable material taken from excavation shall be used in the construction of embankment, subgrade, and for backfilling as indicated on the plans, or as directed, except that if the volume of suitable excavated material exceeds that required to construct the embankments to the grades indicated, the excess shall be used as directed or disposed of off-site.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

The Contractor shall not excavate beyond the dimensions, slopes and elevations established, and no material shall be removed prior to the staking out and cross sectioning the site. Unless otherwise authorized, off-site borrow material shall not be placed until after all suitable excavation has been placed in the embankment unless the use of granular borrow is called for on the plans or required for use under embankments or in conjunction with the use of excavated material or for the maintenance of traffic. If the Contractor places more off-site borrow than is required and thereby causes a waste of suitable excavation material, the amount of such waste will be measured by the method deemed most appropriate and 100% of the amount deducted from the off-site borrow volume.

When it is necessary to temporarily remove fencing designated to remain, the fencing shall be replaced by the Contractor at their expense in as good a condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed. When new fencing for confinement of livestock is required, it shall be erected before existing fencing is disturbed. Where new fencing cannot be erected in its final location, temporary fencing shall be at the Contractor's expense.

Excavating for obliterating old roadways, parking areas and sidewalks, or salvaging material from old roadways parking areas and sidewalks shall include all grading operations necessary to incorporate the old paved areas into the new paved areas and surroundings or placing salvaged material in a stockpile as directed.

The degree of finish for grading ditches and slopes, both fill slopes and cut slopes, shall be that obtainable from machine operations. Ditches shall be constructed to within 6 inches above or below the grade called for on the grading plans or as otherwise modified but in no case shall the ditch be finished in a condition that will not allow the flow of water. Ditches shall be graded to the extent that puddles will not form. All provisions for measurement and payment limits shall remain in force and no payment will be made for unauthorized work done beyond authorized pay limits.

Unstable slopes subject to sliding and slumping shall be excavated to the lines and grades shown or as directed. Immediately after each location is excavated approved stone or granular slope blanket backfill material shall be placed and shaped to match the adjacent slopes.

203.41 Salvage of Existing Hot Mix Asphalt Pavement

Not used.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

203.42 Rock Excavation

NOTE: It is anticipated that a limited amount of rock excavation may be required for construction of utility trenches. Mechanical means of rock excavation shall be the only authorized method for rock excavation. Blasting is prohibited.

The overburden shall be removed or trenches shall be excavated through the overburden at the intervals directed by the Engineer, normally 25 ft. but in no case closer than 10 ft. apart to permit cross sectioning of the rock in its original position. Rock removed prior to sectioning will be considered as Common Excavation.

The depth of rock excavation under paved areas shall extend to a minimum of 12 inches below the subbase surface elevation to eliminate water pockets within the pavement section.

203.5 Excavation

Excavation shall be maintained in such condition that the excavation surface will be well drained. Temporary drains, drainage ditches and culverts shall be constructed to intercept and divert water that may adversely affect the condition of the excavation and the prosecution of the work.

Excavation in general, shall proceed in an upgrade direction. Subgrades shall be promptly graded and rolled to minimize absorption of water. Adjacent ditches shall be graded to the extent that puddles will not form. Grubbing areas which cannot be drained shall be promptly filled with approved excavation or borrow to such an elevation that surface drainage will be effective. If, due to unusual circumstances, drainage by gravity cannot be accomplished, the Engineer may require the Contractor to provide adequate means of pumping the area. Pumping may be required on a 24 hour a day continuous basis and no direct compensation for cost of pumping will be made.

Muck shall be removed in such a manner to insure its complete removal with no areas remaining or trapped below the embankment. Excavated muck shall be deposited in designated waste areas off-site. When muck is encountered that was not contemplated on the plans, it shall be disposed of as indicated above.

Excavation adjacent to roots of trees or shrubs, which are to remain, shall be removed by hand.

When excavating results in a subgrade of unsuitable soil, the Engineer may require the Contractor to remove the unsuitable material and backfill the area with approved material. The Contractor shall conduct their operations in such a way that the Engineer can take the necessary measurements before the backfill is placed.

Material classified as rock, whether paid for as rock excavation or unclassified excavation, shall be excavated to the required depth. Care shall be taken that undrained pockets will not be left in the surface of the rock remaining.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

The space between the rock remaining and the normal subgrade shown on the plans shall be backfilled with the designated aggregate subbase or aggregate base, pulverized rock or other approved material. The Contractor shall conduct their excavating and hauling work in a manner that will cause as little contamination as possible. Fine grading at the normal subgrade line will be required unless aggregate subbase or aggregate base material is used.

Buried structures and obstructions located within the designated limits of the work, shall be removed as part of the applicable demolition or excavation item. Buried structures and obstructions located below or outside the required excavation, whose removal is ordered, shall be removed and such removal paid for as Common Excavation.

203.5 Drilling and Blasting of Solid Rock Subgrade.

Not used.

203.6 Waste Areas

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 before the establishment of waste areas off the project site. In addition, written permission of the property owners shall be obtained by the Contractor, including permission to dispose of waste in the area. Copies of all required permits shall be given to the Owner.

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. Erosion control measures installed at waste areas shall not be measured or paid for directly, but shall be considered incidental to the excavation pay items.

203.7 Borrow

The location of all borrow pits and rock borrow quarries shall be approved by the Engineer in advance.

The Contractor shall notify the Engineer sufficiently in advance of opening any borrow areas so that cross section elevations and measurements of the ground surface after stripping may be taken and the borrow material can be tested before being used. Existing pits shall, when directed, be graded and shaped by the Contractor before being cross-sectioned for original measurements.

Borrow pits shall be excavated to neat lines and all slopes shall be dressed uniformly and left in a neat condition. Before the completion of the project, all borrow pits and haul roads shall be graded to blend with adjacent ground, loamed if necessary, seeded and mulched. When practicable, the bottom of all pits shall be graded to drain the pit.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

203.8 Preparation of the Embankment Area

When the depth of the embankment, measured vertically below subgrade, does not exceed 5 feet the area on which the embankment is to be placed shall be grubbed. When the embankment is more than 5 feet, as measured above, all vegetation in the embankment area shall be cut flush with the ground surface.

When embankment is to be placed and compacted on hillsides or where new embankment is to be compacted against existing embankment, slopes steeper than 1 vertical to 2 horizontal shall be continuously benched by excavating steps into the existing material of sufficient width to permit operations of placing and compacting the additional material. Material removed shall be placed and compacted along with the new embankment material. When such benching is required, it will be as indicated on the plans, called for in the special provisions or as directed.

203.9 Embankment Construction – General

Layers of material for embankments shall start at the deepest portion of the fill and as placement progresses, layers shall be constructed approximately horizontal. Except for the first layer over swampy ground and cleared areas, embankment of earth material under areas proposed to be paved shall be placed in layers not exceeding 8 inches, loose measure, unless otherwise approved and the material compacted as specified before the next layer is placed.

When it is impractical to construct layers over the full width of the cross section, partial width layers may be authorized at the discretion of the Engineer.

Effective spreading equipment shall be used on each layer to obtain uniform thickness. Each layer shall be crowned and maintained free of ruts and ridges to provide direct drainage of water from the embankment. As the compaction of each layer progresses, grading and manipulating will be required to assure uniform density. Construction equipment shall be routed uniformly over the entire surface of each layer.

Water shall be added or removed, if necessary, in order to obtain required compaction.

When placing layers of specified thickness is not feasible, such as filling in water or over swampy ground, the initial layer of embankment may be constructed in one layer to an elevation where bridging will be accomplished. In embankment areas where no grubbing is required, the material placed in the first layer shall be of sufficient depth to cover all stumps.

When the excavation or borrow consists predominantly of fragments of such size that the material cannot be placed in embankments in layers of specified thickness without breaking down the pieces, such material may be placed in layers in thickness not exceeding the approximate average size of the larger rocks but in no case shall layers exceed 2 feet. Rocks exceeding this thickness shall be separated and collectively placed in accordance with the requirements for rock embankments. Each layer shall be leveled and smoothed with suitable leveling equipment and by even distribution of rock spalls and finer rock fragments or earth. The Engineer may test any or all layers by moisture and density control as specified in this specification. The layers so constructed shall not be placed above an elevation 2 feet below

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

the finish subgrade. The remainder of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 8 inches, loose thickness, and compacted as specified for earth embankments.

Excess or unsuitable excavated material, including rock and boulders, which cannot be used in embankments shall be placed in the nearest available waste areas. When it is impossible to dispose of all material in the manner described, the remainder shall be disposed of in approved waste areas.

When material obtained from excavation is unsatisfactory for use in the formation of embankments due to excessive moisture content, can be rendered satisfactory for such use by combining it with granular material, the unsatisfactory material shall be combined with granular borrow or granular excavation when and as directed by the Engineer.

At the close of each day's work, the embankment surface shall be graded, crowned, smoothed, rolled and sealed against infiltration of water.

The portion of the embankment and subbase outside a 1 vertical to 1½ horizontal slope extending from the edge of the finished shoulder to the existing ground, will be required to be compacted only to the extent that stability of the slope is assured. As construction of the embankment progresses, material placed in the portion of the embankment outside the 1 vertical to 1½ horizontal slope shall not be placed above the elevation of the surface of the main embankment unless provisions are made to allow drainage of surface water from the embankment. The surface of the slopes shall be finished to present a uniform neat appearance.

The portion of the embankment inside the aforementioned 1 vertical to 1½ horizontal slope lines shall be compacted in accordance with the designated embankment compaction requirements specified for the project.

203.10 Construction of Earth Embankment-Layer Method

The layer method will be required unless otherwise specified. Unless otherwise approved the material shall be deposited and spread upon compacted material in full width layers not more than 8 inches in depth, loose measure. Clay or loam soils shall be compacted by use of sheeps foot or tamping type roller having a minimum weight on each tamper, under working conditions, of 250 psi of cross sectional bearing area. Sand or gravel soils shall be compacted by vibratory type compaction equipment or by pneumatic tired equipment and, if necessary, by the addition of water. A combination of the above or other methods capable of producing equivalent results may be used. The compacting operations shall be continued until each layer is compacted to its full depth and width.

With approval from the Engineer, the Contractor may place layers in excess of 8 inches and less than 24 inches, loose measure, providing the specified compaction requirements are obtained and the Contractor agrees to make necessary test excavation for the Engineer to determine density.

The Contractor will be required to demonstrate that the compaction equipment and methods are obtaining satisfactory compaction.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

Satisfactory compaction for the purpose of the demonstration is defined as not less than 90% of the maximum density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, correcting for oversize particles according to AASHTO T 224 except mixtures may have 40 percent or less retained on the ¾ inch sieve. Field density tests will be performed by the Engineer in accordance with AASHTO T 310.

Compaction of each layer of base or subbase material that exceeds 40 percent retained on the ¾ inch sieve shall continue until a density of not less than 98% of the maximum density has been achieved for the full width and depth of the layer. Density tests and the maximum density determined by a control section shall be performed by the Engineer.

If required by the Engineer, a 300 foot section at the start of the operation will be designated as the control section. The contractor shall add or remove water to the control section as directed until the Engineer determines that optimum moisture has been obtained. The control section shall then be rolled as directed using the specified compaction equipment until the Engineer determines that four consecutive passes do not increase the dry density by more than 1 lb/ft³. The compaction process shall be repeated for each roller. Once the compaction process is complete, the Engineer will perform several additional density tests. The average of these tests shall be used to determine the maximum density of the control section.

203.11 Construction of Earth Embankment with Moisture and Density Control

Not used.

203.12 Construction of Rock Embankments

Not used.

203.13 Winter Construction of Embankments

Frozen material shall not be placed in the core embankment. The construction of embankments may continue during cold weather only when all frozen material in the top of the core embankment or the existing ground is moved to the waste area before placing additional material. When this procedure results in additional borrow quantity the additional borrow will not be paid for directly.

Compaction shall be in accordance with the specified method of embankment construction. When the prevailing temperatures are below 30°F all material used in embankment construction shall have a moisture content, at the time of compaction, equal to or less than the optimum moisture content.

The embankment shall not be constructed upon frozen material except that such construction of embankments may be allowed providing the total depth of the added fill, including bases, plus the depth of the frozen material beneath does not exceed 5 feet. Frozen material may be left in the embankment only if it has been compacted as specified before freezing. The Contractor shall not resume construction of any embankments built in this manner until all frozen material has thawed. If test holes are required to make this determination they shall be dug and

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

backfilled with satisfactory compaction at the Contractor's expense. Before additional material is added, uncompacted material on the surface of such embankments shall be either recompactd in accordance with the specified method of embankment construction or removed.

203.14 Preparation and Protection of the Subgrade

Unless otherwise provided, the subgrade shall be brought to a condition of uniform stability and compacted for the full width of the section by grading and rolling operation and shall be maintained above or within 3 inches below the required grade and cross section. The surface shall be compacted to uniform density and stability and graded to the extent that puddles of water will not form. Additional material required as a result of low subgrade shall be furnished and placed at the expense of the Contractor.

The required compaction shall be the same as specified for embankments. When the subgrade occurs in cuts, the required compaction shall apply to a depth of 6 inches below subgrade unless otherwise specified.

The Contractor shall protect the subgrade from damage. Ditches and drains shall be maintained to effectively drain the subgrade. In no case shall vehicles be allowed to travel in a single track and form ruts. No material shall be deposited on a subgrade until the subgrade has been approved by the Engineer.

203.15 Site Restoration

All areas that are disturbed during construction and not shown to be otherwise stabilized by structural measures, shall receive 6 inches of topsoil, seed and mulch. All work shall be performed and paid for in accordance with Section 32 92 00 of these specifications.

203.16 Method of Measurement

Except as otherwise provided, excavation and borrow will be measured by the number of cubic yards measured in its original position by cross sectional elevations. Measurements will include slides in common excavation and unclassified excavation, not attributable to carelessness of the Contractor, and authorized excavation of earth, rock, shale, muck or other unsuitable material. Volumes will be computed by the average end area method or by other methods generally recognized as conforming to good engineering practice.

Muck excavation, to be measured for payment as common excavation, will be the number of cubic yards of material acceptably excavated from areas shown on the plans or other authorized areas not shown on the plans or placed in waste storage areas or hauled to an approved waste area. Muck excavation shall be measured in its original position by cross sectional elevations and the volume computed by the average end area method. If muck is stored in excess of the maximum slope requirements of any waste storage area, the amount requiring reloading, hauling and disposing of in other waste storage areas or approved waste areas will not again be measured for payment.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

When it is impractical to measure excavation by the cross sectional method, acceptable methods involving three-dimensional measurements may be used.

Unless otherwise authorized, measurement for excavation in earth cuts will be made to the designated slopes. Field changes made by the Resident will be measured by cross sections or by other acceptable methods. Elevations for final cross sections shall be determined at the surface of the finished ground with no additional allowance for thickness of loam, sod, riprap, hay mulch, or other type of ground cover except that excavation for slope gravel blanket will be measured by the cubic yard.

Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

Stockpiled material shall not be paid for separately, but considered incidental to the work.

203.17 Basis of Payment

The accepted quantity of excavation and borrow will be paid for at the contract unit price per cubic yard for each of the pay items included in the Schedule of Prices. Payment shall be full compensation for dewatering (if required), excavating, loading, hauling, placing, grading and compacting all materials necessary for the formation of embankments. The disposal of unsuitable excavation and surplus material when necessary shall be considered incidental to the excavation items for payment purposes. Periodic excavation in constructed embankments for the purpose of determining compacted in-place densities shall also be considered incidental.

Payment for removal of unsuitable material below subgrade elevation in cuts and as directed by the Engineer will be paid at the contract unit price per cubic yard for "Common Excavation."

Dewatering of excavation sites shall be considered necessary to the operation and considered incidental to the item and will not be paid for separately.

Water added to embankment material to aid in compaction will not be paid for directly but shall be considered incidental to and included in the respective excavation and borrow pay items.

For "Common Excavation," payment shall be made at the contract unit price per cubic yard of material measured in its original position. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to excavate, load, haul, and place material in stockpiles, or to construct on-site embankments, or to dispose of unsuitable or surplus materials at off-site waste areas to complete the item. No additional measurement or payment will be made under other items for placing excavated materials in embankments, which includes grading and compacting. This price shall include the removal and disposal of all surplus and materials unsuitable for the formation of embankments at a waste area off-site.

For "Rock Excavation," payment shall be made at the contract unit price per cubic yard of material measured in its original position. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to excavate the rock by mechanical

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

methods, load, haul, and dispose of all materials at off-site waste areas. No distinction will be made between subgrade rock excavation and trench rock excavation.

For "Borrow," payment shall be made at the contract unit price per cubic yard of material obtained from off-site excavations, measured in its original position. Borrow shall only be used when the amount of suitable material obtained from on-site excavations (Common Excavation) is not sufficient to construct proposed embankments. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to excavate, load, haul, place material in embankments, grade, compact and complete the item.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
203.1	Common Excavation	Cubic Yard
203.2	Rock Excavation	Cubic Yard
203.2	Borrow (Off-Site)	Cubic Yard

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 203
Excavation, Embankment and Restoration

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

304.1 Description

This work shall consist of furnishing and placing one or more courses of aggregates on a prepared surface in accordance with the specifications in reasonably close conformity with the lines, grades, thickness and typical cross sections, as shown on the plans or established. Placement of geotextiles for subgrade reinforcement is also included in this section.

304.2 Aggregate

Aggregates shall conform to the requirements specified in Section 703.06 of the Maine DOT Standard Specifications and as follows:

The material shall have a Micro-Deval value of 25.0 or less as determined by AASHTO T 327. If the Micro- Deval value exceeds 25.0, the Washington State Degradation DOT Test Method T113, Method of Test for Determination of Degradation Value (January 2009 version) shall be performed, except that the test shall be performed on the portion of the sample that passes the ½ in sieve and is retained on the No. 10 sieve. If the material has a Washington Degradation value of less than 15, the material shall be rejected.

- a) Aggregate Base shall be Type A in accordance with Section 703.06a of the Maine DOT Standard Specifications. The aggregate shall be crushed ledge or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. Type A aggregate for base shall only contain particles of rock that will pass the 2 inch square mesh sieve. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements specified in Table 1 below.

At least 50 percent by weight of the material retained on the No. 4 sieve shall have at least one fractured face as tested by AASHTO T 335.

- b) Aggregate for Subbase shall be Type D in accordance with Section 703.06c of the Maine DOT Standard Specifications. The aggregate shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. Type D aggregate for subbase shall not contain particles of rock which will not pass the 6 inch square mesh sieve. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements specified in Table 1 below.

Type D aggregate for subbase gravel may contain up to 50 percent by weight Recycled Concrete Aggregate (RCA). When RCA is used, the portion of the resulting blend of gravel and RCA retained on a ½ inch square mesh sieve shall contain a total of no more than 5 percent by weight of other recycled materials such as brick, concrete masonry block, or asphalt pavement as determined by visual inspection. RCA shall be substantially free of wood, metal, plaster, and gypsum board as defined in Note 9 in Section 7.4 of AASHTO M 319. RCA shall also be free of all substances that fall under the category of solid waste or hazardous materials.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

Table 1 - AGGREGATE GRADATION

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Type A Base	Type D Subbase
½ inch	45-70	35-80
¼ inch	30-55	25-65
No. 40	0-20	0-30
No. 200”	0-6.0	0-7.0

For The various classes of base and subbase, at the time it is deposited on the prepared subgrade, the aggregate shall conform to the gradation requirements of the contract. The Engineer shall obtain samples from the roadbed for Acceptance either prior to or following compaction. Oversized stones shall be removed from the aggregate before depositing on the prepared subgrade.

Oversized stones for the various types are as follows:

Type A will not pass a 2 inch square mesh sieve

Type D will not pass a 6 inch square mesh sieve

304.3 Reinforcement Geotextile

Fibers used in the manufacture of geotextiles, and the threads used in joining geotextile by sewing, shall consist of long-chain synthetic polymers, composed of 95 percent by weight of polyolefins or polyesters. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including salvages. Geotextile for reinforcement shall be a woven high-performance geotextile such as TenCate Mirafi HP665 or approved equal that meets the requirements of Section 722.01 of the Maine DOT Standard Specifications.

The geotextile shall be placed on areas of soft subgrade prior to placement of the granular subbase layer, in locations directed by the Engineer or shown on the drawings. Placement shall be performed in accordance with Section 620 of the Maine DOT Standard Specifications.

304.4 Placing Aggregate

The maximum compacted thickness of any base or subbase course layer shall not exceed 12

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

inches unless the Contractor demonstrates by a test section that the required compaction can be obtained. If compacted layers more than 12 inches are allowed, the Contractor shall agree to make the necessary excavations and backfilling in the course for the Owner to determine the density.

When layers are constructed of differently graded aggregate, fine grading of the lower layer will not be required except when millings are placed as the upper most layer. In this case the coarse graded base layer shall be fine graded to +/- 3/4 inch and compacted to the required specification prior to placing the layer of millings. The layer of millings shall then be placed, shaped, and compacted within the tolerances specified below.

Each layer of aggregate shall be placed over the full width of the section except, the Owner may authorize the Contractor to place less than full width layers, when existing traffic or other conditions restrict operations over the full width of the section. When the Contractor places material to complete the full width, the exposed edge of the previously placed aggregate shall be cleaned of all contamination before additional base or subbase aggregate is placed adjacent to it.

Aggregate base and subbase courses may be placed upon frozen surfaces when such surfaces have been properly constructed.

The material as spread shall be well mixed with no pockets of either fine or coarse material.

Segregation of large or fine particles will not be allowed.

304.5 Shaping, Compacting and Stabilizing

Compaction of each layer of base and subbase shall continue until a density of not less than 95% of the maximum density has been achieved for the full width and depth of the layer. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, correcting for oversize particles according to AASHTO T 224 except mixtures may have 40 percent or less retained on the 3/4 inch sieve. Field density tests will be performed by the Owner in accordance with AASHTO T 310.

Compaction of each layer of base or subbase material that exceeds 40 percent retained on the 3/4 inch sieve shall continue until a density of not less than 98% of the maximum density has been achieved for the full width and depth of the layer. Density tests and the maximum density determined by a field proctor shall be performed by the Owner.

The surface, compaction and stability, shall be satisfactorily maintained until the pavement course (if specified) has been placed. If required, additional water and fine material shall be applied to prevent checking, raveling or rutting.

If the top of any layer becomes contaminated by degradation of the aggregate or addition of foreign material, the contaminated material shall be removed and replaced with the specified material.

All layers of base and subbase course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

layer shall be placed unless otherwise authorized.

The Contractor shall bear full responsibility for and make all necessary repairs to the subbase course and the subgrade until the full depth of the subbase course is placed and compacted. Repairs shall be considered incidental to the project.

The top of any base or subbase course layer shall be scarified and loosened for a minimum depth of 1 inch immediately prior to the placing of the next layer of aggregate base or subbase. This scarifying shall be considered incidental to placing the course, and no separate payment will be made.

The surface of each layer shall be maintained during compaction operations in such a manner that a uniform texture is produced and the aggregate firmly keyed. The moisture content of the material shall be maintained at the proper percent to attain the required compaction and stability.

If voids remain on the surface after the subbase course has been constructed to grade, compacted, checked and approved, sand-leveling material shall be dumped and spread as directed. The quantity of sand leveling material shall be limited to the amount necessary to fill the voids and the minor low areas on the subbase surface. After the sand leveling material has been spread, it shall be completely rolled by a rubber-tired roller with water applied, if necessary. The surface of this material shall be maintained in its compacted and graded condition until the hot mix asphalt pavement has been placed (if specified). The furnishing, spreading, compacting and maintaining of sand leveling material will be incidental to the placement of the subbase course and no separate payment will be made.

If the Contractor wishes to route public traffic over the completed Aggregate Subbase Course for a period of time greater than 48 hours, the Aggregate Subbase Course shall be constructed with a minimum 2 inch surcharge above the design grade. Whenever the surcharge is used, it shall be constructed with material meeting the requirements of Section 703.06(b), Type D Aggregate of the Maine DOT Standard Specifications. Also, whenever, the surcharge is used, it shall be placed on all the Aggregate Subbase Course subjected to public traffic. When the surcharge is removed, it may be placed in driveways, sidewalks, approach roads, or the outer portions of the shoulders. Removal of the surcharge shall be followed immediately in succession by the fine grading of the aggregate subbase and construction of the next course. The furnishing, placing, maintaining, and removal of the surcharge will not be paid for directly, but will be considered incidental to the Aggregate Subbase Course pay item.

304.6 Surface Tolerance

The completed surface of the subbase or base course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of $\frac{3}{8}$ inch.

304.7 Method of Measurement

The quantity of geotextile will be measured by the number of square yards of surface area



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

covered and in direct contact with the cover material. Measurement will not be made for overlaps, patches and repairs of damaged geotextile unless additional overlap width is required by the Resident in which case measurement will be made for that added overlap area.

Except as otherwise provided, base course and subbase course to the level of subgrade will be measured by the cubic yard in place, after compaction. When measured in place, the width and thickness for measurement will be the width and thickness of base or subbase as shown on the plans or as modified. The length will be along the centerline unless modified by other methods generally recognized as conforming to good engineering practice. All measurements will be in accordance with Section 108.1 - Measurement of Quantities for Payment of the Maine DOT Standard Specifications. As an alternative to in-place measurement, the Contractor and the Engineer may agree in writing that the quantities of base or subbase for payment will be that shown in the Schedule of Items. If such an agreement is reached, no further measuring and computing of quantities will be required and the quantity referred to herein will be final.

Tailings, screenings, overburden, material used as other pay items, waste, and unauthorized use of the material will be deducted from the final quantity amount.

304.8 Basis of Payment

Geotextiles will be paid for at the contract unit price per square yard. Such payment shall be full compensation for furnishing and placing geotextile fabric; for all required surface preparation; for all labor, tools, materials and equipment; for repairing torn and damaged geotextile; and when required, for sewing seams and for furnishing and placing all pins or stakes or other hold down devices; and for all other incidentals necessary to complete the work.

