ADDENDUM #1:

RFP #58A-14

Construction Management Services for the African Burying Ground Memorial Park

April 21, 2014

This Addendum forms part of the original request for proposals document marked: **RFP 58A-14, Construction Management Services for the African Burying Ground Memorial Park**

General Clarifications & Answers to Questions Received:

A. Proposal Process: By way of reminder to pre-qualified firms preparing a response to this RFP: This is a request for proposal process. The City is requesting firms to submit proposals for Construction Services for the African Burying Ground Memorial Park. This unique project involves significant attention to detail and coordination with the City and its partners. This process is intended to identify the most qualified firm who can complete the project work in coordination with multiple partners. The final scope for the pre-construction services and construction services will be negotiated with the first-ranked firm. Pre-construction services are identified in the RFP's scope of work section and, unlike other typical construction management projects, do not include significant re-working of project plans but enhanced coordination for project implementation prior to construction and working to develop a project schedule sensitive to project needs.

B. Project Budget: Proposers are reminded that a budget summary was described and clarified in the information session prior to the pre-proposal. For clarification, more information about what is included in the budget figure follows.

   The estimated construction cost is $1.2 million. The figure includes costs associated with the construction services in this RFP (all work described in the Scope of Service, with the exception of the pre-construction services). The overall figure includes the project artwork as well as consulting services for the project archaeologist and construction clerk. It does not include any funding associated with the 3-year maintenance agreement.

C. Decorative Fence Question: In response to the question from the pre-proposal meeting, we have reviewed the detail related to the decorative fence and determined details related to its connection can be addressed as part of shop

drawings and have confirmed any cost differential would be negligible. The fence will be painted. See specifications.

D. Staging Area: The City of Portsmouth will provide on street or off street staging near the project site. In addition, the City will assist in coordinating an additional off-site staging area if required, further from the project construction.

E. Traffic-induced cleaning post construction: This will not be included as an item in the construction services contract.

F. Maintenance Agreement: To clarify and emphasize, the maintenance agreement is not meant to cover defective work. Defective work is addressed in the Measurement & Payment section of the Project Specifications. Changes to the Maintenance Agreement portion of the RFP are discussed below. In summary, the City anticipates negotiating a final maintenance agreement with the selected firm, however the cost will not be considered as part of the "Lump Sum" in the cost proposal.

G. Brick Sidewalk Question: Court Street sidewalk does have asphalt under it. Walks within the memorial area do not. The Detail 5/L-11 is called out near #97 as similar is a raised curb, but the paving is on flexible base without asphalt at this location.

H. Performance Bonds & Labor and Materials Payment Bonds: The RFP includes a draft contract form which references Performance Bonds and Labor and Materials Payment Bonds. The Performance Bond shall be in an amount equal to 100% of the construction cost. The Labor & Materials Payment Bonds shall, in the sum, equal to 100 percent of the construction cost.

Please make changes to the Request for Proposals document 58A-14, as follows:

1. On page 1 of the RFP document, replace "Construction Management Services" with "Construction Services"

2. On page 1 of the RFP, under "Invitation to Submit Proposal" change the date in the last sentence from "2:00 p.m. on Thursday, May 1, 2014 to Thursday, May 8, 2014". This same change should be made in the fifth bullet of the "Proposal Package" section on page 3.

As a result of this change, proposals submitted in response to this RFP will be accepted until 2:00 p.m. on Thursday May 8, 2014.

2. On page 4, under *Submittal Format for Proposals* #6, change "schedule" to "timeline".

In response to the question at the pre-proposal meeting, it was clarified that the City is looking for a timeline for construction in days, weeks and months as opposed to a "schedule" with actual dates. We are looking to learn from proposers, what a reasonable construction timeline for this project is and, thereby, help inform the construction start date, etc.

3. Substitute the *Attachment A, Cost Proposal Form* with ***Attachment A, Cost Proposal Form – Addenda #1*** included in this addendum. See ***Attachment A, Cost Proposal Form – Addenda #1*** **(attached).**

> This new Attachment A, removes Part 3 Maintenance Cost Proposal from the Lump Sum and removes other language. Contractors are still required to submittal a proposal including cost proposal for a 3-year period as described in the attachment.

4. Substitute *Attachment D, Project Specifications* in the RFP for ***Attachment D, Project Specifications – Addenda #1*** included in this addendum. See *Attachment D, Project Specifications – Addenda #1* (attached). Included in this addendum, is a guide to the changes that have been made. In the document itself, the changes are highlighted or otherwise indicated.

5. Substitute *Attachment E, Project Plan Set* in the RFP for ***Attachment E, Project Plan Set – Addenda #1*****.** See ***Attachment E, Project Plan Set – Addenda #1*** **(attached).**

<u>For convenience of the firms proposing, a "clean" version of the RFP with all changes will be available on the ftp site and will be labeled clearly as such.</u>

All else remains unchanged from original RFP document.

Please acknowledge receipt of this addendum within your proposal, failure to do so may subject proposer to disqualification.

Any additional questions, shall be submitted in writing no later than April 24th at 4:30 p.m. to Community Development Director David Moore at dmoore@cityofportsmouth.com. Any additional addenda, if required, will be issued directly to proposers.

End of Addendum #1

Guide to Changes in
Attachment D, Project Specifications *Technical Specifications*
and Attachment E, Project Plan Set

SPECIFICATIONS

NOTE: ALL CHANGES TO SPECIFICATIONS HAVE BEEN HIGHLIGHTED AND REMOVALS HAVE BEEN STRUCKTHROUGH IN SPECIFICATION SECTION

SECTION		PAGE	PARAGRAPH	CHANGE
02330	SITE PREP	1	1.1 SUMMARY	REMOVE " and with the oversight and direction of the Project Archaeologist."
02331	TREE PROTECTION			NO CHANGES
02300	EARTHWORK	1	1.1 SUMMARY	REMOVE " and with the oversight and direction of the Project Archaeologist."
		2	D. 1.	REMOVE "as directed by Landscape Architect"
02310	BACKFILL AND COMPACTION			NO CHANGES
02540	TEMPORARY EROSION CONTROL	1	1.1 A.	ADD 10. Provide 3 oz. non woven geotextile fabric to cover excavated and all exposed subgrade areas daily at the end of the construction day to provide added erosion control and protection.
02628	GEOCOMPOSITE UNDERSLAB DRAINAGE			NO CHANGES
02630	STORM DRAINAGE			NO CHANGES
02710	CURBING			NO CHANGES
02741	ASPHALT PAVING	2	2.2 A 1. ASPHALT MATERIALS	CHANGE 1. "Asphalt Binder: NHDOT Type B (3/4”) Mix. " to "Asphalt Binder Mix: NHDOT 3/4" Binder Mix".
			2.2 A 2. ASPHALT MATERIALS	CHANGE 2. "2. Wearing Pavement: NHDOT Type F (1/2”) Mix." to " Wearing Mix: NHDOT Wearing 1/2" Mix".
		3	3.5 A HOT MIX ASPHALT PLACING	REMOVE LINE
02742	DECORATIVE TEXTURED PAVEMENT SURFACES			NO CHANGES
		2	2.1 A BRICK PAVERS	REMOVE "The bricks shall not be cored nor have frogs."
02780	BRICK AND STONE PAVING			NO CHANGES
02822	ORNAMENTAL METAL RAILINGS			NO CHANGES
02930	PLANTING			NO CHANGES
03300	CAST IN PLACE CONCRETE			NO CHANGES
04860	STONE MASONRY			

CITY OF PORTSMOUTH, NH
AFRICAN BURYING GROUND
ADDENDA #1
21-Apr-14
DESCRIPTION OF CHANGES

PLANS

SHEET NUMBER	CHANGE
L-1	WINDOW WELL SHOWN ON DRIVEWAY SIDE OF #115
L-3	PROPOSED PIPE REMOVED FROM PLAN BY #133 EXISTING UTILITY POLE LABELED ON COURT STREET
L-4	WINDOW WELL SHOWN ON DRIVEWAY SIDE OF #115
L-6	WINDOW WELL SHOWN ON DRIVEWAY SIDE OF #115, AND NOTE ADDED TO WINDOW WELL SPOT GRADES ADDED TO TOP OF CURB BELOW RETAINING WALL PVC COLLECTOR PIPE SHOWN
L-8	WINDOW WELL SHOWN ON DRIVEWAY SIDE OF #115
L-10	DETAIL 4 - ADA SURFACE STANDARDS NOTE ADDED
L-12	DETAIL 1.2 - SS FRAM SIZE CORRECTED DETAIL 2 - NOTE ON RAILING FINISH ADDED

ATTACHMENT A

AFRICAN BURYING GROUND MEMORIAL PARK

RFP 58A-14

Cost Proposal Form

This proposal form is organized in three parts. **Part 1** constitutes the Cost Proposal that will be one factor in scoring the proposals received from contractors. **Part 2** is intended as a back-up to the cost proposal form. **Part 3** is a proposal for a three-year maintenance agreement beginning from the date of substantial completion.

This proposal form and back-up information will be used by the City to understand the costs associated with the project for the purposes of assigning costs to specific aspects of the project and to determine where savings might be achieved if certain material donations or other project savings are identified going forward.

This cost proposal should be for all construction services, including preconstruction services.

PART 1

*Lump Sum Cost Proposal (Total from **PART 2**):*	
_____	_____
In words	In numbers

CONTRACTOR:

BY: _____

TITLE: _____

ATTACHMENT A

PART 2

PROPOSAL COST BACK-UP

African Burying Ground - Part 2 - Proposal Cost Back-Up

PLEASE NOTE MANY UNITS HAVE BEEN CHANGED (E.G. SY TO LF, SF TO TON)

PLEASE NOTE SOME ITEMS HAVE BEEN REMOVED

DIVISION 2 **SITE CONSTRUCTION**

Section #	Section Name	Item #	Item/Botanical Name	Description/Common Name	**Quantity**	Unit/Size	**Unit Cost**	**Total Cost**
02230	Site Preparation	1	Utilities	Coordinate utilites removal with City		lump sum		
		2	Curb	Remove existing granite curb and salvage		LF		
		3	Brick	Remove existing brick and salvage		SY		
		4	Concrete walk sections	Remove existing concrete walk sections and dispose off-site		SY		
		5	Asphalt	Saw cut Pavement as required		LF		
		6	Asphalt	Strip and dispose off-site		SY		
02231	Tree Protection & Trimming	7	Protection Fence	Erect fence to protect trees to remain		each tree		
		8	Tree Pruning	Prune trees as needed		lump sum		
02300	Earthwork	9	Regrading	work		day		
		10	Base	Gravel		CY		
02310	Backfill and Compaction	11	Backfilling trenches and around structures	work		CY		
		12	compaction	work		lump sum		
		13	soil testing	work		lump sum		
02540	Temporary Erosion Control	14	Erosion control	work and materials		lump sum		
02628	Geocomposite underslab Drainage	15	Drainage mat	J drain 302		SF		
02630	Storm Drainage	16	Pipe	4" HDPE perforated pipe and fittings with encasement		LF		
		17	Pipe	12" HDPE pipe and fittings with encasement		LF		
		18	Structures	Catch Basin		each		
		19		Drop Inlet		each		
02710	Curbing	20	Reset Existing Granite Curb	Remove, clean and Reset section(s) of granite curbing as required		LF		
		21	New Granite Curb	Curbing 5" - straight		LF		
		22		Curbing 5" - curved		LF		
02741	Asphalt Paving	23	Asphalt	3" base		TON		
		24	Asphalt	Surface course		TON		
02742	Decorative Textured Pavement	25	Decorative Stone Surface Treatment of Roadway	Surfacing and work		SF		
		26	Cold planing			SF		
		27	Crosswalk Striping	Imprint		SF		
02780	Brick and Stone Paving	28	Bluestone	Irregular		SF		
		29	Brick Sidewalk	Morin brick paver		SF		
		30	Petition Line	Granite ribbon paver engraved with verbage to be determined		LF		
		31		Engraving		lump sum		
		32	Vault ring	granite border		LF		
02822	Ornamental Metal Railings	33	Decorative Railing	Stainless Steel Tubing and hardware; painted		lump sum		
02930	Planting	34	Soil	Loam		CY		
		35	Planting bed preparation	Compost, other soil additives		CY		
		36	mulch	black hardwood mulch as specified		CY		
		37	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust		5-6" cal		
		38	*Ilex glabra 'Shamrock'*	Shamrock Inkberry		5 gal		
		39	*Vinca minor 'Bowles'*	Bowles Periwinkle		2.5" Pots		
		40	*Narcissus 'Fragrant Breeze'*	Fragrant Breeze Daffodil		top size		
		41	*Narcissus 'Passionale'*	Passionale Daffodil		top size		
		42	*Narcissus 'King Alfred'*	King Alfred Daffodil		top size		
		43	*Hemerocallis 'Big Time Happy'*	Big Time Happy Daylily		1 gal		
		44	*Hemerocallis 'Barbara Mitchell'*	Barbara Mitchell Daylily		1 gal		
		45	*Hemerocallis 'Jovial'*	Jovial Daylily		1 gal		
		46	*Hemerocallis 'Pink Apricot Serenade'*	Pink Apricot Serenade Daylily		1 gal		

Division 2 Subtotal _____

DIVISION 3 **CONCRETE**

Section #	Section Name	Item #	Item	Description	Quantity	Unit/Size	Unit Cost Installed	Total Cost Installed
03300	Cast-in-place Concrete	47	Vault	Concrete Vault Structure	1	each		
		48	sculpture base			lump sum		

Division 3 Subtotal _____

DIVISION 4 **STONE MASONRY**

Section #	Section Name	Item #	Item	Description	Quantity	Unit/Size	Unit Cost	Total Cost
04860	Masonry	49	Curbing 24" -Custom Cut	Woodbury Granite block curbing 24" wide x 10" deep		LF		
		50	Vault Decoration	Wausau Red Granite collar		lump sum		
		51		Bluestone Facia		SF		
		52	Truncated Dome Paver	Granite		each		
		53	Sculpture Bases	Wausau Red Granite		lump sum		
		54	Retaining wall	Woodbury Granite block retaining wall		LF		
		55	Retaining wall	Engraving		LS		
		56	Bench	Solid Woodbury Granite Block Bench of Remembrance		lump sum		
		57	Seat Walls	Woodbury Granite Block Seat walls		LF		
		58	Sculpture installation			lump sum		

Division 4 Subtotal: _____

DIVISION 16 **ELECTRICAL**

Section #	Section Name	Item #	Item	Description	Quantity	Unit/Size	Unit Cost	Total Cost
16521		54	Light Fixtures			each		
		55	transformers			each		
		56	Pull box(es)			each		
		57	Conduit			LF		
		58	Electrical Work	Tie into exisitng circuits, fusing, and permits		lump sum		

Division 16 Subtotal: _____

MISCELLANEOUS

Section #	Section Name	Item #	Item	Description	Quantity	Unit/Size	Unit Cost	Total Cost
		59	General Conditions			lump sum		
		60	Mobilization			lump sum		
		61	Pre-construction Services			lump sum		
		62	All Project Incidentals	Referenced in Project Specs.		lump sum		
		63	Flaggers	Flaggers		Hour		
		64	Insurance	see contract for amounts		lump sum		
		65	Bonds	see contract for amounts		lump sum		
							Miscellaneous Subtotal:	
							TOTAL	
							GRAND TOTAL	
		Unit Prices Not Included in Lump Sum						
		62	Project Delay (Archaeological Investigation) - 0-20 mins No Cost	Delay due to on-site monitoring		No cost		
		63	Project Delay (Archaeological Investigation) - 20 mins to 2 hours	Delay due to on-site monitoring		lump sum		
		64	Project Delay (Archaeological Investigation) - 2 hours to end of day	Delay due to on-site monitoring		hour		

ATTACHMENT A

PART 3

Maintenance Agreement Proposal

Attach to this page, a one-page proposal for a three-year maintenance agreement; identify costs or a means of determining cost.

Due to the unique nature of this African Burying Ground site and Memorial Park, the City is exploring alternative methods for ensuring quality workmanship and managing the initial maintenance issues that may arise resulting from the unique design parameters that are part of this project. As part of this effort, the City anticipates including in the contract for this project a three-year agreement for site maintenance. Firms submitting proposals for this project are asked to also submit a proposal, including a price proposal, for on-going maintenance for a three year period.

This agreement is additional work and is separate from the warranty period in paragraph 7 of the Measurement Payment section in the project specifications.

Attachment D

Project Specifications

Addenda #1

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CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

AFRICAN BURYING GROUND MEMORIAL PARK

WE STAND IN HONOR OF THOSE FORGOTTEN

Portsmouth NH
African Burying Ground

City of Portsmouth

State of New Hampshire

John P. Bohenko, City Manager

Prepared by:
Woodburn & Company
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel.: 603.659.5949
Fax: 603.659.5939

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GENERAL REQUIREMENTS

SCOPE OF WORK

1. INTENT OF CONTRACT

The intent of the Contract is to provide for the construction and completion in every detail of the work described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the terms of the Contract. The Contractor shall be required to conform to the intent of the plans and specifications. No extra claims shall be allowed for portions of the work not specifically addressed in the plans and specifications but required to produce a whole and complete project, such work will be considered subsidiary to the bid items.

2. INCIDENTAL WORK

- Incidental work items for which separate payment is not measured includes, but is not limited to, the following items:

a. Clearing, grubbing and stripping (unless otherwise paid for)

b. Site fencing

c. Clean up

d. Plugging existing sewers and manholes

e. Signs

f. Mobilization/Demobilization (unless otherwise paid for)

g. Restoration of property

h. Cooperation with the City, its consultants, other contractors, abutters and utilities.

i. Utility crossings, (unless otherwise paid for)

j. Minor items - such as replacement of fences, guardrails, rock wall, etc.

k. Steel and/or wood sheeting as required.

l. Accessories and fasteners or components required to make items paid for under unit prices or lump sum items complete and functional.

3. ALTERATION OF PLANS OR OF CHARACTER OF WORK

The Owner reserves the right, without notice to Surety, to make such alterations of the plans or of the character of the work as may be necessary or desirable to complete fully and acceptably the proposed construction; provided that such alterations do not increase or decrease the contract cost. Within these cost limits, the alterations authorized in writing by the Owner shall not impair or affect any provisions of the Contract or bond and such increases or decreases of the quantities as a result from these alterations or deletions of certain items, shall not be the basis of claim for loss or for anticipated profits by the contractor. The contractor shall perform the work as altered at the contract unit price or prices.

4. EXTRA WORK ITEMS

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Extra work shall be performed by the Contractor in accordance with the specifications and as directed, and will be paid for at a price as provided in the Contract documents or if such pay items are not applicable than at a price negotiated between the contractor and the Owner or at the unit bid price. If the Owner determines that extra work is to be performed, a change order will be issued.

5. CHANGE ORDERS

The Owner reserves the right to issue a formal change order for any increase, decrease, deletion, or addition of work or any increase in contract time or price. The contractor shall be required to sign the change order and it shall be considered as part of the Contract documents.

6. FINAL CLEANING UP

Before acceptance of the work, the contractor shall remove from the site all machinery, equipment, surplus materials, rubbish, temporary buildings, barricades and signs. All parts of the work shall be left in a neat and presentable condition. On all areas used or occupied by the contractor, regardless of the contract limits, the bidder shall clean-up all sites and storage grounds.

The items prescribed herein will not be paid for separately, but shall be paid for as part of the total contract price.

7. ERRORS AND INCONSISTENCY IN CONTRACT DOCUMENTS

Any provisions in any of the Contract Documents that may be in conflict with the paragraphs in these General Requirements shall be subject to the following order of precedence for interpretation.

1. Standard Specifications for Road & Bridge Construction will govern General Requirements.
2. Technical Specifications will govern Standard Specifications.
3. Plans will govern Technical Specifications, and General Requirements.

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CONTROL OF WORK

1. AUTHORITY OF DIRECTOR OF PUBLIC WORKS

(a) All work shall be done under supervision of the Director of Public Works and to his satisfaction. The Director of Public Works will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work; all questions that may arise as to the interpretation of the plans and specifications; and all questions as to the acceptable fulfillment of the Contract by the Contractor.

(b) The Director of Public Works will have the authority to suspend the work wholly or in part for such periods as he may deem necessary due to the failure of the Contractor to correct conditions unsafe for workers or the general public; for failure to carry out provisions of the Contract; for failure to carry out orders; for conditions considered unsuitable for the prosecution of the work, including unfit weather; or for any other condition or reason deemed to be in the public interest. The Contractor shall not be entitled any additional payments arising out of any such suspensions.

(c) The Owner reserves the right to demand a certificate of compliance for a material or product used on the project. When the certificate of compliance is determined to be unacceptable to the Director of Public Works the Contractor may be required to provide engineering and testing services to guarantee that the material or product is suitable for use in the project, at its expense (see Sample of Certificate of Compliance).

2. PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPES

(a) The Contractor shall use every precaution to prevent injury or damage to wires, poles, or other property of public utilities; trees, shrubbery, crops, and fences along and adjacent to the right-of-way, all underground structures such as pipes and conduits, within or outside of the right-of-way; and the Contractor shall protect and carefully preserve all property marks until an authorized agent has witnessed or otherwise referenced their location.

(b) The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted.

(c) When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or as a result of the failure to perform work by the Contractor, the Contractor shall restore, at its own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing rebuilding, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

(d) The Contractor shall replace damaged trees if so determined by the Tree Warden, in his or her sole discretion.

(e) If the Contractor fails to repair, rebuild or otherwise restore such property as may be deemed necessary, the Owner, after 48 hours notice, may proceed to do so, and the cost thereof may be deducted from any money due or which may become due the Contractor under the contract.

(f) It is the intent of the Parties that the Contractor preserve, to as great an extent as possible, the natural features of the site.

3. MAINTENANCE DURING CONSTRUCTION

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The Contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and workers to ensure that the structure is kept in satisfactory conditions at all times.

4. SAFETY PRECAUTIONS

Upon commencement of work, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions necessary to ensure the safety of employees on the site, other persons who may be affected thereby, including the public, and other property at the site or adjacent thereto.

5. PERMITS

It will be the responsibility of the Contractor to obtain all permits required for the operation of equipment in, or on, all city streets and public ways.

6. BARRICADES, WARNING SIGNS AND TRAFFIC OFFICERS

a) The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Roadway closed to traffic shall be protected by effective barricades. Obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided to control and direct traffic in a proper manner, as approved by the engineer.

b) The Contractor will be held responsible for all damage to the work from traffic, pedestrians, and animals or any other cause due to lack of adequate controlling devices.

c) The Contractor shall provide such police officers as the Director of Public Works deems necessary for the direction and control of traffic within the site of project.

d) The work prescribed herein will not be paid for separately but will be paid for as part of the Contract Price unless specifically appearing as a bid item.

7. PROJECT ARCHAEOLOGY:

In order to comply with the provisions of NH State Law, coordination is required between the City, Contractor, Project Archaeologist (PA) and State Archaeologist. As a known burial site of human remains, the proposed work calls for excavation and removal of surface materials and selected digging below the surface materials. Sensitive areas that will require coordination during the project work include:

General Site Demolition - Westerly Side of Chestnut Street.
Curbing
Concrete
Pavement
Brick Pavers

Excavation Below Surface Subgrade:
Entry Sculpture at State Street
Drop Inlet
Sewer Manhole Grade Adjustments
Utility Pole
Catch Basin
12” Drainage Pipe

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Parking Meters

The City, PA and State Archaeologist shall establish protocols and contingencies to facilitate construction of the memorial, minimize delays and fulfill the requirements of NH law as they pertain to discovery of human remains.

If there is an unanticipated discovery of human remains or delays related to assessing excavated materials, there are provisions in the contract for various events. These allowances are noted in the Measurement and Payment and the Bid Form under Incidental Delay (0 to 20 min: No Charge), Minor Delay (20 min. to 2 hr: Lump Sum) and Major Delay (2 hr. to Close of Work: Hourly). The Contractor is expected to make all possible schedule adjustments in order to mitigate delay costs.

Through previous excavation cobblestones are known to exist below pavement and shall remain in place. A demolished fire house is mapped in Chestnut adjacent to #388/390 State.

To help protect the site and for erosion and sediment control purposes, the excavated and prepped areas on Chestnut shall be covered by temporary 3 oz nonwoven geotextile. This issue is addressed in the section on temporary erosion control.

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TEMPORARY FACILITIES

1. STORAGE FACILITIES

a. The Contractor shall not store materials or equipment in a public right-of-way beyond the needs of one working day.

b. The Contractor shall protect all stored materials from damage by weather or accident and shall insure adequate drainage at and about the storage location.

c. Prior to final acceptance of the work all temporary storage facilities and surplus stored materials shall be removed from the site.

2. SANITARY FACILITIES

a. The Contractor shall provide for toilet facilities for the use of the workers employed on the work.

b. Temporary toilet facilities may be installed provided that the installation and maintenance conform with all State and local laws, codes, regulations and ordinances governing such work. They shall be properly lit and ventilated, and shall be kept clean at all times.

c. (c) Prior to final acceptance of the work all temporary toilet facilities shall be removed from the site.

3. TEMPORARY WATER

The Contractor shall make all arrangements with the local water department for obtaining water connections to provide the water necessary for construction operations and shall pay all costs.

4. TEMPORARY ELECTRICITY

The Contractor shall make all arrangements with the Public Service of New Hampshire (PSNH) for obtaining electrical connections to provide the electrical power necessary for construction operations and security lighting and shall pay all electrical connection and power costs.

The Contractor shall be responsible with obtaining an electrical permit from the City Electrical Inspector.

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MEASUREMENT AND PAYMENT

1. MEASUREMENT OF QUANTITIES

a. All work completed under the contract will be measured according to the United States standard measure.

b. The methods of measurement and computations shall conform to US customary measure. Quantities of materials furnished and work performed under the contract shall be measured as complete in place.

c. Unless otherwise specified, longitudinal measurements for area computations will be made horizontally. Unless otherwise specified, transverse measurements for area computations will be the dimensions shown on the plans or ordered in writing.

d. Structures will be measured according to lines shown on the plans or as ordered unless otherwise provided for elsewhere in the specifications.

e. In computing volumes of excavation, embankment, and borrow, the average end area method will be used. Where it is impracticable to measure by the cross-section method, acceptable methods involving three-dimensional measurement may be used.

f. In computing volumes of concrete, stone and masonry, the prismoidal method will be used. The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois.

g. Except as specified below, all materials that are measured or proportioned by weight shall be weighed on scales which the Contractor has had sealed by the State or by a repairman registered by the Commissioner of Agriculture. All weighing shall be performed in a manner prescribed under the Rules and Regulations of the Bureau of Weights and Measures of the New Hampshire Department of Agriculture.

h. Weighing of materials on scales located outside New Hampshire will be permitted for materials produced or stored outside the state, when requested by the Contractor and approved. Out-of-state weighing in order to be approved, must be performed by a licensed public weigh master or a person of equal authority in the state concerned on scales accepted in the concerned state.

i. Each truck used to haul material being paid for by weight shall bear a plainly legible identification mark, and if required, shall be weighed empty daily at such times as directed.

j. When material is weighed, the individual weight slips, which shall be furnished by the Contractor, for trucks, trailers, or distributors, shall show the following information: the date; the project; the material or commodity; the dealer or vendor; the Contractor or Subcontractor; the location of the scales; the vehicle registration number or other approved legible identification mark; the tare and net weights, with gross weights when applicable; and the weigher's signature or his signed initials.

k. The right is reserved to weight any truck, trailer, or distributor, at locations designated, before and after making deliveries to the project.

l. Bituminous materials will be measured by the gallon or ton.

m. The term "lump sum" when used as an item of payment will mean complete payment for the work described in the item.