The accepted quantities of base course and subbase course of the type specified will be paid for at the respective contract unit price per cubic yard complete in place. Payment for base and subbase courses shall be full compensation for purchasing material, stripping pits, excavating, crushing, screening, hauling, placing, compacting and other necessary processes which are required to furnish acceptable material under this item. Water and/or fines added to material to aid compaction and stabilization to prevent raveling and rutting shall be incidental to the work.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 304
Aggregate Base and Subbase Course

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
304.1	Reinforcement Geotextile	Square Yard
304.2	Aggregate Base Course - Type A	Cubic Yard
304.3	Aggregate Subbase Course - Type D	Cubic Yard

END OF SECTION

**Construction Contract ‘A’
East Campus Infrastructure Improvements**

**Section 401
Hot Mix Asphalt Pavement**

401.1 Description

The Contractor shall furnish a uniformly blended, homogenous mixture placed as one or more courses of Hot Mix Asphalt Pavement (HMA) on an approved base in accordance with the contract documents and in reasonably close conformity with the lines, grades, thickness, and typical cross sections shown on the plans or established by the Engineer. The Engineer will accept this work under Quality Assurance provisions, in accordance with these specifications and the requirements of Section 106 – Quality of the Maine DOT Standard Specifications, the provisions of AASHTO M 323 except where otherwise noted in sections 401 of these specifications and 703 of the Maine DOT Standard Specifications, and Maine DOT Policies and Procedures for HMA Sampling and Testing.

401.2 Materials

Materials shall meet the requirements specified in Section 700 - Materials of the Maine DOT Standard Specifications and contained herein:

Asphalt Cement	702.01
Aggregates for HMA Pavement	703.07
RAP for HMA Pavement	703.08
HMA Mixture Composition	703.09

401.3 Composition of Mixtures

The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 2. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture meeting the grading requirements of the Job Mix Formula (JMF). The Contractor may use a maximum of 20 percent reclaimed asphalt pavement (RAP) in mixtures used on this project.

The Contractor shall submit a Maine DOT approved JMF to the Engineer for approval for each mixture to be supplied. Should the Contractor elect to change the JMF during construction, the Contractor shall submit the new JMF to the Engineer for approval a minimum of 21 calendar days prior to scheduled placement. The JMF shall establish a single percentage of aggregate passing each sieve size within the limits shown in Table 1. The mixture shall be designed and produced, including all production tolerances, to comply with the allowable control points for the particular type of mixture as outlined in Table 1. The JMF shall state the original source, gradation, and percentage to be used of each portion of the aggregate including RAP when utilized, and mineral filler if required. It shall also state the proposed PGAB content, the name and location of the refiner, the supplier, the source of PGAB submitted for approval, and the type of PGAB modification if applicable.

In addition, the Contractor shall provide the following information with the proposed JMF:



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

- Properly completed JMF indicating all mix properties (Gmm, VMA, VFB, etc.)
- Stockpile Gradation Summary
- Design Aggregate Structure Consensus Property Summary
- Design Aggregate Structure Trial Blend Gradation Plots (0.45 power chart)
- Trial Blend Test Results for at least three different asphalt contents
- Design Aggregate Structure for at least three trial blends
- Test results for the selected aggregate blend at a minimum of three binder contents
- Specific Gravity and temperature/viscosity charts for the PGAB to be used
- Recommended mixing and compaction temperatures from the PGAB supplier
- Material Safety Data Sheets (MSDS) For PGAB
- Asphalt Content vs. Air Voids trial blend curve
- Test report for Contractor's Verification sample
- Summary of RAP test results (if used), including count, average and standard deviation of binder content and gradation

TABLE 1: AGGREGATE GRADATION CONTROL POINTS

SIEVE DESIGNATION	Nominal Max. Aggregate Size - Control Points (Percent Passing)			
	TYPE 25.0 mm	TYPE 19.0 mm	TYPE 12.5 mm	TYPE 9.5 mm
	PERCENT BY WEIGHT PASSING - COMBINED AGGREGATE			
37.5 mm	100			
25 mm	90-100	100		
19 mm	-90	90-100	100	
12.5 mm	-	-90	90-100	100
9.5 mm	-	-	-90	90-100
4.75 mm	-	-	-	-90
2.36 mm	19-45	23-49	28-58	32-67
1.18 mm	-	-	-	-
600 µm	-	-	-	-
300 µm	-	-	-	-
75 µm	2.0-6.0	2.0-6.0	2.0-6.0	2.0-7.0*

**For 9.5mm nominal maximum aggregate size mixtures, the maximum design aim for the percent passing the 75 µm sieve is 6.5%.*

At the time of JMF submittal, the Contractor shall identify and make available the stockpiles of all proposed aggregates at the plant site. The Engineer may obtain samples for

**Construction Contract ‘A’
East Campus Infrastructure Improvements**

**Section 401
Hot Mix Asphalt Pavement**

laboratory testing. The Contractor shall also make available to the Engineer the PGAB proposed for use in the mix in sufficient quantity to test the properties of the asphalt and to produce samples for testing of the mixture. Before the start of paving, the Contractor and the Engineer shall split a production sample for evaluation. The Contractor shall test its split of the sample and determine if the results meet the requirements of the Department’s written policy for mix design verification (See MaineDOT Policies and Procedures for HMA Sampling and Testing available at the Central Laboratory in Bangor). If the results are found to be acceptable, the Contractor will forward their results to the Engineer’s Lab, which will test the Engineer’s split of the sample. The results of the two split samples will be compared and shared between the Engineer and the Contractor. If the Engineer finds the mixture acceptable, an approved JMF will be forwarded to the Contractor and paving may commence. The first day’s production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement.

The Contractor shall be allowed to submit aim changes within 24 hours of receipt of the first Acceptance test result. Should all of the Acceptance samples of a Lot be obtained prior to the receipt of the first Acceptance result, the Engineer will not allow the aim changes to be applied to that Lot. Adjustments will be allowed of up to 2% on the percent passing the 2.36 mm sieve through the 0.075 mm and 3% on the percent passing the 4.75 mm or larger sieves. Adjustments will be allowed on the %PGAB of up to 0.2%. Adjustments will be allowed on GMM of up to 0.010.

The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. The cold feed percentage for RAP may be reduced up to 10 percentage points from the amount listed on the JMF and shall not exceed the percentage of RAP approved in the JMF or for the specific application under any circumstances.

TABLE 2: VOLUMETRIC DESIGN CRITERIA

Design ESAL’s (Millions)	Required Density (Percent of G_{mm})			Voids in the Mineral Aggregate (VMA)(Minimum Percent)					Voids Filled with Binder (VFB) (Minimum %)	Fines/Eff. Binder Ratio
				Nominal Maximum Aggregate Size (mm)						
	$N_{initial}$	N_{design}	N_{max}	25	19	12.5	9.5	4.75		
<0.3	≤ 91.5	96.0	≤ 98.0	13.0	14.0	15.0	16.0	16.0	70-80	0.6-1.2
0.3 to <3	≤ 90.5								65-80	
3 to <10	≤ 89.0								65-80*	
10 to <30										
≥ 30										



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

*For 9.5 mm nominal maximum aggregate size mixtures, the maximum VFB is 82.

*For 4.75 mm nominal maximum aggregate size mixtures, the maximum VFB is 84.

401.31 Aggregates

Coarse aggregate and fine aggregate for hot mix asphalt pavements shall be of such gradation that when combined in the proper proportions, including filler, if required, the resultant blend will meet the composition of mixture for the type of pavement specified.

Coarse aggregate, that material retained on the No. 4 sieve, shall be crushed stone or crushed gravel and, unless otherwise stipulated, shall consist of clean, tough, durable fragments free from an excess of soft or disintegrated pieces and free from stone coated with dirt or other objectionable matter. Coarse aggregate, shall not exceed an absorption of 2.0 percent by weight as determined by AASHTO T 85.

Fine aggregate, material that passes the No. 4 sieve, shall consist of natural sand, manufactured sand, or a combination of these. It shall consist of hard, tough grains, free from injurious amounts of clay, loam, or other deleterious substances. Fine aggregate, shall not exceed an absorption of 2.3 percent by weight as determined by AASHTO T 84.

The composite blend, minus any reclaimed asphalt pavement used (RAP), shall have a Micro-Deval value of 18.0 percent or less as determined by AASHTO T 327. In the event the material exceeds the Micro-Deval limit, a Washington Degradation test shall be performed. The material shall be acceptable if it has a value of 30 or more as determined by Washington State DOT Test Method T 113, Method of Test for Determination of Degradation Value (January 2009 version) except that the reported degradation value will be the result of testing a single composite specimen from that portion of the sample that passes the ½ inch sieve and is retained on the No. 10 sieve, minus any reclaimed asphalt pavement used.

Aggregates shall also meet the following consensus properties, except that aggregates extracted from RAP will not be included in the sand equivalent test. The Engineer reserves the right to sample and test the composite aggregate for any of the following properties at any time:

**Construction Contract 'A'
East Campus Infrastructure Improvements**

**Section 401
Hot Mix Asphalt Pavement**

**TABLE 3: AGGREGATE CONSENSUS PROPERTIES CRITERIA
(3 to <10 Million ESAL'S)**

AASHTO T335 Coarse Aggregate Angularity (Minimum)	AASHTO T-304 Method A Uncompacted Void Content of Fine Aggregate (Minimum)	ASTM D 4791 (8.4) Flat and Elongated Particles (Maximum)	AASHTO T176 Clay Content/Sand Equivalent (Minimum)
85/80	45	10	45

ASTM D 5821 - "85/80" denotes that 85% of the coarse aggregate has one fractured face and 80% has two fractured faces.

AASHTO T304 - Criteria are presented as percent air voids in loosely compacted fine aggregate, (U).

ASTM D 4791 - Criteria are presented as maximum percent by weight of flat and elongated particles. (5:1 ratio).

The entire HMA wearing course shall come from the same source of material and the same job mix formula, except when permission is obtained from the Resident to change sources.

401.4 Temperature Requirements

After the JMF is established, the temperatures of the mixture shall conform to the following tolerances:

In the truck at the mixing plant – allowable range 275 to 325°F

At the Paver– allowable range 275 to 325°F

The JMF and the mix subsequently produced shall meet the requirements of Table 3 and Section 703.07 of the Maine DOT Standard Specifications.

401.5 Performance Graded Asphalt Binder

The PGAB shall be PG 64-28. The PGAB shall meet the applicable requirements of AASHTO M320 - Standard Specification for PGAB. Polymer-modified PGAB shall meet the applicable requirements of AASHTO MP 19. The Contractor shall provide the Engineer with an approved copy of the Quality Control Plan for PGAB in accordance with AASHTO R 26 Certifying Suppliers of PGAB.

The Contractor shall request approval from the Engineer for a change in PGAB supplier or



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

source by submitting documentation stating the new supplier or source a minimum of 24 hours prior to the change. In the event that the PGAB supplier or source is changed, the Contractor shall make efforts to minimize the occurrence of PGAB co-mingling.

401.6 Weather and Seasonal Limitations

The State is divided into two paving zones as follows:

- a.Zone 1 Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais.
- b.Zone 2 Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.

The Contractor may place Hot Mix Asphalt Pavement for use other than a traveled way wearing course in either Zone between the dates of April 15th and November 15th, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 40°F or higher.

The Contractor may place Hot Mix Asphalt Pavement as traveled way wearing course in Zone 1 between the dates of May 1st and the Saturday following October 1st and in Zone 2 between the dates of April 15th and the Saturday following October 15th, provided the air temperature determined as above is 50°F or higher. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes. The atmospheric temperature for all courses on bridge decks shall be 50°F or higher.

Hot Mix Asphalt Pavement used for curb, driveways, sidewalks, islands, or other incidentals is not subject to seasonal limitations, except that conditions shall be satisfactory for proper handling and finishing of the mixture. All mixtures used for curb, driveways, sidewalks, islands, or other incidentals shall conform to section 401.4 - Temperature Requirements. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface and the air temperature shall be 40°F or higher.

On all sections of overlay with wearing courses less than 1 in thick, the wearing course for the travelway and adjacent shoulders shall be placed between the dates of May 15th and the Saturday following September 15th.

On all sections of overlay with wearing courses less than 1 inch thick, the wearing course for the travelway and adjacent shoulders shall be placed between the dates of June 1st and the Saturday following September 1st if the work is to be performed, either by contract requirement, or Contractor option, during conditions defined as "night work".

The Engineer may allow paving to occur beyond the dates stated above if the temperature allows, according to the following table:

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

TABLE 4: BASE TEMPERATURE LIMITATIONS

Mat Thickness	Base Temperature (Minimum)	
	Deg. F	Deg. C
3 in. (7.5 cm) or greater	40	4
Greater than 1 in. (2.5 cm) but less than 3 in. (7.5 cm)	45	7
1 in. (2.5 cm) or less	50	10

401.7 Hot Mix Asphalt Plant

401.71 General Requirements HMA plants shall conform to AASHTO M156.

a. Truck Scales When the hot mix asphalt is to be weighed on scales meeting the requirements of Section 108 - Payment (Maine DOT Standard Specifications), the scales shall be inspected and sealed by the State Sealer as often as the Department of Transportation deems necessary to verify their accuracy.

Plant scales shall be checked prior to the start of the paving season, and each time a plant is moved to a new location. Subsequent checks will be made as determined by the Resident. The Contractor will have at least ten 50 pound masses for scale testing.

401.72 Automation of Batching

Batch plants shall be automated for weighing, recycling, and monitoring the system. In the case of a malfunction of the printing system, the requirements of Section 401.74 c. of this specification will apply.

The batch plant shall accurately proportion the various materials in the proper order by weight. The entire batching and mixing cycle shall be continuous and shall not require any manual operations. The batch plant shall use auxiliary interlock circuits to trigger an audible alarm whenever an error exceeding the acceptable tolerance occurs. Along with the alarm, the printer shall print an asterisk on the delivery slip in the same row containing the out-of-tolerance weight. The automatic proportioning system shall be capable of consistently delivering material within the full range of batch sizes. When RAP is being used, the plant must be capable of automatically compensating for the moisture content of the RAP.

All plants shall be equipped with an approved digital recording device. The delivery slip load ticket shall contain information required under Section 108.1.3 - Provisions Relating to Certain Measurements, Mass of Maine DOT Standard Specifications, and paragraphs a, b, and c of Section 401.73



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

401.73 Automatic Ticket Printer System on Automatic HMA Plant

An approved automatic ticket printer system shall be used with all approved automatic HMA plants. The requirements for delivery slips for payment of materials measured by weight, as given in the following Sections of Maine DOT Standard Specifications, shall be waived: 108.1.3 a., 108.1.3 b., 108.1.3 c., and 108.1.3 d. The automatic printed ticket will be considered as the Weight Certificate.

The requirements of Section 108.1.3 f. - Delivery Slips of Maine DOT Standard Specifications, shall be met by the weigh slip or ticket, printed by the automatic system, which accompanies each truckload, except for the following changes:

- a. The quantity information required shall be individual weights of each batch or total net weight of each truckload.
- b. Signatures (legible initials acceptable) of Weighmaster (required only in the event of a malfunction as described in 401.74 c.).
- c. The Maine DOT designation for the JMF.

401.74 Weight Checks on Automatic HMA Plant

At least twice during each 5 days of production either of the following checks will be performed:

- a. A loaded truck may be intercepted and weighed on a platform scale that has been sealed by the State Sealer of Weights and Measures within the past 12 months. The inspector will notify the producer to take corrective action on any discrepancy over 1.0%. The producer may continue to operate for 48 hours under the following conditions.
 1. If the discrepancy does not exceed 1.5%; payment will still be governed by the printed ticket.
 2. If the discrepancy exceeds 1.5%, the plant will be allowed to operate as long as payment is determined by truck platform scale net weight.

If, after 48 hours the discrepancy has not been addressed and reduced below 1.0%, than plant operations will cease. Plant operation may resume after the discrepancy has been brought within 1.0%.

- b. Where platform scales are not readily available, a check will be made to verify the accuracy and sensitivity of each scale within the normal weighing range and to assure that the interlocking devices and automatic printer system are functioning properly.
- c. In the event of a malfunction of the automatic printer system, production may be

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

continued without the use of platform truck scales for a period not to exceed the next two working days, providing total weights of each batch are recorded on weight tickets and certified by a Licensed Public Weighmaster.

401.8 Hauling Equipment

Trucks for hauling Hot Mix Asphalt Pavement shall have tight, clean, and smooth metal dump bodies, which have been thinly coated with a small amount of approved release agent to prevent the mixture from adhering to the bodies. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.

All truck dump bodies shall have a cover of canvas or other water repellent material capable of heat retention, which completely covers the mixture. The cover shall be securely fastened on the truck, unless unloading.

All truck bodies shall have an opening on both sides, which will accommodate a thermometer stem. The opening shall be located near the midpoint of the body, at least 12 inches above the bed.

401.9 Pavers

Pavers shall be self-contained, self-propelled units with an activated screed (heated if necessary) capable of placing courses of Hot Mix Asphalt Pavement in full lane widths specified in the contract on the main line, shoulder, or similar construction.

On projects with no price adjustment for smoothness, pavers shall be of sufficient class and size to place Hot Mix Asphalt Pavement over the full width of the mainline travel way with a 10 ft minimum main screed with activated extensions.

The Contractor shall place Hot Mix Asphalt Pavement on the main line with a paver using an automatic grade and slope controlled screed, unless otherwise authorized by the Engineer. The controls shall automatically adjust the screed and increase or decrease the layer thickness to compensate for irregularities in the preceding course. The controls shall maintain the proper transverse slope and be readily adjustable so that transitions and superelevated curves can be properly paved. The controls shall operate from a fixed or moving reference such as a grade wire or ski type device (floating beam) with a minimum length of 30 ft, a non-contact grade control with a minimum span of 24 ft, except that a 40 ft reference shall be used on Expressway projects.

The Contractor shall operate the paver in such a manner as to produce a visually uniform surface texture and a thickness within the requirements of Section 401.101 - Surface Tolerances. The paver shall have a receiving hopper with sufficient capacity for a uniform spreading operation and a distribution system to place the mixture uniformly, without segregation in front of the screed. The screed assembly shall produce a finished surface of

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screeds shall have auger extensions and tunnel extenders as per the manufacturer's recommendations, a copy of which shall be available if requested.

The Contractor shall have the paver at the project site sufficiently before the start of paving operations to be inspected and approved by the Engineer. The Contractor shall repair or replace any paver found worn or defective, either before or during placement, to the satisfaction of the Engineer. Pavers that produce an unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA.

On a daily basis, the Contractor shall perform density testing across the mat being placed, prior to being compacted by equipment at 12 in intervals. If the density values vary by more than 2.0% from the mean, the Contractor shall make adjustments to the screed until the inconsistencies are remedied.

Failure to replace or repair defective placement equipment may result in a letter of suspension of work and notification of a quality control violation resulting in possible monetary penalties as governed by Section 106 - Quality of Maine DOT Standard Specifications.

401.10 Rollers

Rollers shall be static steel, pneumatic tire, oscillatory, or approved vibrator type. Rollers shall be in good mechanical condition, capable of starting and stopping smoothly, and be free from backlash when reversing direction. Rollers shall be equipped and operated in such a way as to prevent the picking up of hot mixed material by the roller surface. The use of rollers, which result in crushing of the aggregate or in displacement of the HMA will not be permitted. Any Hot Mix Asphalt Pavement that becomes loose, broken, contaminated, shows an excess or deficiency of Performance Graded Asphalt Binder, or is in any other way defective shall be removed and replaced at no additional cost with fresh Hot Mix Asphalt Pavement, which shall be immediately compacted to conform to the adjacent area.

The Contractor shall repair or replace any roller found to be worn or defective, either before or during placement, to the satisfaction of the Engineer. Rollers that produce grooved, unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA. The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided specification densities are attained and with the following requirements:

- a. On variable-depth courses, the first lift of pavement over gravel, reclaimed pavement, on irregular or milled surfaces, or on bridges, at least one roller shall be 16 ton pneumatic-tired. Unless otherwise allowed by the Resident, pneumatic-tired rollers shall be equipped with skirting to minimize the pickup of HMA materials from the paved surface. When required by the Resident, the roller shall be

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

ballasted to 20 ton.

- b. Compaction with a vibratory or steel wheel roller shall precede pneumatic-tired rolling, unless otherwise authorized by the Engineer.
- c. Vibratory rollers shall not be operated in the vibratory mode when checking or cracking of the mat occurs, or on bridge decks.
- d. Any method, which results in cracking or checking of the mat, will be discontinued and corrective action taken.
- e. The use of an oscillating steel roller shall be required to compact all mixtures placed on bridge decks.

The maximum operating speed for a steel wheel or pneumatic roller shall not exceed the manufacturer's recommendations, a copy of which shall be available if requested.

401.101 Surface Tolerances

The Engineer will check surface tolerance utilizing the following methods :

- a.) A 16 ft straightedge or string line placed directly on the surface, parallel to the centerline of pavement.
- b.) A 10 ft straightedge or string line placed directly on the surface, transverse to the centerline of pavement.

The Contractor shall correct variations exceeding $\frac{1}{4}$ in by removing defective work and replacing it with new material as directed by the Engineer. The Contractor shall furnish a 10 foot straightedge for the Engineer's use.

401.11 Preparation of Existing Surface

The Contractor shall thoroughly clean the surface upon which Hot Mix Asphalt Pavement is to be placed of all objectionable material. When the surface of the existing base or pavement is irregular, the Contractor shall bring it to uniform grade and cross section. All surfaces shall have a tack coat applied prior to placing any new HMA course. Tack coat shall conform to the requirements of Section 409 – Bituminous Tack Coat and Section 702 – Bituminous Material of the Maine DOT Standard Specifications, and all applicable sections of the contract.

401.12 Hot Mix Asphalt Documentation

The Contractor and the Engineer shall agree on the amount of Hot Mix Asphalt Pavement that has been placed each day. All delivery slips shall conform to the requirements of 401.73.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

401.13 Preparation of Aggregates

The Contractor shall dry and heat the aggregates for the HMA to the required temperature. The Contractor shall properly adjust flames to avoid physical damage to the aggregate and to avoid depositing soot on the aggregate.

401.14 Mixing

The Contractor shall combine the dried aggregate in the mixer in the amount of each fraction of aggregate required to meet the JMF. The Contractor shall measure the amount of PGAB and introduce it into the mixer in the amount specified by the JMF.

The Contractor shall produce the HMA at the temperature established by the JMF.

The Contractor shall dry the aggregate sufficiently so that the HMA will not flush, foam excessively, or displace excessively under the action of the rollers. The Contractor shall introduce the aggregate into the mixer at a temperature of not more than 25°F above the temperature at which the viscosity of the PGAB being used is 0.150 Pa^os.

The Contractor shall store and introduce into the mixer the Performance Graded Asphalt Binder at a uniformly maintained temperature at which the viscosity of the PGAB is between 0.150 Pa^os and 0.300 Pa^os. The aggregate shall be coated completely and uniformly with a thorough distribution of the PGAB. The Contractor shall determine the wet mixing time for each plant and for each type of aggregate used. The resultant material shall be a uniformly blended, homogenous HMA mixture.

401.15 Spreading and Finishing

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the Contractor shall spread, rake, and lute the HMA with hand tools to provide the required compacted thickness. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.

On roadways with adjoining lanes carrying traffic, the Contractor shall place each course over the full width of the traveled way section being paved that day, unless otherwise noted by the Engineer.

401.16 Compaction

Immediately after the Hot Mix Asphalt Pavement has been spread, struck off, and any surface irregularities adjusted, the Contractor shall thoroughly and uniformly compact the HMA by rolling.

The Contractor shall roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. The Contractor shall prevent adhesion of the HMA to the rollers or vibrating compactors without the use of fuel



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

oil or other petroleum based release agents. Solvents designed to strip asphalt binders from aggregates will not be permitted as release agents on equipment, tools, or pavement surfaces.

The Contractor shall immediately correct any displacement occurring as a result of the reversing of the direction of a roller or from other causes to the satisfaction of the Engineer. Any operation other than placement of variable depth shim course that results in breakdown of the aggregate shall be discontinued. Any new pavement that shows obvious cracking, checking, or displacement shall be removed and replaced for the full lane width as directed by the Resident at no cost to the Owner.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the Contractor shall thoroughly compact the HMA with mechanical vibrating compactors. The Contractor shall only use hand tamping in areas inaccessible to all other compaction equipment. On depressed areas, the Contractor may use a trench roller or cleated compression strips under a roller to transmit compression to the depressed area.

Any HMA that becomes unacceptable due to cooling, cracking, checking, segregation or deformation as a result of an interruption in mix delivery shall be removed and replaced, with material that meets contract specifications at no cost to the Owner.

401.17 Joints

The Contractor shall construct wearing course transverse and longitudinal joints in such a manner that minimum tolerances shown in Section 401.101 - Surface Tolerances are met when measured with a straightedge.

The paver shall maintain a uniform head of HMA during transverse and longitudinal joint construction.

The HMA shall be free of segregation and meet temperature requirements outlined in section 401.4. Transverse joints of the wearing course shall be straight and neatly trimmed. The Contractor may form a vertical face exposing the full depth of the course by inserting a header, by breaking the bond with the underlying course, or by cutting back with hand tools. The Engineer may allow feathered or "lap" joints on lower base courses or when matching existing base type pavements.

Longitudinal joints shall be generally straight to the line of travel, and constructed in a manner that best ensure joint integrity. Methods or activities that prove detrimental to the construction of straight, sound longitudinal joints will be discontinued.

The Contractor shall apply a coating of emulsified asphalt immediately before paving all joints to the vertical face and 3 in of the adjacent portion of any pavement being overlaid except those formed by pavers operating in echelon. The Contractor shall use an approved

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

spray apparatus designed for covering a narrow surface. The Engineer may approve application by a brush for small surfaces, or in the event of a malfunction of the spray apparatus, but for a period of not more than one working day.

Where pavement under this contract joins an existing pavement, or when the Engineer directs, the Contractor shall cut the existing pavement along a smooth line, producing a neat, even, vertical joint. The Engineer will not permit broken or raveled edges. The cost of all work necessary for the preparation of joints is incidental to related contract pay items.

401.18 Quality Control Method A, B & C

The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.6 - Acceptance of the Maine DOT Standard Specifications and this Section. The Contractor shall not begin paving operations until the Engineer approves the QCP in writing.

Prior to placing any mix, the Engineer and the Contractor shall hold a Pre-paving conference to discuss the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, random sampling, project lots and sublots and traffic control. The Engineer's random numbers for Acceptance testing shall be generated and on file with the Resident and the Project Manager. All personnel of the Engineer and the Contractor who have significant information relevant to the paving items shall attend, including the responsible onsite paving supervisor for the Contractor. The Engineer will prepare minutes of the conference and distribute them to all attendees. Any requests to revise the minutes must be made to the Engineer within 7 Days of Receipt. These minutes will constitute the final record of the Pre-paving conference.

The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement including, but not limited to, the following:

- a. JMF(s)
- b. Hot mix asphalt plant details
- c. Stockpile Management (to include provisions for a minimum 2 day stockpile)
- d. Make and type of paver(s)
- e. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers
- f. Name of QCP Administrator, and certification number
- g. Name of Process Control Technician(s) and certification number(s)
- h. Name of Quality Control Technicians(s) and certification number(s)
- i. Mixing & transportation including process for ensuring that truck bodies are clean and free of debris or contamination that could adversely affect the finished pavement

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

- j. Testing Plan
- k. Laydown operations including longitudinal joint construction, procedures for avoiding paving in inclement weather, type of release agent to be used on trucks tools and rollers, compaction of shoulders, tacking of all joints, methods to ensure that segregation is minimized, procedures to determine the maximum rolling and paving speeds based on best engineering practices as well as past experience in achieving the best possible smoothness of the pavement. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.
- l. Examples of Quality Control forms including a daily plant report, daily paving report, and delivery slip template for any plant to be utilized.
- m. Silo management and details (can show storage for use on project of up to 36 hours)
- n. Provisions for varying mix temperature due to extraordinary conditions or production limitations. If a warm-mix technology is utilized, a proposed target production temperature range (not to exceed 50°F) will be provided for each mix design.
- o. Name and responsibilities of the Responsible onsite Paving Supervisor.
- p. Method for calibration/verification of Density Gauge
- q. A note that all testing will be done in accordance with AASHTO and the MaineDOT Policies and Procedures for HMA Sampling and Testing.
- r. A detailed description of RAP processing, stockpiling and introduction into the plant as well as a note detailing conditions under which the percent of RAP will vary from that specified on the JMF.
- s. A detailed procedure outlining when production will be halted due to QC or Acceptance testing results.
- t. A plan to address the change in PGAB source or supplier and the potential co-mingling of differing PGAB's.
- u. A procedure to take immediate possession of acceptance samples once released by the Engineer and deliver said samples to the designated acceptance laboratory.
- v. Provisions for how the QCP will be communicated to the Contractor's field personnel

The QCP shall include the following technicians together with following minimum requirements:

- a. QCP Administrator - A qualified individual shall administer the QCP. The QCP Administrator must be a full-time employee of or a consultant engaged by the Contractor or paving subcontractor. The QCP Administrator shall have full authority to institute any and all actions necessary for the successful operation of the QCP. The QCP Administrator (or its designee in the QCP Administrator's absence) shall be available to communicate with the Department at all times. The QCP Administrator shall be certified as a Quality Assurance Technologist certified by the New England Transportation Technician Certification Program

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

(NETTCP).

- b. Process Control Technician(s) (PCT) shall utilize test results and other quality control practices to assure the quality of aggregates and other mix components and control proportioning to meet the JMF(s). The PCT shall inspect all equipment used in mixing to assure it is operating properly and that mixing conforms to the mix design(s) and other Contract requirements, and that delivery slips and plant recordation accurately reflects the mix being produced with all the required information. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one PCT is required. The Plan shall include the criteria to be utilized by the PCT to correct or reject unsatisfactory materials. The PCT shall be certified as a Plant Technician by the NETTCP.

- c. Quality Control Technician(s) (QCT) shall perform and utilize quality control tests at the job site to assure that delivered materials meet the requirements of the JMF(s). The QCT shall inspect all equipment utilized in transporting, laydown, and compacting to assure it is operating properly and that all laydown and compaction conform to the Contract requirements. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one QCT is required. The QCP shall include the criteria utilized by the QCT to correct or reject unsatisfactory materials. The QCT shall be certified as a Paving Inspector by the NETTCP.

The QCP shall detail the coordination of the activities of the Plan Administrator, the PCT and the QCT. The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

The Contractor shall sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with the following minimum frequencies:

TABLE 5 : MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Temperature of mix	6 per day at street and plant	-
Temperature of mat	4 per day	-
%TMD (Surface)	1 per 125 ton (As noted in QC Plan)	ASTM D2950
%TMD (Base)	1 per 250 ton (As noted in QC Plan)	AASHTO T269
Fines / Effective Binder	1 per 500 ton	AASHTO T 312*
Gradation	1 per 500 ton	AASHTO T30
PGAB content	1 per 500 ton	AASHTO T164 or T308
Voids at N_{design}	1 per 500 ton	AASHTO T 312*
Voids in Mineral Aggregate at N_{design}	1 per 500 ton	AASHTO T 312*
Rice Specific Gravity	1 per 500 ton	AASHTO T209
Coarse Aggregate Angularity	1 per 5000 ton	ASTM D5821
Flat and Elongated Particles	1 Per 5000 ton	ASTM D4791
Fine Aggregate Angularity	1 Per 5000 ton	AASHTO T304

*Method A and B only

The Contractor may utilize innovative equipment or techniques not addressed by the Contract documents to produce or monitor the production of the mix, subject to approval by the Engineer.

The Contractor shall submit all Hot Mix Asphalt Pavement plant test reports, inspection reports and updated pay factors in writing, signed by the appropriate technician and present them to the Engineer by 1:00 P.M. on the next working day, except when otherwise noted in the QCP due to local restrictions. The Contractor shall also retain splits of the previous 5 QC tests, with QC results enclosed for random selection and testing by the Engineer during QA inspections of the HMA production facility. Test results of splits that do not meet the Dispute Resolution Variance Limits in Table 10 shall trigger an investigation by the MaineDOT Independent Assurance Unit, and may result in that lab losing NETTCP certification and the ability to request a dispute [Section 401.223- Process for Dispute Resolution (Methods A , B and C only)].

The Contractor shall make density test results, including randomly sampled densities, available to the Engineer onsite. Summaries of each day's results, including a daily paving report, shall be recorded and signed by the QCT and presented to the Engineer by 1:00 p.m. the next

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

working day.

The Contractor shall have a testing lab at the plant site, equipped with all testing equipment necessary to complete the tests in Table 5. The Contractor shall locate an approved Gyrotory Compactor at the plant testing lab or within 30 minutes of the plant site.

The Contractor shall fill all holes in the pavement resulting from cutting cores by the Contractor or the Engineer with a properly compacted, acceptable mixture no later than the following working day. Before filling, the Contractor shall carefully clean the holes and apply a coating of emulsified asphalt. On surface courses, cores shall not be cut except for Verification of the Nuclear Density Gauge, at a rate not to exceed 3 per day or 2 per 1000 ton placed.

The Contractor shall monitor plant production using running average of three control charts as specified in Section 106 - Quality of the Maine DOT Standard Specifications. Control limits shall be as noted in Table 6 below. The UCL and LCL, shall not exceed the allowable gradation control points for the particular type of mixture as outlined in Table 1 of this specification.

TABLE 6: Control Limits

Property	UCL and LCL
Passing 4.75 mm and larger sieves	Target +/-4.0
Passing 2.36 mm sieve	Target +/-2.5
Passing .075 mm sieve	Target +/-1.2
PGAB Content*	Target +/-0.3
Voids in the Mineral Aggregate	LCL = LSL + 0.2
% Voids at Ndesign	JMF Target +/-1.3

**Based on AASHTO T 308*

The Contractor shall cease paving operations whenever one of the following occurs on a lot in progress:

- a. Method A: The Pay Factor for VMA, Voids @ N_d , Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.85.
- b. Method B: The Pay Factor for VMA, Voids @ N_d , Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.90.
- c. Method C: The Pay Factor for VMA, Voids @ N_d , Percent PGAB, percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, percent passing 0.075 mm sieve or density using all Acceptance or all available Quality Control tests for the current lot is less than 0.85.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

- d. The Coarse Aggregate Angularity or Fine Aggregate Angularity value falls below the requirements of Table 3: Aggregate Consensus Properties Criteria for the design traffic level.
- e. Each of the first 2 control tests for a Method A or B lot fall outside the upper or lower limits for VMA, Voids @ Nd, or Percent PGAB; or under Method C, each of the first 2 control tests for the lot fall outside the upper or lower limits for the nominal maximum, 2.36 mm, 0.300 mm or 0.075 mm sieves, or percent PGAB.
- f. The Flat and Elongated Particles value exceeds 10% by ASTM D4791.
- g. There is any visible damage to the aggregate due to over-densification other than on variable depth shim courses.
- h. The Contractor fails to follow the approved QCP.

The Contractor shall notify the Resident in writing as to the reason for shutdown, as well as the proposed corrective action, by the end of the work day. Failure to do so will be treated as a second incident under 106.4.6 QCP Non-compliance of the Maine DOT Standard Specifications. The Engineer will consider corrective action acceptable if the pay factor for the failing property increases, based on samples already in transit, or a verification sample is tested and the property falls within the specification limits.

In cases where the corrective action can be accomplished immediately, such as batch weight or cold feed changes, the Contractor may elect to resume production once the corrective action is completed. Additional QC testing shall be performed to verify the effectiveness of the corrective action. Subsequent occurrences of shutdown for the same property in a Lot in progress will require paving operations to cease. Paving operations shall not resume until the Contractor and the Engineer determines that material meeting the Contract requirements will be produced. The Engineer may allow the Contractor to resume production based upon a passing QC sample, with a split of the sample being sent to the Engineer for verification testing. If the submitted verification sample test results fall outside the specification limits, the Contractor shall cease production until a verification sample is submitted to the Engineer has been tested by the Engineer and found to be within specification limits.

If the Contractor's control chart shows the process to be out of control (defined as a single point outside of the control limits on the running average of three chart) on any property listed in Table 6 : Control Limits, the Contractor shall notify the Resident in writing of any proposed corrective action by 1:00 PM the next working day.

The Engineer retains the exclusive right, with the exception of the first day's production of a new JMF, to determine whether the resumption of production involves a significant change to the production process. If the Engineer so determines, then the current lot will be terminated, a pay factor established, and a new lot will begin.

**Construction Contract ‘A’
East Campus Infrastructure Improvements**

**Section 401
Hot Mix Asphalt Pavement**

401.19 Quality Control Method D

For Items covered under Method D, the Contractor shall submit a modified QC Plan detailing, how the mix is to be placed, what equipment is to be used, and what HMA plant is to be used. All mix designs (JMF) shall be approved and verified by MaineDOT prior to use. Certified QC personnel shall not be required. The Contractor shall certify the mix and the test results for each item by a Certificate of Compliance.

401.20 Acceptance Method A, B & C

These methods utilize Quality Level Analysis and pay factor specifications.

The Acceptance Testing Method will be determined by the total quantity of material represented by a pay item. Method A will be used if the total quantity represented by a pay item is expected to be 1,000 tons or greater. Method B will be used if the total quantity represented by a pay item is expected to be less than 1,000 tons.

For Hot Mix Asphalt Pavement designated for acceptance under Quality Assurance provisions, the Engineer will sample once per subplot on a statistically random basis, test, and evaluate in accordance with the following Acceptance Criteria:

TABLE 7: ACCEPTANCE CRITERIA

PROPERTIES	POINT OF SAMPLING	TEST METHOD
Gradation	Paver Hopper	AASHTO T30
PGAB Content	Paver Hopper	AASHTO T308
%TMD (Surface)	Mat behind all Rollers	AASHTO T269
%TMD (Base or Binder)	Mat behind all Rollers	AASHTO T269
Air Voids at Nd	Paver Hopper	AASHTO T 312
%VMA at Nd	Paver Hopper	AASHTO T 312
Fines to Effective Binder	Paver Hopper	AASHTO T 312
%VFB	Paver Hopper	AASHTO T 312

In the event the Engineer terminates a Lot prematurely but fails to obtain the required number of acceptance samples to calculate the volumetric property pay factor under the test method specified in the contract, the pay factor shall be calculated using the number of samples actually obtained from the contract. Should the number of acceptance samples taken total less than three, the resulting pay factor shall be 1.0 for volumetric properties. A minimum of three cores will be used for a density pay factor using the contract’s specified Acceptance method, if applicable, for quantities placed to date.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

Should the Contractor request a termination of the Lot in progress prior to three acceptance samples being obtained, and the Engineer agrees to terminate the Lot, then the pay factor for mixture properties shall be 0.80. A minimum of three cores will be used to determine a density pay factor using the contract's specified Acceptance method, if applicable, for quantities placed to date.

Lot Size For purposes of evaluating all acceptance test properties, a lot shall consist of the total quantity represented by each item listed under the lot size heading.

Sublot size Refer to section 401.201, 401.202, and 401.203 for minimum size and number of sublots. The quantity represented by each sample will constitute a sublot.

If there is less than one-half of a sublot remaining at the end, then it shall be combined with the previous sublot. If there is more than one-half sublot remaining at the end, then it shall constitute the last sublot and shall be represented by test results. If it becomes apparent partway through a Lot that, due to an underrun, there will be insufficient mix quantity to obtain the minimum number of sublots needed, the Resident may adjust the size of the remaining sublots and select new sample locations based on the estimated quantity of material remaining in the Lot.

Acceptance Testing The Engineer will obtain samples of Hot Mix Asphalt Pavement in conformance with AASHTO T168 Sampling Bituminous Paving Mixtures, and the MaineDOT Policies and Procedures for HMA Sampling and Testing, which will then be transported by the Contractor to the designated Laboratory within 48 hours (except when otherwise noted in the project specific QCP due to local restrictions), as directed by the Engineer in approved transport containers to be provided by the Engineer, unless otherwise directed by the Engineer. Failure to deliver an acceptance sample to the designated acceptance laboratory will be considered the second incident under 106.4.6-QCP Non- Compliance of the Maine DOT Standard Specifications.

The Engineer will take the sample randomly within each sublot. Target values shall be as specified in the JMF. The Engineer will use Table 8 for calculating pay factors for gradation, PGAB Content, Air Voids at N_{design} , VMA, Fines to Effective Binder and VFB. The Engineer will withhold reporting of the test results for the Acceptance sample until 7:00 AM, on the second working day of receipt of the sample, or after receipt of the Contractors results of the Acceptance sample split. Upon conclusion of each lot, where there is a minimum of four sublots, results shall be examined for statistical outliers, as stated in Section 106.7.2 - Statistical Outliers of Maine DOT Standard Specifications.

Isolated Areas During the course of inspection, should it appear that there is an isolated area that is not representative of the lot based on a lack of observed compactive effort, excessive segregation, a change in process or any other questionable practice, that area may be isolated

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

and tested separately. An area so isolated that has a calculated pay factor below 0.80 for Method A and C or below 0.86 for Method B, based on three random tests shall be removed and replaced at the expense of the Contractor for the full lane width and a length not to be less than 150 ft.

Pavement Density The Engineer will measure pavement density using core samples tested according to AASHTO T-166. The Engineer will randomly determine core locations. The Contractor shall cut 6 inch diameter cores at no additional cost to the Owner by the end of the working day following the day the pavement is placed, and immediately give them to the Engineer. Cores for Acceptance testing shall be cut such that the nearest edge is never within 9 inches of any joint. The cores will be placed in a transport container provided by the Engineer and transported by the Contractor to the designated Lab as directed by the Engineer. Pre-testing of the cores will not be allowed. At the time of sampling, the Contractor and the Engineer shall mutually determine if a core is damaged. If it is determined that the core(s) is damaged, the Contractor shall cut new core(s) at the same offset and within 3 ft of the initial sample. At the time the core is cut, the Contractor and the Engineer will mutually determine if saw cutting of the core is needed, and will mark the core at the point where sawing is needed. The core may be saw cut by the Contractor in the Engineer's presence onsite, or in a Lab by the Engineer, without disturbing the layer being tested to remove lower layers of Hot Mix Asphalt Pavement, gravel, or RAP. No recuts are allowed at a test location after the core has been tested. Upon conclusion of each lot, density results shall be examined for statistical outliers as stated in Section 106.7.2 of the Maine DOT Standard Specifications.

On all sections of overlay with wearing courses designed to be 3/4 in or less in thickness, there shall be no pay adjustment for density otherwise noted in Section 403 - Hot Mix Asphalt Pavement of the Maine DOT Standard Specifications. For overlays designed to be 3/4 in or less in thickness, density shall be obtained by the same rolling train and methods as used on mainline travelway surface courses with a pay adjustments for density, unless otherwise directed by the Engineer.

There shall be no pay adjustment for density on shoulders unless otherwise noted in Section 403 - Hot Mix Asphalt Pavement of the Maine DOT Standard Specifications. Density for shoulders shall be obtained by the same rolling train and methods as used on mainline travelway, unless otherwise directed by the Engineer. Efforts to obtain optimum compaction will not be waived by the Engineer unless it is apparent during construction that local conditions make densification to this point detrimental to the finished pavement surface course.

For 9.5 mm HMA mixtures the following pay adjustment shall also apply:

The average percent passing for the 0.075 mm sieve shall be evaluated for each Lot. If



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

the average is greater than 6.5%, a pay adjustment according to TABLE 7A below shall apply in addition to the other pay adjustments for the given method of testing.

TABLE 7A: 0.075 mm SIEVE PAY ADJUSTMENT

AVERAGE PERCENT PASSING 0.075 MM SIEVE	PAY ADJUSTMENT
6.6% - 7.0%	-5% Pay Adjustment
> 7.0%	-10% Pay Adjustment

The Engineer shall notify the Contractor whenever the average of at least three samples in a given Lot is greater than 6.5%. Disputes on the 0.075 mm sieve values shall not be allowed for Method A or Method B Lots.

401.201 Method A

Lot Size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 tons, with unanticipated over-runs of up to 1500 ton rolled into the last lot. Sublot sizes shall be 750 ton for mixture properties, 500 ton for base or binder densities and 250 ton for surface densities. The minimum number of sublots for mixture properties shall be 4, and the minimum number of sublots for density shall be five.

TABLE 8: METHOD A ACCEPTANCE LIMITS

Property	USL and LSL
Passing 4.75 mm and larger sieves	Target +/-7%
Passing 2.36 mm to 1.18 mm sieves	Target +/-4%
Passing 0.60 mm	Target +/-3%
Passing 0.30 mm to 0.075 mm sieve	Target +/-2%
PGAB Content	Target +/-0.4%
Air Voids	4.0% +/-1.5%
Fines to Effective Binder	0.9 +/-0.3
Voids in the Mineral Aggregate	LSL Only from Table 1
Voids Filled with Binder	Table 1 values plus a 4% production tolerance for USL only
% TMD (In place density)	95.0% +/- 2.5%

401.202 Method B

Lot Size will be the entire production per JMF for the project and shall be divided into 3 equal sublots for Mixture Properties and 3 equal sublots for density.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

TABLE 9: METHOD B ACCEPTANCE LIMITS

Property	USL and LSL
Percent Passing 4.75 mm and larger sieves	Target +/-7
Percent Passing 2.36 mm to 1.18 mm sieves	Target +/-5
Percent Passing 0.60 mm	Target +/-4
Percent Passing 0.30 mm to 0.075 mm sieve	Target +/-3
PGAB Content	Target +/-0.5
Air Voids	4.0% +/-2.0
Fines to Effective Binder	0.9 +/-0.3
Voids in the Mineral Aggregate	LSL from Table 2
Voids Filled with Binder	Table 2 plus a 4% production tolerance for USL.
% TMD (In-place Density)	95.0% +/- 2.5%

401.203 Method C

Lot Size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 tons, with unanticipated over-runs of up to 1500 ton rolled into the last lot. Sublot sizes shall be 750 ton for mixture properties, 500 ton for base or binder densities and 250 ton for surface densities. The minimum number of sublots for mixture properties shall be 4, and the minimum number of sublots for density shall be five.

TABLE 10: METHOD C ACCEPTANCE LIMITS

Property	USL and LSL
Passing 4.75 mm and larger sieves	Target +/-7%
Passing 2.36 mm to 1.18 mm sieves	Target +/-5%
Passing 0.60 mm	Target +/-4%
Passing 0.30 mm to 0.075 mm sieve	Target +/-2%
PGAB Content	Target +/-0.4%
Air Voids	4.0% +/-1.5%
Fines to Effective Binder	0.9 +/-0.3
Voids in the Mineral Aggregate	LSL Only from Table 2
Voids Filled with Binder	Table 2 values plus a 4% production tolerance for USL only
% TMD (In place density)	95.0% +/- 2.5%

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

401.21 Method of Measurement

The Engineer will measure Hot Mix Asphalt Pavement by the ton in accordance with Section 108.1 - Measurement of Quantities for Payment of the Maine DOT Standard Specifications.

401.22 Basis of Payment

The Engineer will pay for the work, in place and accepted, in accordance with the applicable sections of this Section, for each type of HMA specified.

The accepted quantities of hot mix asphalt pavement will be paid for at the contract unit price per ton for the mixtures, including hot mix asphalt material complete in place. Sawcutting of existing pavements to produce clean, vertical edges shall be incidental to the respective HMA pay items. Tack coat between lifts shall be incidental to the respective HMA pay items.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
401.1	Hot Mix Asphalt, 19.0 mm Nominal Max. Size (binder course)	Ton
401.2	Hot Mix Asphalt, 9.5 mm Nominal Max. Size (wearing course)	Ton
401.3	Hot Mix Asphalt, 9.5 mm Nominal Max. Size (sidewalks and islands)	Ton

The Engineer will pay for the work specified in Section 401.11, for the HMA used, except that cleaning objectionable material from the pavement and furnishing and applying bituminous material to joints and contact surfaces is incidental.

Payment for this work under the appropriate pay items shall be full compensation for all labor, equipment, materials, and incidentals necessary to meet all related contract requirements, including design of the JMF, implementation of the QCP, obtaining core samples, transporting cores and samples, filling core holes, applying emulsified asphalt to joints, and providing testing facilities and equipment.

The Engineer will make a pay adjustment for quality as specified below.

401.221 Pay Adjustment

The Engineer will sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with Section 106 - Quality of the Maine DOT Standard Specifications, and Section 401.20 - Acceptance, of this Specification.

401.222 Pay Factor (PF)

The Engineer will use the following criteria for pay adjustment using the pay adjustment



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

factors under Section 106.7 - Quality Level Analysis of the Maine DOT Standard Specifications:

Density If the pay factor for Density falls below 0.80 for Method A or C or 0.86 for Method B, all of the cores will be randomly re-cut by Sublot. A new pay factor will be calculated that combines all initial and retest results. If the resulting pay factor is below 0.80 for Method A or C or below 0.86 for Method B, the entire Lot shall be removed and replaced with material meeting the specifications at no additional cost to the Owner, except that the Engineer may, when it appears that there is a distinct pattern of defective material, isolate any defective material by investigating each mix sample subplot and require removal of defective mix sample sublots only, leaving any acceptable material in place if it is found to be free of defective material. Pay factors equal to or greater than the reject level will be paid accordingly.

Gradation For HMA evaluated under Acceptance Method A or B, the Engineer will determine a composite pay factor (CPF) using applicable price adjustment factors "f" from Table 11: Table of Gradation Composite "f" Factors, and Acceptance limits from Table 8: Method A Acceptance Limits, for Method A or Table 9: Method B Acceptance Limits, for Method B. The Engineer will not make price adjustments for gradation on Methods A and B, but will monitor them as shutdown criteria.

TABLE 11: TABLE OF GRADATION COMPOSITE " f " FACTORS (Methods A and B)

Constituent		"f" Factor			
		19 mm	12.5 mm	9.5 mm	4.75 mm
Gradation	25 mm		-	-	-
	19 mm	4	-	-	-
	12.5 mm		4	4	-
	9.50 mm				4
	2.36 mm	6	6	6	8
	1.18 mm				
	0.60 mm	2	2	2	2
	0.30 mm	2	2	2	2
	0.075 mm	6	6	6	8

For HMA evaluated under Acceptance Method C, the Engineer will determine a pay factor using acceptance limits from Table 10: Method C Acceptance Limits.

VMA, Air Voids, VFB and Fines to Effective Binder The Engineer will determine a pay factor



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

(PF) using the applicable Acceptance Limits.

The following variables will be used for pay adjustment:

PA	= Pay Adjustment
Q	= Quantity represented by PF in ton
P	= Contract price per ton
PF	= Pay Factor

Pay Adjustment Method A

The Engineer will use the following criteria for pay adjustment: density, Performance Graded Asphalt Binder content, voids @N_d, VMA, VFB, F/B_{eff}, and the screen sizes listed in Table 11 for the type of HMA represented in the JMF. If any single pay factor for PGAB Content, VMA, or Air Voids falls below 0.80, then the composite pay factor for PGAB Content, VMA, and Air Voids shall be 0.55.

Density: For mixes having a density requirement, the Engineer will determine a pay factor using Table 8: Method A Acceptance Limits:

$$PA = (\text{density PF} - 1.0)(Q)(P) \times 0.50$$

PGAB Content, VMA and Air Voids: The Engineer will determine a pay adjustment using Table 8: Method A Acceptance Limits as follows:

$$PA = (\text{voids @ } N_d \text{ PF} - 1.0)(Q)(P) \times 0.20 + (\text{VMA @ } N_d \text{ PF} - 1.0)(Q)(P) \times 0.20 + (\text{PGAB PF} - 1.0)(Q)(P) \times 0.10$$

VFB and Fines to Effective Binder The Engineer will determine a pay factor (PF) using Table 8: Method A Acceptance Limits. The Engineer will not make price adjustments for VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Pay Adjustment Method B

The Engineer will use the following criteria for pay adjustment: density, Performance Graded Asphalt Binder content, voids @N_d, VMA, VFB, F/B_{eff}, and the screen sizes listed in Table 11 for the type of HMA represented in the JMF. If any single pay factor for PGAB Content, VMA, or Air Voids falls below 0.86, then the composite pay factor for PGAB Content, VMA, and Air Voids shall be 0.70.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

Density: For mixes having a density requirement, the Engineer will determine a pay factor using Table 9: Method B Acceptance Limits:

$$PA = (\text{density PF} - 1.0)(Q)(P) \times 0.50$$

PGAB Content, VMA and Air Voids: The Engineer will determine a pay adjustment using Table 9: Method B Acceptance Limits as follows:

$$PA = (\text{voids @ } N_d \text{ PF} - 1.0)(Q)(P) \times 0.20 + (\text{VMA @ } N_d \text{ PF} - 1.0)(Q)(P) \times 0.20 + (\text{PGAB PF} - 1.0)(Q)(P) \times 0.10$$

VFB and Fines to Effective Binder The Engineer will determine a pay factor (PF) using Table 9: Method B Acceptance Limits. The Department will not make price adjustments for VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

Pay Adjustment Method C

The Engineer will use density, Performance Graded Asphalt Binder content, and the percent passing the nominal maximum, 2.36 mm, 0.300 mm and 0.075 mm sieves for the type of HMA represented in the JMF. If the PGAB content falls below 0.80, then the PGAB pay factor shall be 0.55.

Density: For mixes having a density requirement, the Engineer will determine a pay factor using Table 10: Method C Acceptance Limits:

$$PA = (\text{density PF} - 1.0)(Q)(P) \times 0.50$$

PGAB Content and Gradation The Engineer will determine a pay factor using Table 10: Method C Acceptance Limits. The Engineer will calculate the price adjustment for Mixture Properties as follows:

$$PA = (\% \text{ Passing Nom. Max PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing } 2.36 \text{ mm PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing } 0.30 \text{ mm PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing } 0.075 \text{ mm PF} - 1.0)(Q)(P) \times 0.10 + (\text{PGAB PF} - 1.0)(Q)(P) \times 0.25$$

VMA, Air Voids, VFB and Fines to Effective Binder The Engineer will determine a pay factor (PF) using Table 10: Method C Acceptance Limits. The Engineer will not make price



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

adjustments for VMA, Air Voids, VFB or Fines to Effective Binder, but will monitor them as shutdown criteria.