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Deleted: to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice. Unless otherwise stated all quantities measured for payment shall be computed or adjusted for "in place" conditions.

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Deleted: When measurement of borrow in vehicles is permitted, the quantity will be determined as 80 percent of the loose volume.

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n. When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories, so as to provide the item complete and functional. Except as may be otherwise provided, partial payments for lump sum items will be made approximately in proportion to the amount of the work completed on those items.

o. Material wasted without authority will not be included in the final estimate.

2. SCOPE OF PAYMENT

a. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract in a complete and acceptable manner and for all risk, loss, damage or expense of whatever character arising out of the nature of the work or the prosecution thereof.

b. The Contractor shall be liable to the Owner for failure to repair, correct, renew or replace, at his own expense, all damage due or attributable to defects or imperfections in the construction which defects or imperfections may be discovered before or at the time of the final inspection and acceptance of the work.

c. No monies, payable under the contract or any part thereof, except the first estimate, shall become due or payable if the Owner so elects, until the Contractor shall satisfy the Owner that the Contractor has fully settled or paid all labor performed or furnished for all equipment hired, including trucks, for all materials used, and for fuels, lubricants, power tools, hardware and supplies purchased by the Contractor and used in carrying out said contract and for labor and parts furnished upon the order of said Contractor for the repair of equipment used in carrying out said contract; and the Owner, if he so elects, may pay any and all such bills, in whole or in part, and deduct the amount of amounts so paid from any partial or final estimate, excepting the first estimate.

3. COMPENSATION FOR ALTERED QUANTITIES

a. Except as provided for under the particular contract item, when the accepted quantities of work vary from the quantities in the bid schedule the Contractor shall accept as payment in full, so far as contract items are concerned, at the original contract unit prices for the accepted quantities of work done. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense on the part of the Bidder and subsequent loss of expected reimbursements therefore or from any other cause.

b. Extra work performed will be paid for at the contract bid prices or at the price negotiated between the Owner and the Contractor if the item was not bid upon. If no agreement can be negotiated, the Contractor will accept as payment for extra work, cost plus 15% (overhead and profit). Costs shall be substantiated by invoices and certified payroll.

4. PARTIAL PAYMENTS

Partial payments will be made on a monthly basis during the contract period. From the total amount ascertained as payable on each monthly invoice, retainage will be held according to the following schedule:

- Ten percent (10%) retainage for work completed and billed from the commencement of the project until 50% complete; and

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- Five percent (5%) retainage for work completed and billed from 50% complete to Final Acceptance.

5. FINAL ACCEPTANCE

Upon due notice from the Contractor of presumptive completion of the entire project, the Director of Public Works will make an inspection. If all construction provided for and contemplated by the contract is found complete to his satisfaction, this inspection shall constitute the final inspection and the Director of Public Works will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of the final inspection.

If, however, the inspection discloses any work in whole or in part, as being unsatisfactory, the Director of Public Works will give the Contractor the necessary instructions for correction of such work, and the Contractor shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection provided the work has been satisfactorily completed. In such event, the Director of Public Works will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

6. ACCEPTANCE AND FINAL PAYMENT

a. When the project has been accepted and upon submission by the Contractor of all required reports, completed forms and certifications, the Owner will review the final estimate of the quantities of the various classes of work performed. The Contractor may be required to certify that all bills for labor and material used under this contract have been paid.

b. The Contractor shall file with the Owner any claim that the Contractor may have regarding the final estimate at the same time the Contractor submits the final estimate. Failure to do so shall be a waiver of all such claims and shall be considered as acceptance of the final estimate. Upon final acceptance, 60% of retainage held on the project will be released to the Contractor with the remaining 40% retained by the Owner for the guaranty period. All retainage may be released, at the discretion of the City, provided a Maintenance Bond has been posted or other instrument or agreement agreed to by the Owner.

c. After approval of the final estimate by the Owner, the Contractor will be paid the entire sum found to be due after deducting all previous payments and all amounts to be retained or deducted under the provisions of the contract.

d. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

7. GENERAL GUARANTY AND WARRANTY OF TITLE

a. Neither the final certification of payment nor any provision in the contract nor partial or entire use of the improvements embraced in this Contract by the Owner or the public shall constitute an acceptance of work not done in accordance with the Contract or relieve the Contractor of liability in respect to any express or implied warranties or responsibility for faulty materials or workmanship. The Contractor shall promptly remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of twelve (12) months from the date of final acceptance of the work. The Owner will give notice of defective materials and work with reasonable promptness.

b. No material, supplies or equipment to be installed or furnished under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other

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agreement by which an interest therein or in any part thereof is retained by the Seller or supplier. The Contractor shall warrant good title to all materials, supplies and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this Contract shall have the right to a lien upon any improvements or appurtenances thereon.

c. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontractors and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

8. NO WAIVER OF LEGAL RIGHTS

a. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or be stopped from recovering from the Contractor or his Surety, or both, such overpayment as it may sustain by failure on the part of the Contractor to fulfill his obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

b. The Contractor, without prejudice to the Contract shall be liable to the terms of the Contract, shall be liable to the Owner for latent defects, fraud or such gross mistakes as may amount to fraud, and as regards the Owner's right under any warranty or guaranty.

9. TERMINATION OF CONTRACTOR'S RESPONSIBILITY

Whenever the improvement provided for by the Contract shall have been completely performed on the part of the Contractor and all parts of the work have been released from further obligations except as set forth in his bond and as provided in Section 8 above.

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SHOP DRAWINGS

Shop Drawings for this project shall be submitted under the following conditions:

1. The Contractor shall submit working and detail drawings, well in advance of the work, to the Director of Public Works & Building Inspector for review.

2. The Contractor's drawings shall consist of shop detail, erection and other working plans showing dimensions, sizes and quality of material, details and other information necessary for the complete fabrication and erection of the pertinent work.

3. The Contractor shall submit three (3) sets of drawings to the Director of Public Works .

4. Prior to the approval of the drawings, any work done or materials ordered for the work involved shall be at the Contractor's risk.

5. One (1) set of the drawings will be returned to the Contractor approved or marked with corrections to be made. After approval has been given, the Contractor shall supply the Director of Public Works with two sets of the revised detail working drawings.

6. The Director of Public Works 's approval of the Contractor's working drawings will not relieve the Contractor from responsibility for errors in dimensions or for incorrect fabrication processes, or from responsibility to complete the contract work.

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TECHNICAL SPECIFICATIONS¶
Unless otherwise specifically called out in these specifications, the Standard Technical Specifications for this project are the Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation including any Addenda.¶
Exemptions from the NHDOT specifications include, but are not exclusive to, depths of foundations and depths of base and pavements. See Drawings.¶
Additional Technical Specifications for this project are attached.

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SPECIAL CONDITIONS & CRITICAL TIMELINES

REQUIRED DEADLINES

This project will take place in a dense urban setting within Portsmouth's historic downtown, which is home to a variety of special events, festivals and races among other civic events. This section is intended to provide notice to contractors regarding the special requirements and schedule adjustments that may need to be made to accommodate these and others dates.

Work will not be allowed on the second Saturday of June or Memorial Day.

Work will commence no earlier than 7am and will stop no later than 5 pm daily unless allowed by the Director of Public Works.

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LIST OF SUBMITTALS

This list of Drawings is for convenience only and is not to be considered comprehensive. The contractor shall read all specifications documents and shall determine submittals required.

1) Cut Sheets for all light fixtures
2) Materials Samples
    a) Drainage Mat Sample
    b) Railing Mockup
    c) Brick Sample
    d) Samples of all Granite types with appropriate finishes
        i) Petition Line Mockup
    e) Bluestone Sample with appropriate finish
    f) Decorative Stone Surface paving aggregate
    g) Imprint color sample

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LIST OF DRAWINGS TO BE SUBMITTED

This list of Drawings is for convenience only and is not to be considered comprehensive. The contractor shall read all specifications documents and shall determine submittals required.

1. Erosion & Sediment Control Stormwater Management Plan
2. Catch Basin and Drop-in Structures Shop Drawings
3. Stainless Steel Railing Shop Drawings
4. Petition Line Shop Drawings
5. Sculpture Bases Shop Drawings
6. Bench of Remembrance Shop Drawings
7. Detectable Warning Pad Shop Drawings
8. Vault Shop Drawings
9. Granite Block Retaining Wall Shop Drawings including engraving
10. Granite Seat Walls Shop Drawings
11. Granite Plaza Curbing Shop Drawings including Transition Curb sections
12. Electrical Plan As-Built

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TECHNICAL SPECIFICATIONS

Unless otherwise specifically called out in these specifications, the Standard Technical Specifications for this project are the Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation including any Addenda.

Exemptions from the NHDOT specifications include, but are not exclusive to, depths of foundations and depths of base and pavements. See Drawings.

Additional Technical Specifications for this project are attached. Measurement and Payment paragraphs from NHDOT Standard Specifications are superceded by this document.

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SECTION 02230 - SITE PREPARATION

PART 1 - GENERAL

~~1.1~~ SUMMARY: In order to protect the integrity of the underlying conditions of the project, all excavation and removals shall be done with the utmost care ~~and with the oversight and direction of the Project Archaeologist.~~

A. Section Includes:

1. Protecting existing adjacent vegetation to remain.
2. Removing above- and below-grade site improvements.
3. Disconnecting, capping or sealing site utilities.
4. Temporary erosion- and sedimentation-control measures.

1.2 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain the property of The City of Portsmouth, NH. Cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, driveways and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, driveways, walks, or other adjacent occupied or used facilities without permission from The City of Portsmouth and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by The City of Portsmouth or authorities having jurisdiction.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store as directed by The City of Portsmouth where indicated. Coordinate final storage location with The City of Portsmouth.

C. Utility Locator Service: Notify utility locator service for area where Project is located before site preparation.

D. Do not commence site preparation operations until temporary erosion and sedimentation control and plant-protection measures are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.

4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to The City of Portsmouth.

3.2 TEMPORATY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control according to requirements in Division 2 Section 02540 “Temporary Erosion Control.”

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site and immediately adjacent to work area on abutter’s property (with abutter’s permission; City of Portsmouth to coordinate) according to requirements in Division 2 Section 02231 "Tree Protection and Trimming." Coordinate with the City of Portsmouth Representative.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Landscape Architect.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

2. Coordinate with the City of Portsmouth to shut off any City-Owned utility services.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by The City of Portsmouth and Abutters or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Clerk not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Clerk's written permission.

3.5 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction and in compliance with special restrictions. Coordinate with the City of Portsmouth.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off The City of Portsmouth's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 02230

SECTION 02231 - TREE PROTECTION AND TRIMMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections
   1. Division 2 Section “Earthwork”

1.2 REFERENCE STANDARDS

A. ANSI Z133 Tree Pruning, Tree Removal and Other Tree Care Operations

1.3 DEFINITIONS

A. Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and as indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA, licensed arborist in jurisdiction where Project is located, current member of ASCA, or registered Consulting Arborist as designated by ASCA.

B. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. The following practices are prohibited within tree protection zones:

   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements. Previously used materials may be used when approved by Landscape Architect.
   1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart. High-visibility orange color, nonfading.
   2. Height of Fencing: 4 feet.

B. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.2 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent intrusion into protected area by construction.
   1. Posts: Set or drive posts without concrete footings into ground no more than 6”. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Landscape Architect.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Landscape Architect.

C. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Landscape Architect and in accordance with Division 2 Section 02930 “Planting”.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Landscape Architect and remove when construction operations are complete and equipment has been removed from the site.

3.3 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Division 2 Section 02300 "Earthwork."

B. Trenching near Trees: Where trenches are required within protection zones, hand excavate around tree roots. Do not cut main lateral tree roots or taproots; only cut roots that interfere with installation.

C. Do not allow exposed roots to dry out before placing permanent backfill.

3.4 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Temporarily support and protect roots from damage until they are permanently covered with soil.
3. Cover exposed roots with burlap and water regularly.
4. Backfill as soon as possible according to requirements in Division 2 Section 02300 "Earthwork."

B. Root Pruning at Edge of Protection Zone: Prune roots by cleanly cutting all roots to the depth of the required excavation.

3.5 CROWN PRUNING

A. If required, with approval of Landscape Architect or City Representative, prune branches that are affected by temporary and permanent construction. Prune branches as follows:

1. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
2. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and the following:
3. Cut branches with sharp pruning instruments; do not break or chop.
4. Do not apply pruning paint to wounds.

B. Chip removed branches and dispose of off-site.

3.6 FIELD QUALITY CONTROL

A. Inspections: Coordinate tree protection operations with Landscape Architect prior to commencement of and during installation operations.

3.7 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations in a manner approved by Landscape Architect.

1. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
2. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
3. Perform repairs within 24 hours.
4. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off The City of Portsmouth's property.

END OF SECTION 02231

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

~~1.1~~ SUMMARY: In order to protect the integrity of the underlying conditions of the project, all excavation and removals shall be done with the utmost ~~care and with the oversight and direction of the Project Archaeologist.~~

A. Section Includes:

1. Preparing subgrades for slabs-on-grade, walks, pavements, and plants.
2. Excavating and backfilling for structures.
3. Drainage course for walkways.
4. Base course for walkways and pavements.
5. Base course for asphalt paving.
6. Excavating and backfilling for utility trenches.

B. Related Sections
1. Division 2 Section 02231 “Tree Protection and Trimming”
2. Division 2 Section 02310 “Backfill and Compaction”

1.2 REFERENCE STANDARDS

A. Sieve Analysis of Fine and Course Aggregates: ASTM C136

B. Sampling Aggregates: ASTM D75

C. Moisture Density Relations of Soils (Modified Proctor): ASTM D1557

D. State of New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction (latest edition).

1.3 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Base Course: Aggregate layer supporting on-grade pavements that also minimizes upward capillary flow of pore water.

D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Landscape Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: IS NOT PERMITTED.

E. Structures: Footings, foundations, retaining walls, slabs, vault, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

F. Subgrade: Uppermost surface of an excavation immediately below base course, drainage fill, drainage course, or topsoil materials.

G. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 QUALITY ASSURANCE

A. Pre-excavation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. Utilities:
1. The information about known utilities was collected from the owning agency and may or may not have been supplemented by additional field survey or investigation.
2. The approximate locations of known buried and overhead utilities are shown on the Drawings. No guarantee is made as to the accuracy or correctness of the locations shown and the completeness of the information given. The Contractor is responsible for confirming the location of utilities in the field prior to commencement of work.
3. Utility Locator Service: Notify DIGSAFE before beginning earth moving operations.
   a. 888-DIG-SAFE (344-7233)
4. Discontinue excavation by machinery when the excavation approaches pipes, conduits, or other underground structures of which the approximate locations are known. Use manual excavation methods to locate the utilities.
5. See DIGSAFE @ 1-888-344-7233 for utility notification and marking requirements.

B. Do not commence earth moving operations until plant-protection measures specified in Division 2 Section 02231 "Tree Protection and Trimming" are in place.

C. Perform excavation in such a manner that will prevent any possibility of undermining or disturbing existing structures, utilities, and work previously completed under this Contract.

D. Where existing buildings and other structures are in close proximity to the proposed construction, exercise extreme caution and utilize sheeting, bracing, and all other precautionary measures that may be required.

E. Repairing Damage: Repair all damage to existing utilities, structures, grassed, or paved areas which results from construction operations, at no additional cost to the City of Portsmouth, to the complete satisfaction of the City of Portsmouth, the Clerk, the utility company and the property owner.

F. Do not leave any trenches or pits open overnight. Cover with steel paneling used for such purposes that is strong enough to support pedestrian as well as vehicular traffic. Secure steel paneling to prevent movement overall and to prevent removal by vandals.

G. Unless authorized in writing by the City of Portsmouth, all roadways shall be accessible to traffic at the end of each day.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Unsuitable Material:
1. If, in the opinion of the Director of Public Works, or his designee, Clerk, Clerk or Landscape Architect, (shown as CLERK below) the material encountered above the indicated grade as shown on the Drawings for excavation is unsuitable the Contractor shall remove the material to the widths and depths as directed by the Clerk. Replace this material as specified in Section 02310 “Backfill and Compaction.”
2. If, in the opinion of the Clerk, the material encountered at or below the indicated invert or grade shown on the Drawings for excavation is unstable (as determined by the Clerk), the Contractor shall remove the material. Replace this material with thoroughly compacted crushed stone bedding material as shown on the Drawings, or as directed by the Clerk.
3. Materials made unsuitable by Contractor’s construction methods shall be suitably dried for reuse or removed from the site and replaced with suitable materials at no additional cost to The City of Portsmouth, NH. This material shall not be eligible for payment as unsuitable material.
4. Materials determined unsuitable only due to moisture content shall be aerated and stockpiled and may be used as suitable backfill with the approval of the Clerk.

B. Disposal of Excess Material:
1. All excess material that is, in the opinion of the Clerk, suitable shall remain the property of the Contractor unless specified otherwise.

C. Disposal of Unsuitable Material:
1. All unsuitable material shall become the property of the Contractor unless specified otherwise.

D. Disposal of Material:
1. Disposal of excess and unsuitable material shall be the responsibility of the Contractor.
2. Dispose of suitable and unsuitable material in accordance with applicable environmental law and, if applicable, at the locations acceptable to The City of Portsmouth, NH and/or funding agency.
3. The property owners where the material is disposed of shall sign a release form indemnifying all The City of Portsmouth, NH, Clerk, Landscape Architect, and Contractor from any liability of disposal of the said material.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. Shoring and Bracing:
1. Structures: Provide, install, and maintain sheeting and bracing as necessary to support the sides of the excavation and to prevent and movement of earth which could diminish the width of the excavation or otherwise injure workers, the work, adjacent structures and property in accordance with all Local, State and OSHA Safety Standards.
2. Trenches: As trench excavation progresses, install such shoring and bracing necessary to prevent caving and sliding and to meet the requirements of the Local, State, and OSHA Safety Standards.

3.2 INSPECTION

A. Inspection and approval by the Clerk of conditions are required before work may commence.

3.3 EXCAVATION, GENERAL

A. Carefully excavate only to designated depths to remove only what is absolutely necessary. Take care to NOT disturb subgrade.

B. Excavation: Excavations shall be limited to the removal of:
1. existing brick
2. existing asphaltic paving

3. a limited amount of the existing base material to a depth of 6" for paving materials
4. curbing to the extent of curbing plus material on either side.

5. See Construction Strategy Document for procedures and protocol for archeological finds. This document to be developed prior to construction by the Contractor and The City.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Specific Exceptions to excavation depth rules:
   a. Catch Basins
   b. Drainage Pipes
   c. Curbing
   d. Electrical Conduit located in previously excavated zone.

2. Do not disturb bottom of excavation. Excavate by hand to final grade. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Division 2 Section "Tree Protection and Trimming."

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. All trenches shall be dependent upon oversight by Archeologist

B. Excavate trenches to indicated gradients, lines, depths, and elevations.

C. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated in drawings.

D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of

pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. All removals of objects along trench subgrade shall be dependent upon oversight by Archeologist.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Division 2 Section 02231 "Tree Protection and Trimming."

3.7 SUBGRADE INSPECTION

A. Proof-roll subgrade below pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Landscape Architect, without additional compensation.

3.8 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Place and compact initial backfill of base material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

D. Place and compact final backfill of satisfactory soil to final subgrade elevation.

E. Install warning tape directly above utilities
1. 12 inches below finished grade
2. 6 inches below finished grade under pavements and slabs.

3.9 SOIL MOISTURE CONTROL

A. Uniformly moisten or air dry subgrade and each subsequent backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Air dry subgrade material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.10 COMPACTION OF BACKFILLS

A. Compaction of backfills shall comply with Section 02310 “Backfill and Compaction.”

3.11 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations as indicated on plans.

3.12 DRAINAGE BASE COURSE UNDER PAVEMENTS

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under pavements on-grade as follows:

1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.13 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional base material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

D. Trenches and Pits: If a trench or pit is allowed to be left open during nonworking hours, the Contractor shall erect protection to prevent entry of unauthorized personnel at no additional cost to The City of Portsmouth.

3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off The City of Portsmouth's property.

END OF SECTION 02300

SECTION 02310 - BACKFILL AND COMPACTION

PART 1 - GENERAL

1.1 SUMMARY: In order to protect the integrity of the underlying conditions of the project, all excavation and removals shall be done with the utmost care and with the oversight and direction of the Project Archaeologist.

A. Section Includes:
1. Backfilling trenches and/or excavation around structures with suitable material removed in the course of excavating and other suitable materials.
2. Testing soils

1.2 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain The City of Portsmouth's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 REFERENCE STANDARDS

A. Sieve Analysis of Fine and Coarse Aggregates: ASTM C136

B. Sampling Aggregates: ASTM D75

C. Moisture Density Relations of Soils (Modified Proctor): ASTM D1557

D. Density of Soil In-Place by Nuclear Methods: ASTM D2922

E. State of New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction (latest edition)

1.4 1.3 QUALITY ASSURANCE

A. Testing Agency: City of Portsmouth will engage a qualified geotechnical Clerking testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. The Contractor shall make necessary arrangements to allow compaction testing to be performed at a time, place and elevation determined by the Clerk.

D. Pre-placement testing:

1. The Contractor shall take one sample of each material proposed to be used on the project. The samples shall be taken in the presence of the Clerk and in accordance with ASTM D75.
2. Undisturbed Subgrade Material: TESTING NOT ALLOWED as per The City of Portsmouth, NH.
3. Previously Disturbed Subgrade Material: Proctor density tests shall be performed on the existing subgrade in accordance with the following schedule and in accordance with ASTM D1557:
   a. At the bottom of excavations where structures or slabs will be placed.
   b. Whenever the material has changed in the opinion of the Clerk.
4. Select and Borrow Materials: Sieve and modified proctor density tests shall be performed on all select and borrow material in accordance with the following schedule and in accordance with ASTM C136 and ASTM D1557:
   a. Before any materials are brought to the site.
   b. Whenever the source changes.
5. The result shall be submitted to the Clerk for approval prior to placement.

E. Post-placement testing:
1. The trench and/or excavation shall be prepared using the normal backfill technique employed by the Contractor. No special or additional preparation will be allowed.
2. Determine in-place density in accordance with ASTM D2922 or by other methods as approved by the Clerk. Compaction tests shall be made in accordance with the following table:

* REFER TO DETAILS FOR SPECIFIC DEPTHS TO SUBGRADE

	Material	Testing Frequency	Percent Compaction
Under Slabs or Structures:			
	Native material or borrow material	One for every 500 s.f. of surface area of the slab for every 2 lifts of material placed.	95% 12” lifts
	Structural fill or crushed gravel	One for every 500 s.f. of surface area of the slab for every lift of material placed	95% 6” lifts
Around Structures:			
	Borrow material or other material noted on the drawings	One for every 500 l.f. of wall for every 2 lifts of material placed.	95% 12” lifts
In Trenches:			
	Native material or borrow material	From the blanket material to the underside of the gravel or loam. See Note #1 Below	95% 12” lifts
	Gravels or loam	See requirements for Under paved Areas and Grassed Areas for requirements below	See below
Under Paved Areas:			
	Native material or borrow material	One for every 10,000 s.f. of surface area for every 2 lifts of material placed.	95% 12” lifts

	Gravel	One for every 10,000 s.f. of surface area for every lift of material placed.	95% 6" lifts
	Crushed Gravel	One for every 10,000 s.f. of surface area for every lift of material placed.	95% 6" lifts
Under Grassed or Landscaped Areas			
	Native material or borrow material	One for every 20,000 s.f. of surface area for every 2 lifts of material placed	90% 12" lifts

3. Notes: The Contractor shall propose a method for backfill at the preconstruction conference (including a description of the method to be used to compact around manholes), which shall be confirmed in the field when work is initiated. This proposed method will be tested and modified as required to meet the compaction requirements noted in the above table. The first day of testing shall include testing of a minimum of 4 lifts. This compaction method shall be used until the soil characteristics have changed in the opinion of the Clerk. At that point new compaction tests shall be performed to determine if the requirements are still being met. If they are, the method shall continue, if they are not, the method shall be modified until the requirements are met. Even if the soil characteristics have not changed, confirmatory compaction tests shall be taken every 3 weeks. Confirmatory testing shall include testing of a minimum of 2 lifts. The Clerk shall determine the location of all tests.
4. Should compaction tests fail to meet the specified densities, the Contractor shall modify backfill methods as necessary to obtain passing results. The modified method shall be used from that point on.

1.5 SUBMITTALS

A. The Contractor shall submit at the preconstruction meeting his proposed compaction technique which shall include compaction around field structures (i.e manholes, catch basins, etc.) and valve boxes.

B. The Contractor shall submit sieve and proctor curves to the Clerk for approval 7 days before any material is brought to the site.

C. The Contractor shall submit compaction test result sheets to the Clerk no later than 7 days after the test were performed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Excavated Material Suitable for Reuse:
1. Material shall be friable natural material comprised of gravels, sand, silts, or clayey gravel and sands.
2. Material shall be free from peat, muck, other organic matter, frozen material, ice, and/or snow.

3. Material shall be free from stones, ledge/rock fragments, and asphalt over 8" in the largest dimension.
4. The material shall not have moisture content over 2% of its optimum moisture content.

B. Select and Borrow Materials:
1. Crushed Gravel or Structural Fill (Crushed Gravel Base Course): NHDOT 304.3
   a. Well graded granular crushed gravel material for use as a crushed gravel base.
   b. Material shall be hard and durable, free from frost, organic material, loam, debris and other unsuitable material.
   c. At least 50% of material retained on the 1 inch sieve shall have a fractured face.
   d. Sieve Analysis:

Sieve Designation	% Passing by Weight Square Opening
3"	100
2"	95 - 100
1"	55 - 85
No. 4	27 - 52
No. 200	0 – 12 (of the sand portion)

PART 3 - EXECUTION

3.1 PERFORMANCE

A. General:
1. Provide and place all necessary backfill material.
2. Do not allow large masses of backfill to be dropped into the excavation, as from a grab bucket, in such a manner that may endanger pipes and structures.
3. Place material in a manner that will prevent stones and lumps from becoming nested.
4. Completely fill all voids between stones with fine material.
5. Do not place backfill on or against new concrete until it has attained sufficient strength to support loads without distortion, cracking, and other damage.
6. Deposit backfill material evenly on all sides of structures to avoid unequal soil pressures.
7. Place backfill material evenly in the trench in an effort to maximize compaction.
8. Do not backfill with, or on, frozen materials.
9. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
10. Do not mechanically or hand compact material that is, in the opinion of the Clerk, too wet. Fill material that is too wet to be properly placed back in the trench in its current state shall be dried (disced, harrowed, etc.) to within 2% of optimum moisture content. This material shall not be classified as unsuitable material and is ineligible for payment as such.
11. Material made unsuitable by the Contractor's construction methods shall be replaced with Gravel Borrow at no additional cost to The City of Portsmouth, NH.