401.223 Process for Dispute Resolution (Methods A B & C only)

- a. Dispute Resolution sampling At the time of Hot-Mix Asphalt sampling, the Engineer will obtain a split sample of each Acceptance test random sample for possible dispute resolution testing. The Contractor shall also obtain a split sample of the HMA at this same time. If the Contractor wishes to retain the option of requesting dispute testing of the initial Acceptance sample, the Contractor will test their split of the Acceptance sample and shall report their results to the Resident, with a copy to the QA Engineer by 7:00 AM, on the second working day from time of QA sampling, otherwise dispute resolution will not be initiated. The Engineer dispute resolution split sample will be properly labeled and stored for a period of at least two weeks, or until the sample is tested.
- b. Disputing Acceptance results The Contractor may dispute the Engineer's Acceptance results and request (Methods A, B, & C) that the dispute resolution split sample be tested by notifying the Engineer's Resident and the QA Engineer in writing within two working days after receiving the results of the Acceptance test. The following shall be provided in the request:
- Acceptance sample reference number
 - The specific test result(s) or property(ies) being disputed, and
 - The complete, signed report of the Contractor's testing (In a lab certified by the NETTCP and MaineDOT) of their split of the Acceptance sample indicating that the variances in Table 12: Dispute Resolution Variance Limits, for the specific test result(s) or property(ies) were exceeded.
- c. Disputable Items The Contractor may dispute any or all of the following Method A or B test results when the difference between the Engineer's value and the Contractor's value for that test equals or exceeds the corresponding allowable variation in Table 12: Dispute Resolution Variance Limits, PGAB content, G_{mb} , and G_{mm} . In addition, if the allowable variation for the G_{mb} or G_{mm} is not met or exceeded, the Contractor may dispute either or both of the following material properties provided the difference between results for them equals or exceeds the corresponding allowable variation in Table 12: Voids at N_{design} , and VMA.

For Method C only: The results for PGAB content and the screen sizes used for pay adjustment may be disputed.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 401
Hot Mix Asphalt Pavement

- d. Outcome The value of any disputed result or property reported for the initial Acceptance sample shall stand if the value reported for the dispute resolution sample is not closer to the value the Contractor reported for their split sample than to the value reported for the initial Acceptance sample. If the value reported for the dispute resolution falls precisely half-way between the other two values the value reported for the dispute resolution will replace the original acceptance value. Otherwise, the value reported for the dispute resolution sample will replace the value reported for the initial Acceptance sample, and will be used to re-calculate any other affected results or properties.

TABLE 12: DISPUTE RESOLUTION VARIANCE LIMITS

PGAB Content	+/-0.4%
G_{mb}	+/-0.030
G_{mm}	+/-0.020
Voids @ N_d	+/-0.8%
VMA	+/-0.8%
Passing 4.75 mm and larger sieves	+/- 4.0%
Passing 2.36 mm to 0.60 mm sieves	+/- 3.0%
Passing 0.30 mm to 0.15	+/- 2.0 %
0.075 mm sieve	+/- 1.0%

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

603.1 Description

This work shall consist of constructing pipe culverts, storm drains and french drains, in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established.

This work shall also consist of constructing precast catch basins, field inlets and drain manhole structures at the locations shown on the plans.

603.2 Materials

Materials shall meet the requirements shown on the plans and sections of the Maine DOT Standard Specifications as follows:

- a) Corrugated Polyethylene Pipe - Section 706.06
- b) Flexible Gaskets - Section 705.03
- c) Precast Concrete Units - Section 712.06
- d) Joint Mortar - Section 705.02
- e) Catch Basin and Manhole Steps - Section 712.09
- f) Catch Basin and Manhole Frames, Grates and Covers - Section 712.07

603.3 General

Deflection tests shall be performed by the Contractor when directed by the Engineer if, in the opinion of the Engineer, the installation of the pipe is unsatisfactory. The maximum allowable deflection in smooth lined corrugated polyethylene pipe shall be 5 percent of the sum of the nominal inside diameter minus a 1.5 percent undersize tolerance.

Deflection tests shall not be performed until at least 30 days after completion of installation and compaction of backfill. The pipe shall be cleaned and inspected for offsets and obstructions before testing.

For all pipes 24 inches and smaller, a mandrel shall be pulled through the pipe by hand to ensure the maximum allowable deflections have not been exceeded. The mandrel shall be certified by the Maine Department of Transportation prior to use. If the mandrel fails to pass through the pipe, the pipe will be deemed overdeflected.

Any overdeflected pipe shall be uncovered and if not damaged as determined by the Engineer shall be allowed for reinstallation. Damaged pipe shall not be reinstalled and shall be removed from the work site.

The mandrel shall be a rigid non-adjustable, odd numbered-leg (9 legs minimum) mandrel



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

having an effective length not less than its nominal diameter and having a minimum diameter at any point along the full length as follows:

Nominal Size (Inches)	Minimum Mandrel Diameter (Inches)
12	11.23
15	14.04
18	16.84
24	22.46
30	28.07

When deflection testing reveals over deflected pipe, all costs incurred by the Contractor including mandrel and deflection testing, reinstallation of pipe and delays shall be the responsibility of the Contractor. When deflection testing reveals satisfactory pipe, all costs for deflection testing will be paid for by the Owner.

603.4 Excavation

Trenches and excavations shall be excavated in accordance with the requirements of Section 203 - *Excavation, Embankment and Restoration* and wide enough to allow joining the culvert and compacting the bedding and backfill material under and around the culvert and structure. Unless otherwise designated, trench walls shall be as nearly vertical as possible and the trench width no greater than necessary for installation of the culvert.

603.5 Bedding

Culverts, less than 42 inches in diameter, shall be bedded on a firm foundation of sand of uniform density. After placing the culvert pipe, backfill material shall be placed along the bottom of the trench, thoroughly tamped against the lower portion of the pipe with special care taken not to move the bedded pipe. For culverts 42 inches in diameter and larger, the bottom of the trench shall be compacted to uniform density and shaped to fit a template with reasonable closeness for at least 10 percent of the culvert's total height. On all bedding, when bell and spigot pipe is used, the portion of trench at the joints shall be shaped to fit the bell.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

603.6 Laying Culvert

The Contractor shall not install nor backfill culverts between December 15th and April 1st without written permission. Installing shall begin at the downstream end of the culvert line. Bell or groove ends of rigid culverts shall be placed facing upstream. Elliptically shaped culverts shall be placed with the major axis within 5 degrees of vertical. Elliptically reinforced concrete pipe shall be placed with the vertical axis, indicated by the manufacturer, within 5 degrees of vertical.

603.7 Joining Culverts

The method of joining rigid culvert sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Joints shall be made with rubber ring gaskets, or flexible plastic gaskets. The pipe ends shall be thoroughly cleaned before the joint is made. Joints with rubber ring gasket or flexible plastic gasket shall be made in accordance with the manufacturer's recommended procedures. Flexible culvert section and metal end sections shall be firmly jointed by coupling bands. These bands shall meet the same applicable requirements as the flexible culvert being joined.

603.8 Backfilling Culverts and Stormdrains

After the pipe is installed, it will be inspected before any backfill material is placed. All pipe found to be out of alignment, unduly settled or damaged to the extent that full performance is impaired, shall be taken up and re-laid or replaced. Trenches shall be backfilled as follows.

- a) The backfill material shall be thoroughly rammed under the haunches of the pipe with power or pneumatic operated hand tampers. The remainder of the backfill shall be thoroughly compacted with power tampers or vibratory compactors or other approved equipment or combination of equipment. Backfill shall be placed and compacted in maximum 8 inch lifts to at least 95% of maximum density
- b) When the top of the pipe is exposed above the top of the trench, the embankment material around the pipe shall be placed and compacted on each side of the pipe in the aforementioned manner described for backfilling trenches, for a width of 5 feet measured from the outside diameter of the pipe. Only that portion of the embankment on each side and top of the pipe, for a minimum distance of 15 inches measured from the outside diameter of the pipe, must be of material conforming to the requirements described for backfilling in Section 206.03 of the Maine DOT Standard Specifications. Backfill material beyond these limits may contain stones larger than 3 inches but no greater than the thickness of the layer being placed.
- c) The embankment construction around the pipe shall continue up to an elevation 15 inches above the top of the pipe. Beyond these limits, the embankment shall be placed and compacted in accordance with the embankment construction requirements specified for the work.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

- d) When construction equipment is used or traffic is maintained the Contractor shall provide a minimum cover of 3 feet over all pipes, if possible. Whenever this cover extends above the subgrade the Contractor shall temporarily place earth, which shall be removed when necessary to complete the work in accordance with the plans, or as directed. Any deviation from this practice shall have prior approval.

603.8 Precast Catch Basins

Concrete catch basins and manholes shall be constructed of precast units. Joints for precast concrete units shall be rubber gaskets to form a watertight joint. Catch basins and manholes shall be placed to the required grade on a compacted foundation of uniform density. Inlet and outlet pipe elevations may vary from the elevations shown on the plans depending upon field conditions. Pipe sections entering catch basins shall be firmly connected to the structure wall with no part of the pipe projecting more than 6 inches inside the wall. When a section of culvert is cut, the end shall be finished in a skillful manner. Metal frames and traps, when called for, shall be set in a bed of clay bricks or shale bricks and mortar, or otherwise secured as shown on the plans. Castings shall be set to the correct elevation before the next final course of paving material has been placed. Upon completion, each catch basin and manhole shall be cleaned of all accumulation of silt, debris, or foreign matter and shall be kept clean until final acceptance of the work.

603.9 Altering and Adjusting Catch Basins and Manholes

Existing catch basins and manholes shall be dismantled sufficiently to allow altering or adjusting in accordance with the applicable requirements as shown on the plans for complete catch basins and manholes. When existing frames, covers, and grates are used, they shall be thoroughly cleaned of existing mortar before placing to the new grade.

1. Altering Catch Basin The existing top assembly shall be removed and replaced with a new frame and drain manhole cover set to the required grade using approved high strength structural concrete brick.
2. Adjusting Catch Basins and Manholes The existing top assembly shall be removed, thoroughly cleaned, and reset to the new grade using approved high strength structural concrete brick..

All removed material not reused, including grates, and frames, and curb inlets will be removed from the site and disposed of by the Contractor.

Each catch basin and manhole altered, adjusted, or reconstructed, shall be cleaned of all accumulated silt, debris, and other foreign matter before final acceptance of the work.

603.10 French Drains

Stone shall be placed on compacted subgrade material behind and against the structures with the bottom of the stone at the elevation of the flow line of the weeper drains. The stone shall form a



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

box section, to the dimensions shown on the plans for the entire length of the structure. Erosion control geotextile shall be installed to separate the stone box section from the surrounding gravel. Installation of the erosion control geotextile shall be in accordance with Section 620, Geotextiles.

603.11 Method of Measurement

Culvert and storm drain pipe of the different types and sizes will be measured by the length in linear feet along the invert, laid as directed, complete in place, and accepted. Pipe laid in excess of the authorized length will not be included. When elbows, tees, wyes, or other special fittings are required, each fitting shall be included for payment as 3 additional linear feet of the largest pipeline involved.

French Drains will be measured by the length of linear feet along the invert, laid as directed, complete in place and accepted. When elbows, tees, wyes, or other special fittings are required, each fitting shall be included for payment as 3 additional linear feet of the largest pipeline involved.

Catch basins and drain manholes of the respective types and sizes will be measured by the number of units of each, complete, and accepted in place.

Existing structures to be altered or adjusted will not be measured or paid for under this item, but shall be considered incidental to the Demolition pay item 202.1

603.12 Basis of Payment

The accepted quantities of pipe for culverts and storm drains will be paid for at the contract unit price per linear foot, for the types and sizes specified, complete in place. The price shall be full compensation for excavating and backfilling trenches, laying and joining pipe, and surface restoration with either topsoil or hot mix asphalt pavement. No payment will be made for pipe ordered without written approval of the Resident when such pipe is not required to be installed for completion of the work. Excavation for culverts and storm drains, including excavation below the pipe for bedding and backfilling will be considered incidental, except where rock is encountered, which shall be paid for in accordance with Section 203 of these specifications. Whenever minimum cover material extends above the subgrade, removal of the cover material necessary to complete the work will not be paid for directly but shall be considered part of the work specified herein. Coupling bands and joint material will not be paid for separately but shall be considered included in the unit bid price for the type of pipe being used.

The accepted quantities of French Drain will be paid for at the contract unit price per linear foot, complete in place. The price shall be full compensation for excavating and backfilling trenches, laying and joining pipe, placing stone and geotextile fabric, and all other incidentals necessary to complete the item.

The accepted quantities of catch basins and drain manholes will be paid for at the contract unit price per each of the respective types complete in place. Payment will be full compensation for

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 603
Storm Drains, Catch Basins and Drain Manholes

supplying all equipment and labor to excavate, install materials and structures, backfill, make connections to pipe, and all other incidentals necessary to complete the item. Cleaning of all new catch basin and drain manhole sumps at the end of the project shall be considered incidental to the respective items.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
603.1	6-Inch HDPE Culvert	Linear Foot
603.2	12-Inch HDPE Culvert	Linear Foot
603.3	15-Inch HDPE Culvert	Linear Foot
603.4	18-Inch HDPE Culvert	Linear Foot
603.5	24-Inch HDPE Culvert	Linear Foot
603.6	French Drain with 6-Inch HDPE Perforated Pipe	Linear Foot
603.7	Precast Catch Basin, 4-Foot Diameter	Each
603.8	Precast Drain Manhole, 5-Foot Diameter	Each

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 608
Sidewalks and Ramps

608.1 Description

This work shall consist of furnishing all materials for and constructing sidewalks of Hot Mix Asphalt (HMA) pavement, and curb ramps of Portland Cement Concrete and detectable warning panels with truncated domes, in conformance with this specification and all other applicable Contract Documents.

608.2 Materials, General

All new Portland cement concrete surfaces shall have protective coating applied in accordance with Section 515, Protective Coating for Concrete Surfaces of the Maine DOT Standard Specifications.

608.3 Sidewalk Materials

Materials for sidewalks shall meet the requirements specified as follows:

Portland cement concrete shall be Class A and meet the requirements of Section 502, Structural Concrete of the Maine DOT Standard Specifications, with the following modifications: The permeability requirements and the requirements of Section 703.0201, Alkali Silica Reactive Aggregates, are waived; and use of Ground Granulated Blast Furnace Slag shall not be allowed.

HMA pavement shall meet the requirements of Section 401 of these specifications.

New aggregate required to build new sidewalks shall meet the requirements of Section 203 of these specifications.

Welded Steel Wire Fabric shall meet the requirements of Section 709.02 of the Maine DOT Standard Specifications.

Standard compacting will be required for all sidewalk areas where six inches or more of new or disturbed aggregate is placed. Where less than six inches is placed, compaction will be achieved by use of a plate compactor, hand tamp or other means approved by the Engineer.

608.4 Detectable Warning Materials

Detectable Warning panels shall be made of colorfast and UV stable composite materials, that are wet-set and replaceable. Panels shall be Cast In Place Replaceable Tactile Pavers as manufactured by ADA Solutions Inc. Panels shall be colored Brick Red.

Prior to starting this work, the Contractor shall submit to the Engineer the name of the selected supplier, the manufacturer's literature describing the product, installation procedures, and routine maintenance requirements. Concrete shall meet the requirements of Section 608.3, Sidewalk Materials, of this specification.

608.5 New HMA Sidewalk Construction and Sidewalk Reconstruction

- a) Excavation Excavation shall be to the required depth and width. The foundation shall be shaped and compacted to a firm even surface conforming to the section shown in the Contract Documents. All soft and yielding material shall be removed and replaced with

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 608
Sidewalks and Ramps

acceptable material.

- b) Base Course Base course material shall be placed as shown in the Contract Documents and each layer thoroughly compacted.
- c) Placing HMA Sidewalk Material HMA sidewalk material shall be placed on the compacted base course in two courses to provide the required depth when rolled. Compaction shall be by a power roller having a minimum total weight of 1 ton with a minimum of 65 lb/in of width of the drive roll or by satisfactory power vibratory compaction equipment. In areas inaccessible to other equipment, hand tamping may be permitted by the Engineer. In any case, the HMA sidewalk material shall be uniformly compacted.
- d) **All sidewalks shall be graded to provide at least 1.5% grade in at least one direction. Longitudinal grades shall not exceed 5%; Transverse grades shall not exceed 2%.**

608.6 Sidewalk Regrading

This work shall consist of removing the existing pavement, adding and compacting new base aggregate, as necessary, and regrading the gravel base to conform to the grading limits shown in the Contract Documents. Place a surface of HMA in accordance with section 608.5c above. Shoulders shall be graded and seeded as necessary and shall not exceed 5% for a two foot shoulder on either side.

Unless specifically identified on the drawings as "Sidewalk Regrading," all sidewalk areas shown to be reconstructed shall be constructed in accordance with section 608.5 of this specification.

608.7 Concrete Curb Ramps

New concrete shall be placed and finished for the ramp as shown on the Contract Drawings. Detectable warning panels, where shown on the plans, shall be set into the wet concrete according to the manufacturers recommendations. Panels shall be set square with the curb edge and the base of the truncated domes shall be set flush with adjacent surfaces to allow for proper drainage. Panels shall be secured with heavy duty stainless steel bolts once the concrete has cured.

- a) Excavation Excavation shall be to the depth and width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm even surface conforming to the section shown in the Contract Documents. All soft and yielding material shall be removed and replaced with acceptable material.
- b) Forms Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be true, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.
- c) Placing Concrete The foundation shall be thoroughly moistened immediately prior to

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 608
Sidewalks and Ramps

placing the concrete. The proportioning, mixing and placing of the concrete shall be in accordance with the requirements of Section 502, Structural Concrete of the Maine DOT Standard Specifications.

- d) Finishing The concrete surface shall receive a float finish, in accordance with Section 502, Structural Concrete of the Maine DOT Standard Specifications. Additionally, a light broom finish shall be applied, perpendicular to the sidewalk. No plastering of the mortar will be permitted. All outside edges of the slab and all joints shall be finished with a sidewalk edging tool, two inches in width, with a ¼ inch radius lip.
- e) Joints Joints shall be located as shown in the Contract Documents. Slabs shall be placed alternately and the joints coated with an approved bituminous material before placing the adjacent slab. When a concrete ramp is constructed adjacent to a building, retaining wall, granite curb, or other fixed structure, preformed joint filler, ¼ inch thick, shall be used between the slab and the structure.
- f) Curing Concrete shall be cured for at least 72 hours. Curing shall be by moist burlap or mats, or by application of a curing compound listed on the Maine DOT's Qualified Products List. The curing compound shall be applied continuously by approved mechanical pressure spraying or distributing equipment at a rate necessary to obtain an even, continuous membrane, meeting the manufacturer's recommendations, but at a rate of not less than 1 gallon per 200 ft² of surface; at a minimum, two coats shall be applied using a pressurized sprayer, with the first coat being applied within 15 minutes after finishing is complete and the second coat being applied within 30 minutes of, and at right angles to, the first; handpump sprayers, rollers or brushes shall not be used. During the curing period, all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as may be deemed necessary by the Engineer.

608.8 Method of Measurement

Concrete curb ramps will be measured by the square yard of finished surface, rounded up to the nearest 0.5 square yard.

Regrading sidewalk will be measured by the square yard of finished surface rounded up to the nearest 0.5 square yard.

New HMA pavement sidewalks and full depth sidewalk reconstruction will not be measured or paid for under this section, but shall instead be measured by the respective pay items for Common Excavation, Base Gravels, and HMA Pavement listed in other sections of these specifications.

608.9 Basis of Payment

The accepted quantities of concrete curb ramps will be paid for at the Contract Unit Price per square yard complete and in place. Payment will be for all work, including demolition and excavation of existing ramps, sidewalks or subgrade soils, placement of base gravels, placement and jointing of concrete, steel reinforcement, detectable warning panels (where indicated), and

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 608
Sidewalks and Ramps

protective coatings. Expansion joint material, joint filler, and other related items will not be paid for separately but shall be considered incidental to this pay item. Curbing will be paid for separately under other respective pay items.

Excavation will be paid for under Section 203, Excavation and Embankment. Base and subbase material will be paid for under Section 304, Aggregate Base and Subbase Course. HMA mixture for sidewalks will be paid for under Section 401, Hot Mix Asphalt Pavement.

For regrading sidewalk, payment will be for removing existing pavement, or removing existing concrete pavers and bituminous setting bed, regrading and scarifying existing gravel base, adding new material as necessary to provide a smooth surface, compacting, and placement of a new HMA surface consisting of two equal lifts. Restoration of sidewalk shoulders, including placement of additional topsoil as needed, and applying seed and mulch shall be incidental to this pay item.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
608.1	Concrete Curb Ramps	Square Yard
608.2	Regrading Sidewalks	Square Yard

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 609
Curb

609.1 Description

This section includes the construction or resetting of curb. The types of curb are designated as follows:

Type 1 - Stone curbing of quarried granite stone

Type 2 - Bituminous curbing

609.2 Materials

Except as provided below, the materials used shall meet the requirements of the following Sections of Division 700 - Materials of the Maine DOT Standard Specifications:

Joint Mortar	705.02
Stone Curbing and Edging	712.04
Epoxy Resin	712.35
Bituminous Curbing	712.36

Circular curb, terminal sections and transition sections shall be in reasonably close conformity with the shape and dimensions shown on the plans or included in Maine DOT Standard Details and to the applicable material requirements herein for the type of curb specified.

609.3 Vertical Stone Curb, Terminal Section and Transition Sections

- a) Installation The curb stone shall be set on a concrete foundation so that the front top arris line conforms to the lines and grades required. The foundation shall be prepared by grading the proper elevation, providing temporary supports, placing the curb section, and placing concrete. The required spacing between stones shall be assured by the use of an approved spacing device to provide an open joint between stones of at least $\frac{1}{4}$ inch and no greater than $\frac{5}{8}$ inch.
- b) Backfilling All remaining spaces under the curb shall be filled with approved material and thoroughly hand tamped so the stones will have a firm uniform bearing on the foundation for the entire length and width. Any remaining excavated areas surrounding the curb shall be filled to the required grade with approved materials. This material shall be placed in layers not exceeding 8 inches in depth, loose measure and thoroughly tamped.

When backfill material infiltrates through the joints between the stones, small amounts of joint mortar or other approved material shall be placed in the back portion of the joint to prevent such infiltrating

- c) Protection The curb shall be protected and kept in good condition. All exposed surfaces smeared or discolored shall be cleaned and restored to a satisfactory condition or the curb stone removed and replaced.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 609
Curb

609.4 Bituminous Curb

- a) Preparation of Base Before placing the curb, the foundation course shall be thoroughly cleaned of all foreign and objectionable material. String or chalk lines shall be positioned on the prepared base to provide guide lines. The foundation shall be uniformly painted with tack coat at a rate of 0.04 to 0.14 gal/yd².
- b) Placing The curb shall be placed by an approved power operated extruding type machine using the shape mold called for. A tight bond shall be obtained between the base and the curb. The Resident may permit the placing of curbing by other than mechanical curb placing machines when short sections or sections with short radii are required. The resulting curbing shall conform in all respects to the curbing produced by the machine.
- c) Painting When required, the curb shall be painted and coated with glass beads in accordance with Section 627 - Pavement Marking. Curb designated to be painted shall not be sealed with bituminous sealing compound.
- d) Acceptance Curb may be accepted or rejected based on appearance concerning texture, alignment, or both. All damaged curb shall be removed and replaced at the Contractor's expense.
- e) Fibers Polyester fibers shall be uniformly incorporated into the dry mix at a rate of 0.25 percent of the total batch weight. Certification shall be provided from the supplier with each shipment meeting the following requirements:

Average Length	0.25 inches ± 0.005
Average Diameter	0.0008 inches ± 0.0001
Specific Gravity	1.32-1.40
Melting Temperature	480 °F Minimum

609.5 Resetting Stone Curb

The curb shall be installed, backfilled and protected in accordance with Section 609.3, except as follows:

- a) Removal of Curbing The Contractor shall carefully remove and store curb specified on the plans or designated for salvage or resetting. Curb damaged or destroyed, because of the Contractor's operations or because of their failure to store and protect it in a manner that would prevent its loss or damage, shall be replaced with curbing of equal quality at the Contractor's expense.
- b) Cutting and Fitting Cutting or fitting necessary in order to install the curbing at the locations directed shall be done by the Contractor.
- c) Stockpile When the amount of stone curb removed by the Contractor exceeds what is required to be re-set, the Contractor shall stockpile the remaining stone curb at a location on the campus specified by the Engineer. Curb damaged or destroyed, because of the Contractor's operations or because of their failure to store and protect it in a manner that

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 609
Curb

would prevent its loss or damage, shall be replaced with curbing of equal quality at the Contractor's expense.

609.6 Method of Measurement

Curb, both new and reset, will be measured by the linear foot along the front face of the curb at the elevation of the finished pavement, including terminal, transition and circular sections, complete in place and accepted.

609.7 Basis of Payment

The accepted quantities of curbing will be paid for at the contract unit price per linear foot for each kind and type of curbing as specified. There will be no separate payment for concrete, tack coat, pointing, geotextile fabric, supporting and bedding of curbing, and for cutting and fitting, but these will be considered included in the work of the related curb. Excavation for placement of new or re-set curb, and gravel backfill shall be accomplished in accordance with sections 203 and 304 of these specifications, however no separate payment will be made under those items. All excavation and backfill work shall be included in the unit price for the respective curb pay items.

Backing up bituminous curb is incidental to the curb items.

Removal of existing curb and stockpiling as directed shall be incidental to the respective demolition pay items.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
609.1	Vertical Granite Curb, Type 1	Linear Foot
609.2	Bituminous Curb, Mold 1	Linear Foot
609.3	Re-Set Stone Curb	Linear Foot

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 609
Curb

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 610
Riprap Aprons, Channels and Level Spreaders

610.1 Description

This item shall consist of furnishing required materials and constructing riprap areas for aprons, channels, inlets, outlets, plunge pools, and headwalls in accordance with these specifications at the locations shown in the plans. This item shall also consist of constructing stone bermed level spreaders to distribute stormwater runoff across flat graded turf areas.

This item shall include any excavation, grading, and / or backfill required to construct riprap areas, the placement of specified geotextile fabric linings, and placement of stone riprap and all incidentals necessary to complete the item to the satisfaction of the Engineer.