12. Fill that is too dry shall be uniformly watered. The water shall be placed over a loose lift to allow for the water to migrate through the entire lift before compaction.
13. Do not continue backfilling until the previously placed and/or new materials have dried sufficiently to permit proper compaction.
14. When original excavated material is, in the opinion of the Clerk, unsuitable, use only approved gravel borrow for backfilling.
15. Backfill excavation/trench as early as possible to allow for the maximum time for natural settlement.
16. Slope grade away from structures at a minimum slope of 1.5%.
17. The Contractor shall remove excess fill material from the site.

B. Sheeting:
1. Leave sheeting in place when damage is likely to result from its withdrawal. This shall only be allowed with written approval of the Clerk.
2. Completely fill with suitable material and thoroughly compact all voids left by the removal of sheeting.
3. Sheet shall be left in-place and incrementally moved up to allow for a safe work environment in which to properly compact the excavation/trench.

C. Backfilling Around Trench Obstacles
1. Material must be properly compacted around trench obstacles (i.e. manholes, catch basin, valve boxes, etc.). Uncompacted fill will not be allowed to be placed around these obstacles.
2. The Contractor shall provide adequate excavation supports to allow for a safe work environment in which to properly compact the excavation/trench.
3. The Contractor shall use methods that compensate for the space limitations in the immediate area around these obstacles.

D. Backfilling in Paved Areas:
1. Backfill trenches in streets and other paved areas by maintaining moisture content within 2% of optimum.
2. In an effort to allow the road to heave uniformly, backfill material that was removed from the top portion of the trench shall be replaced back into the top of the trench. Similarly, the material removed from the middle of the trench shall be replaced back into the middle of the trench. Existing material removed from the bottom of the trench (i.e. where the pipe box is located) shall be stockpiled for later use.
3. Backfill in such a manner as to permit the rolling and compaction of the filled trench with the adjoining material to provide the required bearing value for paving immediately after backfilling is completed.
4. Where required, place excavated material, that is acceptable to the Clerk for surfacing or pavement subbase, at the top of the backfill to the depths as needed to adequately support pavement.

E. Backfilling Trenches in Nonpaved Areas:
1. Grade the ground to a reasonable uniformity.
2. Leave the mounding over the trenches in a uniform and neat condition, satisfactory to the Clerk.

F. Bedding & Backfilling of Pipelines:

1. Install pipe bedding and cushion and primary backfill in accordance with the requirements noted herein, in the specific pipe Specification Section, and on the Drawings.
2. Deposit and thoroughly compact the remainder of the backfill as noted herein.

G. Placing and Compacting Backfill:
1. Water Jetting: Shall not be allowed without the approval of the Clerk.
2. Puddling: Shall not be allowed without the approval of the Clerk.
3. Place backfill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
4. Tamping:
   a. Deposit and spread the backfill material in uniform parallel layers not exceeding the lift thicknesses noted herein.
   b. Tamp each layer as required to obtain a thoroughly compacted mass.
   c. If necessary, furnish and use an adequate number of power driven tampers, each weighing at least 150 lbs.
5. Rolling:
   a. Compact material by rolling only when the width and depth of the excavation are sufficient to accommodate the rollers, dozers, mechanical tampers, or other similar powered equipment, as may prove to be acceptable, and when it can be performed without causing damage to pipes and structures installed in the excavation.
   b. Deposit and spread the backfill material in uniform parallel layers not exceeding the lift thicknesses noted herein.
   c. Roll each layer as required to obtain a thoroughly compacted mass.
6. Other placing and compacting methods may be employed only when approved by the Clerk.

H. Improper Backfill
1. When, in the opinion of the Clerk, excavation and trenches have been improperly backfilled, and when settlement occurs, reopen the excavation to the depth required, as directed by the Clerk.
2. Refill and compact the excavation or trench with suitable material and restore the surface to the required grade and condition.
3. Excavation, backfilling, compacting work and testing performed to correct improper backfilling shall be performed at no additional cost to The City of Portsmouth, NH.

END OF SECTION 02310

SECTION 02540 – TEMPORARY EROSION CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Description of Work:
   1. Comply with all Federal, State and local regulations pertaining to erosion and sediment control and stormwater management.
   2. Prepare an Erosion and Sediment Control and Stormwater Management Plan (Plan) for review and approval prior to the start of any construction activities.
   3. Submit NOTICE OF INTENT on-line or by letter to the USEPA for approval. Post the appropriate permit number on site.
   4. Provide all labor, equipment, materials and maintain temporary erosion control devices as described in the Plan.
   5. Provide such erosion control measures as may be necessary to correct conditions that develop prior to the completion of permanent erosion control devices and/or as required to control erosion that occurs during normal construction operations.
   6. Provide such sediment control measures as may be necessary to address conditions created by construction dewatering methods and/or stormwater runoff.
   7. After award of the Contract, prior to commencement of construction activities, meet with the Clerk to discuss the Plan and develop a mutual understanding relative to.
   8. Conduct all construction in a manner and sequence that causes the least practical disturbance of the physical environment.
   9. Stabilize disturbed earth surfaces in the shortest practical time and employ such temporary erosion control devices as may be necessary until such time as adequate soil stabilization has been achieved.
   10. Provide 3 oz. non-woven geotextile fabric to cover excavated and all exposed subgrade areas daily at the end of the construction day to provide added erosion control and protection.

1.2 REFERENCE STANDARDS

A. AASHTO Highway Drainage Guidelines, Volume III, Guidelines for Erosion and Sediment Control in Highway Construction, American Association of State Highway and Transportation Officials, Inc., 444 North Capital St. N.W., Suite 249, Washington, D.C. 20001.

B. Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire, New Hampshire Department of Environmental Services, Public Information Office, P.O. Box 95, 29 Hazen Drive, Concord, New Hampshire.

C. Storm Water Phase II Compliance Assistance Guide, Section 5 Small Construction Activity, United State Environmental Protection Agency, Publication No. 833-R-00-003.

PART 2 - PRODUCTS

2.1 PLAN

A. Prior to the start of construction submit the Plan for approval.

B. Prior to the start of construction submit a Notice of Intent for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY Under a NPDES General Permit.

C. To assist in Plan preparation, the Clerk will supply the following as available:
1. Specific Reproducible plan sheet and if available, cross sections of the project.
2. Drainage calculations as available.
3. Permits obtained for the project.

2.2 ACCEPTABLE MATERIALS

A. Baled Hay or Straw: At least 14" x 18" x 30" securely tied and staked twice per bale.

B. Stone Check Dams: Washed ¾ inch crushed septic system stone free of sand and silts.

C. Sand Bags: Heavy cloth bags of approximately 1 cubic foot capacity filled with sand or gravel.

D. Mulches:
1. Gravel, crushed stone, loose hay, straw, wood chips, wood excelsior, or wood fiber cellulose.
2. Type and use shall be suitable for the Work.

E. Mats and Netting:
1. Twisted craft paper, yarn, jute, excelsior, and wood fiber mats.
2. Type and use shall be suitable for the Work.

F. Drains:
1. Flexible drains consisting of collapsible neoprene pipe, minimum of 8" in diameter, or an approved equal.
2. Corrugated metal pipe and inlet of a gauge consistent with the loading conditions. A minimum size of 12 inches in diameter or approved equal.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Temporary Stone Checks:
1. Construct temporary erosion checks as needed.
2. Baled hay and/or sand bags may be used in an arrangement to fit local conditions designated by the Clerk.
3. Terrace side slopes to retard runoff velocities.

B. Temporary Slope Drains: Shall be collapsible pipe with corrugated metal pipe inlet with a crescent shaped barrier placed at each slope drain.

C. Debris Basin:
   1. A barrier or dam constructed across waterway or other suitable location to form a silt or sediment basin.
   2. Capacity shall be equal to the volume of sediment expected to be trapped at the site during the planned use for life of the structure or, if the periodic removal of debris would be practical, the capacity shall be proportionally reduced.

3.2 PERFORMANCE

A. Protection:
   1. Locate storage of materials in shop yards where erosion and sediment hazards are slight.

3.3 REMOVAL AND DISPOSAL

A. General: When permanent soil stabilization has been achieved, remove all temporary materials and devices that are unsightly.

B. Reuse: Materials and devices of suitable type and conditions may be reused at other onsite locations. Materials and devices, determined by the Clerk to be unsuitable for reuse, shall become the Contractor's property and shall be disposed of in a manner and location approved by The City of Portsmouth, NH.

END OF SECTION

SECTION 02628 - GEOCOMPOSITE UNDERSLAB DRAINAGE

PART 1 - PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Subdrainage system material for underslab drainage as complete designed working drainage system channeling liquid water to storm drainage piping system specified elsewhere.

B. Related sections:

1. 02300 “Earthwork”.

1.2 REFERENCE STANDARDS

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

1.3 DEFINITIONS

A. Terms 1 through 4 taken from ASTM D4439:

1. Geotextile: Any permeable textile used with foundation, soil, rock, earth, or any other geotechnical material, as an integral part of man-made product, structure, or system.
2. Normal direction: Direction perpendicular to the plane of a geotextile.
3. Permittivity: Volumetric flow rate of water per unit cross sectional area per unit head under laminar flow conditions, in the normal direction through a geotextile.
4. Permeability: Rate of flow of a liquid under a differential pressure through a material.
5. Transmissivity: Flow or amount of liquid water per foot of material width passing through composite system at certain maximum soil pressure against geotextile at defined hydraulic gradient.

1.4 SYSTEM DESCRIPTION

A. Performance requirements:

1. Geotextile:
   a. UV resistance: 70% or more when tested in accord with ASTM D4355-02.
   b. Permittivity: 150 gal/min/ft2 (6105 l/min/m2) when tested in accord with ASTM D4491-99a.
2. Core material, compressive strength: Specified in PART 2 - PRODUCTS Article below for selected materials.
3. Transmissivity or Flow Q with hydraulic gradient of 1 with confining stress indicated in MANUFACTURED UNITS Article in accord with ASTM D4716-01.

1.5 SUBMITTALS

A. Product data: Manufacturer's product data; indicate products supplied. Provide complete installation instructions proposed for use.

B. Samples:

1. Subdrainage system material: 4” by 4”.

1.6 QUALITY ASSURANCE

A. Preinstallation conferences: Coordinate with conference scheduled for waterproofing materials. Follow requirements indicated in waterproofing materials section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packing and shipping: Provide materials in original unopened containers with manufacturer's labels intact and legible.

B. Acceptance at site:
1. Unload materials: check for damage.
2. Damaged materials determined by visual inspection will not be accepted.
3. Remove rejected materials from site immediately.

C. Storage and protection:

1. Store materials in dry area in manufacturer's protective packaging in original containers with labels and installation instructions intact.
2. Store materials under cover, off ground; protect from sunlight.
3. Transmissivity or Flow Q with hydraulic gradient of 1 with confining stress indicated in MANUFACTURED UNITS Article in accord with ASTM D4716-01.

PART 2 - PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Acceptable manufacturers:
1. Products specified as standard of quality are manufactured by:
JDR Enterprises, Inc.
292 South Main Street Suite 200
Alpharetta, Georgia 30004
Telephone: 800.843.7569 or 770.442.1461.
Fax: 770.664.7951.
Website: www.j-drain.com

2. Products of other manufacturers similar in type and quality are acceptable, subject to compliance with these specifications.

a. Contractor shall supply product information for alternative drainage material for approval by Clerk.

B. Geonet Drainage System material, characteristics:

1. Type: JDR Enterprises, Inc.; J-Drain 302 Series; extra heavy duty core, double sided fabric (providing drainage and filtration from both sides).
2. Core:
   a. Material: Extruded HDPE; High Density Polyethylene Polymer, 0.945 density.
   b. Thickness: 0.25" (0.635cm), nominal, normal duty.
   c. Compressive strength: 40,000 PSF (1915 kN/m2), minimum.
3. Geotextile:
   a. Material: Non-woven needle punch polypropylene.
   b. Weight: 4.0 oz. per square yard (136 g/m2), minimum.
   c. Treat fabric for UV stability to meet requirements in SYSTEM DESCRIPTION Article above.
   d. Permittivity: Meet requirements in SYSTEM DESCRIPTION Article above.
4. Bonding core material to geotextile: Manufacturer's standard heat lancing.
5. Transmissivity or Flow Q of composite construction, geotextile bonded to core when tested in accord with ASTM D4716-01 with hydraulic gradient of 1 with confining stress of 3600 PSF: 302 Series: 9.0 gallons/min/ft. (112.0 lpm/m) width in accord with ASTM D4716-01.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions:

1. Verify slope to underslab collection pipes or site water drainage system at underslab drainage system location substrate.
2. Examine conditions and substrates where products specified in this section are installed; submit written notification of unacceptable conditions or substrates.
3. Proceeding with construction activities of this section:
   a. Indicates acceptance of conditions or substrates.
   b. Additional work in this section due to pre-existing conditions not noted will not be paid as extra.

3.2 INSTALLATION

A. Underslab drainage installation, general:

1. Install collection pipes or site water drainage system in trenches as indicated for positive drainage from subdrainage system to collection system and vent to daylight or sump in accord with manufacturer's reviewed installation instructions.
2. Roll out subdrainage system material to cover entire subbase surface in accord with manufacturer's reviewed installation instructions with core material facing protection board.

3. Butt adjacent panels; lap geotextile fabric and use adhesive to bond adjacent fabric panels in accord with manufacturer's installation instructions.

END OF SECTION 02628

SECTION 02630 - STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Encasement for piping.
3. Cleanouts.
4. Nonpressure transition couplings.
5. Expansion joints.
6. Catch basins.
7. Drop inlets.
8. Pipe outlets.

B. See Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and Addenda.

C. Related Sections:
1. Division 2 Section 02628 “Geocomposite Underslab Drainage” for jdrain drainage mat

END OF SECTION 02630

SECTION 02710 - CURBING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes installation of typical granite street curbing.

1. See Standard Specifications for Road and Bridge Construction of the State of New Hampshire Department of Transportation and Addenda.

B. See section 04860 “Stone Masonry” for Plaza curbing.

END OF SECTION 02710

SECTION 02741 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold milling of existing hot-mix asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt paving overlay.

B. Related Sections:

1. Division 2 Section 02300"Earthwork"
2. Division 2 Section 02310 “Backfill and Compaction”

1.2 SUBMITTALS

A. The Contractor shall submit the proposed mix designs as regulated by NHDOT requirements and with Division 01 documents of these specifications.

B. Material Certificates: For each paving material, from manufacturer.

1.3 REFERENCE STANDARDS

A. State of New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction (latest edition).

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by NHDOT.

B. Materials: Use only materials furnished by a bulk bituminous concrete producer regularly engaged in the production of hot-mixed, hot-laid asphalt.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of New Hampshire Department of Transportation Standard Specifications for asphalt paving work.

D. Pre-installation Conference: Conduct conference at Project site.

E. Prior to installation the Contractor shall provide the necessary survey to verify that the roadway is shaped in accordance with the plans and sections and that stormwater will flow to catch basins, drains or gutters without formation of puddles.

F. All work shall be performed to the satisfaction of The City of Portsmouth and Clerk.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
1. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
2. Asphalt Surface Course: Minimum surface temperature of 40 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Aggregate sub-base and base courses shall be in accordance with Division 2 Section 02310 "Backfill and Compaction."

B. Materials shall conform to Division 700: Materials, Section 702: Bituminous Materials and Section 703: Aggregates of the NHDOT Standard Specifications, latest edition.

2.2 ASPHALT MATERIALS

A. Bituminous binder and wearing course pavements shall be as shown on the Drawings and shall conform to Division 400, Section 401 Plant Mix Pavements – General of the NHDOT Standard Specifications, latest edition.
~~1. Asphalt Binder: NHDOT Type B (3/4") Mix~~. Asphalt Binder: NHDOT ¾" Binder Mix
2. ~~Wearing Pavement: NHDOT Type F (1/2") Mix~~. Wearing Pavement: NHDOT ½" Wearing Mix.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

C. The subgrade shall have been properly installed in accordance with the Contract Documents and shall have been approved by the Clerk.

3.2 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

1. Mill to a depth of 3/4".

3.3 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

3.5 HOT-MIX ASPHALT PLACING

~~A. Bituminous pavement shall not be placed until 30 days after the last excavation has been performed.~~

B. Place permanent pavement only when the underlying surface is dry, frost-free, when the surface temperature is above 40 degrees F for pavement courses greater than 1-¼" in compacted depth and above 50 degrees F when the pavement course is less than or equal to 1-¼" in compacted depth, and when the weather is not foggy, rainy or when wind conditions are such that rapid cooling will prevent satisfactory compaction, provided however, that the Clerk may permit in case of sudden rain, the placing of the mixture then in transit from the plant, if laid at the proper temperature and if the roadbed is free from pools of water. Such permission shall in no way relax the requirements for quality of the pavement and smoothness of surface.

C. Place pavement in accordance with NHDOT requirements and as specified herein. Upon discrepancy between the two requirements, the more stringent requirement shall govern.

D. The following equipment shall be used to place the pavement:
1. Pavers: Shall be self-contained, self-propelled long-body pavers capable of spreading the required thickness and width of pavement. Short-body pavers, drag boxes, and hot boxes shall not be allowed.
2. Rollers: All of the following rollers shall be used and be self-propelled:
   a. 8-12 ton tandem-drum roller.
   b. 3-5 ton tandem drum roller.

c. 1-ton tire pressure pneumatic rubber tire roller.

3. Trucks: Shall be clean with a heated bed.
4. Hand-tools: As required.

E. All equipment shall be well maintained and in good working condition.

F. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Spread mix at temperatures between 260 and 350 degrees F.
2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

G. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

H. Placement of any course shall be as nearly continuous as possible, keeping the number of transverse joints to a minimum. Stopping of the paver shall only be done in emergencies. If the Clerk determines that the paving operations result in excessive stopping of the paver, he may suspend all paving operations until the Contractor makes arrangements to synchronize the rate of paving with the rate of delivery of material.

I. Prior to the installation of the wearing course, the Contractor shall provide the necessary survey or other documentation to verify that the roadway is shaped in accordance with the drawings and that stormwater will flow to catch basins, drains or gutters without formation of puddles. Additionally, the wearing course shall not be placed until guard rails, cleanup, and other miscellaneous work requiring a piece of machinery has been completed.

J. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

K. The Contractor shall provide, at no additional cost to the Owner, any shim necessary to provide the crown specified or to eliminate any puddles noted.

L. If any imperfections (or high areas) are found in any course, the Contractor shall remove the unsatisfactory material and replace it as required. If the area(s) is in the binder course, the existing pavement shall be cut at the limit of the imperfection and the existing pavement edges shall be coated with emulsified asphalt prior to the placement of the new material. If the area(s) is in the wearing course, the pavement shall be repaired and all joints shall be infra-red heated at least 12” onto existing pavement.

3.6 JOINTS

1. See NHDOT Standards 401.3.13

3.7 COMPACTION

A. See NHDOT Standards 401.3.12

3.8 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.9 PAVEMENT MARKING

A. Coordinate Pavement Marking with the City of Portsmouth.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: The City of Portsmouth, NH will engage a qualified testing agency to perform tests and inspections.

B. Replace and compact hot-mix asphalt where core tests were taken.

C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.11 DISPOSAL & CLEANUP

A. Trucks that have just discharged their load shall be cleaned at a designated cleanup area. Disposal of cleanup material from trucks shall not be allowed to be placed in front of the paver.

B. All bituminous material remaining on exposed surfaces of curbs, sidewalks, masonry structures, or other surfaces shall be removed by the Contractor.

C. All material left at truck cleanup areas shall be removed.

D. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 02741

SECTION 02742 – DECORATIVE TEXTURED PAVEMENT SURFACES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removal of existing hot-mix asphalt pavement in preparation for installation of Decorative Textured Pavement Surface
2. Installation of Decorative Textured Pavement Surface. (Imprint®)
3. Installation of Decorative Stone Surface Treatment.

B. Related Sections:

1. Division 2 Section 02741 "Asphalt Paving" for base surface treatment.

C. Special Conditions:

1. The Contractor shall hold The City of Portsmouth harmless from liability of any nature or kind due to infringement of any copyrighted and/or proprietary compositions, secret processes, patented or unpatented inventions, articles or appliances furnished or used to satisfy these technical requirements. The Contractor agrees further to defend at his/her own expense, any and all actions brought against The City of Portsmouth or himself/herself because of unauthorized use of such articles.
2. No waiver of conditions of material and/or Contractor experience will be considered or allowed.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties and confirm color.

1. Job-Mix Designs: For each job mix proposed for the Work.
2. Certification of Approval of each job mix proposed for the work.

B. Material Certificates: For each paving material, from manufacturer.

C. Independent laboratory report documents shall be provided that documents the epoxy binder to be used meets the requirements of this specification.

D. References for five (5) completed projects utilizing IMPRINT® .

E. Record of project applications and locations within the last three calendar years with a minimum of 3000 SF of installed high-friction epoxy binder and aggregate with references including Owner’s contact information for Stone Surface Treatment application for roadway.

F. Certification from the manufacturer that aggregate topping for Decorative Stone Surface Treatment for roadway meets the above requirements.

G. Documentation of the in-placed friction characteristics (min 65 FN40R in accordance with ASTM E274) of aggregate bonded to a vehicular bearing surface using the modified epoxy binder for Decorative Stone Surface Treatment for roadway.

H. Verifcation of stamping patterns and colors must be submitted to the Landscape Architect for approval prior to construction.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by NHDOT.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of The City of Portsmouth and the NHDOT for asphalt paving work.

C. Preinstallation Conference: Conduct conference at Project site.

D. Contractor Experience:
1. Contractor must possess and be familiar with the specialized machinery necessary to perform the procedures as outlines and contained within these specifications, including, but not limited to, appropriate trucks, air compressors, miscellaneous asphalt equipment, dispensers, mixers, melters, applicators, cutters and or other specialized tools.
2. A working knowledge of the specified technology is required. Accordingly, the Contractor shall verify that he/she is accredited, licensed installer of the patented Imprint material/process (U.S. Patent 6,358,624) with a minimum of five (5) years related experience.
3. Contractor shall furnish references for five (5) completed projects utilizing this specialized, specified class of work.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply IMPRINT or Decorative Stone Surface Treatments if surface is wet or excessively damp or if rain is imminent or expected before time required for adequate cure.

PART 2 - PRODUCTS

2.1 IMPRINT® MATERIAL

A. IMPRINT® is a product of Dynamic Surface Applications Ltd. www.dsa-ltd.com/Imprint.

B. Provide IMPRINT material and pigments to be utilized in the decorative surfacing of the crosswalks as shown on plans.

C. The products used in this surfacing system shall meet the material specifications and conform to the minimum following physical and performance properties:
1. hot-applied resin-based compound developed specifically for use on bituminous concrete
2. superior adhesion and flexibility

3. superior abrasion resistance
4. color stability:
5. chemical resistance:
6. scrub ability:
7. Demonstrated satisfactory field performance and integrity of the work so performed in accordance with these specifications for minimum period of five (5) years.
8. Grade: 45 heavy traffic
9. Avg. Temp. Range: 25-113 degrees F
10. Wheel Tracking @ 113° F: less than 1 mm/hr
11. Wheel Tracking @ 140° F: N/A
12. Density: 2.12
13. Cone Flow Test: 15% maximum (5 hrs @ 194 F)
14. Plane Test: 5% maximum (5 hrs @ 194 F)
15. Indent @ 104 F: 25 dmm maximum
16. Indent @ 122 F: N/A
17. Ash Content: 90% maximum
18. Skid Resistance Value: 55-70
19. Color: as noted on drawings
20. Pattern: as shown on drawings

2.2 STONE SURFACE TREATMENT MATERIAL

A. Provide STONE SURFACE TREATMENT material to be utilized in the decorative surfacing of the roadway as shown on plans.

B. This work shall consist of furnishing and applying a skid resistance surfacing system in accordance with these specifications and in reasonably close conformity with the lines and details as shown on the plans.

C. Materials:
1. Use a two-part cold-applied modified exothermic epoxy resin binder treatment containing epoxy binder covered with a bauxite aggregate surfacing or an Clerk approved equal.
   a. Epoxy Binder:
      1) The binder shall consist of a thermosetting modified epoxy compound which holds the aggregate firmly in position and shall meet the following requirements:

Specification	**Result**	**Test Method**
Percent Solids	100%	
Viscosity	Epoxy Hybrid Resin 600-1000 cP	
Viscosity	Amine Resin 1500-5000 cP	ASTM D-2196
Gel time @ 77 degrees F	10 minutes	ASTM D-2196
Cure time	2 hours at 77 degrees F	
Adhesion	>300 psi	ASTM D-7234
Hardness, Shore D	70 minutes	ASTM D-2240
Tensile Strength	2800 psi	ASTM D-638
Elongation	30% minimum	ASTM D-638
Water Absorption	0.25% maximum at 24 hrs	ASTM D-570
Coefficient of Skid (number)	80	ASTM E-274
Coverage: Liquid Binder	0.36 gallons/ sq. yd. (25 SF/gal min)	

Coverage: Aggregate	22-24 lb/square yard	
Mixing Ratio	50:50 +/- 4% by weight	

2) Two-part epoxies which are not exothermic in curing and do not meet the viscosity requirements or specified mixing ratios will not be allowed.
3) Independent laboratory report documents shall be provided that documents the epoxy binder to be used meets the requirements of this specification.

b. Aggregate Topping:
1) The aggregate topping shall be a granite or bauxite mix consisting of a 1-3 mm gradation. The aggregate shall be delivered to the construction site in clearly labeled 55 pound bags or 2200 pound super-sacks. The aggregate shall be clean, dry, and free from foreign matter.
2) The aggregate shall meet the following requirements:

Property Methods	**Requirement**	**Test**
Aggregate Abrasion Value	10% max.	LA Abrasion Test
Aggregate Grading	No. 6 Sieve size	95% max +/- 0.5 % passing
	No. 8 Sieve size	80% max. +/- 0.5% passing
	No. 16 Sieve size	5% max. +/- 0.5% passing

3) Color as shown on plans
4) Submit certification from the manufacturer that aggregate topping for Stone Surface Treatment for driveway meets the above requirements.
5) Submit documentation of the in-placed friction characteristics (min 65 FN40R in accordance with ASTM E-274) of aggregate bonded to a vehicular bearing surface using the modified epoxy binder for Stone Surface Treatment for driveway.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 IMPRINT® SURFACES

A. Pavement Removal
1. The section(s) of pavement to be replaced shall be precut in neat straight lines by approved methods.
2. The existing pavement surface shall be removed to an approximate uniform depth of 0.75 inches.
3. The Contractor shall immediately remove all residues resulting from this work. All excavated material(s) shall be disposed of in a proper manner in accordance with these specifications.
4. The Contractor shall properly prepare all work sites in accordance with the appropriate material manufacturer's requirements.
5. The contractor shall leave all work areas where the pavement has been removed in a neat and clean condition, satisfactory to The City of Portsmouth.

6. Pavement removal specifications described herein are preparatory to the installation of Imprint and the Contractor shall adhere to this prerequisite in accordance with these specifications at all times.