610.2 Materials

1. Riprap Stone: Riprap stone shall be sound durable rock which is angular in shape and free from overburden, shale, spoil, and organic materials. Round stones, boulders, sandstone, or similar soft stone or relatively thin slabs are not acceptable. The d-50 diameter shall be as indicated on the drawings for culvert inlets and outlets and for drainage channels.
2. Geotextile Fabric for Riprap: The geotextile fabric to be installed under riprap areas as shown on the construction drawings shall be an 8 oz. non-woven needle-punched geotextile fabric, Mirafi 140N as manufactured by TenCate or approved equal. The geotextiles shall be furnished in a protective wrapping which shall protect the fabric from ultraviolet radiation and from abrasion due to shipping and handling. Fabric shall be furnished in rolls with minimum 15 ft. widths.
3. Level Spreader: Materials for construction of the stone bermed level spreader shall be as shown on drawing A-C503.

610.3 Preparation

The Contractor shall excavate or fill as necessary to construct riprap and level spreader areas to meet the slopes, grades and alignments indicated on the construction drawings. Fill and embankment shall meet the requirements of Section 203 of these specifications, although no separate or additional payment shall be made for any excavation or fill materials or labor needed for the construction of riprap areas or level spreaders.

610.4 Subgrade

The subgrade to receive fill shall be rolled smooth and shall not contain holes greater than 3 inches in depth and shall not have any protruding stones which could damage the fabric to be placed over it.

610.5 Geotextile Fabric



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 610
Riprap Aprons, Channels and Level Spreaders

Fabric shall be placed over the prepared subgrade layer immediately after it is completed. Fabric shall be placed starting at the bottom of the apron or plunge pool working up the longitudinal slope. Fabric shall be placed so that the long dimension of the fabric is parallel to the main direction of flow. Fabric shall be lapped a minimum of two (2) feet or as indicated on the plans, with the top layer of all overlaps ending on the downhill side.

Fabric torn during placement shall be patched with overlaps of at least three feet in all directions from the damaged areas. Fabric shall be protected from ultraviolet damage caused by excessive exposure to sunlight while being stored on the jobsite or prior to the placement of stone.

Costs for furnishing and installing geotextile fabric shall be incidental to and included in the cost for the riprap.

610.6 Riprap Stone

Riprap stones shall be placed from the toe of the slope upward with close joints set perpendicular to the slope with large stone at the toe of the slope. Open joints will be chinked in with successively smaller stones until the riprap becomes stable with no movement of stones when the entire layer is walked on.

Stone shall be carefully placed over the completed fabric in such a manner as not to damage stone or fabric. No stone shall be dropped more than one (1) foot onto the fabric. Any damage to fabric which results will require that stone be completely removed to the extent necessary to allow the overlaid fabric to overlap the damaged sections of fabric by a minimum of three (3) foot in all directions. The finished surface shall be uniform in appearance and parallel to and within four (4) inches of line and grade shown on the construction drawings.

610.7 Stone Bermed Level Spreader

The stone bermed level spreader shall be constructed in accordance with the notes included on drawing A-C503.

610.8 Method of Measurement

The quantity of riprap areas shall be the number of square yards of fabric and stone placed in the specified width and thickness at locations indicated on the construction drawings, completed and accepted by the Engineer.

The quantity of stone bermed level spreader shall be measured as a single lump sum item, completed and accepted by the Engineer.

610.9 Basis of Payment

Payment for riprap areas will be made at the contract unit price per square yard of riprap installed in place by the Contractor and accepted by the Engineer. No distinction between the various stone sizes or thicknesses of the riprap layers shall be made for payment purposes. This price shall be full compensation for furnishing all materials and for all preparation, excavation,

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 610
Riprap Aprons, Channels and Level Spreaders

grading, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment for stone bermed level spreaders will be made at the contract unit price per lump sum for the entire level spreader installation, including: excavation, grading and compacting of the area; all piping and structures downstream of and inclusive of Drain Manhole #5; construction of the stone trench, stone berm and check dams; dunnage; pipe straps; field inlet; riprap plunge pool and piping for overflow; buffer signs and posts (4); and all other items shown on drawing A-C503 necessary to install and complete the item unless specifically identified herein to be paid for under other items.

Items that are not included for payment under the lump sum are as follows:

- Drainage structures and piping upstream of Drain Manhole #5;
- Rock excavation
- Erosion control blanket, silt fence and haybales

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
610.1	Riprap	Square Yard
610.2	Stone Bermed Level Spreader	Lump Sum

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 610
Riprap Aprons, Channels and Level Spreaders

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 625
Water Service and Hydrant Assembly

625.1 Description

This work shall consist of installing water pipe, backflow preventers, water meters, enclosures and other appurtenances in reasonably close conformity with the lines and grades shown on the plans or established. The installation shall include the assembly of all components and materials shown on the plans or as directed, and trenching required for the installation of subsurface utilities.

625.2 Materials

1. Copper Tubing: Shall be Type 'K' and shall meet the requirements Section 712.32 of the Maine DOT Standard Specification.
2. Water service valves, boxes, meters and other appurtenances shall be as shown on the drawings and shall meet the requirements of the Greater Augusta Utility District where none is specified.
3. Backflow preventer Enclosure shall be a heated enclosure shall be a Watts Box Model WB-2 or approved equal. The exterior of the box shall be primed and painted dark green.
4. Yard hydrant shall be a Y34 Freezeless Yard Hydrant as manufactured by Woodford or approved equal.
5. Electrical components including conduit and conductors providing power to the backflow preventer enclosure shall be performed in accordance with Sections 260519 and 260533 of these specifications.

625.3 General

This work shall be done with as little interruption of water service as possible. Ample notification shall be given to the users of the water before any disruption of water service.

625.4 Pipe Sleeves

Pipe for sleeves shall be metallic or non-metallic rigid and be laid on a firm foundation at the line and grade designated. When the pipe installation is in a trench all excavating and backfilling shall be in accordance with Section 203.

After installation of the pipe, special care shall be taken to protect the pipe from heavy hauling equipment loads, rocks or any other damage caused by the Contractor's work. All pipe broken from such causes shall be removed and replaced at the Contractor's expense.

Pipe sleeves to be placed in concrete shall be supported during placement of concrete. Special care shall be taken while placing and compacting concrete around the sleeves to prevent voids around the outside of the sleeves. Ends of the sleeves shall be capped with end plates until the water pipes are installed through the sleeves.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 625
Water Service and Hydrant Assembly

625.5 Installing Water Pipe

All connections to existing pipes shall be done in accordance with recognized plumbing practices and in accordance with the requirements of the Greater Augusta Utility District (GAUD). Contractor shall coordinate all tapping of existing water lines and installation of meters with the GAUD. Necessary fittings, adapters, and reducers shall be furnished by the Contractor as required.

625.6 Installing Heated Enclosure

The heated enclosure shall be installed on a new reinforced concrete pad. Provide pipe sleeves and stubs within pad for installation of water pipes and routing of electrical conductors. The enclosure shall be anchored to the pad using anchor clips recommended by the manufacturer. Fixtures, heat trace, and electrical feeds shall be installed as shown on the drawings.

625.7 Method of Measurement

Construction of the yard hydrant assembly and associated water service shall be measured as a single lump sum unit, complete in place.

625.8 Basis of Payment

The accepted quantity of Yard Hydrant Assembly will be paid for at the contract lump sum price, which price shall be full compensation for constructing the yard hydrant, water service line in trench, tapping of existing water main, construction of heated enclosure and concrete pad, furnishing and installation of water meter, backflow preventer and other water line fixtures, constructing electrical homerun between the enclosure and the Campbell Barn, making the required electrical connections within the barn electrical panel, providing heat tracing of new water service tubing to a depth of at least 5 ½' below grade, for all excavation, backfill and site restoration, and all other items shown on the drawings to provide a complete system. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Pipe Bollard protection shall be paid for in accordance with Section 627 of these specifications.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 625
Water Service and Hydrant Assembly

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
625.1	Yard Hydrant Assembly	Lump Sum

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 625
Water Service and Hydrant Assembly

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

627.1 Description

This work shall consist of furnishing and placing reflectorized pavement lines and markings, removing pavement lines and markings, and furnishing and applying reflectorized paint to curbing in reasonably close conformity with the plans and as designated.

This work shall consist of furnishing and placing new parking and traffic signs and posts, and re-setting relocated signs on new and relocated posts in accordance with the latest version of the Manual on Uniform Traffic Control Devices (MUTCD).

This work shall also consist of furnishing and installing pipe bollards and bike racks as shown on the plans.

627.2 Materials

- a) Pavement marking materials shall conform to the requirements specified in the following Sections of Division 700 - Materials of the Maine DOT Standard Specifications:

Pavement Marking Paint	708.03
Reflectorized Plastic Pavement Marking	712.05

- b) New traffic and parking signs shall meet the standards of the latest version of the MUTCD for their intended use. Sign size shall be in accordance with Table 2B-1 of the MUTCD. Signs shall be made of heavy-duty reflective aluminum (63 mil for signs up to 12"x18"; 80 mil for signs over 12"x18"), with 3M Diamond grade reflective performance.
- c) Posts for traffic signs shall be made from the materials shown on the drawings. Fastening hardware shall be stainless steel.
- d) Pipe Bollards shall be made of schedule 40 HD Galvanized pipe with protective cap and sleeve as manufactured by DAWG Inc. or approved equal. Concrete shall meet the requirements of Section 502 of the Maine DOT Standard Specifications.
- e) Bike Racks shall be ribbon style made of galvanized steel to the dimensions shown on the drawings. Bike Racks shall be a Gametime Model 77000 or approved equal.

627.3 General

All pavement lines and markings shall be applied in accordance with the Manual on Uniform Traffic Control Devices. Longitudinal lines placed on tangent roadway segments shall be straight and true. Longitudinal lines placed on curves shall be continuous smoothly curved lines consistent with the roadway alignment. All pavement markings placed shall meet the tolerance limits shown on the plans.

Broken lines shall consist of alternate 10 foot painted line segments and 30 foot gaps.

Temporary pavement marking lines, defined in Special Provision Section 652, Maintenance of Traffic of the Maine DOT Standard Specifications will be applied as many times as necessary to



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

properly delineate traffic lanes and pedestrian routes for the safe passage of traffic and pedestrians.

Newly painted lines, markings and curb shall be protected from traffic by the use of cones, stationary vehicles or other approved methods until the paint is dry.

627.4 Preparation of Surface

Immediately before applying the pavement marking paint to the pavement or curb, the surface shall be dry and entirely free from dirt, grease, oil, or other foreign matter.

Surface preparation for application of plastic markings shall conform to the manufacturer's recommendations.

627.5 Application

Prior to applying paint for final pavement lines, the Contractor shall perform a test for paint thickness by furnishing and placing a piece of smooth, clean metal with an area of at least 144 in² in the path of the striping truck. The striping truck shall be passed over the piece of metal, painting the surface as it passes, without applying beads. The result of this test will be used to determine the pressure setting and speed of the truck when applying paint to obtain the specified thickness. Additional paint thickness testing may be required on the final paint markings. The wet thickness of paint without beads on final pavement lines shall be a minimum of 16 mils.

All final pavement markings including on curb, shall be applied in two uniform covering coats, each at least 10 mils thick. Before the second coat of paint has dried, the glass beads shall be applied by a pressure system that will force the glass beads onto the undried paint as uniformly as possible.

Glass beads shall be applied to the final and temporary pavement lines, marking and curb at the rate of 8 lbs./gal of paint and in sufficient quantity to assure complete and uniform coverage of hand painted surfaces.

Temporary painted lines and markings shall be applied as specified for permanent painted lines, except that it will only require a single application and the thickness shall be a minimum of 16 mils.

Temporary pliant polymer marking material shall be used for temporary markings on the final pavement and on pavements not to be resurfaced when such pavement markings do not conform to the final pavement markings pattern.

The plastic final pavement lines and markings shall be applied in accordance with the manufacturer's recommendations by the inlay method of application.

627.6 Establishment Period

Inlaid plastic pavement lines and marking material furnished and installed under this contract for final pavement markings shall still be subject to a six-month period of establishment.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

The period of establishment shall commence as soon as the plastic pavement lines and markings are complete and in place and shall continue for six months. At the end of the establishment period, a minimum of 95% of the plastic pavement lines and markings shall still be in place to be acceptable.

If less than 95% of the plastic pavement lines and markings are in place after six months, the Contractor shall replace all unsatisfactory plastic pavement lines and markings on the project without additional payment. Plastic pavement lines and markings designated for replacement shall be installed according to these specifications, unless otherwise directed. Plastic pavement lines and markings replaced at the end of the six month establishment period will not be subject to a further establishment period.

627.7 Removing Lines and Markings

When it is necessary to remove pavement lines and markings, it shall be done by high pressure water, sand blasting, solvent or other acceptable means. The method chosen must be capable of completely eradicating the existing line or marking without damage to the pavement. Burning and grinding to remove temporary markings from final pavement or from existing pavement not to be resurfaced will not be permitted.

627.8 Installing Signs on New Posts

Relocated and new signs that are indicated to be installed on new posts shall be installed as follows:

- Where U-Channel posts are indicated, the post and fastening hardware as described in this specification and shown on the drawings shall be supplied. Construct a weed barrier receiving sleeve as shown on the drawings and install the post into the ground to the minimum depth specified. Existing sign posts and fastening hardware shall be disposed of in accordance with the demolition specification.
- Where Bollard posts are indicated, the bollard, post and hardware as described in this specification and shown on the drawings shall be supplied. The bollard shall be filled with concrete after placement of the steel sign post, and the concrete crowned and smoothed. Pipe and concrete crown shall be primed and painted safety yellow.

Relocated signs that are indicated to be installed on relocated posts shall be installed as directed by the Engineer in a manner to replicate the existing installation. This method is intended primarily for existing signs that include wooden or steel posts other than U-channel posts, or signs with multiple legs.

627.9 Installing Bike Racks

Bike racks shall be installed on a new reinforced concrete slab as shown on the drawings. The Contractor shall follow the installation instructions and recommendations of the rack manufacturer.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

627.10 Method of Measurement

The quantity of permanent pavement marking lines measured for payment will be the number of square feet of paint applied to the pavement surface, based on the nominal dimensions shown on the drawings.

The quantity of striped islands measured for payment will be the number of square yards of islands that are striped, including the outside boundary and non-painted spacing within the islands.

The quantity of marking symbols and words for payment will be the number of square feet of paint applied to the pavement surface.

The quantity of temporary pavement marking lines measured for payment will be the number of square feet of paint applied to the pavement surface, based on the nominal dimensions shown on the drawings.

Reflectorized curb will be measured by the linear foot of curb actually painted and reflectorized.

Pavement marking removal will not be measured for payment under this item, but shall be considered incidental to the demolition pay item.

Traffic and Parking signs shall be measured by the unit of each sign installed as a complete item.

Bike Racks shall be measured by the unit of each rack installed as a complete item.

Pipe Bollards shall be measured by the unit of each bollard installed as a complete item.

627.11 Basis of Payment

The accepted quantity of temporary and permanent pavement markings will be paid for at the contract unit price as measured. Payment will include layout, placement, application of glass beads, site clean-up, and all other tools and items necessary to complete the item. No adjustment will be made to the quantity for payment for areas that are painted outside the limits shown on the drawings or otherwise directed by the Engineer. No payment shall be made for overspray, spills or other errors by the Contractor.

Payment for final plastic pavement lines and markings will be made in two parts. The first payment of 75% will be made when plastic pavement lines and markings are placed. The payment of the remaining 25% will be made at the end of the establishment period for all plastic line and pavement markings accepted.

The accepted quantity of new traffic or parking signs will be paid for at the contract unit price per each, which shall be full compensation for furnishing and installing the sign, mounting post, mounting hardware, concrete base, weed barrier receiving sleeve, and for all other tools and items necessary to complete the item.

The accepted quantity of relocated traffic or parking signs on new post will be paid for at the contract unit price per each, which shall be full compensation for installing the existing sign on a

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

new mounting post, with new mounting hardware, and new weed barrier receiving sleeve, and for all other tools and items necessary to complete the item.

The accepted quantity of relocated guidance signs on relocated posts will be paid for at the contract unit price per each, which shall be full compensation for installing the existing sign on relocated mounting posts, with new mounting hardware, and for all other tools and items necessary to complete the item.

The accepted quantity of bike racks will be paid for at the contract unit price per each, which shall be full compensation for constructing concrete pads and foundations, furnishing and installing the rack, mounting hardware, excavation and backfill beneath the pad and for all other tools and items necessary to complete the item.

The accepted quantity of pipe bollards of the size indicated on the drawings will be paid for at the contract unit price per each, which shall be full compensation for all excavation, concrete foundation construction, furnishing and installing the galvanized steel pipe, protective sleeves, site restoration, and for all other tools and items necessary to complete the item.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
627.1	Permanent Pavement Marking Lines	Square Foot
627.2	Striped Islands	Square Yard
627.3	Pavement Symbols and Words	Square Foot
627.4	Reflectorized Curb Marking	Linear Foot
627.5	Temporary Pavement Markings	Square Foot
627.6	Pavement Marking Removal	Square Foot
627.7	New Traffic Sign and Post, U-Channel	Each
627.8	New Traffic Sign and Post, Barrier Free	Each
627.9	Relocate Existing Traffic Sign on New Post	Each
627.10	Relocate Existing Guidance Sign on Relocated Posts	Each
627.11	Bike Rack, Installed on Concrete Pad	Each
627.12	Pipe Bollard, 6-Inch Diameter	Each

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 627
Pavement Markings, Signs and Bike Racks

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 642
Reinforced Concrete Steps

642.1 Description

This work shall consist of the construction of wooden steps, precast concrete steps or cast-in-place concrete steps in accordance with these specifications and in reasonably close conformity with dimensions and designs shown on the plans.

642.2 Materials, General

Materials for the steps shall meet the requirements as specified in the following Sections of Division 700 - Materials of the Maine DOT Standard Specifications:

- Exterior Ready Mixed Paint 708.01
- Timber Preservative 708.05
- Precast Concrete Units 712.06

Precast concrete steps shall conform to the specifications of precast units except as modified herein and shall be of the dimensions detailed on the plans or as otherwise approved. Exposed surfaces shall have a rubbed finish as specified in Section 502.14-d-2 of the Maine DOT Standard Specifications.

Cast-in-place concrete steps, shall conform to the requirements of Section 502 - Structural Concrete of the Maine DOT Standard Specifications, Class A.

Railings and hardware shall be as shown on the drawings.

642.3 Precast Concrete Steps

Precast concrete steps shall be placed on a compacted gravel bed with horizontal joints level and vertical joints plumb. The foundation shall be prepared in advance of setting the steps by grading and compacting the aggregate subbase to the proper elevation. The steps shall be set with a uniform tread width to match the finish grade of the slope. All remaining excavated areas surrounding the steps shall be filled to the required grade with approved materials and thoroughly tamped.

642.4 Cast-In Place Concrete Steps

Cast-in-place concrete steps shall conform to the applicable requirements of Section 502 - Structural Concrete of the Maine DOT Standard Specifications.

642.5 Method of Measurement

Concrete steps, whether precast or cast-in-place will be measured by each unit, complete and in place.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 642
Reinforced Concrete Steps

642.6 Basis of Payment

The accepted quantities of concrete steps will be paid for at the contract unit price for each, complete in place, which price shall be full compensation for furnishing and placing all materials including reinforcing steel and railings, for all excavation and backfill, placement of aggregate base, and all other incidentals necessary to complete the item.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
642.1	5-Step Concrete Unit	Each
642.2	6-Step Concrete Unit	Each

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

656.1 Description

This item shall consist of temporary control measures as shown on the plans, in accordance with section 656 of the Maine DOT Standard Specifications, and as ordered by the Engineer during the life of the contract to control water pollution, soil erosion, and siltation through the use of barriers, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites. Off-site controls are the responsibility of the Contractor and shall not be measured or paid for under these items, but shall be considered incidental to the project as a whole.

A Storm Water Pollution Prevention Plan (SWPPP) prepared by the Engineer for the project is hereby made a component of this specification (refer to the Erosion and Sediment Control Plan included in the project drawings). The Contractor shall make all inspections and perform all maintenance as stipulated in the SWPPP. No separate payment will be made for implementing the SWPPP or conducting the required inspections, as these tasks will be incidental to the various erosion and sedimentation control measures included below.

If the Work includes the handling, use, or storage of petroleum products or hazardous Matter/Substances including the onsite fueling of Equipment, the Contractor shall prepare and submit a Spill Prevention Control and Countermeasure Plan (SPCCP) to the Engineer for review. At a minimum, the SPCCP must comply with the requirements of section 656.3.4f of the Maine DOT Standard Specifications.

Reference is hereby made to the environmental permits obtained for the project (refer to the appendix of these specifications). All conditions and requirements of said permit shall be binding on the Contractor for the duration of the project.

656.2 Materials

- a) Temporary Grass: Grass that will not compete with the grasses sown later for permanent cover shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover.
- b) Mulches: Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials.
- c) Inlet Sediment Filters: Inlet sediment filters shall be installed at all catch basin inlets



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

within the project vicinity while ground remains un-stabilized, and shall be of the type shown on the plans.

- d) Siltation Fence: The siltation fence shall consist of a woven, polypropylene geotextile fabric that is inert to biological degradation and naturally encountered chemicals, alkalis, and acids.
- e) Hay Bales: The hay bales shall be composed of hay, straw, or other suitable material reasonably clean and free of noxious weeds and deleterious materials.
- f) Wood Stakes: Wood stakes shall have minimum size of 2 inch by 2 inch and minimum length of 3 feet unless otherwise shown or approved.
- g) Erosion Control Blanket: Erosion control blanket shall be composed of a straw fiber matrix sewn between two photo-degradable nets, such as S150 Erosion Control Blanket manufactured by North American Green or approved equal. Erosion control blanket shall be installed at specific locations as shown on the drawings, as requested by the Engineer and/or shall be held in reserve for use in a contingency.
- h) Winter Mulch: Winter mulch shall consist of hay or straw applied to a depth of 4 inches at the rate of 150-200 pounds per 1,000 square feet. Winter mulch shall be applied over disturbed areas that cannot otherwise be stabilized during the winter period.
- i) Other All other materials, including washed crushed stone for stabilized construction exits, geotextile fabric, and pressure-treated lumber, shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

656.3 Construction Requirements

- a) General In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The Engineer shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

- b) Schedule Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the Engineer.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

- c) Authority of the Engineer The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, to limit the surface area of erodible earth material exposed by excavation, borrow and fill operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment.

Representatives of the Department of Environmental Protection shall be given the opportunity to inspect any area of the jobsite at any time during the course of construction and shall have the authority to specify or alter, through the Engineer, the exact location and quantities for erosion control items on the project.

- d) Construction Details The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion is likely to be a problem, clearing and grubbing operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, temporary erosion control measures may be required between successive construction stages.

The Engineer will limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or are ordered by the Engineer, such work shall be performed by the Contractor at his/her own expense.

The Engineer may increase or decrease the area of erodible earth material to be exposed at one time as determined by analysis of project conditions.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

The erosion control features installed by the Contractor shall be acceptably maintained by the Contractor during the construction period.

Whenever construction equipment must cross watercourses at frequent intervals, and such crossings will adversely affect the sediment levels, temporary structures should be provided.

Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto.

656.4 Method of Measurement

Temporary erosion and pollution control work required which is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls will be performed as scheduled or ordered by the Engineer.

Completed and accepted work will be measured as follows:

- a) Temporary seeding and mulching shall be measured per unit of 1,000 square feet (MSF) along the slope of the ground.
- b) Winter mulching of hay to a depth of 4 inches shall be measured per unit of 1,000 square feet (MSF) along the slope of the ground.
- c) Inlet sediment filters will be measured per each in place and complete, and shall include on-going maintenance, sediment removal, or replacement as needed.
- d) Silt fence barrier shall be measured by the linear foot of barrier specified, complete and in place, including hay bales, maintained throughout the life of construction, and removed following the establishment of vegetation or other stabilization methods. Removal shall include restoration of trench by smoothing, seeding and mulching. Silt fence required around construction staging areas shall not be measured for payment, but shall be considered incidental to this item.
- e) Hay bales used for erosion control dikes and check dams shall be measured by the unit of each bale, including wooden stakes, in place, complete, maintained throughout the life of construction, and removed following the establishment of vegetation.
- f) Erosion control blanket shall be measured by the unit of square yard, in place, complete, and maintained throughout the life of construction.
- g) Stabilized construction exits shall be measured per each in place, complete, maintained throughout the life of construction, and removed at the end of the project. Incidental to the item shall be any required culverts, riprap, and site restoration needed after removal.
- h) Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material staging and

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor with costs included in the contract prices bid for the items to which they apply.

656.5 Basis of Payment

Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the Engineer and measured as provided in paragraph 656-4 will be paid for under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
656.1	Temporary Seed and Mulch	MSF
656.2	Winter Mulch	MSF
656.3	Inlet Sediment Filter	Each
656.4	Silt Fence Barrier	Linear Foot
656.5	Hay Bales	Each
656.6	Erosion Control Blanket	Square Yard
656.7	Stabilized Construction Exit	Each

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 656
Temporary Soil Erosion and Water Pollution Control

Failure by the Contractor to follow this Specification, Section 656 of the Maine DOT Standard Specifications, and/or the SWPPP prepared by the Engineer will result in a violation letter and a reduction in total payment as shown in the schedule below. The Engineer or any other representative of the Owner reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Owner / Engineer shall not be held responsible for any delay in the work due to any suspension under this item.

Original Contract Amount		Amount of Penalty Damages per Violation			
From More Than	Up to and Including		1 st	2 nd	3 rd & Subsequent
\$0	\$1,000,000		\$250	\$500	\$1,250
\$1,000,000	\$2,000,000		\$500	\$1,000	\$2,500
\$2,000,000	\$4,000,000		\$1,000	\$2,000	\$5,000
\$4,000,000	And more		\$2,000	\$4,000	\$10,000

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 659
Mobilization

659.1 Description

When this item is listed as a Pay Item in the Bid, it shall consist of preparatory work and operations including, but not limited to those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.

This item shall also consist of work required by the Contractor that is temporary in nature for the safe and orderly prosecution of construction, that is not otherwise included in other pay items. This includes temporary fencing and pavement markings, traffic control, temporary barricades and lights, and temporary construction signage and flag persons.