B. Construction
1. The Contractor shall be responsible for the preparation, placement and patterning of IMPRINT. This synthetic paving material shall be composed of a hot-applied, resin-based compound formulated with a color stable pigment throughout that shall be surface textured to simulate hand-laid brick. The contractor shall overlay IMPRINT in previously prepared recessed pavement surfaces as described herein as shown on plans.
2. Using the manufacturer prescribed methods and equipment, the Contractor shall adequately heat and uniformly mix the IMPRINT material(s) together. Use the selected IMPRINT application color from the available pigments supplied by the manufacturer as per plans. Maximum heating temperature of the completed formulation is 440 degrees Fahrenheit.
3. The Contractor shall then apply the heated, mixed IMPRINT material to the surface of the hardened, structurally sound bituminous concrete previously prepared. The IMPRINT material shall be spread to the desired thickness of 0.75 inches using specialized ironing tools, heated sufficiently to smooth the surface to a state of readiness for texturizing. No material shall be applied when precipitation is present.
4. The color and surface pattern shall be in accordance with the design as shown on plans. Texturizing will begin immediately after leveling, while the material is still hot enough to allow the mold to adequately penetrate the surface and create the pattern.
5. Once the finished surface has cooled sufficiently, the application area may be opened to vehicular and/or pedestrian traffic.

3.3 STONE SURFACE TREATMENT

A. Application: The two part modified epoxy binder material shall not be applied on a wet surface.

B. Preparation:
1. Surfaces must be clean, dry, and free of all dust, oil, debris, and any other material that might interfere with the bond between the epoxy binder material and the existing surfaces.
2. Existing surfaces shall be cleaned by use of mechanical sweepers, high pressure air, or other methods approved by the Clerk prior to the installation.
3. Adequate cleaning of all surfaces will be determined by the Clerk and/or manufacturer's representative.
4. Utilities, drainage structures, curbs and any other structures within or adjacent to the treatment location shall be protected against the application of surface treatment materials.
5. Cover and protect all existing pavement markings that are adjacent to the application surfaces as directed by the Clerk. Pavement markings that conflict with the surface application shall be removed by grinding and the surface shall be swept clean prior to the binder application.
6. Clean and fill all inadequately sealed joints and cracks greater than ¼" in width and depth with a modified emulsion and mineral filler.
7. Install the high friction epoxy binder as aggregate topping a minimum of 15 days after the placement of the underlying and adjacent asphalt pavement to reduce the likelihood do "tracking."

C. Mixing and Application of Epoxy Binder
1. Place the epoxy binder and aggregate in accordance with manufacturer's recommended methods at a coverage rate of no less than 9.5 square yards and no more than 12.5 square yards per 4.54 gallons of mixed epoxy binder depending on the quality of surface and type of pavement.
2. The two-part modified epoxy binder components part A/part B shall be proportioned to the correct ratio (50:50 +/- 4% by weight.) and mixed using a low-speed, high-torque drill fitted with a helical stirrer at a rate recommended by the manufacturer. The Contractor may choose to mix the epoxy binder using a plural component pump system of a type approved by and in accordance with the binder manufacturer. Follow binder and pump manufacturer's recommendations.
3. The homogenously mixed binder shall be uniformly distributed over the pavement section to be treated and within the temperature range specified.
4. Operations shall proceed in such a manner that will not allow the epoxy material to chill, set up, dry, or otherwise impair retention of the aggregate topping.
5. The mixed components shall be applied on to the cleaned surface at a minimum coverage rate of 2.5 pounds per square yard. Hand applied binder shall be uniformly spread onto the substrate surface by means of a serrated edged squeegee.

D. Application of Aggregate Wearing Course:
1. Immediately apply the dry aggregate onto the applied binder prior to the binder reaching its gel time at a rate of no less than 13 pounds per square yard coverage.
2. Do not compact the aggregate after placement.
3. Complete coverage of the "wet" epoxy binder with aggregate is necessary to achieve a uniform surface.
4. No exposed wet spots shall be visible once the aggregate is placed.

E. Curing:
1. Allow the aggregate topped binder to cure in accordance with manufacturer's recommendations for approximately 3 hours.
2. Protect treated surfaced from traffic and environmental effects until the area has cured.
3. Remove the excess aggregate by hand brooms, mechanical sweeping, or suction sweeping before opening to traffic.
4. Excess Aggregate can be reused on the following day's installation provided the aggregate is clean, uncontaminated, and dry.
5. The coverage rate of the retained aggregate on the binder shall be between 12-14 pounds for square yard.
6. Additional mechanical or vacuum sweeping may be necessary after the system fully cures and the treated surface is open to traffic as directed by the Clerk.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: The City of Portsmouth, NH will engage a qualified testing agency to perform tests and inspections.

B. Replace and compact hot-mix asphalt where core tests were taken.

C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.5 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

B. Any residues resulting from work shall be removed and disposed of in a legal manner.

3.6 CLEANUP

A. The complete work area shall be left in a neat and clean condition, satisfactory to The City of Portsmouth.

END OF SECTION 02742

SECTION 02780 – BRICK AND STONE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Brick pavers set in aggregate setting beds.
2. Stone set in aggregate and mortar setting beds.
3. Steel edge restraints.

1.2 SUBMITTALS

A. Product Data: For all materials other than water and aggregates.

B. Samples for stone, brick, and edge restraints.

C. Shop Drawings: Text layout and spacing with fonts as called out on drawings for Petition Line.

1.3 REFERENCE STANDARDS

A. All labor and materials shall conform to the NHDOT Standard Specifications for Road and Bridge Construction.

1.4 QUALITY ASSURANCE

A. DELIVERY, STORAGE, AND HANDLING

1. Deliver mortar, grout, and additive materials in manufacturer's unopened and undamaged containers with labels intact and legible. Store off the ground and protect from weather damage and deterioration.
2. Protect pavers from damage, chipping and soiling during delivery and storage. Store off the ground on pallets or wood platforms.
3. Store loose granular materials in a well drained area on a solid surface to prevent mixing with foreign materials.

B. Contractor shall be skilled in the installation of stone paving and brick pavement.

C. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of typical pavement area for stone and brick pavement
   a. Stone pavement: mockup about 96 inches square.
   b. Brick sidewalk: 8’ long

2. Approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.

1.5 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or build on frozen subgrade or setting beds.

B. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and higher.

PART 2 - PRODUCTS

2.1 BRICK PAVERS

~~A.~~ Brick Pavers: Light-traffic paving brick complying with ASTM C 902, Class SX, Type I, Application PS. . ~~The bricks shall not be cored nor have frogs.~~

1. Physical characteristics

a. Grade SW
b. Compressive strength: 6,000 psi minimum
c. Size: modular
1) Thickness: 2-1/4 inches (57 mm).
2) Face Size: 3-5/8 by 7-5/8 inches (92 by 194 mm).
d. Color: Artisan Flashed.

2. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Morin Brick
130 Morin Brick Road Pvt
Auburn, ME 04210
(207) 784-9375

2.2 STONE PAVERS

A. Granite Pavers: Paving slabs made from granite complying with ASTM C 615, Specification for Structural Granite

1. Physical characteristics:

a. Standard grade, Architectural Building Granite.

b. Absorption: ASTM C97, 0.4% maximum.
c. Density: ASTM C97, 160 lbs.
d. Compressive strength: ASTM C170, 19,000 psi minimum.
e. Modulus of rupture: ASTM C99, 1,500 psi minimum.

2. Products: Provide the following:

a. Truncated Dome Pavers provided by Cold Spring Granite
1) Color and Grain: Sierra White
2) Finish: Thermal.
3) Thickness: Not less than 2" unless otherwise indicated.
4) Face Size: As indicated on drawings.
5) ADAAG compliant (Title 49 DFR Transportation, Part 37.9 Standard for Accessible Transportation Facilities, Appendix A, Section 4.29.2-Detectable Warning on Walking Surfaces)

b. Curved Granite Pavers on Vault
1) Color and Grain: Wausau Red.
2) Finish: Heavy Thermal.
3) Thickness: As indicated on drawings
4) Face Size: As indicated on drawings

c. Granite Petition Line Paver
1) Color and Grain: Woodbury Gray.
2) Finish: Heavy Thermal.
3) Thickness: As indicated on drawings
4) Face Size: As indicated on drawings

d. Bases for Sculptures and Information Markers
1) Color and Grain: Wausau Red.
2) Finish: Heavy Thermal.
3) Thickness: As indicated on drawings
4) Face Size: As indicated on drawings

3. Manufacturers: Subject to compliance with requirements, products available by the following:
a. Swenson Granite
369 State Street
Concord, New Hampshire 03301
(606) 225-4322
b. North Carolina Granite Corporation
PO Box 151
Mount Airy, NC 27030
(336) 786-5141

B. Bluestone Pavers: Paving slabs made from Tar Hollow Sawn Bluestone –Equinunk Quarry complying with ASTM C 616, Classification I Exterior, with a fine, even grain from clear, sound stock

1. Physical characteristics:
a. Absorption: ASTM C97, 0.92%.

b. Density: ASTM C97, 160 lbs.
c. Compressive strength: ASTM C170.
d. Modulus of rupture: ASTM C99, 2,700 psi minimum.
e. Color: Blue.
f. Finish: thermal.
g. Thickness: As indicated on drawings.
h. Face Size: Irregular and as indicated on drawings.

2. Manufacturers: Subject to compliance with requirements, products available by the following:
a. Tompkins Bluestone
325 Tar Hollow Rd
Deposit NY 13754
607-637-5222

2.3 EDGE RESTRAINTS

A. Steel Edge Restraints: Manufacturer's standard painted steel edging 1/4 inch thick by 5 inches high with loops pressed from or welded to face to receive stakes at 36 inches o.c., and steel stakes 15 inches long for each loop.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Border Concepts, Inc.
b. Collier Metal Specialties, Inc.
c. J. D. Russell Company (The).
d. Sure-loc Edging Corporation.

2. Color: black.

2.4 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Base: Crushed gravel complying with NHDOT 304.3

B. Stonedust for Leveling Course (Setting Bed): The stone dust shall be from stone crushing operations with a maximum size of 1/8 inch.

C. Joint Filler:

1. Joints between stone pavers: Use Polymeric Stone Dust
a. Gator Dust ®
2. Joints between clay brick pavers: Use Polymeric Sand

D. Herbicide: Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

2.5 MORTAR SETTING-BED MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II; color to match polymeric stonedust joint filler.

B. Hydrated Lime: ASTM C 207, Type S.

C. Sand: ASTM C 144.

D. Latex Additive: water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed, and not containing a retarder.

E. Water: Potable.

2.6 MORTAR AND GROUT MIXES

A. General: Comply with referenced standards and with manufacturers' written instructions Discard mortars and grout if they have reached their initial set before being used.

B. Mortar-Bed Bond Coat: Mix neat cement and latex additive to a creamy consistency.

C. Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C 270, Proportion Specification.

D. Latex-Modified, Portland Cement Setting-Bed Mortar: Comply with written instructions of latex-additive manufacturer and as necessary to produce stiff mixture with a moist surface when bed is ready to receive pavers. Compressive strength of 3,000 psi, bond strength of 500 psi and water absorption of 4% maximum

E. Latex-Modified, Portland Cement Bond Coat: Proportion and mix portland cement, aggregate, and liquid latex for bond coat to comply with written instructions of liquid-latex manufacturer. Compressive strength of 5,000 psi, bond strength of 500 psi, tensile strength of 500 psi, and water absorption of 4% maximum

F. Packaged Grout Mix: Proportion and mix grout ingredients according to grout manufacturer's written instructions.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine substrates and installation conditions. Do not start stone masonry work until unsatisfactory conditions are corrected.

3.2 INSTALLATION, GENERAL

A. The Contractor shall provide neat and square cutting of existing adjacent asphalt surface as needed.

B. In areas where the edge of the walkway is not adjacent to a hard and/or vertical surface (i.e.curbing or buildings)

1. The excavation shall be 6 inches wider than the finished sidewalk width.
2. The Contractor shall install edging to hold the bricks in place. Such edging shall be installed per the manufacturer's recommendations.

C. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

D. The Contractor shall lay the bricks so that approximately 5 bricks shall cover one square foot.

E. Cut pavers with motor-driven masonry saw equipment to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible.

1. All half bricks will be snapped and all efforts will be made to keep brick dust to a minimum. All cuts not made by snapping will be wet cut.

F. Joint Pattern: As indicated on drawings.

G. Tolerances: Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) nor 1/8 inch in 24 inches and 1/4 inch in 10 feet from indicated slope, for finished surface of paving.

3.3 AGGREGATE SETTING-BED APPLICATIONS

A. Compact subgrade uniformly to at least 95 percent of ASTM D 698 laboratory density.

B. Place aggregate base, compact by tamping with plate vibrator, and screed to depth indicated.

C. Place leveling course and screed to indicated thickness; take care that moisture content remains constant and density is loose and uniform until pavers are set and compacted.

D. Treat leveling course with herbicide to inhibit growth of grass and weeds.

E. Joints

1. Brick pavers shall be set with a hand tight joint (butt-jointed), being careful not to disturb leveling base. Use string lines to keep straight lines. Fill gaps with paver pieces cut to fit; match typical pattern.
2. Bluestone and Granite pavers shall be set with a joints width as indicated on drawings, being careful not to disturb the leveling base.

F. Vibrate brick pavers into leveling course with a low-amplitude plate vibrator capable of a 3500- to 5000-lbf compaction force at 80 to 90 Hz.

G. Tamp Bluestone and Granite pavers with a rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances.

H. Apply jointing materials as per manufacturer's instructions.

3.4 MORTAR SETTING-BED APPLICATIONS

A. Saturate concrete subbase with clean water several hours before placing mortar setting bed. Remove surface water about one hour before placing setting bed.

B. Apply mortar-bed bond coat over surface of concrete subbase about 15 minutes before placing mortar bed. Limit area of bond coat to avoid its drying out before placing setting bed. Do not exceed 1/16-inch thickness for bond coat.

C. Apply mortar bed over bond coat; spread and screed mortar bed to uniform thickness at subgrade elevations required for accurate setting of pavers to finished grades indicated.

D. Mix and place only that amount of mortar bed that can be covered with pavers before initial set. Before placing pavers, cut back, bevel edge, and remove and discard setting-bed material that has reached initial set.

E. Wet pavers before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

F. Place pavers before initial set of cement occurs. Immediately before placing pavers on mortar bed, apply uniform 1/16-inch- thick bond coat to mortar bed or to back of each paver with a flat trowel.

G. Tamp or beat pavers with a wooden block or rubber mallet to obtain full contact with setting bed and to bring finished surfaces within indicated tolerances. Set each paver in a single operation before initial set of mortar; do not return to areas already set or disturb pavers for purposes of realigning finished surfaces or adjusting joints.

H. Spaced Joint Widths: as indicated on drawings.

I. Cleaning: Remove excess mortar from exposed paver surfaces; wash and scrub clean.

3.5 CLEANING

A. All waste material shall be removed and disposed of off-site at the Contractor's own expense.

END OF SECTION 02780

SECTION 02822 - ORNAMENTAL METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Steel ornamental railings with steel “paddles”.

B. Related Sections include the following:

1. Division 4 Section 04860 "Stone Masonry" for granite walls.

1.2 REFERENCE STANDARDS

A. SSPC-PA: Steel Structures Painting Council Paint Application

B. NAAMM: National Association of Architectural Metal Manufacturers

1.3 SUBMITTALS

A. Submit product data in the form of manufacturer's technical data, specifications, and installation instructions for railings.

B. Shop Drawings: Submit shop drawings showing location of railings, including each post, details of post installation, hardware, and accessories. Show sizes and thicknesses of all members, types of materials, methods of connection and assembly, complete dimensions, clearances, anchorage, relationship to surrounding work, and other pertinent details of fabrication and installation.

C. Samples for Verification: Submit samples for each profile and pattern of fabricated metal and for each type of metal finish required, prepared on metal of same thickness and alloy indicated for the Work. Include samples of the following:

1. Full-size sample of railing, fully finished, full height including frame, post, at least 3 paddles including one paddle with the tile frame bracket.
2. Hardware.
3. Paint Color

D. Qualification Data: Submit qualification data for fabricator.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Arrange for installation of ornamental metal railings specified in this Section by the same firm that fabricated it.

B. Fabricator Qualifications: A firm experienced in producing ornamental metal railings similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

PART 2 - PRODUCT

2.1 MATERIALS

A. Stainless Steel:
1. Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304.
2. Bars and Shapes: ASTM A 276, Type 304.

B. Fasteners: Type 304 stainless-steel. Select fasteners for type, grade, and class required.

C. Anchoring Cement: as per drawings

D. Gasket Material: as per drawings

E. Paint:
1. Primer: Intertuf (modified epoxy, high build, high solids) primer by International Coatings Ltd.
2. Topcoat: Interthane 990HS (polyurethane) by International Coatings Ltd.

2.2 ORNAMENTAL METAL RAILINGS

A. Railing Design: Custom; see drawings.

B. Railing Height: As indicated on Drawings.

C. Paddles: As indicated on Drawings.

D. Rails: As indicated on Drawings.

E. Posts: As indicated on Drawings.

2.3 FABRICATION, GENERAL

A. Shop Assembly: Preassemble railing in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Straighten paddles. Maximum deviation from straight shall be 1/8 inch in 4 feet.

C. Shear and punch metals cleanly and accurately. Remove burrs.

D. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. All forging shall be coal forged.

F. Provide castings that are sound and free of warp or defects which impair strength or appearance.

G. Make all welds continuous, to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal railing rigidly in place.

I. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.4 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish ornamental metal railings after assembly.

2.5 STEEL FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below and SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" for surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Remove all loose scale by blasting in accordance with SSPC-SP6. Perform blasting with an air compressor having a minimum capacity of 200 C.F.M. and an air dryer with a minimum capacity of 250 C.F.M.. Use cast steel grit blast media G25, G40, or G50 in accordance with SAE J1993.
2. Apply coating system within four hours of blasting, in a suitably designed spray booth capable of controlling environmental conditions. Do not apply paint when the air, steel or paint materials are below 50 degrees F. or the humidity is above 80 percent.

a. Do not apply paint when the relative humidity exceeds 80 percent or when the temperature is less than 5 degrees above the dew point. The temperature of the material to be coated must be within 5 degrees of the ambient temperature with minimum material temperature to be above 50 degrees. Monitor and record temperature and relative humidity on a daily basis during each application.

B. Shop Priming: Shop apply epoxy primer, *within four hours of blasting*, to uncoated surfaces of metal at 4.0 to 6.0 mils DFT. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Prime surfaces prior to application of finish coat. Surfaces to be painted shall be clean and free of oil and dirt. Fill cracks and crevices at scrolls, circles, and at sandwiched components, with Dymonic polyurethane caulking after priming has cured and prior to application of the finish paint coat.
2. Stripe paint corners, crevices, bolts, welds, and sharp edges.

C. Finish Coat: Shop apply one finish coat of polyurethane applied at 2.0 to 3.0 mils DFT.

1. Color: flat black to dark gray. Contractor shall supply color sample alternates for approval.

D. Provide finished product free of runs, sags, pinholes and holidays. Allow paint to fully cure before installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install ornamental metal railings in accordance with approved shop drawings. Do not begin installation and erection before final leveling of granite block wall is established.

B. Setting Posts in Stone:
1. Core drill post holes as shown on drawings.
2. Clean holes of loose material, insert posts, and fill space around post as per drawings.
3. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8 inch buildup, sloped away from post.

C. Railing Assembly: Install fully assembled railing sections as indicated on Drawings. Set bottom rail as indicated on Drawings.

3.2 CLEANING AND PROTECTION

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work.

END OF SECTION 02822

SECTION 02930 - PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Trees, plants, and groundcovers.
2. Planting soils and soil preparation
3. Mulches
4. Plant accessories
5. Maintenance
6. Warranty.

1.2 REFEENCE STANDARDS

A. ANSI Z133 Tree Pruning, Tree Removal and Other Tree Care Operations

B. ANSI Z60.1 American Standard for Nursery Stock

C. American Joint Committee of Horticultural Nomenclature

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

F. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

G. Planting Soil: Standardized soil used for planting: existing, native surface topsoil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

H. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

I. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

J. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

K. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

L. Topsoil: The top-most layer of soil in undisturbed areas technically defined as the A horizon which contains organic matter and soil organisms that sustain plant growth.

1.4 SUBMITTALS

A. Submit to Landscape Architect all of the following:
1. Product Data: For each type of product indicated, including soils, mulch and compost
2. Product certificates.
3. Maintenance Instructions: Recommended procedures to be established by The City of Portsmouth for maintenance of plants during a calendar year.

1.5 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

1. Pesticide Applicator: State licensed, commercial.

B. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory.
1. Report suitability of tested soil for plant growth.
a. State the pH factor, mechanical analysis, and percentage of organic matter.
b. Report presence of problem salts, minerals, or heavy metals; if present, provide additional recommendations for corrective action.
c. State the recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.

C. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of 2 years.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1. ("American Standard for Nursery Stock")

a. Provide stock true to botanical name and legibly tagged. Comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade.
b. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable, at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25% are of the minimum size indicated and 75% are of the maximum size indicated.

E. Provide "specimen" plants with a special height, shape, or character of growth. Tag specimen trees or shrubs at the source of supply. The Landscape Architect will inspect specimen selections at the source of supply for suitability and adaptability to selected location. When specimen plants cannot be purchased locally, provide sufficient photographs of the proposed specimen plants for approval.

F. Plants may be inspected and approved at the place of growth, for compliance with specification requirements for quality, size, and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.

G. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Plants

1. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected.
   a. Dig, pack, transport, and handle plants with care to ensure protection against injury.
   b. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
   c. Cover plants transported on open vehicles with a protective covering to prevent wind burn.
2. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival, the certificate shall be filed with the Landscape Architect.
3. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
4. Handle planting stock by root ball.
5. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.
6. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

B. Other Materials

1. Deliver fertilizer and other materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in manner to prevent wetting and deterioration.

2. Do not handle planting soils if they are wet.

1.7 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period for Trees and Shrubs: 30 days after Final Acceptance.
2. Maintenance Period for Ground Cover and Other Plants: 30 days from date of Final Acceptance.

PART 2 - PRODUCTS

2.1 PLANTING SOILS

A. Planting Soil: Fertile, friable, natural topsoil of a loamy character with an acidity range of between pH 5.5 and 7, without admixture of subsoil material, obtained from a well-drained arable site. Do not obtain topsoil from agricultural land, bogs or marshes. Provide topsoil free of substances harmful to the plants which will be grown in the soil. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, sticks, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix soil with approved soil amendments and fertilizers in quantities recommended by soil testing agency to produce satisfactory planting soil for the intended crop.

B. Provide dry, loose soil for planting bed mixes. Frozen or muddy topsoil is not acceptable.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

B. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings and free of sewer sludge. Analysis and certifications to be submitted prior to use.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Organic Bio-stimulant: organic substances which stimulate plants to meet their maximum, healthy potential and cause regeneration of healthy soil. Bio-stimulants promote rot and shoot growth, increase stress resistance and reduces fertilizer requirements.

2.4 FERTILIZERS

A. Bonemeal (Calcium phosphate): Commercial, raw or steamed, finely ground; a minimum of 2 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.5 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

1. A secondary root system may exist if the trunk has been buried during nursery operations. Contractor shall verify the exposed root flare is the original flare, not a secondary adventitious root system above the original.
2. Trees that have formed a secondary root system and a false root flare above the original flare may be rejected.
3. Trees that have more than 4” of planting soil over the root flare may be rejected

C. Container-grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.

1. No plants shall be loose in the container.
2. Container stock shall not be pot bound.

D. Provide tree species that mature at heights over 25 feet with a single main trunk. Trees that have the main trunk forming a "Y" shape are not acceptable.

E. Plants planted in rows or pairs of trees shall be matched in form.

F. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect.

1. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.

G. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the plant list.

H. No pruning wounds shall be present with a diameter of more than 1" and such wounds must show vigorous bark on all edges.

I. Evergreen trees shall be fully branched to the ground.

J. Shrubs and small plants shall meet the requirements for spread and height indicated in the plant list.

1. The measurements for height shall be taken from the ground level to the height of the top of the plant and not the longest branch.
2. Single stemmed or thin plants will not be accepted.
3. Side branches shall be generous, well-twigged, and the plant as a whole well-bushed to the ground.

K. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

2.6 MULCHES

A. Organic Mulch: 6-month-old, well-rotted, shredded, native hardwood bark mulch not larger than 1" in length and 1/2" in width, free of woodchips and sawdust and dark brown or black in color.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

2.7 PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.8 WATER: Provide water for irrigating that is free of substances harmful to plant growth. Hoses or other methods of water transportation to be furnished by Contractor.

2.9 ACCESSORIES

A. Stakes for Staking: Hardwood, 2" x 2" x 8'-0" long.

B. Stakes for Guying: Hardwood, 2" x 2" x 36" long.

C. Guying/Staking/Wire: No. 10 or 12 gage galvanized wire.

D. Turnbuckles: Galvanized steel of size and gage required to provide tensile strength equal to that of the wire. Turnbuckle openings shall be at least 3".

E. Staking and Guying Hose: Two-ply reinforced garden hose not less than 1/2" inside diameter.

F. Anti-desiccant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.

G. Tree wrap of any kind shall NOT be used.

H. Landscape fabric for weed prevention shall NOT be used.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

A. Protect existing utilities, paving, and other facilities from damage caused by landscaping operations.

3.2 INSPECTION

A. Pre-installation Examination Required: The Contractor shall examine previous work, related work, and conditions under which this work is to be performed and notify Landscape Architect in writing of all deficiencies and conditions detrimental to the proper completion of this work. Beginning work means Contractor accepts substrates, previous work, and conditions. The Contractor will not place any planting soil mixtures until all work in adjacent areas is complete an approved by the Landscape Architect.

3.3 PREPARATION

A. Planting shall be performed only by experience workmen familiar with planting procedures under the supervision of a qualified supervisor.

B. Planting Seasons: Work only within seasonal limitations for proper planting as follows:

Plant Material	Spring Season	Fall Season
Deciduous	April 15 to Jun 15	Sept 1 to Nov 15
Evergreens	April 15 to Jun 15	Sept 1 to Nov 15
Perennials and Ground Covers	April 15 to Jun 15	Sept 1 to Nov 15

C. Contractor shall notify the Landscape Architect of commencement of planting operations a minimum of seven (7) days prior to the beginning of work.

1. A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
2. Locate plants as shown on plans. If obstructions are encountered above or below grade that are not shown on the drawings, do not proceed with planting operations: contact the Landscape Architect for direction.
3. Contractor shall stake the location of proposed trees for approval by the Landscape Architect.
4. After approval contractor shall lay out the proposed shrubs for approval by the Landscape Architect.
5. Landscape Architect may require all shrubs to be placed in their proposed locations prior to accepting the layout.
6. Upon acceptance of the tree and shrub layouts and their installations, groundcovers and bulbs may be installed.

3.4 PLANTING AREA ESTABLISHMENT

A. Do not loosen or otherwise disturb subgrade. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off The City of Portsmouth's property.

1. Apply fertilizer directly to subgrade.
2. Thoroughly blend planting soil off-site before spreading, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
3. Spread planting soil to a depth of as indicated on drawings but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.

B. In the case where root balls are deeper than the planting soil DO NOT DISTURB SUBSOIL. Notify Landscape Architect for direction.

3.6 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly with sharp pruners; do not break, rip or tear.

C. Set stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Use planting soil for backfill.
2. Balled and Burlapped: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Container-Grown: Carefully remove root ball from container without damaging root ball or plant. Loosen roots gently with fingers.
4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

E. Stake and Guy trees and large shrubs immediately after planting.
1. Guy deciduous trees over 3” in caliper.
2. Stake large deciduous shrubs over 6’ in height.

3.7 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

3.8 GROUND COVER AND PERENNIAL PLANTINGS

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on drawings in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Mulch in Planting Areas: Apply 2-inch average thickness of mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.10 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use practices to minimize the use of pesticides and reduce hazards.

D. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate

applications with The City of Portsmouth's operations and others in proximity to the Work. Notify The City of Portsmouth before each application is performed.

E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.11 WARRANTY

A. Inspection of plants will be made by the Landscape Architect at completion of planting.

B. Warrant all plant material to remain alive and be in healthy vigorous condition for a period of 1 year after substantial completion and acceptance of project.

C. Replace, in accordance with the drawings and specifications, all plants that are dead or, as determined by the Landscape Architect, to be in an unhealthy or unsightly condition and have lost their shape due to dead branches or other causes due to the Contractor’s negligence. The cost of such replacements is at the Contractor’s expense. Warrant all replacement plants for 1 year after installation.

D. Warranty shall not include damage or loss of trees shrubs or groundcovers caused by fires floods, freezing rains, lightening storms, or winds over 75 miles per hour, acts of vandalism or negligence on the part of The City of Portsmouth or incidents that are beyond Contractor's control.

E. Remove and immediately replace all plants, as determined by the Landscape Architect, to be unsatisfactory during the initial planting installation.

F. Owner’s Responsibilities and Warranty Exclusions: After completion of the Contractor’s maintenance responsibilities, the City of Portsmouth is responsible for maintenance.

END OF SECTION 02930

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, concrete curing, and finishes.

1. See NHDOT Standard Specifications for Road and Bridge Construction and Addenda.
    a. Section 520
    b. Section 530
    c. Section 541
    d. Section 544

END OF SECTION 03300

SECTION 04860 - STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following applications of stone masonry:

1. Monolithic granite pinned together:
   a. Granite Retaining Wall
   b. Granite Plaza Curbing
2. Granite Sculpture Bases
3. Granite Informational Markers

B. Related Sections:

1. Division 2 Section 02710 “Curbing”

2. Division 2 Section 02780 “Brick and Stone Paving”

3. Division 2 Section 02822 “Ornamental Metal Railings”

1.2 REFERENCE STANDARDS

A. ASTM - American Standards for Testing and Materials

B. NBGQA - National Building Granite Quarries Association Specifications for Architectural Granite

1.3 SUBMITTALS

A. Product Data: For each type of product indicated to Landscape Architect

B. Shop Drawings: submit to Clerk
1. Provide text layout and spacing with fonts as called out on drawings.
2. Illustrate layout, cutting, and setting showing dimensions, arrangement, and provisions for jointing, and anchoring.

C. Samples:

1. For each stone type indicated to Landscape Architect

1.4 PROJECT CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 GRANITE

A. Granite: Monolithic granite blocks complying with ASTM C 615, Specification for Structural Granite

1. Physical characteristics:
   a. Standard grade, Architectural Building Granite.
   b. Absorption: ASTM C97, 0.4% maximum.
   c. Density: ASTM C97, 160 lbs.
   d. Compressive strength: ASTM C170, 19,000 psi minimum.
   e. Modulus of rupture: ASTM C99, 1,500 psi minimum.

2. Products: Provide the following:
   a. Plaza Curbing: detailed as per drawings
   b. Informational Marker: detailed as per drawings
   c. Entry Sculpture Base: detailed as per drawings
   d. Community Figures Base: detailed as per drawings
   e. Stone Retaining Wall: detailed as per drawings
   f. Stone Seat Walls: detailed as per drawings

3. Manufacturers: Subject to compliance with requirements, products available by the following:
   a. Swenson Granite
      369 North State Street
      Concord, New Hampshire 03301
      (603) 225-4322
   b. North Carolina Granite Corporation
      PO Box 151
      Mount Airy, NC 27030
      (336) 786-5141

2.2 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry

surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Diedrich Technologies, Inc.
    b. Dominion Restoration Products.
    c. EaCo Chem, Inc.
    d. Hydrochemical Techniques, Inc.
    e. Prosoco, Inc.

2.3 MORTAR MIXES

A. General: Do not use admixtures unless otherwise indicated.

1. Do not use calcium chloride.
2. Limit cementitious materials in mortar to portland cement and lime.

B. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.

1. Mortar for Setting Stone: Type S.

2.4 FABRICATION

A. Cut stone to produce pieces of thickness, size, and shape indicated, including details as accepted and detailed on final Shop Drawings. Provide holes and sinkages cut or drilled for railing and weeps. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated.

B. Finish exposed faces and edges of stone to comply with requirements indicated for finish and to match approved samples and mockups.

1. Finish: As indicated on drawings.

    a. Finish exposed ends same as front and back faces.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine substrates and installation conditions. Do not start stone masonry work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Establish lines, levels, and coursing.

B. Clean rough stone before setting. Provide edges and surfaces free of dirt and foreign matter.

C. Do not use stone units with chips, cracks, voids, stains, or other visible defects.

3.3 SETTING OF STONE MASONRY

A. GENERAL
1. Perform necessary field cutting and trimming as stone is set.
   a. Use power saws to cut stone that is fabricated with saw-cut surfaces.
   b. Use hammer and chisel to split stone that is fabricated with split surfaces.
2. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.
3. Arrange stones as shown in plans and previously approved Shop Drawings in range ashlar pattern with course heights as indicated, lengths as indicated, uniform joint widths, and with offset between vertical joints as indicated.
4. Maintain uniform joint widths.

B. SPECIAL
1. Contractor shall drill holes for pinned sculptures and informational markers to match actual pin locations. Drilling shall be done only when sculptures and informational markers are on site and ready for installation.

3.4 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/2 inch in 40 feet or more.

B. Variation from Level: For bed joints and lines of retaining wall, do not exceed 1/4 inch in 20 feet or more.

3.5 EXCESS MATERIALS AND WASTE

A. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Do not dispose of masonry waste as fill within 18 inches of finished grade.

END OF SECTION 04860

Attachment E

Project Plan Set

AFRICAN BURYING GROUND

CHESTNUT STREET

PORTSMOUTH, NEW HAMPSHIRE

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

LANDSCAPE ARCHITECT

MJS ENGINEERING, PC
CIVIL
ENVIRONMENTAL
CONSULTING ENGINEERING
5 RAILROAD STREET, P.O. BOX 359
NEWMARKET, NH 03857
PHONE: (603) 659-4979, FAX: (603) 659-4627
E-MAIL: MJS@MJS-ENGINEERING.COM

CIVIL & STRUCTURAL ENGINEERS

Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-Mail: JBE@JONESANDBEACH.COM

SURVEYOR

Seacoast Consulting Engineers, LLC
Mechanical, Electrical & Energy Engineers
261 Jennie Lane
Eliot, Maine 03903
207-370-7230
Lee@SeacoastEngineers.com

ELECTRICAL ENGINEER

DATE	DESCRIPTION
7/21/2009	*95% for Review*
11/5/2009	*WSA Review*
6/29/2010	*RW Final Review*
11/29/2010	*Revisions per RW Review - Final Review Set*
04/29/2013	*Revisions for Bid*
05/21/2013	*Revisions for Bid*
02/27/2014	*Issued for RFQ*
04/07/2014	*Issued for RFP*
04/21/2014	*Issued for Addenda #1*

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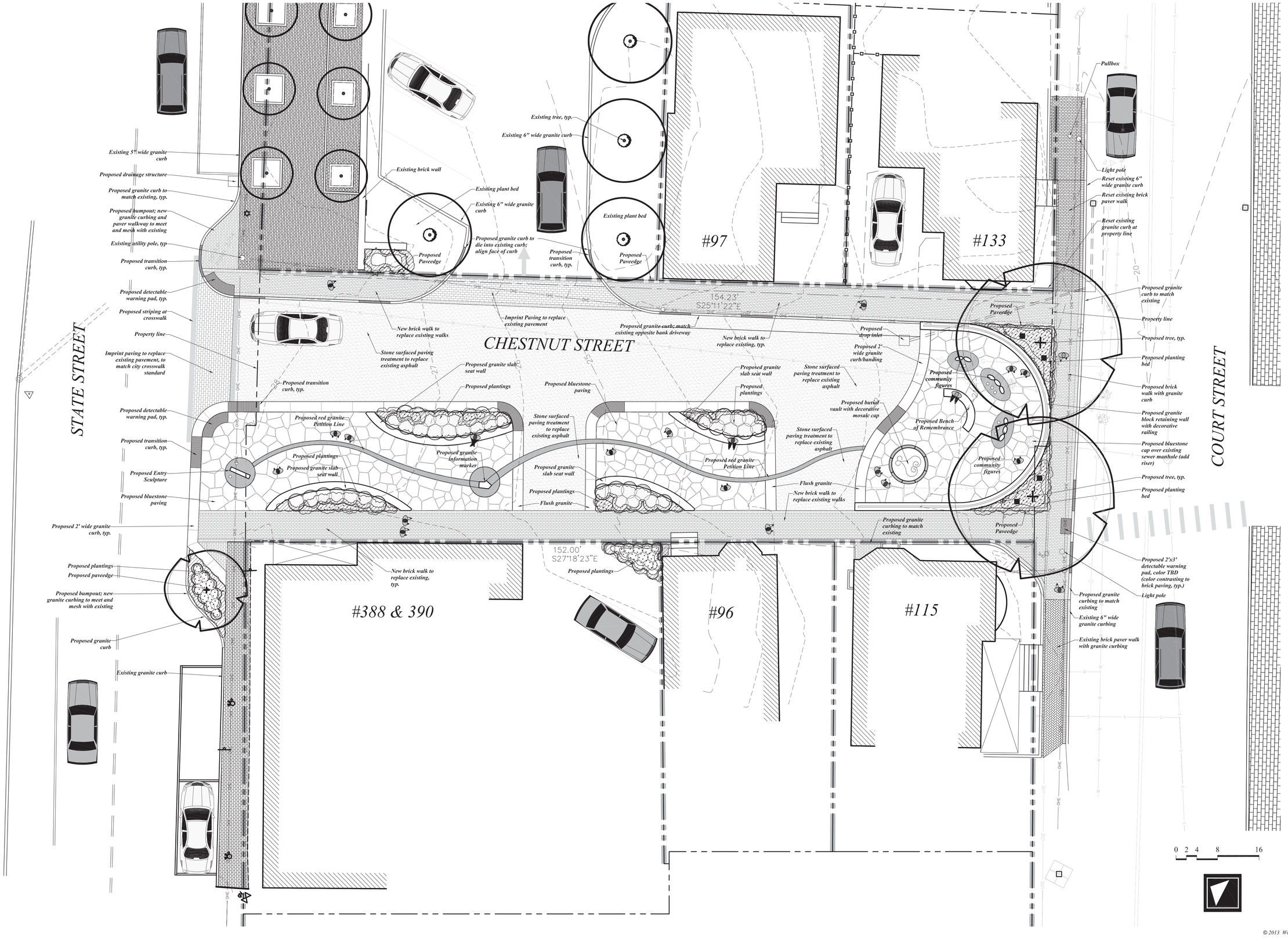

WOODBURN & COMPANY
Landscape Architecture, LLC

103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Illustrative Site Plan

Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*1/8"=1'-0"*
Date:	*2009-07-21*
	95% For Review
Revisions:	*2010-06-29*
	2010-11-29
Revisions for Bid	*2013-04-29*
Revisions for Bid	*2013-05-21*
Issued for RFQ	*2014-02-27*
Issued for RFP	*2014-04-07*
Issued for Addenda #1	*2014-04-21*

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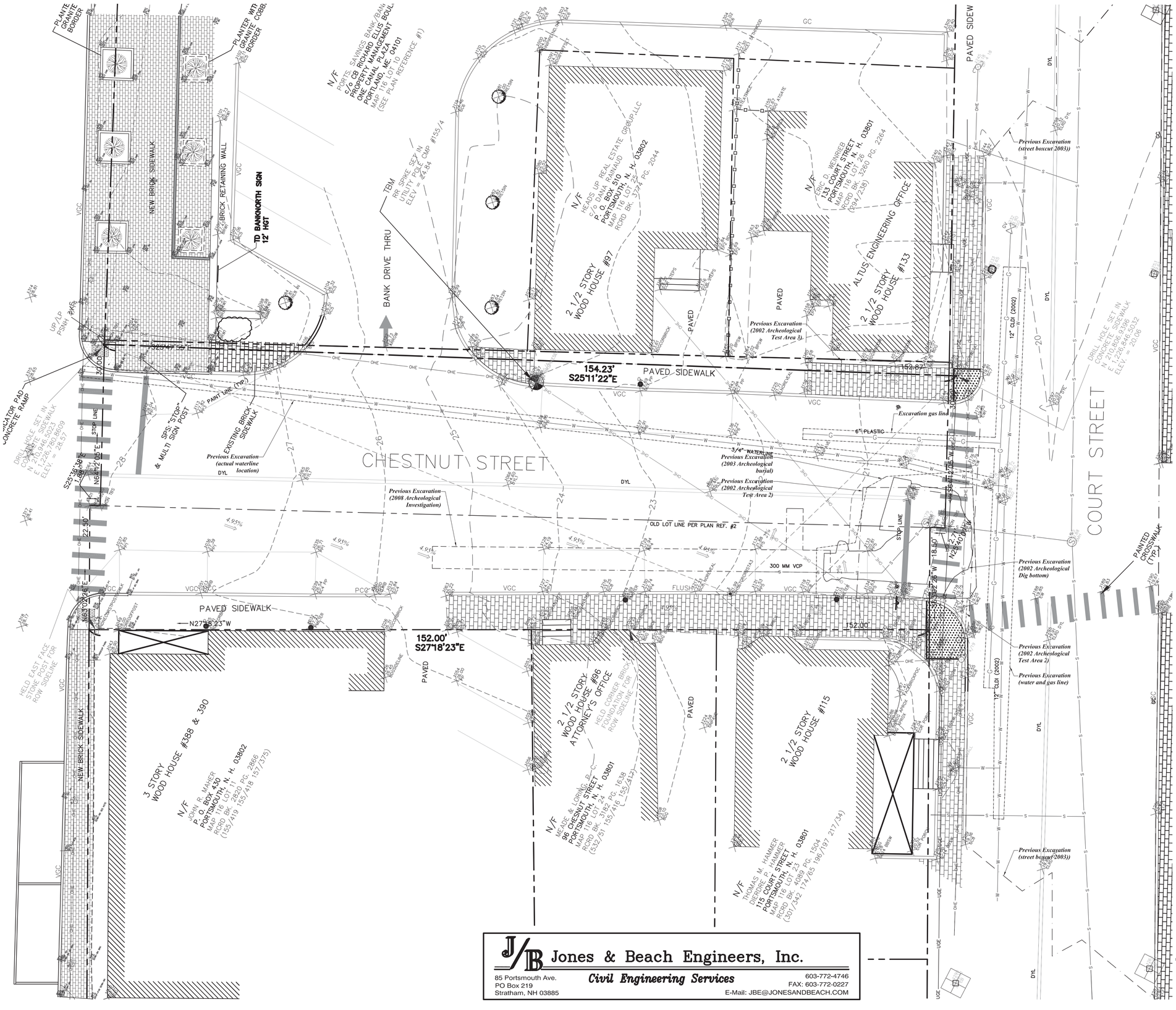
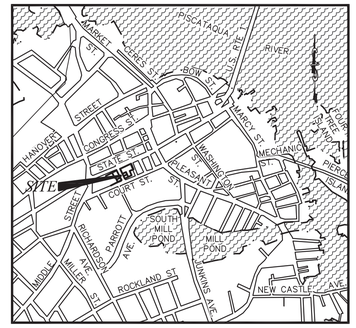
Sheet 1 of 15





LOCUS PLAN
Scale: 1"=1000'

Note:

- *Original survey provided by Jones and Beach Engineers, Inc. (received 2013-04-11)*
- *Previous excavation information provided by Independent Archaeological Consulting, LLC (IAC) compiled Jan 2009*

PLAN REFERENCES

1. "PLAN OF LAND IN PORTSMOUTH, N. H., FOR THE PORTSMOUTH SAVINGS BANK" BY JOHN W. DURGIN, FILE #2839 PLAN #4362, DATED FEBRUARY, 1975 (NOT RECORDED).
2. "PLAN OF A PART OF CHESTNUT STREET WITH THE LOT ADJOINING BELONGING TO THE CITY OF PORTSMOUTH" BY BENJAMIN ACKERMAN, DATED JUNE, 1852. (NOT RECORDED) ON FILE AT DEPT. PUBLIC WORKS.

NOTES

1. THE DETAILS SHOWN HEREON ARE THE RESULTS OF AN ON THE GROUND FIELD SURVEY PERFORMED APRIL, 2007 AND MARCH OF 2013. THE SAID DETAILS BEING LOCATED FROM AN ENCLOSED TRAVERSE HAVE AN UNADJUSTED ERROR OF CLOSURE OF 1/69,300.
2. THE COORDINATES SHOWN FOR THE BASELINE BETWEEN TWO DRILL HOLES SET ON THE EAST SIDE OF CHESTNUT STREET WERE DERIVED FROM PORTSMOUTH GIS CONTROL POINTS "MEMO" AND "MAPL" BY ABOVE STATED FIELD SURVEY. THE COORDINATES ARE BASED ON NORTH AMERICAN DATUM 83 "NAD83" AND THE ELEVATIONS ARE BASED ON "NAVD88".
3. PLAN REFERENCE 2 DELINEATES A 30 FOOT WIDE CHESTNUT STREET RIGHT OF WAY WITH A STRIP ADJOINING THE WEST EDGE OWNED BY THE CITY OF PORTSMOUTH WITH AN ENGINE HOUSE THEREON. THE SAID STRIP IS 22.5 FEET WIDE ON NORTH END AND 18.5 FEET WIDE ON SOUTH END. THIS STRIP APPARENTLY BECAME PART OF CHESTNUT STREET.
4. PORTSMOUTH TOWN RECORD BOOK FOR 1833–1844 VOL. 6 PAGE 426 STATES THAT CHESTNUT WAS FORMERLY NAMED PRISON LANE AND RENAMED CHESTNUT STREET IN 1838. SEE ALSO RCRD DEEDS BK. 217 PG. 34 (1818) AND BK. 294 PG. 238 MAKES REFERENCE TO PRISON LANE.
5. PROPERTY ON THE WEST SIDE OF CHESTNUT STREET WAS DEEDED OUT AS TWO LOTS PER RCRD BK. 155 PAGE 417 & 418 ON MAY 14, 1800, AND REFERS TO THE EAST SIDE ABUTTING BURIAL GROUNDS. RCRD BK. 208 PG. 439 REFERENCES "NEGRO BURYING GROUND" AND RCRD BK. 157 PG. 375 REFERS TO THE NORTHEAST CORNER AS BEGINNING AT THE NORTHWEST CORNER OF THE NEGRO BURYING GROUND IN 1801. THIS IS THE NORTHEAST CORNER OF MAP 116 LOT 11.
6. PARCEL DOES NOT LIE WITHIN 100 YEAR FLOOD ZONE PER COMMUNITY PANEL 33015C0259E MAY 17, 2005.
7. ZONING IS CBB – CENTRAL BUSINESS B AND MRO – MIXED RESIDENTIAL OFFICE. THE PROPERTY FALLS WITHIN THE HDA – HISTORIC DISTRICT A. SEE ARTICLE X OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.

LEGEND

PROPERTY LINE
EDGE OF PAVEMENT
CURB (AS LABELED– VERT. GRAN. CURB–SLOPE GRAN. CURB) VGC SGC
FENCE (AS LABELED)
CONCRETE PAD
GAS SHUT OFF VALVE
APPROX. GAS LINE
BRICK PAVERS
STONE RETAINING WALL
SIGN
DECIDUOUS TREE
APPROX. WATER LINE 8"CI WATER
OVERHEAD ELECTRIC OHE
UTILITY POLE
APPROX. SEWER LINE S
WATER SHUT OFF
OVERHEAD WALK LIGHT
CATCH BASIN
SEWER MANHOLE
DRILL HOLE
ONE FOOT CONTOUR 40
PARKING METER
RCRD ROCKINGHAM COUNTY REGISTRY OF DEEDS

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Existing Conditions Plan

Portsmouth, New Hampshire

Drawn By:	*WSA*
Checked By:	*RW*
Scale:	*1/8"=1'-0"*
Date:	*2009-07-21*
	95% For Review
Revisions:	*2010-06-29*
	2010-11-29
Revisions for Bid	*2013-04-29*
Revisions for Bid	*2013-05-21*
Issued for RFQ	*2014-02-27*
Issued for RFP	*2014-04-07*
Issued for Addenda #1	*2014-04-21*

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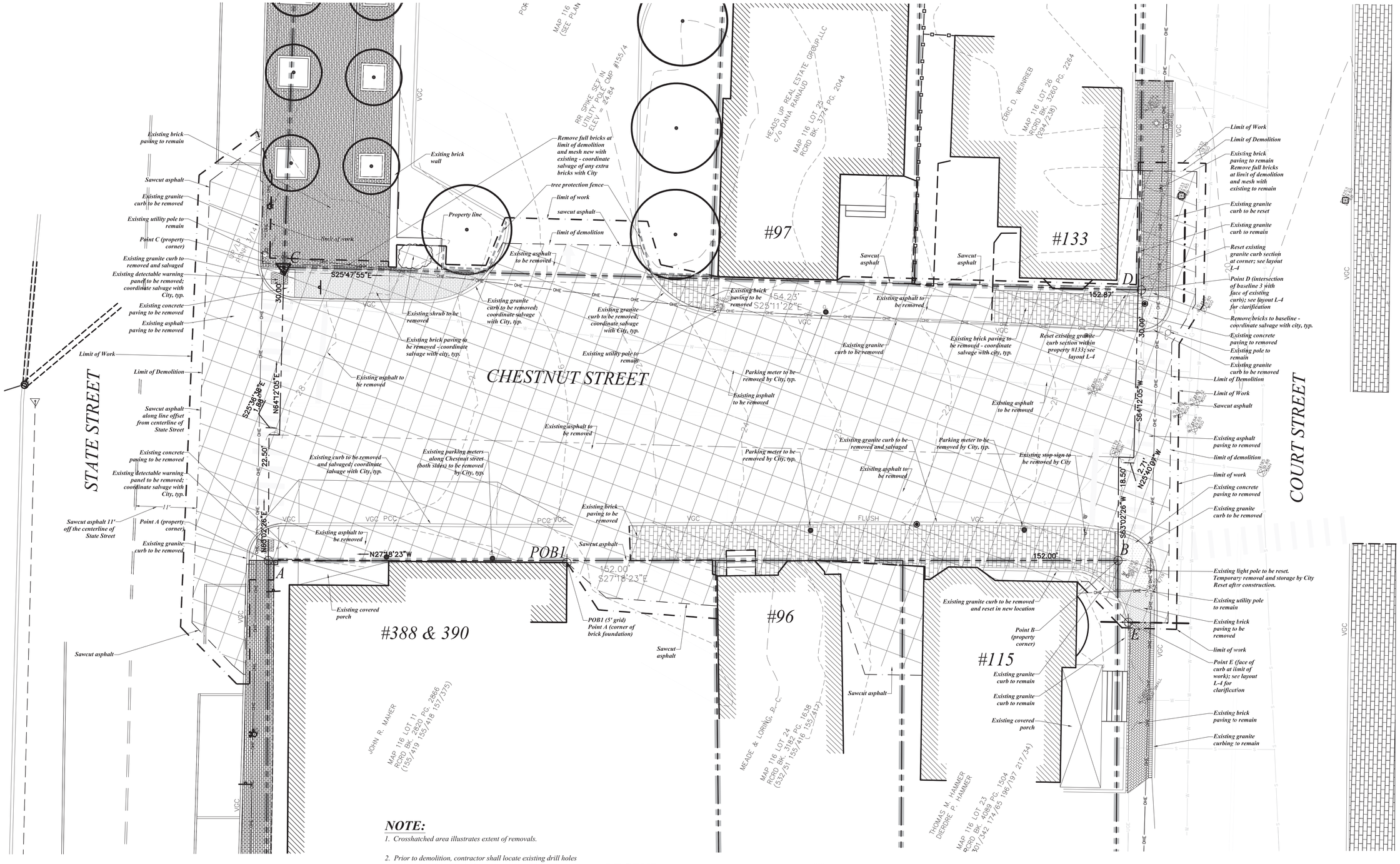
Sheet 2 of 15

JBE Project No. 06217

J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-Mail: JBE@JONESANDBEACH.COM



POINTS KEY

A	Property Corner
B	Property Corner
C	Property Corner
D	Intersection of Baseline 3 with face of existing curb SEE L-4
E	Face of existing curb at Limit of Work SEE L-4

POB1	Point of Beginning for 5' layout grid SEE L-4
X	Corner of Brick Foundation SEE L-4
Y	Endpoint of curb face SEE L-4

NOTE:

1. Crosshatched area illustrates extent of removals.
2. Prior to demolition, contractor shall locate existing drill holes and maintain locations for layout purposes.
3. Contractor shall remove all existing paving including asphalt, concrete & brick within limit of work. Subbase materials shall be removed below brick & concrete, to a total depth of 4" below existing grade. Asphalt thickness may be greater than 4" in depth.
4. For all excavations beyond 4" in depth (with the exception of thick asphalt areas) work shall be done by hand with archeologist to observe and direct as appropriate.
5. All granite curbing and bricks to be removed shall be salvaged; contractor shall coordinate with City to determine storage location

LEGEND

PROPERTY LINE
CURB (AS LABELED- VERT. GRAN. CURB-SLOPE GRAN. CURB) VGC SGC
FENCE (AS LABELED)
CONCRETE PAD
GAS SHUT OFF VALVE
APPROX. GAS LINE
BRICK PAVERS
TREE PROTECTION FENCE
SIGN
LIMIT OF DEMOLITION
DECIDUOUS TREE (existing)
APPROX. WATER LINE
OVERHEAD ELECTRIC
UTILITY POLE
APPROX. SEWER LINE
WATER SHUT OFF
OVERHEAD WALK LIGHT
LIMIT OF WORK
CATCH BASIN
SEWER MANHOLE
ONE FOOT CONTOUR
PARKING METER
DRILL HOLE
AREA OF REMOVALS