659.2 Basis of Payment

Mobilization will be paid for at the contract lump sum price. Partial payments for mobilization will be made with the first and last partial pay estimates paid on the contract, and will be made at the rate of 75% of the lump sum price on the first partial pay estimate, and the remaining 25% on the final partial pay estimate, provided the amount bid for mobilization does not exceed 2 percent of the total amount bid for the contract. Where the amount bid for the item of mobilization exceeds 2 percent of the total amount bid for the contract, 1 percent of the total amount bid will be paid on each of the first two partial pay estimates, and that portion exceeding 2 percent will be paid on the final pay estimate.

Such price and payment includes but is not limited to the movement of personnel, equipment, supplies, and incidentals to the project site, for the establishment of contractor offices, buildings, construction signage, temporary fencing and markings, and other facilities necessary for work on the project, the removal and disbandment of those personnel, equipment, supplies, incidentals, or other facilities that were established for the prosecution of work on the project; and for all other work and operations that shall be performed for costs incurred prior to beginning work on the various items on the project site.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
659.1	Mobilization	Lump Sum

END OF SECTION



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 659
Mobilization

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

260519.1 General

1.1. Section Includes

- 1.1.1. Building wire and cable.
- 1.1.2. Wiring connectors and connections.

1.2. Related Sections

- 1.2.1. Section 260570 - Electrical General Requirements.
- 1.2.2. Section 260533 - Conduit.
- 1.2.3. Section 260553 - Electrical Identification.

1.3. References

ANSI/NFPA 70 - National Electrical Code.

1.4. Submittals

- 1.4.1. Submit under provisions of Section 260570 - Electrical General Requirements.
- 1.4.2. Product Data: Provide for each cable assembly type
- 1.4.3. Test Reports: Indicate procedures and values obtained.
- 1.4.4. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.5. Qualifications

Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.6. Regulatory Requirements

Conform to requirements of UL.

1.7. Project Conditions

- 1.7.1. Verify that field measurements are as shown on Drawings.
- 1.7.2. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions.
- 1.7.3. Where wire and cable routing is not shown, and designation only is indicated, determine exact routing and lengths required.

1.8. Coordination

- 1.8.1. Coordinate work under provisions of Section 260570 - Electrical General Requirements.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

- 1.8.2. Determine required separation between cable and other work.
- 1.8.3. Determine cable routing to avoid interference with other work.

260519.2 Products

2.1. Manufacturers – Building Wire and Cable

- 2.1.1. American Insulated Wire Corp.
- 2.1.2. Carol Cable
- 2.1.3. The Okonite Co.
- 2.1.4. Paronite Essex Group
- 2.1.5. Pirelli

2.2. Building Wire and Cable

- 2.2.1. Description: Single conductor insulated wire.
- 2.2.2. Conductor: Copper.
- 2.2.3. Insulation Voltage Rating: 600 volts.
- 2.2.4. Insulation Type THWN/XHHW.
- 2.2.5. Insulation Color: Color of all service, feeder, branch, motor control, and signaling circuit conductors shall be green for grounding conductors, and white for neutrals (except where neutrals of more than one system are installed in same raceway or box, the other neutral shall be white with a colored (not green) stripe). The color of the ungrounded conductors in different voltage systems shall be as follows:
 - 2.2.5.1. 120/208 volt, 3-phase:
Phase A - black, Phase B - red, Phase C – blue.
 - 2.2.5.2. 277/480 volt, 3-phase:
Phase A - brown, Phase B - orange, Phase C – yellow
 - 2.2.5.3. 120/240 volt, single phase:
Phase A - black, Phase B – black.
 - 2.2.5.4. On a 3-phase, 4-wire delta system, the high leg shall be orange as required by NFPA 70.

2.3. Wiring Connectors

- 2.3.1. Insulated Terminal Blocks – 3 or 4 conductor in line #2 AWG TO 250 KCMIL
 - 2.3.1.1. IlSCO
 - 2.3.1.2. Burndy
 - 2.3.1.3. NSI



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

- 2.3.1.4. Substitutions: Under provisions of Section 260570 – General Electrical Requirements.
- 2.3.2. Spring Wire Connectors #18 AWG - # 6 AWG
 - 2.3.2.1. Ideal Model
 - 2.3.2.2. Buchannan
 - 2.3.2.3. Scotch-lok
 - 2.3.2.4. Water-proof in outdoor enclosures and hand holes
 - 2.3.2.5. Substitutions: Under 260570 - Electrical General Requirements

260519.3 Execution

3.1. Examination

- 3.1.1. Verify that interior of building has been protected from weather.
- 3.1.2. Verify that mechanical work likely to damage wire and cable has been completed.

3.2. Preparation

Completely and thoroughly swab raceway before installing wire.

3.3. Wiring Methods

All locations: Use only building wire Type THWN/XHHW insulation, in raceway.

3.4. Installation

- 3.4.1. Install products in accordance with manufacturer's instructions.
- 3.4.2. Use solid conductor for feeders and branch circuits 12 AWG and smaller.
- 3.4.3. Use stranded conductors for control circuits.
- 3.4.4. Use conductor not smaller than 12 AWG for power and lighting circuits.
- 3.4.5. Use conductor not smaller than 16AWG for control circuits.
- 3.4.6. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet or as specified.
- 3.4.7. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet or as specified.
- 3.4.8. Pull all conductors into raceway at same time.
- 3.4.9. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- 3.4.10. Protect exposed cable from damage.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

- 3.4.11. Support cables above accessible ceiling if applicable, using spring metal clips or plastic cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels. Alternatively use uni-strut and metal clips above suspended ceilings.
- 3.4.12. Use suitable cable fittings and connectors.
- 3.4.13. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- 3.4.14. Clean conductor surfaces before installing lugs and connectors.
- 3.4.15. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

3.5. Interface with Other Products

- 3.5.1. Identify wire and cable Section 260553 - Electrical Identification.
- 3.5.2. Identify each conductor with its circuit number, control wiring id or other designation indicated on Drawings.

3.6. Field Quality Control

- 3.6.1. Perform field inspection and testing under provisions of Section 260570 - Electrical General Requirements.
- 3.6.2. Inspect wire and cable for physical damage and proper connection.
- 3.6.3. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- 3.6.4. Verify continuity of each branch circuit conductor.

3.7. Method of Measurement

Cable in conduit shall be measured by the number of linear feet of cable wire installed in duct bank, or conduit, including trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable installed in duct bank or conduit.

Cable slack is considered incidental to this item and is included in the contractor's unit price. No separate measurement or payment will be made for cable slack.

3.8. Basis of Payment

Payment will be made at the contract unit price per linear foot of cable, including equipment grounds, installed in conduit in place by the Contractor and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, testing, and installation of these materials, and for all labor, equipment, tools, and incidentals, including splicing into existing circuits, ground rods and ground connectors, necessary to complete these items:

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

Payment will be made under:

- 260519.1 No. 10 AWG THWN CU – per linear foot
- 260519.2 No. 10 AWG THWN CU Green Equipment Ground – per linear foot
- 260519.3 No. 8 AWG THWN CU – per linear foot
- 260519.4 No. 8 AWG THWN CU Green Equipment Ground – per linear foot
- 260519.5 No. 6 AWG THWN CU – per linear foot
- 260519.6 No. 6 AWG THWN CU Green Equipment Ground – per linear foot
- 260519.7 No. 4 AWG THWN CU – per linear foot
- 260519.8 No. 4 AWG THWN CU – Green Equipment Ground per linear foot

3.9. Material Requirements

FED SPEC J C 30	Cable and Wire, Electrical Power, Fixed Installation (cancelled; replaced by A-A-59544 Cable and Wire, Electrical (Power, Fixed Installation
FED SPEC A-A-55809	Insulation Tape, Electrical, Pressure Sensitive Adhesive, Plastic
ASTM D 4388	Rubber tapes, Nonmetallic Semiconducting and Electrically Insulating

3.10. Reference Documents

NFPA No. 70	National Electrical Code (NEC)
MIL-S-23586C	Sealing Compound, Electrical, Silicone Rubber Building Industry Consulting Service International (BICSI)

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260519
Building Wire and Cable

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260526
Secondary Grounding

260526.1 General

1.1. Work Includes

- 1.1.1. Power system grounding.
- 1.1.2. Electrical equipment and raceway grounding and bonding.
- 1.1.3. Connections for Surge Suppression Devices.

1.2. Related Sections

- 1.2.1. Section 260570 - General Electrical Requirements.

1.3. System Description

- 1.3.1. Ground the electrical service system ground at service entrance equipment to building steel and grounding electrodes as shown on drawings.
- 1.3.2. Bond together service entrance ground, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables. **Avoid creation of parallel paths with neutral conductor at service entrance.**

260526.2 Products

2.1. Materials

- 2.1.1. Ground Rods where specified: Copper-encased steel, 5/8 inch diameter, minimum length 10 feet.
- 2.1.2. Mechanical Connectors: Bronze "acorn" style clamps, above grade, exothermic weld kits, pipe clamp connectors, or tin plated copper lugs.
- 2.1.3. Grounding Bushings: Cast type with set screw and grounding lug. OZ Gedney or approved equal.
- 2.1.4. Corrosion resistant coatings: 3M Scotch-Kote or approved equal.

260526.3 Execution

3.1. Examination

Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2. Installation

- 3.2.1. Install products in accordance with manufacturers' instructions and comply with NFPA 70, Article 250.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260526
Secondary Grounding

- 3.2.2. Provide a separate, insulated equipment grounding conductor in all feeder and branch circuit raceways unless noted otherwise. Terminate each end on a grounding lug, bus, or bushing. Bond multiple runs of metal conduit entering slabs together, and connect to ground bus or terminal.
- 3.2.3. Connect grounding electrode conductors to building steel using a suitable ground clamp or exothermic weld.
- 3.2.4. Supplementary Grounding Electrodes: Use driven ground rod at main service equipment area and transformer located as indicated on drawings. Use effectively grounded metal frame of the building. Multiple ground rods shall be spaced apart at the length of the ground rods.
- 3.2.5. Use bare stranded copper wire sized as indicated on drawings.
- 3.2.6. Install grounding bushings on all conduits 1 1/2" and larger at entrance to pull boxes, rising up in slabs and at panelboards and switchgear. Provide equipment grounding and grounding electrode conductors in accordance NFPA 70, Article 250.
- 3.2.7. Install corrosion resistant coating on above ground fittings that are not exothermic. 3M ScotchKote or equal.

3.3. Field Quality Control

- 3.3.1. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- 3.3.2. GROUND RESISTANCE TEST REPORT
 - 3.3.2.1. Use IEEE 81-1983 for industry standard three point or fall of potential test
 - 3.3.2.2. No current shall be flowing on the ground
 - 3.3.2.3. The furthest test probe (C2) must go out at least 3-5 times the size of the system or a minimum of 100' in at least two directions.
 - 3.3.2.4. Use a ground test instrument specifically designed for electrical ground testing
 - 3.3.2.5. Instrument shall be calibrated within the past 12 (twelve) months The report shall consist of the following:
Provide: A sketch showing building/structure and test directions & distances
 - 3.3.2.6. Model of Test instrument
 - 3.3.2.7. Serial number of the test instrument
 - 3.3.2.8. Proof of calibration within the past year (Test Certification or paid invoice)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260526
Secondary Grounding

3.3.2.9. Date of test

3.3.2.10. Test readings at 52%, 62%, 72% of the C2 distances

If the average of the 62% values of the tests exceeds the 25-ohm value for power systems or 5-10 ohms for low voltage systems or static grounding systems, the engineer shall be informed immediately.

A "Megger" ground probe may also be used to determine the system resistance. Disregard low readings where the conductors are "looped". The utility neutral shall be disconnected for any test to eliminate stray currents.

3.4. Method of Measurement

Integral to work in other specification sections.

3.5. Method of Payment

Integral to work in other specification sections.

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260526
Secondary Grounding

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

260533.1 General

1.1. Work Includes

- 1.1.1. Rigid metal conduit and fittings.
- 1.1.2. Non-metallic conduit and fittings.

1.2. Related Sections

- 1.2.1. Section 260570 - Electrical General Requirements.
- 1.2.2. Section 304 and as indicated on Drawings – Trenching and Backfill
- 1.2.3. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated.
- 1.2.4. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.
- 1.2.5. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- 1.2.6. ANSI 80.3 – Electrical Metallic Tubing

260533.2 Products

2.1. Rigid Metal Conduit and Fittings

Fittings and Conduit Bodies: ANSI/NEMA FB 1; threaded type, material to match conduit.

2.2. Plastic Conduit and Fittings

- 2.2.1. Conduit: NEMA TC 2; Schedule 80 & 40 PVC.
- 2.2.2. Fittings and Conduit Bodies: NEMA TC 3.

2.3. Electrical Plastic Tubing and Fittings

- 2.3.1. EPT: NEMA TC 2; PVC.
- 2.3.2. Fittings and Conduit Bodies: NEMA TC 3

2.4. Electrical Metallic Tubing (EMT)

Fittings set screw type.

2.5. Conduit Supports

Conduit Clamps, Straps, and Supports: Steel or malleable iron.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

2.6. Warning Tape

Buried Warning and Identification Tape: Provide detectable aluminum foil plastic-backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried cable and conduit. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 2 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED ELECTRIC CABLE BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material

260533.3 Execution

3.1. Conduit Sizing, Arrangement and Support

- 3.1.1. Size conduit for conductor type installed or for Type XHHW conductors, whichever is larger; 1" inch minimum size.
- 3.1.2. Arrange conduit to maintain headroom and present a neat appearance.
- 3.1.3. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.
- 3.1.4. Maintain minimum 6 inch clearance between conduit and piping. Maintain 12 inch clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.
- 3.1.5. Arrange conduit supports to prevent distortion or misalignment by wire pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers.
- 3.1.6. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.
- 3.1.7. Do not fasten conduit with wire or perforated pipe straps. Remove all wire used for temporary conduit support during construction, before conductors are pulled.
- 3.1.8. Support conduit at a maximum of 7 feet on center.

3.2. Conduit Installation

- 3.2.1. Cut conduit square using a saw or pipe-cutter; de-burr cut ends.
- 3.2.2. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- 3.2.3. Use conduit hubs or sealing locknuts for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations unless conduit entry is at the bottom of the enclosure.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

- 3.2.4. Install no more than the equivalent of three 90-degree bends between boxes, handhole or pole mounted luminaires.
- 3.2.5. Use conduit bodies to make sharp changes in direction, as around beams.
- 3.2.6. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 1 inch size.
- 3.2.7. Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting at conduit low point.
- 3.2.8. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.
- 3.2.9. Provide No. 12 AWG insulated conductor or suitable nylon pull rope in empty conduit, except sleeves and nipples.
- 3.2.10. Install expansion joints where conduit crosses building expansion or seismic joints. Provide joints at exterior where underground raceways are connected to fixed enclosures or structures.
- 3.2.11. Where conduit penetrates fire-rated walls and floors, provide pipe sleeve two sizes larger than conduit; pack void around conduit with oakum and fill ends of sleeve with fire-resistive compound or provide mechanical firestop fittings with UL listed fire rating equal to wall or floor rating. Seal opening around conduit with UL listed foamed silicone elastomer compound.
- 3.2.12. Conduit: Non-Metallic Wipe plastic conduit clean and dry before joining. Apply full even coat of cement to entire area that will be inserted into fitting. Let joint cure for 20 minutes minimum. Provide spacers for multiple runs of buried raceways.
- 3.2.13. Where conduit(s) pass(es) from refrigerated or cooled atmospheres to warmer areas where condensation of water vapor may occur within raceways, conduit bodies sealed with "duct seal" type compound shall be provided after conductors are installed.
- 3.2.14. Flexible conduit shall not exceed three (3) feet in length.

3.3. Underground Duct Bank Installation (See Detail on Drawings)

- 3.3.1. Install top of duct bank minimum depth below finished grade as shown on drawings.
- 3.3.2. Install conduit with minimum grade of 4 inches per 100 feet.
- 3.3.3. Terminate conduit in end bell at manhole/handhole or pole foundation entry.
- 3.3.4. Use suitable separators and chairs installed not greater than 4 feet on centers. Band conduit together with suitable banding devices. Securely anchor conduit to



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

prevent movement during concrete placement where applicable.

- 3.3.5. Contact Dig Safe at 1-888-344-7233 before beginning excavation work.
- 3.3.6. Install magnetic ribbon warning tape below grade above duct bank location as shown on drawings.

3.4. Schedule of Conduit Installation

- 3.4.1. Underground Installations More than Five Feet From Foundation Wall Schedule 40 plastic conduit sand encased. Use long sweep 90 degree bends.
- 3.4.2. Installations In or Under Concrete Slab, or Underground Within Five Feet of Foundation Schedule 40 plastic conduit encased in sand.
- 3.4.3. Exposed Outdoor Locations: Rigid steel conduit or Schedule 80 PVC as indicated on drawings.
- 3.4.4. Concealed Dry Interior Locations: EMT in electrical rooms.
- 3.4.5. Duct Banks: Schedule 40 in earth with sand encasement.
- 3.4.6. Exposed Dry Interior Locations subject to mechanical damage: Rigid steel conduit.

3.5. Method of Payment

- 3.5.1. Underground conduits, and duct banks shall be measured by the linear feet of conduits, and duct banks installed, including encasement, locator tape, trenching and backfill with designated restoration, resolution, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.
- 3.5.2. Concrete encasement of existing underground conduits and duct banks shall be measured by the linear feet of encasement installed, including locator tape, trenching and backfill with designated restoration, all measured in place, completed, and accepted.
- 3.5.3. The reaming of existing ducts shall be measured by the number of linear feet of each duct cleared, measured in place and accepted. No distinction will be made for different sizes of ducts.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

3.6. Basis of Payment

Payment will be made at the contract unit price per linear foot for each type and size of conduit, and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, including expansion fittings, and for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with the provisions and intent of the plans and specifications.

Payment will be made under:

- 260533.1 2 inch PVC Schedule 40 Sand Encased Conduit – per linear foot
- 260533.2 1 ½ inch PVC Schedule 40 Sand Encased Conduit – per linear foot
- 260533.3 Concrete encasement of existing 6 x 4” duct banks envelope (20” x 40”) – per linear foot
- 260533.4 Reaming of Existing Duct - per linear foot

3.7. Material Requirements

Underwriters Laboratories Standard 514B	Fittings for Cable and Conduit
Underwriters Laboratories Standard 651	Schedule 40 and 80 Rigid PVC Conduit (for Direct Burial)

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260533
Conduit

(This Page Intentionally Left Blank)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260553
Electrical Identification

260553.1 General

1.1. Work Includes

- 1.1.1. Nameplates and tape labels.
- 1.1.2. Wire and cable markers.
- 1.1.3. Underground marker tape.
- 1.1.4. Warning signs

1.2. Related Sections

- 1.2.1. Section 260570 - General Electrical Requirements.
- 1.2.2. Section 260519 - Building Wire and Cable.

1.3. Submittals

- 1.3.1. Submit shop drawings under provisions of Section 260570 - General Electrical Requirements.
- 1.3.2. Include schedule for nameplates and tape labels.

260553.2 Products

2.1. Materials

- 2.1.1. Nameplates: Engraved three-layer laminated melamine plastic, 0.125 inch thick, white letters on a black background.
- 2.1.2. Wire and Cable Markers: Cloth markers, split sleeve, or tubing type.
- 2.1.3. Underground Warning Tape: 4 inch wide plastic tape with foil or magnetic stripe, colored yellow with suitable warning legend describing buried electrical lines. Also see Section 16370, Site Primary & Secondary Power Distribution.
- 2.1.4. Warning Signs: 7"x10" self-adhesive, suitable for outdoor installation.
- 2.1.5. Cable Identification: Plastic coated self-sticking markers (water proof), colored nylon cable ties and plates or heat shrink type sleeves.

260553.3 Execution

3.1. Installation

- 3.1.1. Provide list of labels for approval by Engineer prior to installation.
- 3.1.2. Degrease and clean surfaces to receive nameplates.
- 3.1.3. Install nameplates parallel to equipment lines.
- 3.1.4. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260553
Electrical Identification

nameplate to inside face of recessed panelboard doors in finished locations.

3.1.5. Embossed tape will not be permitted for any application.

3.1.6. Cable Identification: Apply marker tape and circuit ID number as required..

3.2. Wire Identification

Provide wire markers on each line and load connection point at source and junction points.

3.3. Nameplate Engraving Schedule

Provide nameplates to identify all transformer, disconnects, electrical distribution equipment, and loads served. Letter Height: 1/4 inch for individual disconnect switches and loads served, 1/2 inch for distribution equipment identification.

3.4. Marker Tape

Identify underground conduits using detectable underground warning tape. Install one tape per trench 8" below finished grade.

3.5. Warning Signs

Provide warning signs on the transformer on all sides stating "Danger High Voltage - Keep Out".

3.6. Disconnecting Means

Provide signs at new service equipment and two existing service entrances to building. Signs at service disconnects shall identify load served and describe locations of all other service disconnecting means. Obtain approval of Engineer for text before making signs.

3.7. Arc Flash Labels

Install Arc Flash labels on equipment per NFPA 70 – 110.16. Add to existing equipment as required.

3.8. Method of Measurement

Integral to work in other specifications.

3.9. Method of Payment

Integral to work in other specifications.

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

260570.1 General

1.1. Section Includes

Basic Electrical Requirements specifically applicable to Division 26 Specification Sections.

1.2. Scope of Work

The work to be accomplished under this contract involves the following: Demolition as noted on Drawings for existing fixtures and utilities. Provide feeders to new poles in parking and walkway fixtures and poles as indicated on the drawings. Relocate existing walkway fixtures as shown on drawings. Coordinate work with 2 other trades:

- Lighting Manufacturer; and
Greg Cormier
BGS, Property Management Division
207-287-3894.

1.3. References

- 1.3.1. ANSI/NFPA 70 - National Electrical Code.
- 1.3.2. ANSI C2 - National Electrical Safety Code.
- 1.3.3. ANSI/NFPA 101 - Life Safety Code.

1.4. Related Requirements

Conditions of the Contract and Division 1 - General Requirements, apply to all work, including work of this Division. Examine all contract documents for requirements affecting this work.

1.5. Submittals

- 1.5.1. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.
- 1.5.2. Mark dimensions and values in units to match those specified.
- 1.5.3. Provide fixture schedule, lighting drawings, panelboard schedules and wiring diagrams for assistance in pricing as applicable. Contractor shall receive one set of black line drawings for reproduction from the engineer for this purpose. See Section 26530.

1.6. Regulatory Requirements

- 1.6.1. Conform to applicable local, State and Federal Building Code for the State of Maine.
- 1.6.2. Electrical: Conform to NFPA 70, NFPA 101, ANSI C2, 2 FM, UL, and applicable ASTM and ANSI Standards.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

- 1.6.3. Contractor shall visit the site to become familiar with all existing conditions affecting this work. No claim shall be recognized for extra compensation due to failure of contractor to familiarize himself/herself with the existing conditions and extent of proposed work.
- 1.6.4. Obtain permits and request inspections by local authority having jurisdiction.

1.7. Project/Site Conditions

- 1.7.1. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- 1.7.2. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Engineer before proceeding.

1.8. Contract Drawings and Specifications

- 1.8.1. It is to be understood that drawings accompanying these specifications are intended to show general arrangement and extent of work to be done, but exact location and arrangement of all components shall be determined as work progresses. Anything shown on the drawings and not specifically mentioned in specifications or vice versa shall be considered as required in both.
- 1.8.2. Locations of equipment, and materials, etc., as given on drawings are approximate unless dimensioned. It shall be understood they are subject to such modifications as may be found necessary or desirable at time of installation in order to meet any structural conditions. Such changes shall be made by the contractor without extra charges.
- 1.8.3. Because of small scale drawings, all required offsets, etc., as may be required to clear work of other Contractors, may not be shown. Contractor, however, shall provide all necessary offsets, etc., as required to complete the installation of their work and not conflict with that of others.
- 1.8.4. It is the intention that wiring systems shall be complete and fully operational. The contractor shall identify system components during the bid process that clearly constitute conditions that would cause the system to be incomplete. Clarification: The remedy to these discrepancies shall be communicated by the engineer to all bidders or included as addenda.
- 1.8.5. The installation of Stadium Lighting is to some extent determined by the manufacturer selected to provide equipment for this project. Shop Drawings shall determine the details of installation.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

1.9. Materials and Labor

- 1.9.1. Bidders for this work shall carefully examine the Plans and Specifications, as the Contractor shall be required to furnish all materials and labor necessary to deliver to the Owner a complete system installed in full accordance with Local State and Federal laws. The system shall be furnished as specified, tested, and turned over to the Owner in perfect operating condition.
- 1.9.2. All materials shall be new and of best quality of their respective kinds. Workmanship in all respects shall be of highest grade and all construction shall be done according to best practices of the trade. Materials shall be warrantied directly by the manufacturer.
- 1.9.3. Contractor shall provide, when required for review of Engineer, labeled samples of any material or equipment specified herein or proposed to be used on this project.
- 1.9.4. Where words "furnish", "provide" or "install" are mentioned, either singly or in combination, these words are hereby interpreted to mean "furnish and install" or "provide and install," including all materials complete with all connections, supplemental devices, accessories and appurtenances, unless specifically otherwise noted. These words are likewise hereby interpreted as being prefixed to all materials, equipment, and apparatus hereinafter mentioned, either in abbreviated or schedule information

1.10. Protection of Work and Materials

- 1.10.1. Contractors shall be responsible for the care and protection of all materials delivered and labor performed until the completion of the work.
- 1.10.2. Cap all uncompleted lines, raceways, and ducts until ready for final connections, or future work as indicated.
- 1.10.3. All portions of the work liable to damage by weather or by those engaged on the project, shall be securely protected by temporary, but substantial covering which must be maintained in position until Engineer authorizes removal.

1.11. Replacements

In the event of damage to any equipment or materials, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the Owner.

1.12. Safety Regulations

All work to be performed and/or installed shall conform to all requirements of the Occupational Safety and Health Act (OSHA) of 1970 and all Amendments thereto

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

1.13. Insurance

The Contractor shall purchase and maintain all Workmen's Compensation Insurance, Public Liability and Property Damage Insurance during the progress of the work and until completion and acceptance of the entire project by the Owner.

1.14. Quality Assurance/Control of Installation

- 1.14.1. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- 1.14.2. Comply fully with manufacturers' instructions, including each step in sequence.
- 1.14.3. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- 1.14.4. 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.
- 1.14.5. Perform work using persons qualified to produce workmanship of specified quality.
- 1.14.6. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and physical distortion or disfigurement.

1.15. Schedule of Materials and Equipment

- 1.15.1. As soon as practicable, and before commencement of installation of any material or equipment, a complete schedule of materials and equipment proposed for installation shall be submitted for review. Schedule shall also include a list of all proposed subcontractors. Partial or incomplete lists will not be considered. Any materials, fixtures, and equipment not conforming to specifications may be rejected. Also see Section 01300, Submittals.
- 1.15.2. Orders for purchase of any devices, material, conduit, etc., or other equipment shall not be placed until this schedule is reviewed

1.16. Underwriter's Approvals

All electrical materials and equipment shall bear label of Underwriter's Laboratories, shall be listed by them in their list of electrical fittings and shall be approved by them for purpose for which they are to be used, unless materials and equipment are of a type for which Underwriter's Laboratories does not list or provide label service.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

1.17. Substitutions

- 1.17.1. Where the specifications allow the substitution of a product for that which has been specified, said substitution must be reviewed by the Engineer and shall be equivalent in all respects to that which is specified. The Engineer's decision shall be obtained on all questions as follows, and his/her judgment shall be final and binding on all parties. Substitutions for lighting fixtures shall meet all the requirements of Section 265119 and this section.
- 1.17.2. Reference in the specifications or on the drawings to any product, material, fixture, form or type of construction, etc., by proprietary name, manufacturer, make or catalog number, shall be interpreted as establishing a standard of quality or design and shall not be construed as limiting competition. The Contractor may, at his/her option, use any fully equivalent substitute provided written review by the Engineer is first obtained indicating acceptance of the equality of the substitute preferred.
- 1.17.3. For materials or equipment which are supplied with integral or factory applied finish, the colors of same shall be considered in evaluating substitutions.
- 1.17.4. For the purpose of avoiding conflicts with other trades, contracts, and adjoining work where more than one (1) article, device, material, fixture, form or type of construction, etc., is referred to by proprietary name, manufacturer, make or catalog number, the first named shall be used as the basis of design and details. The cost of any changes of approved equivalent item shall be borne by the Contractor requesting such change.
- 1.17.5. Luminaires: When proposing alternate fixtures, provide data on efficiency, lumen output per fixture and CU Schedule for various RCR values where relevant.

1.18. Record Drawings

During construction, the Contractor shall keep an accurate record of all deviations to the installation of the work as indicated on the drawings. Upon completion of the work, the Contractor shall furnish a copy of this record to the Engineer, on a black line of the original which will be available from the Engineer. Submit record drawings before requesting final payment.

1.19. Manufacturer's Representatives

At appropriate times, or as directed by the Engineer, provide the services of a competent factory trained Engineer or Technician of the particular manufacturer of equipment or item involved, to inspect, adjust, and place in proper operating condition any and all such items of manufacture. No additional compensation shall be allowed Contractors for such service.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

1.20. Manufacturers' Instructions and Operation and Maintenance Data

- 1.20.1. Provide for each item of equipment or apparatus furnished, a complete set of printed instructions obtained from the manufacturer covering proper operation, care, lubrication, cleaning, servicing, adjustment, etc., together with any special safety instructions.
- 1.20.2. Manufacturers' data shall further include performance data (time current curves, where applicable), complete parts lists, recommended spare parts lists, and wiring diagrams.
- 1.20.3. Data shall be arranged in complete sets, properly indexed and marked.
- 1.20.4. Data shall include complete set of shop drawings.
- 1.20.5. Material shall first be submitted in preliminary fashion for review by Engineer. After approval, Contractor shall submit two (2) copies in bound volumes to the Engineer for distribution.
- 1.20.6. Provide contacts for service agencies for all major system components.

1.21. Guarantees

- 1.21.1. An item becomes "defective" when it ceases to conform to this Contract Document. Guarantees beginning on the date of issuance of the Owner's final payment, or certificate of substantial completion, with Owner taking occupancy or beneficial use thereafter.
- 1.21.2. Upon completion of the work and before applying for final payment, furnish a written guarantee, stating that the work complies with the provisions of codes listed herein and the local enforcing authorities and that it will be free from defects of material and workmanship for the required guarantee period. Guarantee shall further state that the Contractor will, at his own expense, repair and/or replace any of his material and work which may become defective during the time of guarantee, together with other work damaged as a consequence of such defects. All manufacturers written warranties shall apply to materials. Warranties other than that of the manufacturer are not acceptable.
- 1.21.3. The guarantee period shall be one (1) year except when longer periods are indicated for specific equipment.
- 1.21.4. All materials in Division 26 where a written warranty is published shall require the warranty to be offered by the product manufacturer.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

1.22. Existing Utilities and Equipment

Extreme care shall be taken to protect existing utilities and equipment above and below grade and in all other locations. Information contained on drawings is not guaranteed as to location, invert, etc. but represent the best information available as to the location of underground and concealed utilities and equipment. The Contractor shall be responsible for the replacement of all damaged or broken utilities or equipment due to their work or operations.

1.23. Energizing Equipment

Obtain Owner's written approval before energizing any equipment. Use lock out tag out procedures during construction.

260570.2 Products

Not Used.

260570.3 Execution

3.1. Connection to Equipment

- 3.1.1. The Contractor shall be responsible for proper wiring and raceway connections to equipment, make sure of alignment, both initially and under operating conditions, and provide proper supports, brackets, means of expansion, etc., to make sure that no excessive stresses are applied to equipment. Raceways and cable shall be run to the equipment and alignment checked before final bolting and fastening.
- 3.1.2. At the request of the Engineer, dismantle equipment connections to demonstrate proper installation and make such corrections necessary without additional compensation for disassembly, re-connection, or the required corrective work.
- 3.1.3. Equipment shall be installed in such a manner as to permit disconnecting for service and repairs without the necessity of rigging.

3.2. Closing in Uninspected Work

- 3.2.1. General: Do not cover up or enclose work until it has been properly and completely inspected and approved. Engineer may waive this requirement by written permission.
- 3.2.2. Noncompliance: Should any of the work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required, and after it has been completely inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Engineer and at no additional cost to the Owner.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 260570
General Electrical Requirements

3.3. Cleaning of Systems

- 3.3.1. All wiring systems shall be thoroughly cleaned prior to initial operation and in accordance with manufacturer's instructions for equipment to be furnished and/or installed.
- 3.3.2. Furnish all detergents, solvents, cleaning compounds, tools, etc., required in connection with cleaning operations.
- 3.3.3. Thoroughly clean all exposed portions of all equipment, remove all labels, and wipe clean with a damp rag.

3.4. Testing, Balancing and Adjusting

Electrical loads shall be balanced on all phase legs to a tolerance of plus or minus 10 percent. Include testing circuits for shorts to ground. Measure grounding system resistance and confirm it is 25 ohms or less. Document test by date, location and ohmic value. Correct all deficiencies. Provide all test equipment.

3.5. Instructions

On completion of the job, Contractor shall provide competent technicians to thoroughly instruct the Owner's representative in the care and operation of the system. The total period of instruction shall not exceed 2 hours and be performed in a minimum of one interval. The time of instruction shall be arranged with the Owner. The Electrical subcontractor shall be present and participate in the Owner's instruction.

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

265119.1 General

1.1. Section Includes

- 1.1.1. Exterior luminaires and accessories.
- 1.1.2. Poles.
- 1.1.3. LED Drivers.

1.2. Related Sections

- 1.2.1. Section 260570 - General Electrical Requirements
- 1.2.2. Cast-In-Place Concrete: Foundations for Poles as indicated on the drawings.

1.3. References

- 1.3.1. LED Arrays and reflectors as indicated on the drawings
- 1.3.2. ANSI/NFPA 70 - National Electrical Code.

1.4. Scope of Work

- 1.4.1. Provision of Site and Walkway Lighting as shown on the drawings. Provide pole locations, fixture mounting details, connections to existing controls as indicated. Existing walkway fixtures shall be relocated to new foundations as shown on the drawings. Provide site lighting fixtures for parking areas as indicated on the drawings.
- 1.4.2. The construction shall satisfy design requirements for illumination as stated in this specification.

1.5. Design Requirements

- 1.5.1. Design and layout lighting system in conformance with the latest IES recommended procedures.
- 1.5.2. Parking and Walkway Lighting in accordance with RP 20-14.

1.6. Submittals

- 1.6.1. Submit under provisions of Section 260570 - General Electrical Requirements
- 1.6.2. Shop Drawings: Indicate dimensions, features and components for each luminaire.
- 1.6.3. Product Data: Provide dimensions, ratings, and performance data including fixture efficiency and energy requirements, information on control systems, including control schematics and photometric data.
- 1.6.4. Provide warranty information on LED drivers, poles and fixtures.
- 1.6.5. Provide point by point calculations as described in part 1.6.6 for substitutions.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

1.6.6. Design Data

- 1.6.6.1. Include lighting calculations including illuminance levels on a point by point basis (10'x10' grid), for each parking area and walkway, indicating an analysis grid 5 feet larger than the area boundary. An AutoCAD DWG file shall be provided for this purpose. Illuminance levels shall be calculated at grade. Target Values Horizontal: 2 foot-candles average (min), minimum uniformity 4:1 (Avg/Min) and a .5 fc minimum. Illuminance levels shall be calculated at maintained values, including a LLF = .85.
- 1.6.6.2. Include photometric data prepared by an independent testing facility for each lighting fixture used, including a complete listing of candlepower values measured at a minimum of 11 vertical angles at each 3 horizontal angles.
- 1.6.6.3. Include wind loading calculations/data to show that poles and pole anchoring conform to wind design criteria for the geographic area (min 100 mph) to support luminaires and brackets mounted on each pole for designated configurations.
- 1.6.7. Test Reports: Indicate measured illuminance levels, accurate to 1/10 foot-candle, as read across entire area being lighted in 10 foot grids. Measurements shall include illuminance in footcandles for Max, Min, Avg and Avg/Min (uniformity). Apply a light loss factor or .85 to measurements.
- 1.6.8. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under "Regulatory Requirements".
- 1.6.9. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- 1.6.10. Manufacturer's Field Reports: Indicate that installation is complete and system performs according to specified requirements.

1.7. Project Record Documents

- 1.7.1. Submit under provisions of Section 260570 - General Electrical Requirements.
- 1.7.2. Accurately record actual locations of each luminaire.

1.8. Operation and Maintenance Data

- 1.8.1. Submit under provisions of Section 260570 - General Electrical Requirements.
- 1.8.2. Maintenance Data: Include instructions for maintaining luminaires.

1.9. Regulatory Requirements

- 1.9.1. Conform to requirements of ANSI/NFPA 70.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

1.9.2. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose and as specified and shown.

1.10. Delivery, Storage and Handling

1.10.1. Deliver, store, protect, and handle products to site under provisions of Section 260570 - General Electrical Requirements.

1.10.2. Accept products on site. Inspect for damage.

1.10.3. Protect poles and lighting fixtures from finish damage by handling carefully.

1.11. Coordination

Furnish bolt templates and pole mounting accessories to installer of lighting equipment foundations. Provide foundations as indicated on drawings.

265119.2 Products

2.1. Luminaries

2.1.1. Furnish products to meet performance requirements as manufactured by Holophane, Cooper, Philips, Lithonia, Hubbell or approved equal. Assembly minimum warranty 5 years.

2.1.2. Description: Site Lighting type luminaire (approved equal) and decorative walkway fixtures (Washington Postlight as manufactured by Halophane: no substitutions).

2.1.3. Material: Extruded aluminum housing, driver, reflector and LED array.

2.1.4. Enclosure: Clear glass – high temperature glass. Provide gasketing between enclosure and frame and luminaire body.

2.1.5. Photometric Control: Anodized specular aluminum reflector

2.1.6. Photometric Performance: ANSI/IES RP-2. Distribution as specified..

2.1.7. Installation Conditions: Wet/Outdoor location

2.1.8. Mounting: Provide pole mount brackets as required.

2.1.9. LED Driver and array as specified on drawings - Minimum warranty 5 years.

2.1.10. Lamp: LED as provided with luminaries.

2.2. Poles

2.2.1. As indicated on drawings or approved equal.

2.2.2. Description: Steel

2.2.3. Type: Square

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

- 2.2.4. Finish: Hot dipped galvanized as a minimum, meet the requirements of NEMA 250 corrosion-resistance test.
- 2.2.5. Height: approximately as indicated on drawings
- 2.2.6. Anchor Bolts: as provided by manufacturer
- 2.2.7. Accessories
 - 2.2.7.1. Ground lug.
 - 2.2.7.2. Install Wire from Luminaries to hand-hole at base.
- 2.2.8. Pole shall have Structural Loading Capacity Ratings
 - 2.2.8.1. For Luminaire Weight: in pounds.
 - 2.2.8.2. Luminaire and Bracket Effective Projected Area: square feet.
 - 2.2.8.3. Steady Wind: 100 miles per hour, minimum. Gusts 145 MPH for 3 seconds.
- 2.2.9. Controls: Provide contactors and modifications to existing controls in the East Switchgear Building and Panel existing Panel LPA as indicated on Contract Drawings, including the pull box mounted on the Harlow Building.

265119.3 Execution

3.1. Examination

- 3.1.1. Examine excavation and concrete foundation for lighting poles.
- 3.1.2. Examine each luminaire to determine suitability for lamps specified.

3.2. Installation

- 3.2.1. Install in accordance with manufacturer's instructions.
- 3.2.2. Install lighting fixtures, poles at locations indicated on drawings or recommended
- 3.2.3. Install poles plumb. Provide double nuts to adjust plumb manufacturer. Grout around each base.
- 3.2.4. Bond luminaires, metal accessories and metal poles to branch circuit equipment grounding conductor. Provide supplementary grounding electrode at each pole.

3.3. Field Quality Control

- 3.3.1. Operate each luminaire after installation and connection. Inspect for improper connections and operation. Operate for 100 hours or as recommended by lamp manufacturer to "season" lamps.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

- 3.3.2. Measure illumination levels to verify conformance with performance requirements. Factor results to take into account initial illumination levels. Provide a table of results to the engineer on 50 foot centers. Calculate average values and Max/Min uniformity.
- 3.3.3. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

3.4. Adjusting

Replace luminaires which have failed lamps at date of substantial completion.

3.5. Cleaning

- 3.5.1. Clean work under provisions Section 260570 - General Electrical Requirements
- 3.5.2. Clean electrical parts to remove conductive and deleterious materials.
- 3.5.3. Remove dirt and debris from enclosures.
- 3.5.4. Clean finishes and touch up damage.

3.6. Method of Measurement

For each new site light, measurement shall be made per each assembly installed in place, completed and accepted. Payment per each shall include, but not necessarily be limited to, the light pole, light base, required number of light fixtures, ground rods and grounding, wiring in pole as indicated on drawings, any conduit or fittings required, excavation and backfill, site restoration, and all other incidentals necessary to make this item complete. This price shall be considered full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item. Separate payment shall be made for the various types and sizes.

For each relocated site light, measurement shall be made per each assembly relocated and installed on a new concrete base, completed and accepted. Payment per each shall include, but not necessarily be limited to, disassembly and reassembly of the light pole and fixtures, construction of a new light base, ground rods and grounding, wiring in pole as indicated on drawings, any conduit or fittings required, excavation and backfill, site restoration, and all other incidentals necessary to make this item complete. This price shall be considered full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item. Separate payment shall be made for the various types and sizes.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 265119
Site Lighting

Modifications to existing wiring and lighting controls including: a surface mounted NEMA 4X pull box and all terminations installed on the Harlow Building and 2 “ and 1 ½” Spare Conduits installed and capped below grade as indicated on Drawing A-E201 and ; Modifications to the existing control enclosure and existing panel LPA in the East Switchgear Building, including all terminations, conduits and wiring between the existing control enclosure and Panel LPA, lighting contactors, circuit breakers, relocation of existing controls and wiring. Include all connections for a fully functional control system as shown on Drawing A-E201 and accepted by the Engineer. Payment for all items shall be made for a complete installation.

3.7. Basis of Payment

Pay Item

265119.1	Type S1	New Fixture as indicated in schedule, complete installation as accepted by the engineer – per each
265119.2	Type S2	Relocated Fixture on New Base as indicated in schedule, complete installation as accepted by the engineer – per each
265119.3	Type S2A	New Fixture as indicated in schedule, complete installation as accepted by the engineer – per each
26119.4	Modification to existing control panel and installation of a pull box on the Harlow Building – Lump Sum	

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 00 - GENERAL REQUIREMENTS and the Site Sections 202 through 659 which are hereby made a part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Planting of trees, shrubs, vines, groundcovers and flower bulbs.
 - 2. Maintenance and guarantee.

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Site Preparation
- B. Earthwork
- C. Erosion and Sediment Control
- D. Storm Drainage System
- E. Turf and Grasses
- F. Mulch

1.04 SUBMITTALS

- A. Submit manufacturer's product data for the following:
 - 1. Soil analysis results;
 - 2. List of nurseries for selection of plant materials by Owner's Representative;
 - 3. Manufacturer's certificate of compliance for controlled release fertilizer issued by the manufacturer only, showing quantity of material ordered and specific job application;
 - 4. For all plant materials not selected in the field by the Owner's Representative, submit a complete list showing each type, each source of

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

materials, the measured size of each, as well as photographs of materials, with scale figure.

1.05 QUALITY ASSURANCE

- A. Source: For each type of product required for the work of this Section, provide products of one manufacturer and source for consistency.
- B. Codes and Standards: work in compliance with applicable requirements of governing authorities having jurisdiction. Workmanship and finish shall be equal to the best practice of modern shops for each item of work.
- C. Qualifications of Workers: Use adequate numbers of skilled workers who are trained in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.
- D. The work of this Section shall be completely coordinated with the work of other Sections. Verify dimensions and work of other trades that adjoin materials of this Section before installing items specified.
- E. All plant materials shall be true to name according to "Standardized Plant Names," published by the American Joint Committee on Horticulture Nomenclature, 1942 edition. Each plant or bundle shall be tagged with the name and size of plants in accordance with the American Nursery & Landscape Association (ANLA), American Standard for Nursery Stock, ANSI Z60.1. In all cases, botanical names shall take precedence over common names.
- F. Quality and size shall conform to the current edition of "Horticultural Standards" for number one grade nursery stock as adopted by American Nursery & Landscape Association (ANLA).
- G. All plants and plant materials shall comply with all Federal, State and local laws and regulations requiring inspection for plant disease and insect control.

1.06 PROJECT CONDITIONS

- A. Protection: The Contractor shall use all means necessary to protect the materials of this Section before, during, and after installation. In the event of damage, make all repairs and replacements necessary to approval of the Owner's Representative and at no additional cost to the Owner. All work shall be executed in such a

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

manner as to prevent any damage to existing streets, curbs, paving to remain, existing plant materials, and adjoining properties.

- B. The Contractor shall remove all debris, construction equipment, and waste material from areas within the limit of work prior to inspection for acceptance.
- C. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate as required. Maintain grade stakes set by others until removal is mutually agreed upon by all parties concerned.
- D. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Owner's Representative before planting.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. All products and supplies shall be delivered to the job adequately protected from damage during transit.
- B. All products and supplies shall be stored off the ground and shall be protected against damage. Damaged products and/or supplies will be rejected and shall not be employed in the work.
- C. Deliver all items to the job site in their original containers with all labels intact and legible at time of Owner's Representative's inspection.
- D. Immediately remove from the site all plants which are not true to name, and all materials which do not comply with the specified requirements.
- E. Use all means necessary to protect plant materials before, during, and after installation and to protect the work and materials of all other trades.
- F. Replacements: in the event of damage, immediately make all replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 GENERAL



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

- A. Loam/Topsoil: friable, typical of local cultivated topsoil containing 5% (min.) decayed organic matter (humus), no toxic materials, from well drained, arable site, reasonably free of subsoil, stones, earth, clods, sticks, roots or debris.
1. Test for acidity, fertility, and general texture by a recognized commercial or government agency; report findings and recommendations to the Owner's Representative. Add soil conditioners as per testing agency's report and recommendations.
 2. Deliver no topsoil in frozen or muddy condition.
- B. Compost Manufactured Topsoil
1. The Contractor is encouraged to use Compost Manufactured Topsoil in lieu of, or in addition to, new and/or existing on-site topsoil.
 2. This material shall be created from compost blended with soils stockpiled on-site.
 3. Materials:
 - a. Compost shall be derived from organic wastes including sawdust, clean ground wood, leaf and yard residues, and biosolids that meet all State Environmental Agency requirements. The material shall be well composted, free of viable weed seeds and contain material of a generally humus nature capable of sustaining growth of vegetation, with no material toxic to plant growth.
 - i. Compost shall meet the following:

Parameters	Range
pH	5.5 - 8.0
Moisture content	35% - 55%
Soluble salts	< 4.0 mmhos (dS)
C:n ratio	15 - 30:1
Particle size	< 3/4"
Organic matter content	> 20%
Bulk density	< 1200 lbs. Per cubic yard
Foreign matter	< 1% (dry weight)

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

- ii. Compost generator shall also provide minimum available nitrogen and other macro and micro nutrients to determine fertilizer requirements. Generator shall supply documentation showing state approval for intended use.
 - iii. Product shall be Agresoil Compost as distributed by Agresource, Amesbury, MA 01913, 800-313-3320, or approved equal.
- b. Soil Component: Soil shall consist of loose, friable soil, free of ice, snow, and rubbish with no admixture of refuse or material toxic to plant growth. Soil shall be reasonably free of stones, lumps, roots, and weeds or similar objects larger than two inches in diameter.
- i. Soil shall meet additional parameters:

Parameters	Range
pH	5.5 – 7.5
2	35% - 55%
Soluble salts	2.5 mmhos (dS)
Stone and debris	< 5% (by weight)
Foreign matter	< .05% (by weight)

- ii. Particle Size:
 - 1) 100% by volume must pass a 2-inch screen.
 - 2) 95% by volume must pass a ¾-inch screen.
 - 3) Not more than 60% of the soil by weight shall be less than .05 mm (very fine sand) of which no more than 25% by weight shall consist of particles less than .002 mm (clay).
4. Compost Manufactured Topsoil shall consist of soil as described in Section 2.01.B.3.b amended with compost as described in 2.01.B.3.a. Compost manufactured topsoil shall be free of refuse, stones, lumps, roots, and weeds or similar objects larger than two inches in diameter. Compost manufactured topsoil will be uniformly mixed to meet the final requirements listed below:

**Construction Contract 'A'
East Campus Infrastructure Improvements**

Section 32 90 00

Planting

Parameters	Range
pH	5.5 – 8.0
Moisture content	30% - 55%
Soluble salts	2.0 mmhos (dS)
Organic matter	> 5% (by weight)
Foreign matter	< 0.5% (by weight)

- a. Particle Size:
 - i. 100% by volume must pass through a 2-inch screen.
 - ii. 95% by volume must pass through a ¾-inch screen.

- 5. Compost Manufactured Topsoil shall meet the following mechanical analysis:

Textural Class	% of Total Weight	Average %
Sand (0.05 – 2.0 mm dia. range)	45-75	60
Silt (0.002 - 0.05 mm dia. range)	15-35	25
Clay (less than 0.002 mm dia. range)	5-20	15

- C. Superphosphate: finely ground phosphate rock with eighteen percent (18%) minimum available phosphoric acid.
- D. Bone Meal: commercial raw bone meal, finely ground, 1% nitrogen and 18% phosphorus acid (min.).
- E. Manure: well rotted, unleached, cattle manure, reasonably free of wood shavings, sawdust or other litter and no chemicals or other ingredients harmful to plants. Dehydrated manure (Bovung or equal) is acceptable.
- F. Fertilizer: Fertilizer for lawns shall be chosen based on the results of soil tests performed as part of the requirements of this specification. All existing site loam and new topsoil brought to the site shall be tested.
 - 1. Recommendations for amendments shall be made by the testing agency or other qualified soils engineers. The recommendations and product submittals shall be forwarded to the Owner’s Representative for approval.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

G. Compost - shall be a well-decomposed, stable, weed free organic matter source. It shall be derived from agricultural, food, or industrial residuals; biosolids (treated sewage sludge); or yard trimmings.

1. Mix shall meet all state environmental agency requirements.
2. The product shall contain no substances toxic to plants, will possess no objectionable odors, and shall not resemble the raw material from which it was derived.
3. For acid loving plants, only use compost that has not received the addition of liming agents or ash by-products.
4. Compost shall meet the following:

Parameters	Range
Ph	5.5 - 8.0
Moisture content	35% - 55%
Soluble salts	< 4.0 mmhos (ds)
C:n ratio	15 – 30:1
Particle size	< 3/4"
Organic matter content	> 20%
Bulk density	< 1200 lbs. Per cubic yard
Foreign matter	< 1% (dry weight)

H. Lime: ground, calcitic limestone, 95% passing 100 mesh screen.

I. Planting mixture: topsoil thoroughly incorporated with well rotted manure or equivalent dehydrated manure or bone meal and peat proportioned 1 cubic yard to 7 cubic yards topsoil.

J. Mulch: aged pine bark consisting of the outer bark of pine trees with minimum hardwood bark; Bark shall be thoroughly mixed and aged in stock piles a minimum of 6 months, partially decomposed, dark brown in color, and generally free of chunks of wood thicker than 1/4". Aged pine bark containing an excess of fine particles will not be acceptable.

K. Water: Contractor shall furnish hose and connections required for watering all plant materials until completion of the project.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

- L. Tree Staple: Install two TreeStaple™ brand below ground stabilizing system tree “staples,” or approved equal, per root ball as detailed on the Drawings, ONLY if necessary per site conditions.
- M. Tree Staking - Hardwood Stake - for tree guying - 30" long (min.). For tree staking - 8' long (min.). Install as detailed on the Drawings, where required by site conditions.
- N. Wire - pliable No. 12 to 14 gauge galvanized soft steel wire with rubber hose or Chain Lock brand plastic tree tie or approved equivalent, where required by site conditions.
- O. Wrapping material - first quality, heavy, waterproof crepe paper manufactured for this purpose; not less than 4" wide, where required by site conditions.