0 2 4 8 16

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Demolition Plan

Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*1/8"=1'-0"*
Date:	*2009-07-21*
	95% For Review
Revisions:	*2010-06-29*
	2010-11-29
Revisions for Bid	*2013-04-29*
Revisions for Bid	*2013-05-21*
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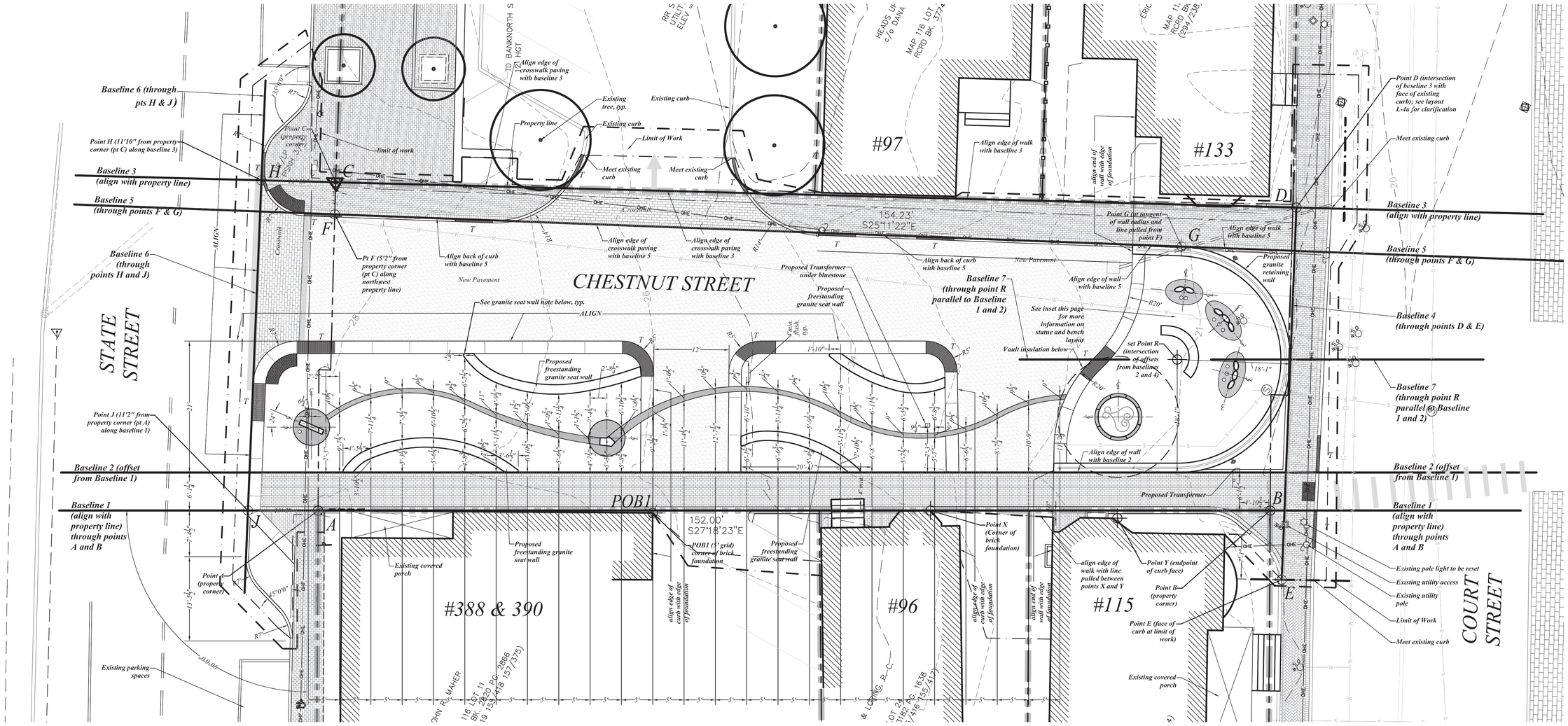
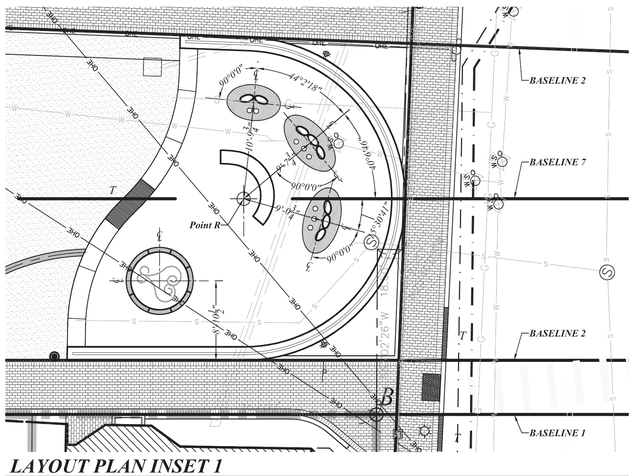


LAYOUT PLAN

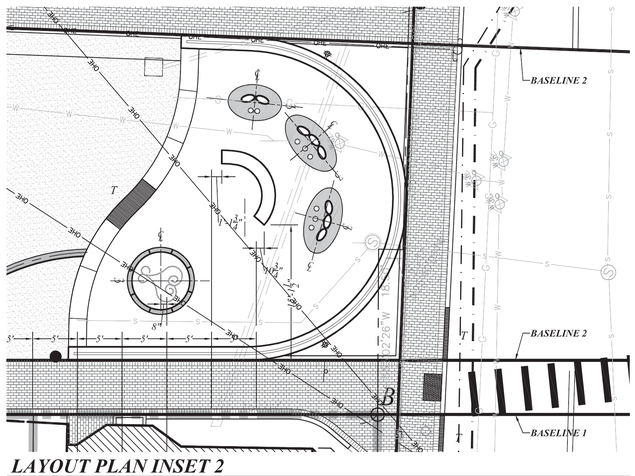
Scale: 1/8"=1'-0"

NOTE: FOR MATERIALS AND DETAIL INFORMATION SEE SHEET L-5



LAYOUT PLAN INSET 1

Scale: 1/8"=1'-0"



LAYOUT PLAN INSET 2

Scale: 1/8"=1'-0"

LEGEND

- PROPERTY LINE
- FENCE (AS LABELED)
- GAS SHUT OFF VALVE
- APPROX. GAS LINE
- BLUESTONE PAVING
- BRICK PAVERS
- SIGN
- DECIDUOUS TREE (existing)
- APPROX. WATER LINE
- OVERHEAD ELECTRIC
- UTILITY POLE
- APPROX. SEWER LINE
- WATER SHUT OFF
- OVERHEAD WALK LIGHT
- CATCH BASIN
- SEWER MANHOLE
- DRILL HOLE
- LIMIT OF WORK
- CURB TRANSITION 2" WIDE
- CURB TRANSITION 6" WIDE
- DETECTABLE WARNING

POINTS KEY

A	Property Corner
B	Property Corner
C	Property Corner
D	Intersection of Baseline 3 with face of existing curb
E	Face of existing curb at Limit of Work
F	5'2" from property corner (pt C) along northwest property line
G	Tangent point of retaining wall radius and line pulled from point F; see sheet L-4
H	11'10" from property corner (pt C) along baseline 3
J	11'2" from property corner (pt A) along baseline 1
POB1	Point of Beginning for 5' layout grid
X	Corner of Brick Foundation
Y	Endpoint of curb face

0 2 4 8 16

GRANITE SEAT WALL NOTE: WALLS WITH ACUTE ANGLE ENDS SHALL HAVE 3" RADIUS EASING, ALL OTHER CORNERS TO BE 1" RADIUS

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Layout Plan: Dimensional

Portsmouth, New Hampshire

Drawn By:	VB, WSA
Checked By:	RW
Scale:	1/8" = 1'-0"
Date:	2009-07-21
	95% For Review
Revisions:	2010-06-29
	2010-11-29
Revisions for Bid	2013-04-29
Revisions for Bid	2013-05-21
Issued for RFQ	2014-02-27
Issued for RFP	2014-04-07
Issued for Addenda #1	2014-04-21

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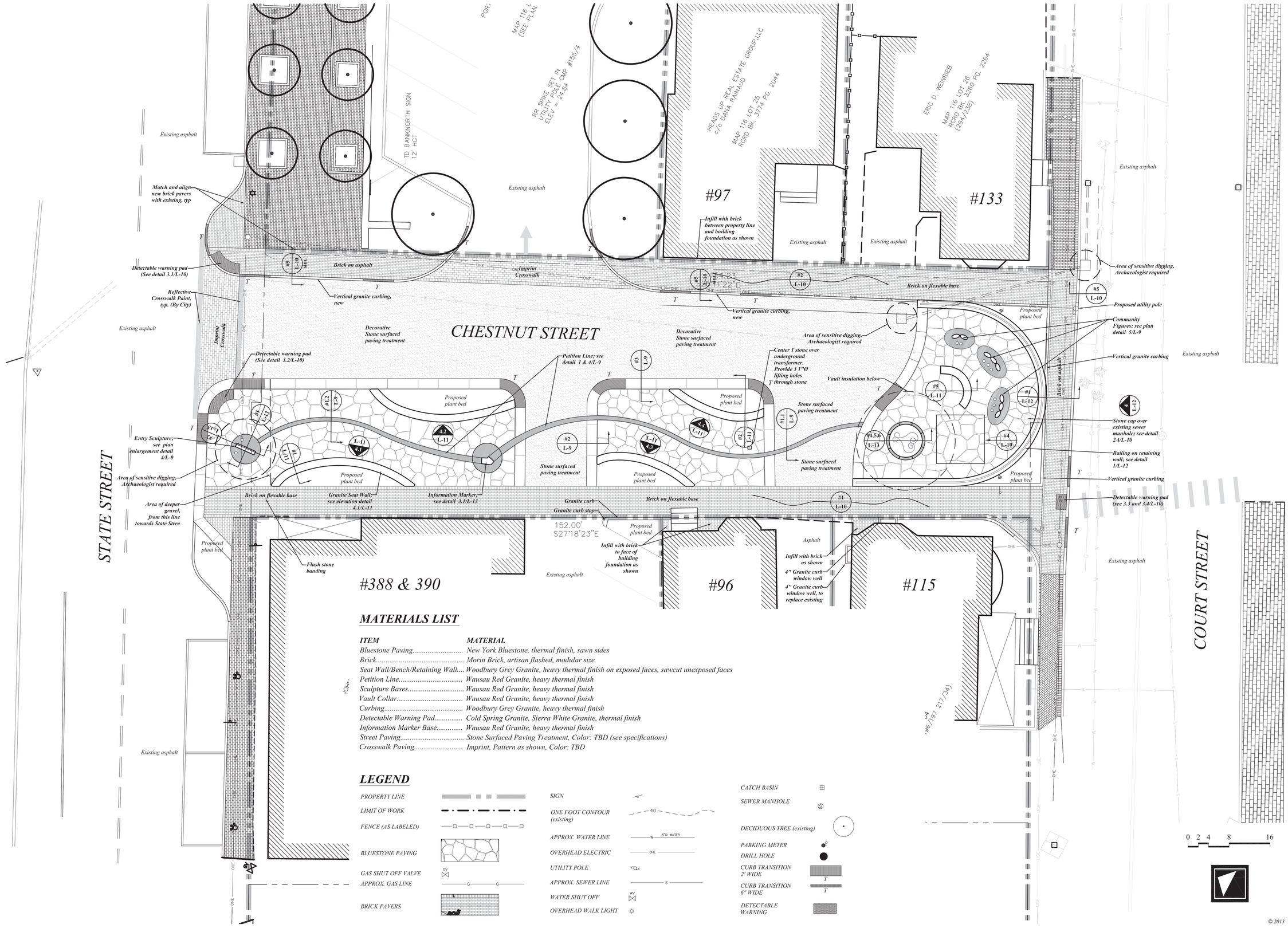

MATERIALS LIST

ITEM	MATERIAL
Bluestone Paving	New York Bluestone, thermal finish, sawn sides
Brick	Morin Brick, artisan flashed, modular size
Seat Wall/Bench/Retaining Wall	Woodbury Grey Granite, heavy thermal finish on exposed faces, sawcut unexposed faces
Petition Line	Wausau Red Granite, heavy thermal finish
Sculpture Bases	Wausau Red Granite, heavy thermal finish
Vault Collar	Wausau Red Granite, heavy thermal finish
Curbing	Woodbury Grey Granite, heavy thermal finish
Detectable Warning Pad	Cold Spring Granite, Sierra White Granite, thermal finish
Information Marker Base	Wausau Red Granite, heavy thermal finish
Street Paving	Stone Surfaced Paving Treatment, Color: TBD (see specifications)
Crosswalk Paving	Imprint, Pattern as shown, Color: TBD

LEGEND

PROPERTY LINE
LIMIT OF WORK
FENCE (AS LABELED)
BLUESTONE PAVING
GAS SHUT OFF VALVE
APPROX. GAS LINE
BRICK PAVERS
SIGN
ONE FOOT CONTOUR (existing)
APPROX. WATER LINE
OVERHEAD ELECTRIC
UTILITY POLE
APPROX. SEWER LINE
WATER SHUT OFF
OVERHEAD WALK LIGHT
CATCH BASIN
SEWER MANHOLE
DECIDUOUS TREE (existing)
PARKING METER
DRILL HOLE
CURB TRANSITION 2" WIDE
CURB TRANSITION 6" WIDE
DETECTABLE WARNING

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Layout Plan: Materials

Portsmouth, New Hampshire

Drawn By:	VB, WSA
Checked By:	RW
Scale:	as noted
Date:	2009-07-21
	95% For Review
Revisions:	2010-06-29
	2010-11-29
Revisions for Bid	2013-04-29
Revisions for Bid	2013-05-21
Issued for RFQ	2014-02-27
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Issued for Addenda #1	2014-04-21

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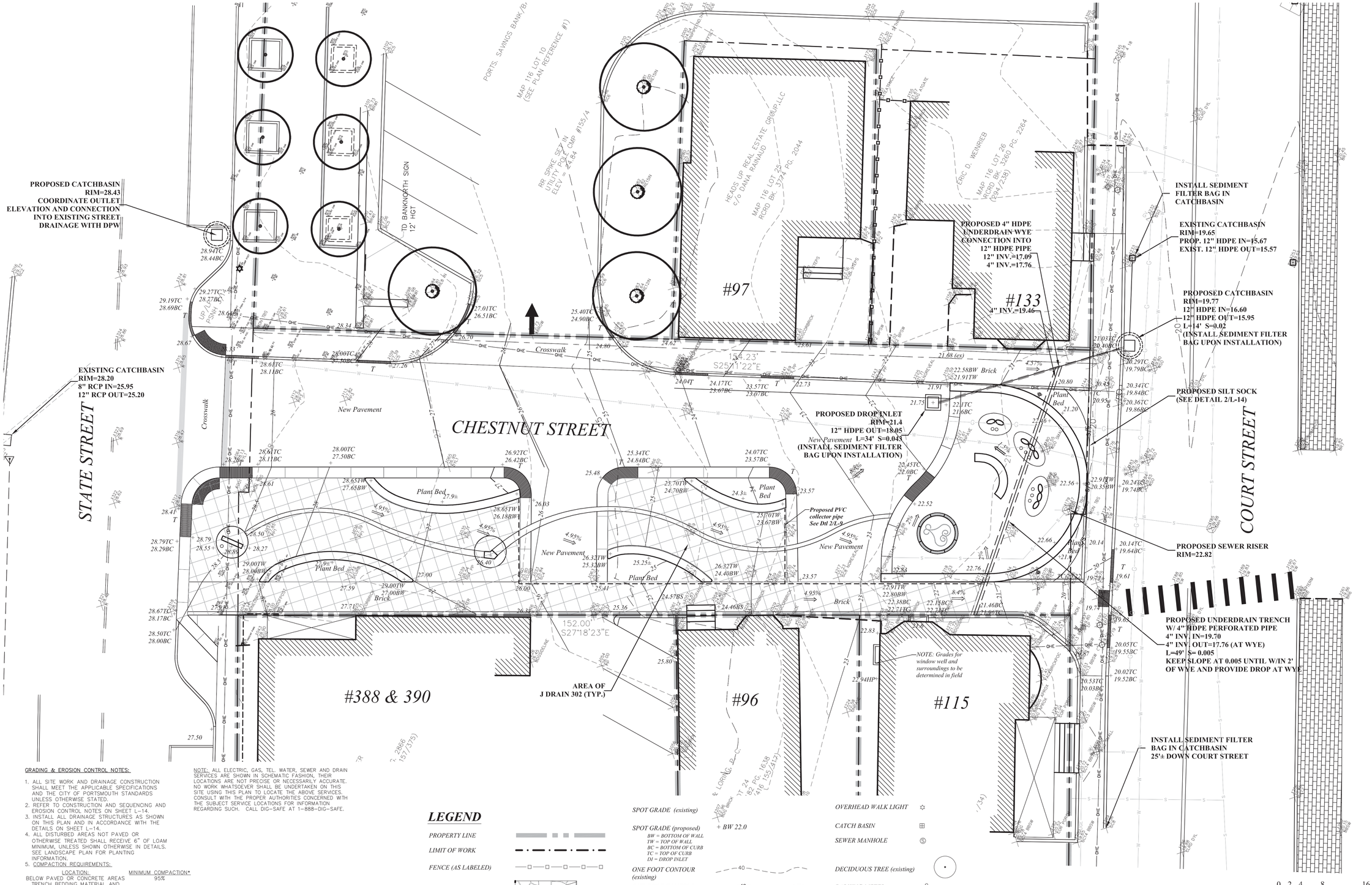
Sheet 5 of 15



GRADING & EROSION CONTROL NOTES:

1. ALL SITE WORK AND DRAINAGE CONSTRUCTION SHALL MEET THE APPLICABLE SPECIFICATIONS AND THE CITY OF PORTSMOUTH STANDARDS UNLESS OTHERWISE STATED.
2. REFER TO CONSTRUCTION AND SEQUENCING AND EROSION CONTROL NOTES ON SHEET L–14.
3. INSTALL ALL DRAINAGE STRUCTURES AS SHOWN ON THIS PLAN AND IN ACCORDANCE WITH THE DETAILS ON SHEET L–14.
4. ALL DISTURBED AREAS NOT PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" OF LOAM MINIMUM, UNLESS SHOWN OTHERWISE IN DETAILS. SEE LANDSCAPE PLAN FOR PLANTING INFORMATION.
5. COMPACTION REQUIREMENTS:

LOCATION:	MINIMUM COMPACTION*
BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

*ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM PROCTOR DENSITY.

6. ADJUST ALL MANHOLES, CATCH BASINS ETC. WITHIN LIMITS OF WORK TO FINISHED GRADE.
7. EROSION CONTROL DEVICES SHALL BE INSPECTED AFTER EACH RAIN STORM OF 0.25 INCHES OR GREATER. DAMAGED EROSION CONTROL DEVICES SHALL BE REPAIRED/MODIFIED AS NECESSARY.
8. ALL TEMPORARY STOCKPILES SHALL RECEIVE TEMPORARY EROSION CONTROL MEASURES.

NOTE: ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG–SAFE AT 1–888–DIG–SAFE.

LEGEND

PROPERTY LINE	▬ ▪ ▪ ▬
LIMIT OF WORK	━ · ━ · ━
FENCE (AS LABELED)	—□—□—□—
BLUESTONE PAVING	▨
GAS SHUT OFF VALVE	GV ⋈
APPROX. GAS LINE	—G—G—
BRICK PAVERS	▦
SIGN	
SPOT GRADE (existing)	
SPOT GRADE (proposed) *BW = BOTTOM OF WALL* *TW = TOP OF WALL* *BC = BOTTOM OF CURB* *TC = TOP OF CURB* *DI = DROP INLET*	+ BW 22.0
ONE FOOT CONTOUR (existing)	— — 40 — —
ONE FOOT CONTOUR (proposed)	—40—
APPROX. WATER LINE	—W— 8"CI WATER
OVERHEAD ELECTRIC	— OHE —
UTILITY POLE	
APPROX. SEWER LINE	— S —
WATER SHUT OFF	WV ⋈
SILT SOCK	—S/S—
OVERHEAD WALK LIGHT	☼
CATCH BASIN	⊞
SEWER MANHOLE	Ⓢ
DECIDUOUS TREE (existing)	⊙
PARKING METER	●
DRILL HOLE	◉
CURB TRANSITION 2' WIDE	▥ T
CURB TRANSITION 6" WIDE	▥ T
DETECTABLE WARNING	▩
AREA OF J DRAIN 302	⊠

MJS ENGINEERING, PC
CIVIL
ENVIRONMENTAL
CONSULTING ENGINEERING
5 RAILROAD STREET, P.O. BOX 359
NEWMARKET, NH 03857
PHONE: (603) 659-4979, FAX: (603) 659-4627
E-MAIL: MJS@MJS-ENGINEERING.COM

0 2 4 8 16

WOODBURN
&COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground
Grading & Drainage Plan
Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*1/8"=1'-0"*
Date:	*2009-07-21* *95% For Review*
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Sheet 6 of 15

LIGHT FIXTURE PHOTO REFERENCE

TYPE "A" FIXTURE

TYPE "B" FIXTURE

TYPE "C" FIXTURE

TYPE "D" FIXTURE

LEGEND

LOW VOLTAGE WIRING, 12-VOLTS, DIRECT BURIED IN 3/4" LIQUID TIGHT CONDUIT

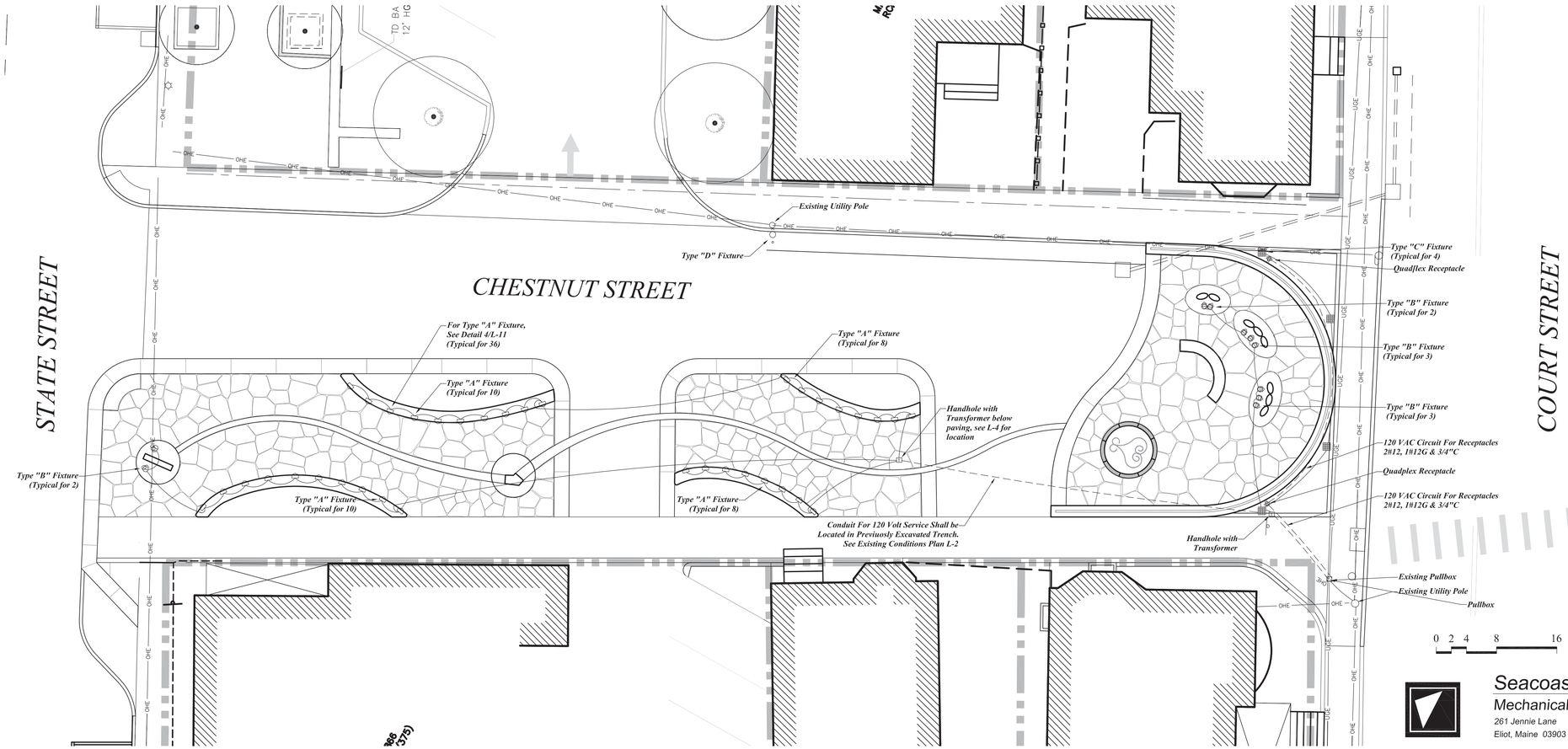
120 VOLT WIRING, DIRECT BURIED IN 3/4" LIQUID TIGHT CONDUIT

T — HANDHOLE WITH LOW VOLTAGE TRANSFORMER

LIGHTING FIXTURE SCHEDULE

LUMINAIRE SCHEDULE

SYMBOL	LABEL	MANUF	CATALOG NUMBER	DESCRIPTION	LAMP	LAMP LUMENS	WATTS
A	A	WINONA	WABRLED 12V 3024 CHS- F0 STD	RECESSED WALL MOUNTED ACCENT/PATHWAY LIGHT WITH LED LAMP	LED	430	3.5
B	B	WINONA	SYBRLED 12V 3024 L3 NAT F0 STD	FLUSH GROUND MOUNTED AIMIBLE UPLIGHT WITH LED LAMP	LED	430	3.5
C	C	WINONA	CHBRLED 3024 12V L3 NAT F0 SHO STD	FLUSH MOUNTED AIMIBLE WELL LIGHT WITH LED LAMP	LED	430	3.5
D	D	ANTIQUE STREET LAMP	EHL 16 ST 49LED 350MA 3K GCF MVOLT R3 SF DBL EAC4 WB MOD PE/PER	ARCHITECTURAL LUMINAIRE WITH DECORITIVE BRACKET AND INTEGRAL PHOTOCELL CONTROL. MOUNT TO EXISTING UTILITY POLE AT 15 FT ABOVE FINISHED GROUND	LED	6000	75



WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Lighting Plan

Portsmouth, New Hampshire

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Seacoast Consulting Engineers, LLC
Mechanical, Electrical & Energy Engineers
261 Jennie Lane
Eliot, Maine 03903
207-370-7230
Lee@SeacoastEngineers.com

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SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

PART 1 – GENERAL

1. GENERAL PROVISIONS: DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK IN CONTRACT. REFER TO ALL DRAWINGS ASSOCIATED WITH THIS PROJECT (EACH TRADE) FOR EXACT LOCATION OF ALL EQUIPMENT AND REQUIRED MOUNTING HEIGHTS.
2. SCOPE: PERFORM WORK AND PROVIDE NEW MATERIAL AND EQUIPMENT AS SHOWN ON DRAWINGS AND AS SPECIFIED IN THIS SECTION OF THE SPECIFICATIONS. PROVIDE ALL COMPONENTS AND MATERIALS, WHETHER SPECIFICALLY SHOWN OR NOT, THAT ARE NECESSARY TO MAKE THE SYSTEMS COMPLETE AND FULLY OPERATIONAL. THE DESIGN INTENT IS THE ILLUMINATION OF THE AFRICAN BURIAL GROUND SITE IN WHICH THERE ARE MULTIPLE SETS OF HUMAN REMAINS IN SHALLOW GRAVES ON THE SITE. THE ELECTRICAL CONTRACTOR SHALL USE GREAT CARE IN PLACING IN–GROUND LIGHTING FIXTURES AND DIRECT BURIED RACEWAYS AND EQUIPMENT IN ORDER NOT TO DISTURB EXISTING REMAINS. EXCAVATION AND BACKFILLING FOR THE ELECTRICAL INSTALLATION SHALL BE PERFORMED BY THE GENERAL CONTRACTOR AND NOT THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AS TO THE ROUTING AND BURIAL DEPTH OF ALL RACEWAYS, LIGHTING FIXTURES AND TRANSFORMERS WHICH THE GENERAL CONTRACTOR WILL ENDEAVOR TO ACCOMMODATE BUT ACTUAL ROUTING OF RACEWAYS AND LOCATION OF ELECTRICAL EQUIPMENT WILL BE DETERMINED BY WHAT MAY BE ENCOUNTERED DURING EXCAVATION WHICH MAY REQUIRE A SHIFT IN LOCATION.
3. SITE VISIT: VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS THAT MAY AFFECT WORK OF THIS SECTION BEFORE SUBMITTING BID. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY DISCERNED.
4. CODES, STANDARDS, AUTHORITIES AND PERMITS: ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE CITY OF PORTSMOUTH CONSTRUCTION STANDARDS, THE STATE ELECTRICAL CODE, NFPA, ANSI/NECA INSTALLATION STANDARDS AND OTHER APPLICABLE CODES, REGULATIONS AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENT, OTHER AUTHORITIES HAVING JURISDICTION AND APPLICABLE BASE BUILDING STANDARDS AND SPECIFICATIONS. CODES, LAWS AND ORDINANCES PROVIDE A BASIS FOR THE MINIMUM INSTALLATION CRITERIA. THESE DRAWINGS AND SPECIFICATIONS ILLUSTRATE THE SCOPE REQUIRED FOR THIS PROJECT, WHICH MAY EXCEED MINIMUM CODE, LAW AND STANDARDS CRITERIA. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY BACKCHARGES AND OBTAIN NECESSARY APPROVALS FROM UTILITY COMPANIES AND AUTHORITIES HAVING JURISDICTION AS REQUIRED FOR THE EXECUTION OF ALL WORK ASSOCIATED WITH THIS PROJECT.
5. INTERPRETATION OF DOCUMENTS: ADVISE THE LANDSCAPE ARCHITECT IN WRITING (RFI) PRIOR TO PROCEEDING WITH PROCUREMENT OR INSTALLATION THAT THE DESIGN INTENT IS UNCLEAR OR THAT CONSTRUCTION DOCUMENTS DO NOT COINCIDE WITH MANUFACTURER'S RECOMMENDATIONS. ALL COSTS FOR REWORK NECESSARY TO RESOLVE DISCREPANCIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. REQUEST FOR INFORMATION: RFI ISSUED TO RESOLVE A CONFLICT OR DISCREPANCY SHALL BE PROVIDED WITH THE PREFERRED SOLUTION VIA WRITTEN DESCRIPTION OR SKETCH.
7. SUBMITTALS: SUBMIT SHOP DRAWINGS OF ALL MATERIAL TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO ORDERING. OBTAIN AND SUBMIT TO THE LANDSCAPE ARCHITECT ANY REQUESTED SAMPLES. SAMPLES SHALL NOT BE RETURNED TO THE CONTRACTOR OR BUILT INTO PROJECT.
8. OPERATION AND MAINTENANCE DATA: SUBMIT (2) SETS OF OPERATING AND MAINTENANCE MANUALS INCLUDING SYSTEM DESCRIPTION, WIRING DIAGRAMS, WRITTEN WARRANTY, RECOMMENDED SPARE PARTS AND ROUTINE MAINTENANCE REQUIREMENTS WITH RECOMMENDED INTERVALS FOR ALL SUPPLIED EQUIPMENT.
9. RECORD DRAWINGS: CAD RECORD DRAWING FILES SHALL BE SUBMITTED AT THE COMPLETION OF THE PROJECT SHOWING THE "AS–BUILT" CONDITION INCLUDING WORK INSTALLED AND ALL MODIFICATIONS OR ADDITIONS TO ORIGINAL DESIGN. OBTAIN THE AUTOCAD FILES FOR PREPARATION OF AS–BUILT DRAWINGS FROM THE LANDSCAPE ARCHITECT. THE LANDSCAPE ARCHITECT AND ENGINEER ARE NOT GRANTING ANY OWNERSHIP OR PROPERTY INTEREST IN THE CAD DRAWINGS BY THE DELIVERY OF THE CAD FILES. THE RIGHTS TO USE THE CAD FILES AND DRAWINGS ARE LIMITED TO USE FOR THE SOLE PURPOSE OF ASSISTING IN THE PERFORMANCE OF CONTRACTUAL OBLIGATIONS WITH RESPECT TO THIS PROJECT. ANY REUSE AND/OR OTHER USE WILL BE AT THE CONTRACTOR'S SOLE RISK AND WITHOUT LIABILITY TO THE ARCHITECT AND ENGINEER.
10. WARRANTIES: WARRANTY INSTALLATION IN WRITING FOR ONE YEAR FROM DATE OF OWNER'S ACCEPTANCE OF CERTIFICATE OF SUBSTANTIAL COMPLETION. REPAIR, REPLACE OR PROVIDE TEMPORARY ACCOMMODATIONS FOR DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN 24 HOURS OF NOTIFICATION. WARRANTY SHALL INCLUDE A CONTACT PERSON (NAME AND 24 HOUR TELEPHONE NUMBER) FOR SERVICE REQUESTS. CORRECT DAMAGE CAUSED WHILE MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER WARRANTY PERIOD AT NO ADDITIONAL COST.
11. COORDINATION: CONFER WITH ALL OTHER TRADES RELATIVE TO LOCATION OF ALL APPARATUS AND EQUIPMENT TO BE INSTALLED AND SELECT LOCATIONS SO AS NOT TO CONFLICT WITH OR HINDER PROGRESS OF WORK OF OTHER SECTIONS. WORK INSTALLED THAT CREATES INTERFERENCE OR RESTRICTS ACCESS REQUIRED BY CODE OR TO CONDUCT MAINTENANCE AND/OR ADJUSTMENTS SHALL BE MODIFIED AT NO ADDITIONAL COST TO THE OWNER.
12. CUTTING AND PATCHING: INCLUDE ALL CORING, CUTTING AND PATCHING NECESSARY FOR THE EXECUTION OF THE WORK OF THIS SECTION.
13. SAFETY PRECAUTIONS: LIFE SAFETY AND ACCIDENT PREVENTION SHALL BE A PRIMARY CONSIDERATION. COMPLY WITH ALL OF THE SAFETY REQUIREMENTS OF THE OWNER AND OSHA THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD OF THE PROJECT. FURNISH, PLACE AND MAINTAIN PROPER GUARDS AND ANY OTHER NECESSARY CONSTRUCTION REQUIRED TO SECURE SAFETY OF LIFE AND PROPERTY.
14. ACCESSIBILITY: ALL WORK PROVIDED UNDER THIS SECTION OF THE SPECIFICATION SHALL BE SO THAT PARTS REQUIRING PERIODIC INSPECTION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE. WORK OF THIS TRADE SHALL NOT INFRINGE UPON CLEARANCES REQUIRED BY EQUIPMENT OF OTHER TRADES,
15. PROTECTION OF WORK AND PROPERTY: THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND PROTECTION OF ALL WORK INCLUDED UNDER THIS SECTION UNTIL THE COMPLETION AND FINAL ACCEPTANCE OF THIS PROJECT. PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE FROM ALL CAUSES INCLUDING, BUT NOT LIMITED TO, FIRE VANDALISM AND THEFT. ALL MATERIALS AND EQUIPMENT DAMAGED OR STOLEN SHALL BE REPAIRED OR REPLACED WITH EQUAL MATERIAL OR EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER. PROTECT ALL EQUIPMENT, OUTLETS AND OPENINGS WITH TEMPORARY PLUGS, CAPS AND COVERS. PROTECT WORK AND MATERIALS OF OTHER TRADES FROM DAMAGE THAT MIGHT BE CAUSED BY WORK OR WORKMEN UNDER THIS SECTION AND MAKE GOOD DAMAGE THUS CAUSED. DAMAGED MATERIALS ARE TO BE REMOVED FROM THE SITE; NO SITE STORAGE OF DAMAGED MATERIALS WILL BE ALLOWED. ANY DAMAGE TO EXISTING SYSTEMS AND EQUIPMENT CAUSED BY THIS CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.

PART 2 – PRODUCTS

1. RACEWAYS AND CONDUIT: RACEWAYS EXPOSED TO THE WEATHER OR RACEWAYS THAT ARE DIRECT BURIAL SHALL BE LIQUID TIGHT WITH ASSOCIATED LIQUID TIGHT FITTINGS. RACEWAYS SHALL BE 3/4" TRADE SIZE UNLESS LARGER SIZES ARE NOTED ON THE DRAWINGS.
2. WIRE AND CABLE: ALL CONDUCTORS SHALL BE TYPE THHN/THWN OR XHHW, COPPER, RATED 75°/90°C, 600 VOLT INSULATION UNLESS OTHERWISE NOTED. MINIMUM SIZE CONDUCTOR SHALL BE #12 AWG COPPER. CONDUCTORS #10 AWG AND LARGER SHALL BE STRANDED; #12 AWG AND SMALLER SHALL BE SOLID. EACH BRANCH CIRCUIT AND FEEDER SHALL BE PROVIDED WITH AN INSULATED GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250.122. CONDUCTOR COLOR CODING SHALL BE IN ACCORDANCE WITH THE DETAILS ON THESE DRAWINGS. COLOR CODING SHALL BE CONSISTENT THROUGHOUT NCLUDING CONDUCTORS INSTALLED IN RACEWAYS.
3. PULL AND JUNCTION BOXES: PROVIDE A BOX WITH SCREW AT EACH JUNCTION POINT AND WHEREVER REQUIRED TO FACILITATE PULLING IN CONDUCTORS. EACH BOX SHALL BE ACCESSIBLE AT THE COMPLETION OF THE PROJECT. EACH BOX SHALL BE SIZED TO HAVE SUFFICIENT VOLUME TO ACCOMMODATE THE NUMBER OF CONDUCTORS ENTERING THE BOX PER THE NATIONAL ELECTRIC CODE. PULL AND JUNCTION BOXES SHALL BE DIRECT BURIED AND THE EXACT LOCATION SHALL BE IDENTIFIED ON THE AS–BUILT DRAWINGS BY MEASUREMENT FROM FIXED OBJECTS.
4. TRANSFORMERS FOR LOW VOLTAGE LIGHTING SYSTEM SHALL BE WINONA LIGHTING #TM1–300–120V, MAGNETIC TYPE COMPLETE WITH CIRCUIT BREAKERS TO BE MOUNTED IN A STAINLESS STEEL ENCLOSURE, U.L. LISTED FOR OUTDOOR WET LOCATION, DIRECT BURIED. TRANSFORMER PRIMARY SHALL BE 120 VOLTS AND THE SECONDARY SHALL BE 12 VOLTS, UNLESS OTHERWISE INDICATED BY LIGHT FIXTURE MANUFACTURER. THE EXACT LOCATION ON THE TRANSFORMERS SHALL BE IDENTIFIED ON THE AS–BUILT DRAWINGS BY MEASUREMENT FROM FIXED OBJECTS.
5. OVERCURRENT PROTECTION: SHALL BE PROVIDED IN THE DECORATIVE STREET LIGHTING POLE WHERE THE EXISTING STREET LIGHTING CIRCUIT IS TAPPED. THE ELECTRICAL CONTRACTOR SHALL INSTALL IN THE BASE OF THE LIGHT POLE AN IN–LINE FUSE HOLDER, BUSS #HLR WITH FUSE RATED 5 AMPERES TO SERVE THE CIRCUIT EXTENSION FOR THE BURIAL GROUND LIGHTING FIXTURES.
6. EQUIPMENT GROUNDING: ALL EXPOSED NON–CURRENT CARRYING CONDUCTIVE MATERIAL ENCLOSING ELECTRICAL EQUIPMENT OR FORMING PART OF SUCH EQUIPMENT OPERATING ON THE 120 VOLT SYSTEM SHALL BE BONDED TOGETHER IN A POSITIVE CONTINUOUS RACEWAY AND EQUIPMENT GROUNDING SYSTEM. SIZES OF GROUNDING CONDUCTORS SHALL BE IN ACCORDANCE WITH TABLE 250.122 OF THE NATIONAL ELECTRIC CODE. GREEN INSULATED EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSTALLED IN EVERY LIGHTING 120 VOLT AND POWER CIRCUIT RACEWAY BONDED TO THE DEVICE OR EQUIPMENT AND CONNECTED TO THE EQUIPMENT GROUND WITHIN THE DECORATIVE LIGHT POLE WHERE THE SOURCE OF POWER IS OBTAINED. GROUNDING CONDUCTOR SHALL BE #12 AWG MINIMUM. THERE SHALL BE ONE GROUNDING CONDUCTOR FOR EACH CIRCUIT. RACEWAYS SHALL BE SIZED TO INCLUDE THE REQUIRED EQUIPMENT GROUNDING CONDUCTOR. WRAPPING OR LOOPING EQUIPMENT GROUNDING CONDUCTORS WILL NOT BE ACCEPTED. FOR MULTIPLE BOND WIRES AT PULL OR JUNCTION BOXES. THEY MUST BE TWISTED TOGETHER, TAPED WHERE EXPOSED TO LIVE PARTS AND INSTALLED UNDER A SOLDERLESS LUG BOLTED TO THE BOX.
7. LIGHTING FIXTURES: SHALL BE NEW, FURNISHED COMPLETE WITH A FULL COMPLIMENT OF THE LAMPS SPECIFIED INSTALLED IN THE FIXTURES AND SPECIFIED APPURTENANCES. FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND DETAILS ON ELECTRICAL AND LANDSCAPE PLANS. SELECTION OF FINISHES FOR ALL LIGHTING FIXTURES SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT. ON–OFF CONTROLS FOR TYPES A, B AND C LIGHTING FIXTURES SHALL BE BY AN EXISTING CONTROL DEVICE WHICH CONTROLS THE STREET LIGHT CIRCUIT THAT IS BEING TAPPED IN THE DECORATIVE STREET LIGHT POLE IDENTIFIED ON THE ELECTRICAL PLAN AT THE INTERSECTION OF CHESTNUT AND COURT STREETS. LIGHTING FIXTURE TYPE D SHALL INCLUDE AN INTEGRAL PHOTO CONTROL FOR ON–OFF CONTROLS. ALL METAL FIXTURES AND CONNECTIONS SHALL BE NON–CORROSIVE.

PART 3 EXECUTION

1. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES, LAMPS EQUIPMENT, DEVICES, RACEWAYS AND WIRING INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE TO THE COMPLETE SATISFACTION OF THE ENGINEER.
2. THE ELECTRICAL CONTRACTOR SHALL REFER TO LANDSCAPE DRAWINGS AND LANDSCAPE ARCHITECT FOR EXACT LOCATION OF EQUIPMENT. ADJUST LOCATIONS AND MOUNTING HEIGHTS AS DIRECTED BY LANDSCAPE ARCHITECT. FIELD VERIFY ALL LOCATIONS PRIOR TO ROUGH–IN.
3. THE ELECTRICAL CONTRACTOR SHALL FULLY COORDINATE WORK WITH OTHER TRADES.
4. AFTER INSTALLATION ALL ELECTRICAL EQUIPMENT SHALL BE PROTECTED FROM DAMAGE DURING THE CONSTRUCTION PERIOD.
5. DURING THE COURSE OF THE CONSTRUCTION THE ELECTRICAL CONTRACTOR SHALL MARK–UP A SET OF ELECTRICAL DRAWINGS TO REFLECT ALL CHANGES IN LOCATION OF ELECTRICAL RACEWAYS AND EQUIPMENT AND SHALL ALSO IDENTIFY THE EXACT LOCATION OF ALL BURIED TRANSFORMERS AND PULL AND JUNCTION BOXES BY DIMENSIONS FROM 2 FIXED POINTS. THESE MARKED–UP DRAWINGS SHALL BECOME THE AS–BUILT DRAWINGS AND SHALL BE INCLUDED IN THE O & M MANUALS.

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground
Lighting Specifications
Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*as noted*
Date:	*2009-04-21*

Revisions:
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Seacoast Consulting Engineers, LLC
Mechanical, Electrical & Energy Engineers
261 Jennie Lane
Eliot, Maine 03903
207-370-7230
Lee@SeacoastEngineers.com

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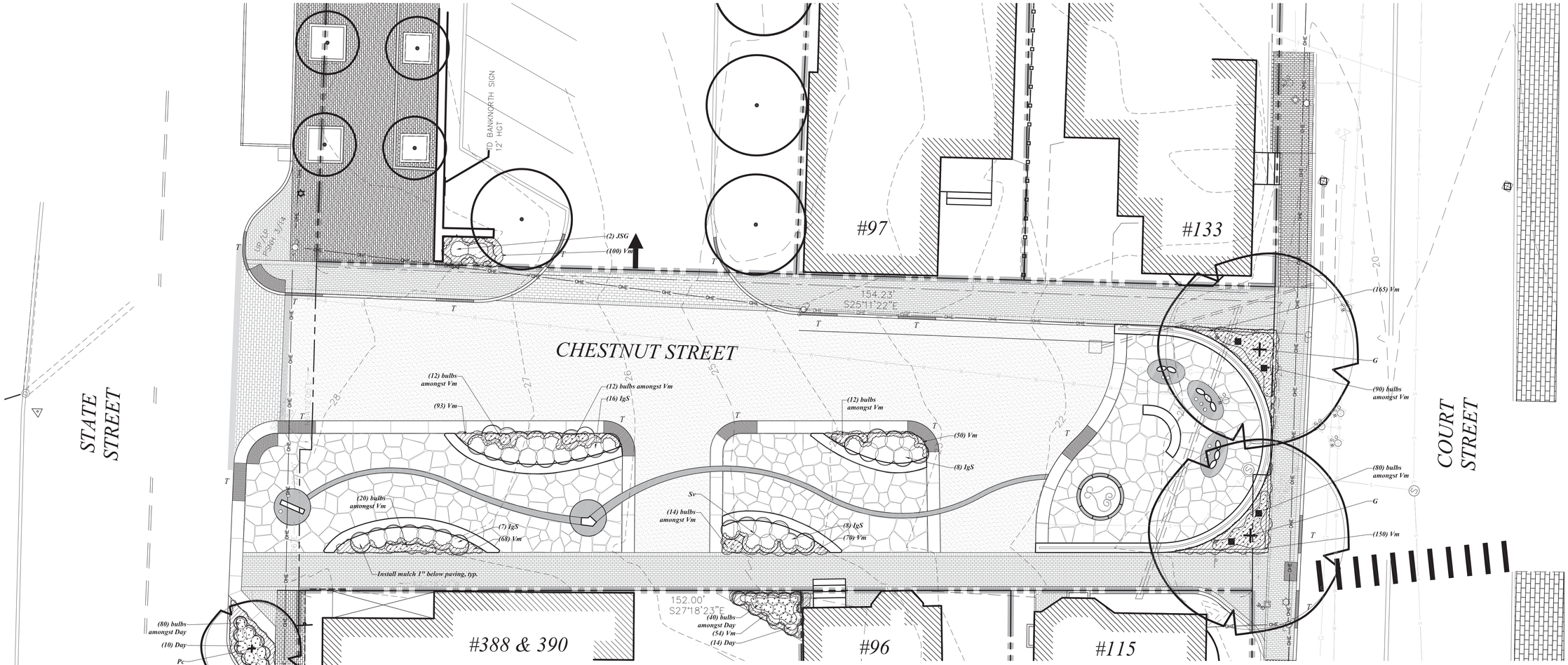


Planting Plan

Scale: 1/8"=1'-0"

General Landscape Notes

1. Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 7' to allow clear and safe passage of vehicles and pedestrians under tree canopy.
2. Plant beds shall be prepared to a depth of 12" max with 75% loam and 25% compost.
3. Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and ½" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer.
4. See specification handbook for additional planting information.
5. Mulch stall be installed 1" below all abutting paving, to prevent mulch from washing onto paving.

Plant List

TREES

	Symbol	Botanical Name	Common Name	Quantity	Size	Comments
¤	G	*Gleditsia triancanthos inermis 'Halka'*	Halka Thornless Honeylocust	2	4" cal	
¤	Pc	*Pyrus calleryana 'Chanticleer'*	Chanticleer Flowering Pear	1	3" cal	

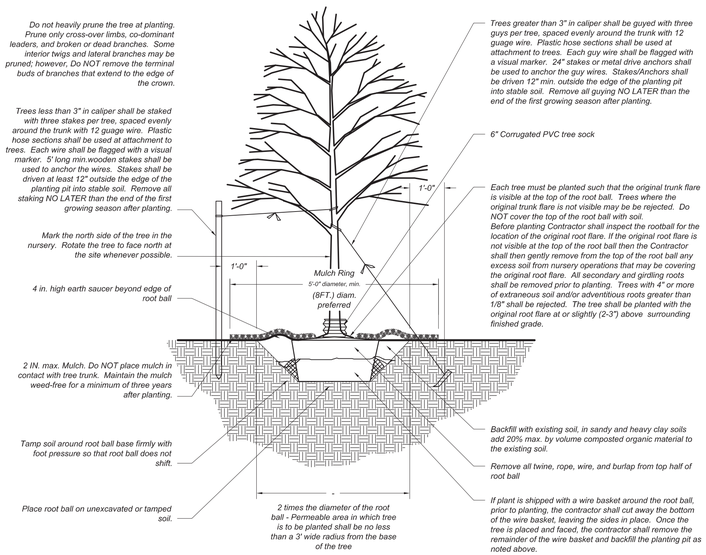
SHRUBS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
IgS	*Ilex glabra 'Shamrock'*	Shamrock Inkberry	39	5 gal	
JSG	*Juniperus chinensis 'Seagreen'*	Seagreen Juniper	2	5 gal	

PERENNIALS, GROUNDCOVERS, VINES and ANNUALS

Symbol	Botanical Name	Common Name	Quantity	Size	Comments
VM	*Vinca minor 'Bowles'*	Bowles Periwinkle	825	1 gal	plant 8" o.c.
bulbs	Daffodil Mix:				plant 8" o.c.
	Narcissus 'Fragrant Breeze'	Fragrant Breeze Daffodil	120	top size	
	Narcissus 'Passionale'	Passionale Daffodil	120	top size	
	Narcissus 'King Alfred'	Bright Yellow Trumpet Daffodil	120	top size	
Day	*Daylily Mix*				mix evenly
	Hemerocallis 'Big Time Happy'		8	1 gal	
	Hemerocallis 'Barbara Mitchell'		8	1 gal	
	Hemerocallis 'Jovial'		7	1 gal	
	Hemerocallis 'Pink Apricot Serenade'		7	1 gal	

¤ To be tagged in field by Landscape Architect



Typical Tree Planting Detail

Scale: NTS

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5049
Fax: 603.659.5939

African Burying Ground

Planting Plan

Portsmouth, New Hampshire

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Revisions for Bid	2013-04-29
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Planting Revised	2013-12-12
	(2014-02-19)
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Issued for Addenda #1	2014-04-21

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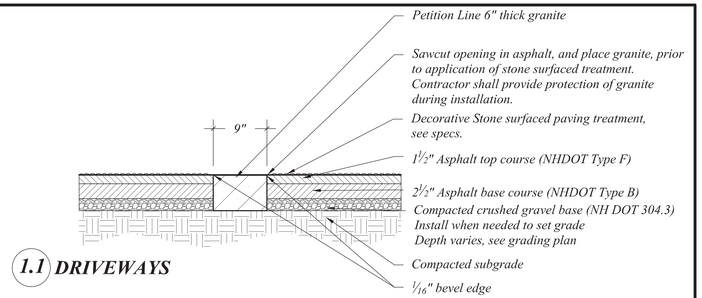
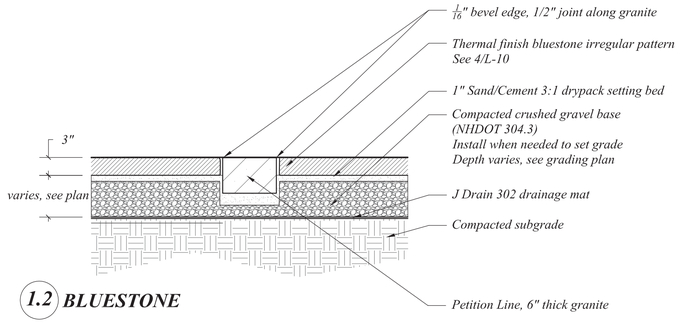


1.1 DRIVEWAYS

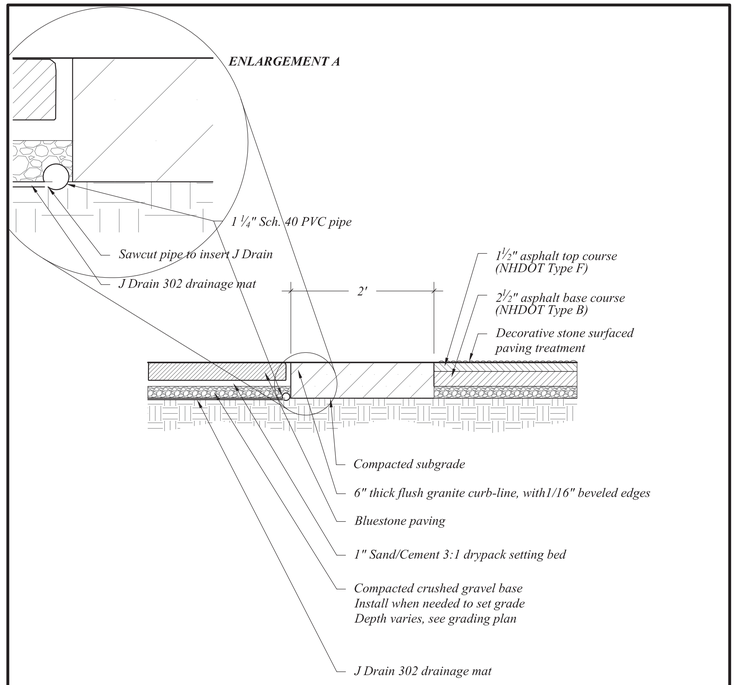


1.2 BLUESTONE

1 PETITION LINE IN BLUESTONE & DRIVEWAYS

Scale: 1"=1'-0"

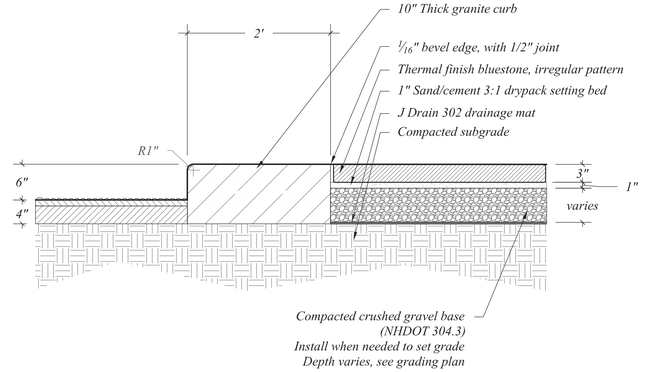
0 1/2 1 2



2 FLUSH CURB AT DRIVEWAY

Scale: 1"=1'-0"

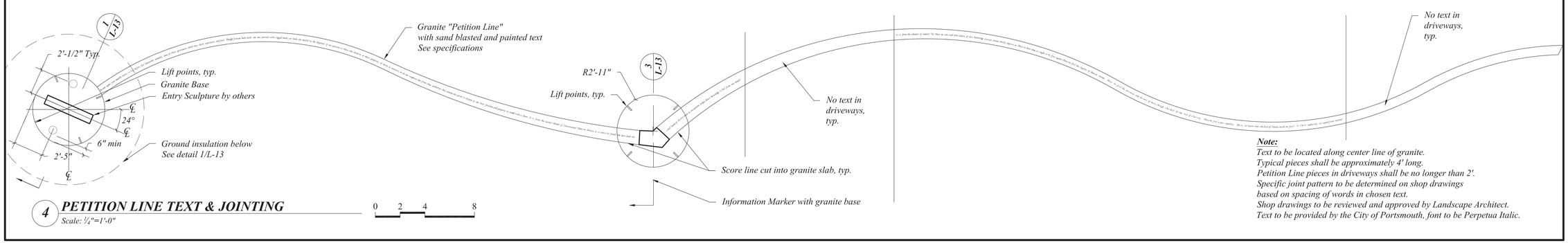
0 1/2 1 2



3 PLAZA CURB, TYP.

Scale: 1"=1'-0"

0 1/2 1 2

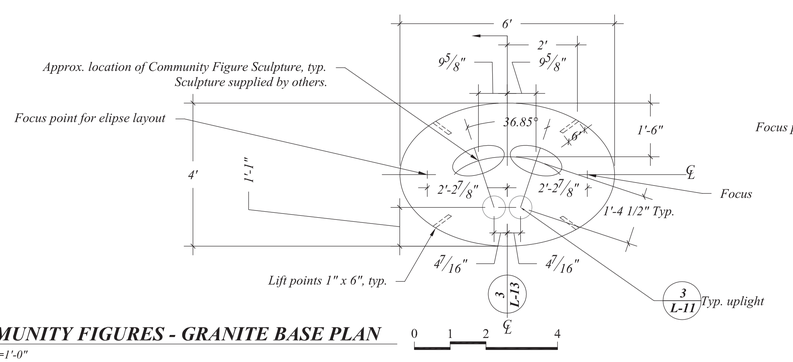


Note:
Text to be located along center line of granite.
Typical pieces shall be approximately 4' long.
Petition Line pieces in driveways shall be no longer than 2'.
Specific joint pattern to be determined on shop drawings based on spacing of words in chosen text.
Shop drawings to be reviewed and approved by Landscape Architect.
Text to be provided by the City of Portsmouth, font to be Perpetua Italic.