2.02 PLANT MATERIALS

- A. Furnish and install all plants as per Drawings in quantities listed on plant materials list. If there is any discrepancy between quantities listed and shrubs shown, notify the Owner's Representative. Contractor shall be responsible for quantity of shrubs graphically shown on plans.
- B. All plants shall be nursery grown unless authorized to be collected.
- C. Plants: in accordance with USDA Standard for Nursery Stock, latest edition, hardy under climatic conditions similar to locality of project, typical of species or variety, normal habit of growth, sound, healthy, vigorous, well-branched, densely foliated when in leaf, free of disease, insect pests, eggs, or larvae, with well developed root systems.
- D. If plants of specified kind or size are not available within a reasonable distance, substitutions may be made upon request, if approved by Owner's Representative.
- E. Plant Dimensions: conform to USDA Standard for Nursery Stock, latest edition, as specified. Exceptions as follows
 - 1. Plants larger than specified may be used if approved by Owner's Representative at no increase in contract price. Increase spread of roots or earth ball in proportion to size of plant.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

2. Undersize plants (10% max.) in any one variety or grade may be used if approved by the Owner's Representative. Provide sufficient plants above size to make average equal to or above specified grade. Undersize plants shall be larger than average size of next smaller grade.
- F. Balled and Burlapped (B & B) plants: dig with firm natural earth roots. Made balls are unacceptable.
1. Protect B & B plants not planted immediately upon delivery with soil, wet moss, or other acceptable material. Prevent voids among roots with careful filling. Bind no plants with wire or rope so as to damage bark or break branches.
- G. Container grown plants: grown in container long enough for root system to have developed sufficiently to hold its soil together firm and whole. Plants loose in container will not be acceptable.
- H. Plants are subject to inspection and approval at place of growth for conformity to specifications as to quality, size, and variety. The expenses incurred by the Owner's Representative for such inspections shall be born by the Contractor. Owner's Representative reserves right of inspection upon delivery at the site or during progress of work or right of rejection due to damage suffered in handling or transportation. Remove defective plants immediately from site. Plants to be accompanied by State Nursery inspection certification, if required.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PLANTING OPERATIONS

- A. Plant nursery stock immediately upon delivery to the site and approval by the Owner's Representative. Layout individual tree and shrub locations and areas for multiple plantings; Stake locations, outline plant beds, and obtain the Owner's Representative approval before proceeding with planting work.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

- B. Planting may be done whenever weather and soil conditions are favorable or as otherwise authorized by Owner's Representative. If this is not feasible, heel-in material with damp soil or mulch to protect from sun and wind.
- C. Notify Owner's Representative at least one week prior to beginning planting operations.
- D. Excavate tree pits 2'-0" diameter (min.) and shrub pits 12" diameter (min.) greater than ball of earth or spread of roots and sufficiently deep to allow for 4" thick layer of compacted planting mixture beneath ball or roots.
- E. Locate pits prepared and backfilled with planting mixture to grade prior to planting by staking and recording on plans for location when planting proceeds.
- F. Set plants in center of pits, plumb and straight, with crown of plant 1" higher, after settlement, than surrounding finished grade.
- G. When B & B trees are set, compact topsoil mixture around bases of balls to fill all voids. Remove burlap, ropes or wires from top one third (1/3) of balls before filling in with planting mixture.
- H. Thoroughly compact planting mixture around roots or balls and water immediately after plant pit is backfilled. Form a shallow basin slightly larger than pit with a ridge of sod or mulch to facilitate and contain watering. Cultivate soil in shrub beds, rake smooth and neatly outline after planting. Provide 12" (min.) of loam between all shrubs and 6" (min.) between all ground covers.
- I. Distribute controlled release fertilizer packets equidistant within the planting pit adjacent to the root ball but not in direct contact with the roots. Placement depth shall be 6 to 8 inches. Packets shall not be cut, ripped or damaged.
- J. Application rates as follows:

Planting Item	Size	No. of Packets
Deciduous Trees:	1-3" cal.	3
	4-6" cal.	4
Shrubs:	2-3'	2
	over 3'	3
Evergreen Trees:	5-10'	4
	over 10'	5
Vines:	1 gal.	1

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

Groundcover:		1 packet per four plants
--------------	--	--------------------------

- K. Stake or guy trees as detailed on the Drawings, only if necessary per site conditions, as directed by the Owner's Representative.
- L. Prune each plant in accordance with ANLA standards to preserve natural character. Remove all dead wood, suckers, broken or badly bruised branches and approximately 1/4 of wood. Prune with clean, sharp tools.
- M. Cover all tree and shrub pits immediately after planting with 3" (min.) layer of specified mulch. Limit of mulch for trees shall be area of pit; for shrubs in beds, entire area of shrub bed. Mulch shall be kept 2" clear of trunk.
- N. Notify Owner's Representative immediately if rock or underground obstructions are encountered in plant pit excavation.
- O. Contractor shall furnish plans showing locations of underground utilities encountered, as required.

3.03 SPREADING OF COMPOST MANUFACTURED TOPSOIL

- A. Compost manufactured topsoil shall be spread evenly upon the previously prepared subgrade surface to the depth specified on the plans for all plant beds.
- B. For all woody plant material, compost manufactured topsoil shall be placed around rootball to even the base of the plant's main leader with the soil grade. All compost manufactured topsoil shall be firmly dressed into place to prevent settling and provide support.
- C. Compost manufactured topsoil used for planting beds of herbaceous plants shall be spread in such a manner as to establish a loose, friable bed for installation of plant material.

3.04 MAINTENANCE – PLANTING

- A. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum of 90 days following final acceptance of all planting.
- B. Maintenance shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, re-mulching, tightening and repairing of guys, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

- C. Plants shall be inspected for watering needs at least twice each week and watered as necessary to promote plant growth and vitality.
- D. Stakes shall be kept plumb and neat in appearance. Guys, wires, and anchoring cables shall be tightened and repaired weekly.
- E. Planting beds and individual plant pits shall be kept free of weeds, and mulch shall be replaced as required to maintain the specified layer of mulch. Beds and individual pits shall be neat in appearance and maintained to the designed layout.
- F. Plants that die during the maintenance period shall be removed and replaced at once, unless designated otherwise by the Owner's Representative.
- G. Spraying for both insect pests and diseases shall be included during the maintenance period as required and as directed.
- H. During the maintenance period, any decline in the condition of plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If requested by the Owner's Representative, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures.

3.05 ACCEPTANCE STANDARDS FOR PLANTING

- A. Following the completion of all planting, the Contractor shall request, from the Owner's Representative in writing, a formal inspection of the completed work. If plant materials and workmanship for the site are acceptable, written notice will be given to the Contractor stating that the work has received acceptance and that the 90 days maintenance and the one year guarantee period has commenced from the date of acceptance.
- B. If a number of plants are sickly or dead at the time of inspection or if, in the Owner's Representative's opinion, workmanship is unacceptable, written notice will be given by the Owner's Representative to the Contractor in the form of a punch list, which itemizes necessary planting replacements and/or other deficiencies to be remedied. The Contractor's responsibility for maintenance of all the plants shall be extended until replacements are made or other deficiencies are corrected. All dead and unsatisfactory plants shall be removed promptly from the project. Replacements shall conform in all respects to the Specifications for new plants and shall be planted in the same manner.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

3.06 GUARANTEE FOR PLANT MATERIALS

- A. Plants shall be guaranteed for a period of one year after written notification of acceptance and shall be alive and in satisfactory growth at the end of the guarantee period.
- B. At the end of the guarantee period, a final inspection will be held to determine whether any additional plant material replacements are required. Each plant shall show at least 75% healthy growth and shall have the natural character of its species as determined by the Owner's Representative. Plants found unacceptable shall be removed promptly from the site and be replaced during the normal planting season, until the plants live through one year.
- C. Replacement plants shall have a one year guarantee from time of planting.

3.07 METHOD OF MEASUREMENT

The quantity of plants to be measured for payment will be the number of individual plants furnished and planted as required and accepted, excluding replacements.

3.08 BASIS OF PAYMENT

Each item of "Planting" will be paid for at the contract unit price for each accepted plant furnished and planted. Payment shall constitute full compensation for; furnishing and placing plants, digging, delivering, rodent protection, preparing plant pits, beds and drains; planting, watering, fertilizing, mulching, pruning, and the cleanup of planting areas; for all, fertilizer, mulch and other necessary materials; all labor, equipment, tools, Maintenance Period work, Replacement and Bonding (if required by Special Provision) and any other incidentals necessary to complete the work.

When a bid item calls for a "Group" of trees, shrubs, vines or other plants, the Contractor shall furnish each individual species within this "Group" for the same unit bid price.

The name and estimated number of individual species within each "Group" will be shown on the estimated quantities sheet of the plans.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 90 00

Planting

Payment will be made under:

	<u>Pay Item</u>	<u>Pay Unit</u>
329000.1	October Glory Maple	Each
329000.2	Black Gum	Each
329000.3	Pin Oak	Each
329000.4	Red Oak	Each
329000.5	Linden	Each
329000.6	Pagoda Dogwood	Each
329000.7	American Hornbeam	Each
329000.8	Higan Cherry	Each
329000.9	Balsam Fir	Each
329000.10	White Spruce	Each
329000.11	White Pine	Each
329000.12	Serviceberry	Each
329000.13	Purple Filbert	Each
329000.14	Meserveae Holly	Each

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 00 - GENERAL REQUIREMENTS and Site Sections 203 through 659 which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK INCLUDED

- A. Refer to the Drawings for the extent and details of this work.
- B. The work of this Section consists of all seeding and related work as shown on the Drawings or required herein and includes, but is not limited to the following:
 - 1. Providing all topsoil from on site sources required for work of this Section.
 - 2. Screening stripped and stockpiled topsoil.
 - 3. Providing additional new topsoil from off-site sources as required to complete work for this Section.
 - 4. Providing all soil amendments, fertilizers, erosion controls and mulches as required for work in this Section.
 - 5. Scarification of subsoil in preparation for loaming.
 - 6. Spreading and fine grading topsoil for all lawn areas.
 - 7. Seeding/sodding required for work in this Section.
 - 8. Maintenance and guarantee.

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. Site Preparation
- B. Earthwork
- C. Erosion and Sediment Control
- D. Storm Drainage System
- E. Planting



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

1.04 SUBMITTALS

- A. Materials list: Submit a complete list of all materials proposed for use in this work, demonstrating complete conformance with the requirements specified.
1. Submit grass seed and sod mixes for approval.
 2. Submit topsoil analysis results for review by the Landscape Architect. State recommended quantities of amendments necessary to produce satisfactory topsoil as stated in the specifications herein. If on-site stockpiled topsoil is to be used, submit topsoil analysis of screened products.
 3. Submit product information with mix ratios and amounts for hydromulching to be used during hydroseeding for Landscape Architect's approval.
 4. Submit fertilizer, herbicide and fungicide products for application as required for Landscape Architect's approval.
 5. Submit mechanical analysis of any soil amendments.

1.05 QUALITY ASSURANCE

- A. All seed and amendments shall comply with all Federal, State and local laws and regulations requiring inspection for plant disease and insect control.

1.06 PRODUCT HANDLING

- A. Delivery and Storage:
1. Deliver all items to the job site in their original containers with all labels intact and legible at time of Landscape Architect's inspection.
 2. Immediately remove from the site all materials which do not comply with the specified requirements
 3. Use all means necessary to protect seed from moisture and other contaminants which may adversely effect proper germination.
 4. Use all means necessary to protect fertilizers, amendments and other materials from moisture and other contaminants which may adversely affect their efficacy.

1.07 JOB CONDITIONS

- A. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate as required. Maintain grade stakes set

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

by others until removal is mutually agreed upon by all parties concerned.

- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before spreading topsoil.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Topsoil

1. Topsoil stockpiled from on-site stripping may be utilized if in compliance with the requirements for new topsoil.
2. All topsoil that was stripped and stockpiled shall be screened to a maximum stone size of 1/2 in.
3. The existing topsoil was tested and the results of this test are included at the end of this section. The contractor is responsible for modifying the existing topsoil as required to meet the specification for new topsoil.

A. New Topsoil

1. New Topsoil: Shall be natural, fertile loam typical of cultivated topsoils of the locality, containing not less than 3.5% or more than 8% by weight, of decayed organic matter (humus) as determined by ASTM F-1647. If organic amendments are needed to obtain the specified matter content of the topsoil, the organic matter source may be a peat or compost material. The peat shall be Canadian sphagnum peat having an ash content not exceeding 15% as determined by ASTM D-2974. Compost may be used, provided that the material has been composted in an in-vessel system, and has an ash content not exceeding 40%.
2. Topsoil shall be taken from a well-drained, arable site, free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris.
3. Topsoil shall be free of Quack-grass rhizomes, *Agropyron Repens*, and the nut-like tubers of Nutgrass, *Cyperus Esculentus*, and all other primary noxious weeds
4. Topsoil shall have a pH not less than 6.0 or greater than 7.0
5. Topsoil shall not be delivered or used while in a frozen or muddy condition

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

6. Topsoil shall conform to the following particle size distribution, as determined by pipette method in compliance with ASTM F-1632

Sand	40-60%
Silt	30-40%
Clay	5-20%

7. If determined by a soil test the existing topsoil that was stripped does not meet these specifications, the topsoil shall be amended to provide an acceptable topsoil for use.

B. Soil Analyses

1. The Contractor shall submit representative samples of topsoil he intends to bring onto the site, and samples of topsoil that was stockpiled from on-site stripping, to a Soil Plant Testing Laboratory acceptable to the Landscape Architect. All reports shall be sent to the Landscape Architect for approval. The cost for testing and analysis of the soils shall be borne by the Contractor.
2. Samples of topsoil to be brought to the site must be approved prior to delivery. Deficiencies in the topsoil shall be corrected by the Contractor.
3. Testing reports shall include the following tests and recommendations.
 - a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.
 - b. The silt and clay content shall be determined by a Pipette Test of soil passing the No. 270 sieve.
 - c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test (ASTM F-1647)
 - d. Tests for gradation and organics shall be performed by a private testing laboratory approved by the Landscape Architect. Tests for soil chemistry and pH may be performed by a public extension service agency
 - e. Chemical analysis shall be undertaken for Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).
 - f. Soil analysis tests shall include recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular objectives noted.
 - g. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

C. Soil Amendment (Washed Screened Sand)

1. Washed screened sand for use as a soil amendment to improve drainage properties and to reduce compaction of existing stripped topsoil or new topsoil, shall meet the following mechanical analysis.

<u>Sieve Size</u>	<u>% Passing by Weight</u>
4 in.	100
No.4	93
No. 8	83
No. 16	71
No. 30	49
No. 50	18
No. 100	2
No. 2000	2

D. Lime

4. Lime shall be an approved agricultural limestone containing no less than fifty (50%) percent of total carbonates and twenty five (25%) percent total magnesium with a neutralizing value of at least one hundred (100%) percent
5. The material shall be ground to such a fineness that forty (40%) percent will pass through a Number 100 U.S. Standard Sieve, and ninety eight (98%) percent will pass through a Number 20 U.S. Standard Sieve.
6. The lime shall be uniform in composition, dry and free flowing and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis.
7. Any lime which becomes caked or otherwise damaged making it unsuitable for use, will be rejected.

E. Fertilizer:

1. Shall be determined based on soil test conducted by an approved soil testing laboratory.

F. Water

1. Water shall be supplied by the Owner unless otherwise specified.
2. General Lawn Areas:



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

- a. The Contractor is responsible for providing all equipment, hoses, etc. for watering throughout the project and until final acceptance of lawn and turf areas by the Landscape Architect.

G. Herbicides, Pesticides And Fungicides

- 1. Herbicides, pesticides, and fungicides may be used subject to the approval of the Landscape Architect, and handled by State Licensed operators only.

H. Seed

- 1. Grass seed shall be clean, new crop seed, composed of a mixture of varieties, mixed in proportion by weight and tested for minimum percentages of purity and germination. Submit proposed mixture to the Landscape Architect for approval.

- a. General Lawn Area Mix:

- 1) Perennial Ryegrass 40%
- 2) Chewings Fescue 30%
- 3) Kentucky Bluegrass 30%

I. Hydroseed mix

- 1. All work will be carried out by an approved spraying machine specifically used for this work. Amounts of fertilizer used shall reflect recommendations outlined in the Soil Analysis, see Section 2.01 C. The Contractor shall submit to the Landscape Architect for approval, prior to the start of work, a certified statement as to number of pounds of fertilizer, amounts and types of grass seed, and processed fiber, per one hundred (100) gallons of water.
- 2. Hydromulch: Shall be Terra-Sorb GB, or an approved equal. Add Terra-Sorb to the hydroseed tank at the amount of 60 pounds per acre.

J. Sod

- 1. Sod shall be a blend of at least three Kentucky bluegrass cultivars in approximately equal proportions. At least 70% of the sod blend shall be at least two of the following varieties: Arcadia, Award, Brilliant, Showcase,

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

America, Connie, Limousine, Rambo, Unique, Apollo, Advocate, Midnight, Total Eclipse, P-105, Odyssey, Blackburg, Blackstone, and Moonlight. Any variety substitutions or deviations from these specifications must be approved by the Owner's Representative.

2. Sod shall be good quality, free of weeds, disease and insects, and of good color and density. Sod shall be machine cut at a uniform soil thickness necessary for plant viability during the harvest-transport-installation cycle. Individual pieces of sod shall be cut to the suppliers' standard width and length. Maximum allowable deviation from standard widths and lengths shall be five (5%) percent. Standard size sections of sod shall be strong enough to support their own weight, and retain their size and shape when suspended vertically from a firm grasp on the upper ten (10%) percent of the section.
3. The sod shall be as grown by Tuckahoe Turf Farms, Inc., Slocum, RI, (800)-556-6985; Kingston Turf Farms, Inc. Kingston, RI, (401) 789-0630; Gold Star Sod Farms, Inc., Canterbury, NH (800) 648-8873; or other approved source.
4. Sod shall be machine cut at a uniform soil thickness of 3/4 in. plus or minus 1/4 in. at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be five (5%) percent. Broken pads and torn or uneven ends will not be acceptable. Sod shall be at least one (1) year old from time of original seeding
5. Sod shall be furnished and installed in rectangular sod strips measuring 12 in. or 16 in. in width and min. 4 ft. in length, stored in rolls with the grass top side inverted so that the topsoil is to the exterior.
6. Stakes: Stakes for pegging the sod shall be sound hardwood approximately one inch by two inches (1"x 2") and of sufficient length to penetrate the mat, the seed bed and to a minimum depth of two (2") inches of subsoil. Stakes shall be free from insects and fungi and capable of remaining in the ground at least two (2) years.

K. Mulch

1. Mulch shall meet the material requirements for cellulose fiber mulch in accordance with section 717.04 of the Maine DOT Standard Specifications.

PART 3 - EXECUTION

3.01 PREPARATION OF SUBSOIL



Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

- A. Prior to spreading topsoil, subsoil should be rough graded to correspond with finish grades as indicated on the Drawings. Subgrade shall slope to allow for subsurface drainage. Depressions shall be filled, and areas which are highly compacted shall be loosened to a depth which is adequate for the passage of gravitational water through the subsoil.
- B. After acceptance of subsoil grades, loosen and mix subgrade material two inches to four inches (2"-4") deep. Remove stones over two (2") inches, sticks, rubbish, and other deleterious materials which may impede the healthy and vigorous growth of grass. Move no heavy objects or machinery, except as necessary for the spreading of topsoil, over sod and seed beds after preparation of subgrade.
- C. Subsoil which becomes compacted due to excessive construction activity, shall be loosened as directed by the Landscape Architect at no additional cost to the Awarding Authority.

3.02 SPREADING OF TOPSOIL

- A. Immediately after approval of subgrade, evenly spread and lightly compact approved topsoil to finish grades as indicated on the Drawings. Do not spread topsoil which is in a muddy or frozen condition. Handle no topsoil when dry or above the plastic limit. Install a minimum of twelve (12") inches of topsoil to lawn areas unless otherwise indicated on the Drawings.
- B. When possible, spreading of topsoil shall be performed from the center of the lawn area to the perimeter. Contractor may use alternate spreading pattern as approved in writing by the Landscape Architect.
- C. Caution should be exercised to minimize or eliminate travel over areas previously covered with topsoil. Topsoil which becomes compacted due to excessive construction activity, shall be stripped and re-spread, or loosened as directed by the Landscape Architect at no additional cost to the Awarding Authority.

3.03 SEED/SOD BED PREPARATION

- A. The minimum depth of topsoil in all seeded areas shall be twelve (12") inches. Contractor is responsible for supplying all topsoil needed from off-site sources if stockpiles are inadequate.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

- B. Grade all lawn areas to finish grades as indicated on the Drawings. When no grades are shown, areas shall have a smooth and continuous grade between existing or fixed controls and elevations shown on plans. Roll, scarify, rake and level as necessary to obtain true even lawn surfaces. All lawn areas shall slope to drain. Finish grades shall be approved by the Landscape Architect prior to commencing any seeding work. Install soil additive per manufacturer's instructions and as indicated on the Drawings.
- C. Place soil amendment in the areas of the lawn areas as shown on the Drawings. Follow the manufacturer's recommendations for installation.
- D. Spreading Limestone: Spread ground limestone evenly over the topsoiled surface. Incorporate limestone within the top two (2") inches of soil prior to finish raking. Apply limestone at the rate recommended by the testing and analysis agency.

3.04 SEEDING

- A. Schedule for Seeding: Sow grass seed between April 1 and May 31 or August 15 and October 1, except as otherwise approved in writing by the Landscape Architect.
- B. If seeding out of season as described above, the Contractor is still obligated by all conditions and responsibilities described under 3.07 LAWN MAINTENANCE, until final acceptance of all lawn areas.
- C. Before seed is sown, scarify soil and rake until surface is smooth, friable, and of uniformly fine texture. Seed evenly at supplier's recommended rates, lightly rake and water with fine spray. It is his or her responsibility to establish a smooth, uniform turf composed of approved grasses. Do not use wet seed which is moldy or otherwise damaged in transit or storage.
- D. Mulch bank areas with 3 to 1 slope or greater with straw mulch, 1-1/2 to 2 tons per acre. Secure mulch at Contractor's discretion as to method or need. Wood fiber mulch may be substituted at rate of 1,400 pounds per acre at same time as seed and fertilizer.

3.05 MULCHING

- A. Mulch shall be applied to all seeded areas immediately after seeding operations in accordance with section 619 of the Maine DOT Standard Specifications.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

3.06 SODDING

- A. Sod may be placed from April 15th to November 1st as long as the ground is not frozen
- B. Sod shall be harvested, delivered and transplanted within a period of twenty four (24) hours. Soil on sod pads shall be kept moist at all times.
- C. Immediately prior to sodding operations, the sod bed shall be lightly scratched with a fine toothed harrow or hand rake to provide a slightly roughened surface to accept the sodding application.
- D. The sod bed shall be reasonably moist and shall be watered, if necessary. The sod shall be laid smoothly, edge to edge with a maximum joint tolerance of 1/16". Vertical joints shall be staggered.
- E. Sod shall be watered during and immediately after installation to prevent drying. It shall then be thoroughly irrigated to a depth sufficient that the underside of the new sod pad, and topsoil immediately below the pad, are thoroughly wet.
- F. After sodding, the sodded area shall be rolled with an approved lawn roller weighing not more than 65 pounds per foot of width.

3.07 FERTILIZING

- A. Contractor to have the topsoil tested for soil fertility by an approved soil testing laboratory, and a complete fertilization program will be recommended by the testing laboratory and Landscape Architect for the installation maintenance period.

3.08 LAWN MAINTENANCE

- A. Maintenance of the grass areas shall begin immediately, and generally consist of watering, weeding, mowing and edging, reseeding, disease and insect pest control, repair of all erosion, and any other procedure consistent with good horticultural practice, necessary to insure normal, vigorous and healthy growth.
- B. Maintenance shall also include filling, regrading, and reseeding as necessary to correct depressions caused by settling, subsidence, or other physical or mechanical damage.
- C. Maintenance shall also include all temporary protection fences, barriers, signs and all

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

other work incidental to proper maintenance.

- D. The Contractor shall be responsible for maintenance to establish a uniform stand of the approved grasses until acceptance. After the grass has started, all areas and parts of areas showing poor germination or growth shall be re-seeded, repeatedly, until all areas are covered with a satisfactory growth of grass. At the time of the first cutting, mow lawn with sharp mowing units not less than two and one half (2-1/2") inches high. Lawn shall be maintained between two and one half inches to three and one half inches (2-1/2"-3-1/2") high. Do not remove more than one third (1/3) of the grass blade. All lawns shall receive a minimum of three mowings before Contractor's request for inspection and acceptance. Additional mowings may be required before acceptance.
- E. Watering: The Contractor shall include cost for daily, and if necessary, continuous watering of all grass areas during a normal 8 hour working day. The seed bed shall be maintained in a continuous moist condition, satisfactory for good germination and growth of grass, as specified. Seeded grass areas must be kept in a moist condition until acceptance.
- F. Full and complete written instructions for maintenance of the lawn areas are to be furnished to the Awarding Authority, by the Contractor at least ten (10) days prior to the end of the contractual maintenance period, to familiarize him with the maintenance requirements for proper care and development of the lawns.

3.09 INSPECTION AND ACCEPTANCE

- A. The Landscape Architect shall inspect the lawns upon written request by the Contractor. The request shall be received at least ten (10) days before the anticipated date of inspection.
- B. Final acceptance will not be granted until all seeded areas are in satisfactory condition
- C. If the grass is in satisfactory condition, the Contractor's care and maintenance responsibilities will end. If the grass stand is unsatisfactory, the Contractor's maintenance responsibility shall continue, including a normal program of mowing, irrigation, reseeded, fertilization and repair until an acceptable stand of grass is achieved.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

3.10 CLEAN UP

- A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the Landscape Architect, at no cost to the Awarding Authority.

3.11 METHOD OF MEASUREMENT

Topsoil will be measured by the cubic yard complete in place after finishing to the required depths as shown on the plans or directed. Lateral measurements will be parallel with the slope of the ground. Removal of existing topsoil salvaged from within the lines of improvement will be measured for payment in accordance with Section 203. The depth of the salvaged topsoil to be included for payment as on-site topsoil shall be the depth authorized in its final position. Topsoil obtained from off-site sources shall be measured in its final position to the depth authorized. NOTE: All on-site sources shall be exhausted prior to obtaining topsoil from off-site.

The Engineer will measure Seeding and Mulching for payment by the area of seeded and mulched surface in Units of 1000 square feet (MSF) along the slope of the ground.

3.12 BASIS OF PAYMENT

The Engineer will pay for the accepted quantities of seeding and mulching at the Contract price per Unit for the method specified, which price shall be full compensation for furnishing and spreading seed, limestone, fertilizer, mulch and inoculant. The price shall also include any reseeding, watering, and maintenance necessary to meet the requirements of Section 3.08 and 3.09, Maintenance and Acceptance.

When seeding is completed, amounts due for these items will be payable.

The accepted quantities of topsoil will be paid for at the contract unit price per cubic yard complete in place.

Payment for topsoil obtained from on-site sources shall include screening, hauling, testing, adding soil amendments, placing and all other items and labor necessary to complete the item to the satisfaction of the Engineer.

Payment for topsoil obtained from off-site sources shall include locating sufficient quantities from off-site sources, hauling, testing, placing, and all other items and labor necessary to complete the item to the satisfaction of the Engineer.

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
329200.1 Topsoil, Obtained from On-Site Sources	Cubic Yard
329200.2 Topsoil, Obtained from Off-Site Sources	Cubic Yard
329200.3 Seeding and Mulching	MSF

END OF SECTION

Construction Contract 'A'
East Campus Infrastructure Improvements

Section 32 92 00

Turf and Grasses

(This page intentionally left blank)