4 PETITION LINE TEXT & JOINTING

Scale: ¼"=1'-0"

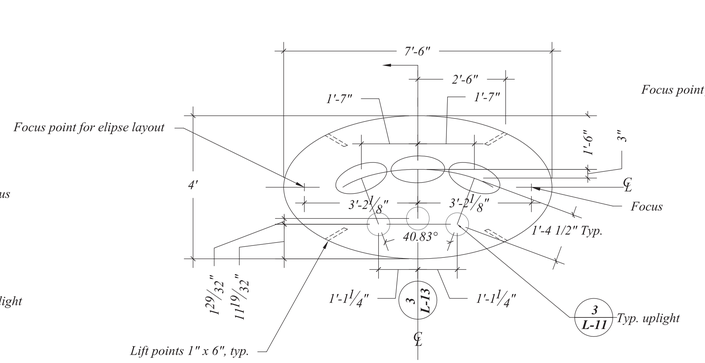
0 2 4 8

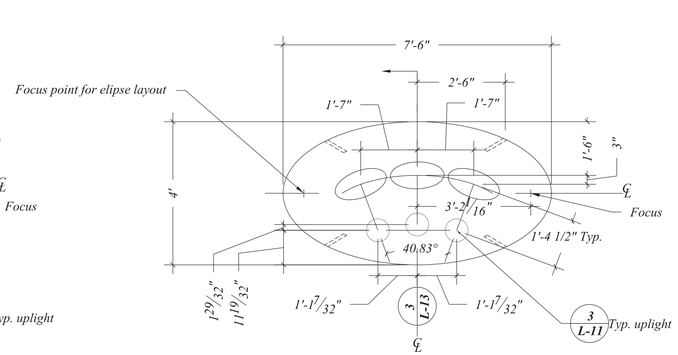


5 COMMUNITY FIGURES - GRANITE BASE PLAN

Scale: ½"=1'-0"

0 1 2 4





WOODBURN & COMPANY
Landscape Architecture, LLC

103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Petition Line & Curbing Details

Portsmouth, New Hampshire

Drawn By:	VB, WSA
Checked By:	RW
Scale:	as noted
Date:	2009-07-21
	95% For Review
Revisions:	2010-06-29
	2010-11-29
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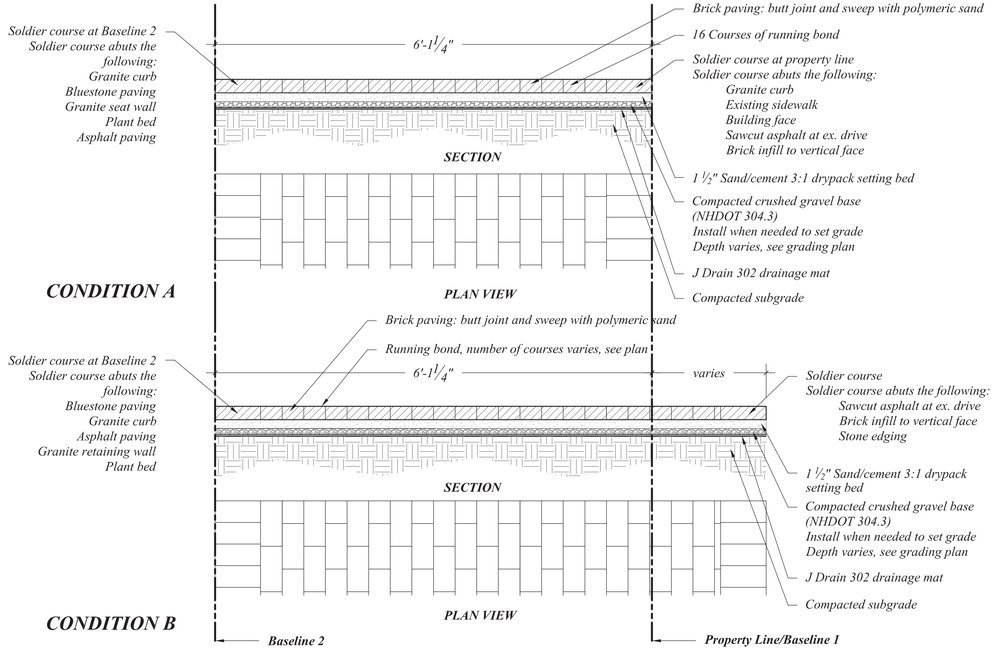
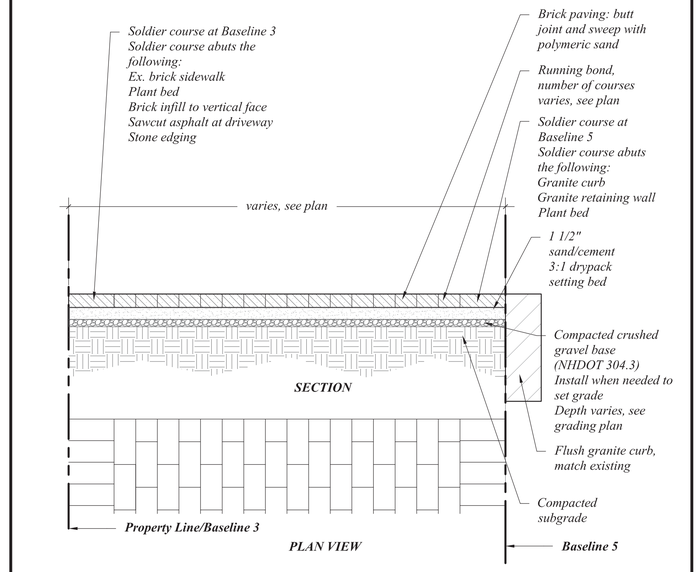
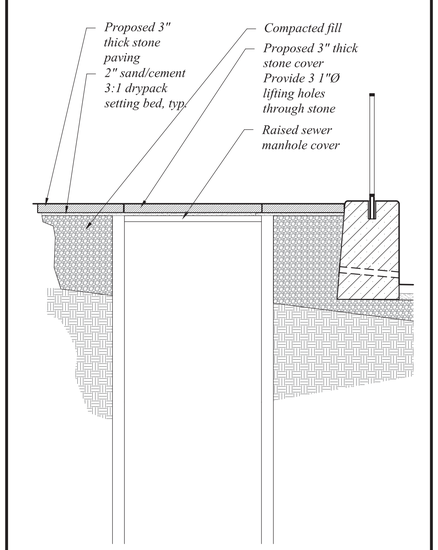


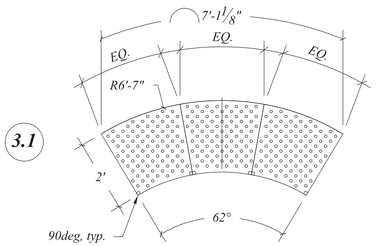
1 BRICK WALK AT BASELINE 1
Scale: 1"=1'-0"



2 BRICK WALK AT BASELINE 3
Scale: 1"=1'-0"

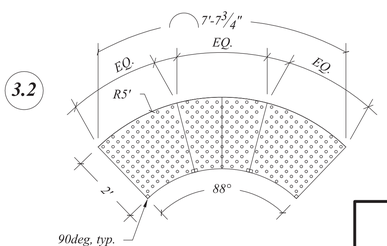


2A STONE COVER
Scale: 1/2"=1'-0"



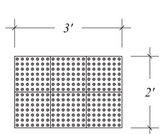
3.1

Note:
Detectable warning pad supplied by Cold Spring Granite.
Contractor to provide shop drawings illustrating compliance with ADA standards



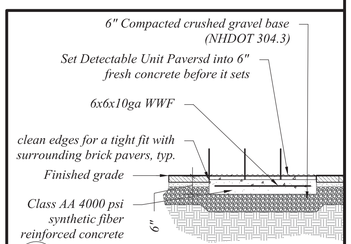
3.2

Note:
Detectable warning pad supplied by Cold Spring Granite.
Contractor to provide shop drawings illustrating compliance with ADA standards



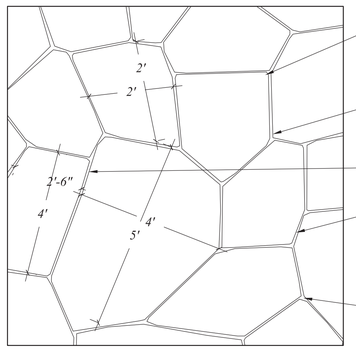
3.3

Note:
Detectable warning pad shall comply with City of Portsmouth Standards. Pad shall consist of Engineered Plastic units. Color to be light gray.



3.4 Setting Detail

3 DETECTABLE WARNING PADS



Sharp corners or acute angles to be roughly rounded

Brush joints with polymeric stonedust

Limit length of straight joints to 7' max.

Typical joints to measure ½" to 1 ½"

Joints at the juncture of 3 or more stones shall have a maximum joint width of 1 ½"

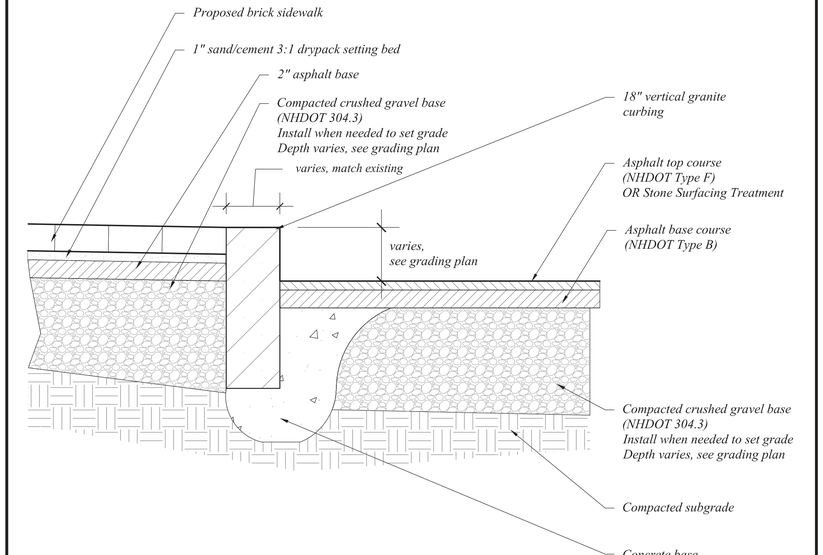
IRREGULAR PAVING SIZES	SQUARE FEET	% OF TOTAL PAVED AREA
18" x 18" (min)	2.25	25
24" x 24"	4.0	25
3' x 3'	9.0	25
4' x 4'	16.0	15
5' x 5' (max)	25.0	10

* all numbers approximate

Note:
Contractor shall provide 12' x 12' sample panel of paving pattern for review and approval by Landscape Architect

All paving shall comply with ADA surface standards

4 BLUESTONE PAVING PATTERN, TYP.



5 VERTICAL GRANITE CURB
Scale: 1-½"=1'-0"

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Paving Details

Portsmouth, New Hampshire

Drawn By:	VB, WSA
Checked By:	RW
Scale:	as noted
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	95% For Review
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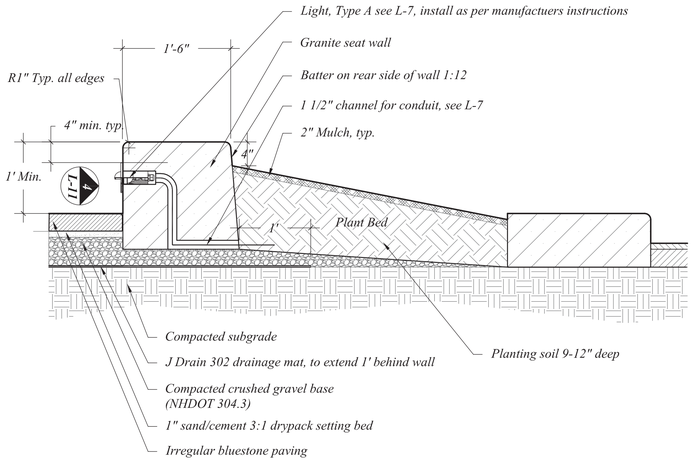
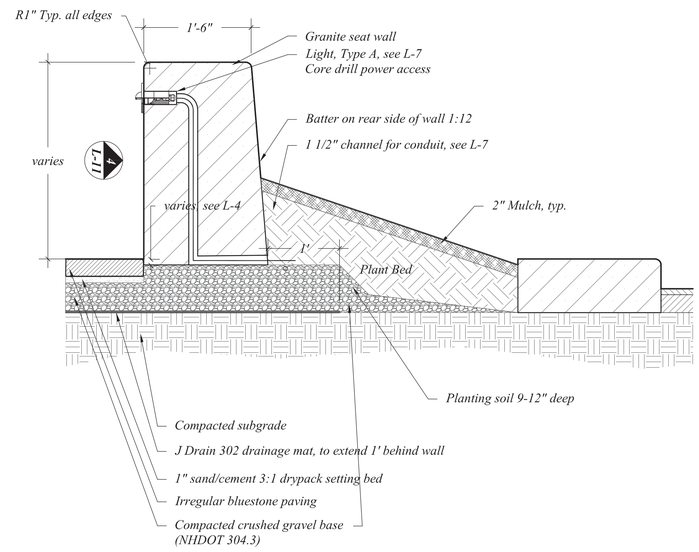


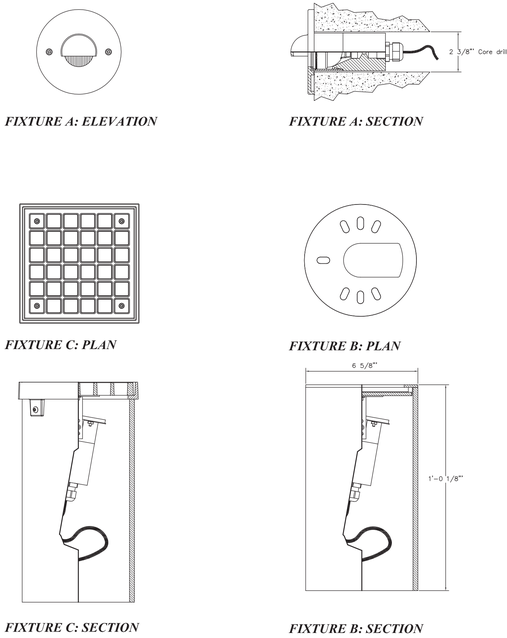
1 GRANITE SEAT WALL - SHORT
Scale: 1"=1'-0"

0 1/2 1 2



2 GRANITE SEAT WALL - TALL
Scale: 1"=1'-0"

0 1/2 1 2



FIXTURE A: ELEVATION

FIXTURE A: SECTION

FIXTURE C: PLAN

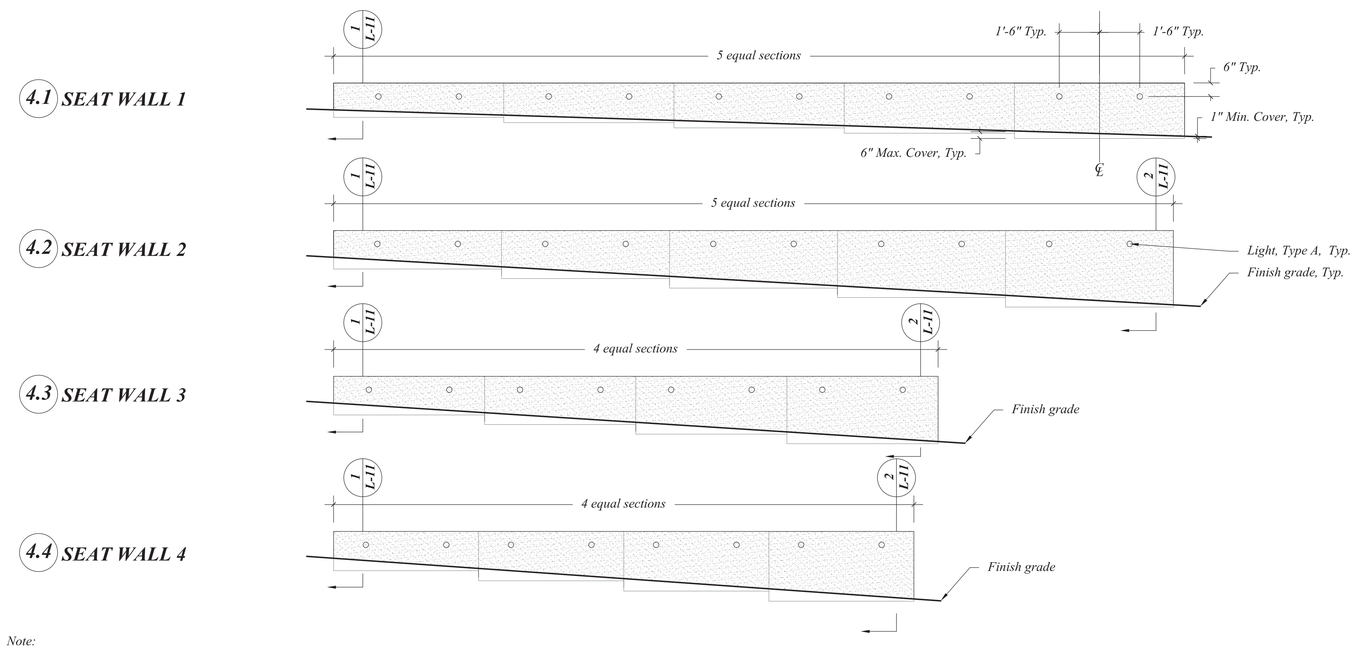
FIXTURE B: PLAN

FIXTURE C: SECTION

FIXTURE B: SECTION

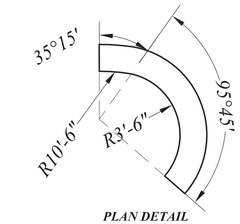
NOTE: ALL DIMEMTIONS TO BE VERIFIED WITH MANUFACTUER SPECS.

3 LIGHTING
Scale: NTS

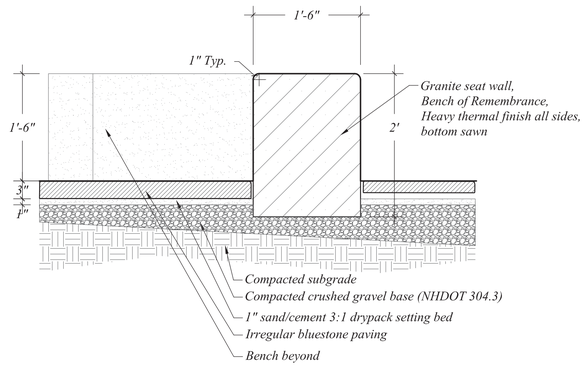


Note:
Contractor shall supply shop drawings for walls.

4 GRANITE SEAT WALL ELEVATIONS
Scale: 3/8"=1'-0"



PLAN DETAIL



5 BENCH OF REMEMBRANCE
Scale: 1"=1'-0"

0 1/2 1 2

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Seat Walls & Benches Details

Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*as noted*
Date:	*2009-07-21*
	95% For Review
Revisions:	*2010-06-29*
	2010-11-29
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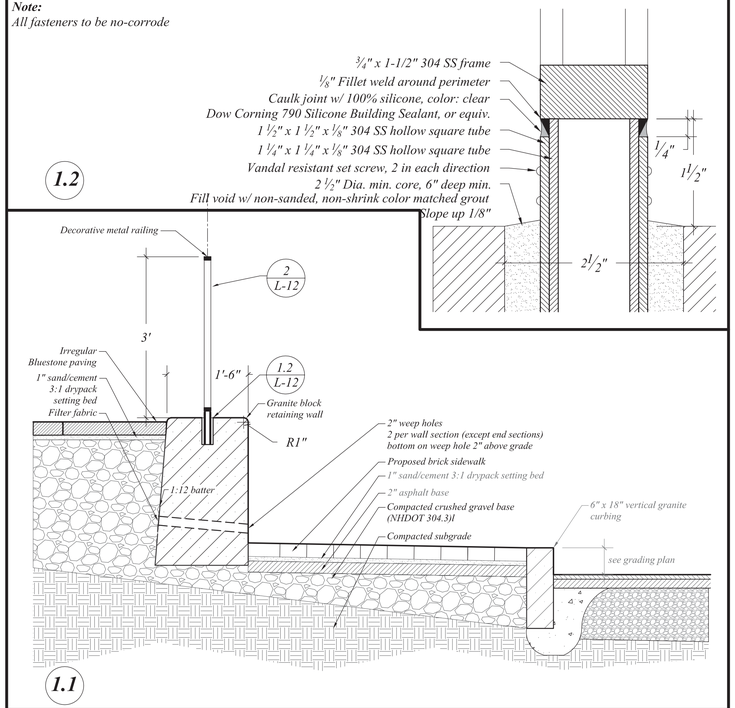
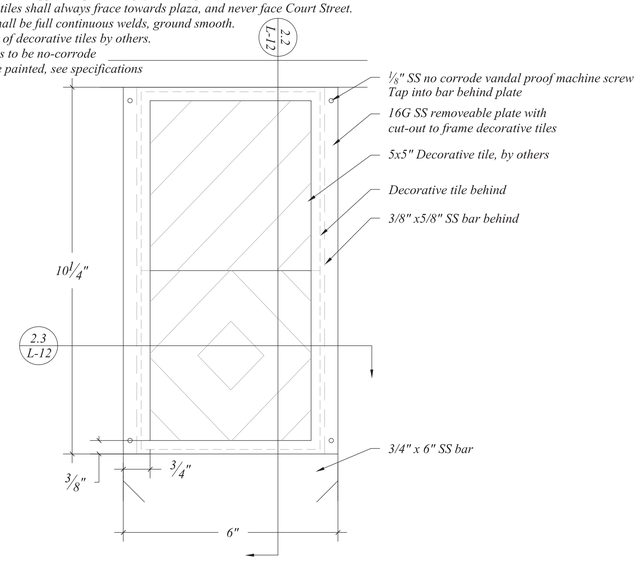
Note:
All fasteners to be no-corrode

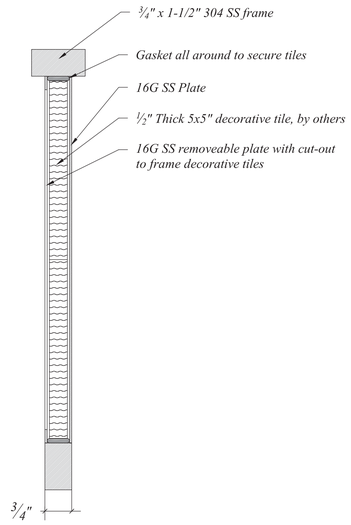


1 RETAINING WALL & RAILING ATTACHMENT
Scale: ¾"=1'-0"

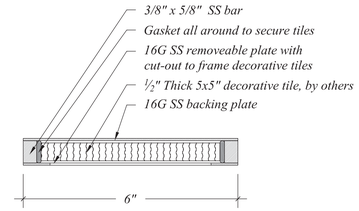
Note:
Railing to be fabricated by contractor.
Contractor shall supply shop drawings for railing.
Decorative tiles shall always frace towards plaza, and never face Court Street.
All welds shall be full continuous welds, ground smooth.
Installation of decorative tiles by others.
All fasteners to be no-corrode
Finish to be painted, see specifications



2.1 ELEVATION



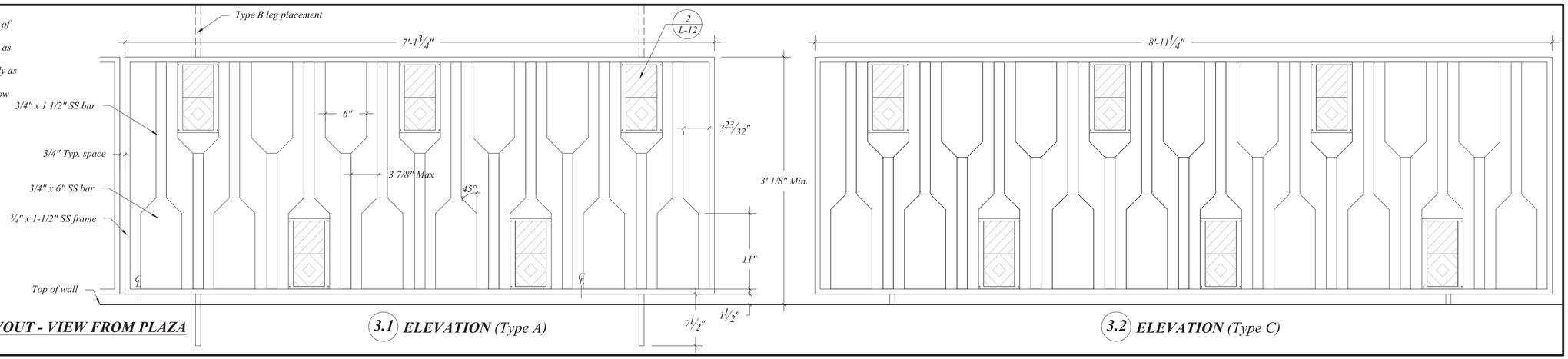
2.2 VERTICAL SECTION



2.3 HORIZONTAL SECTION

2 PICKET WITH DECORATIVE TILE
Scale: ½"=1"

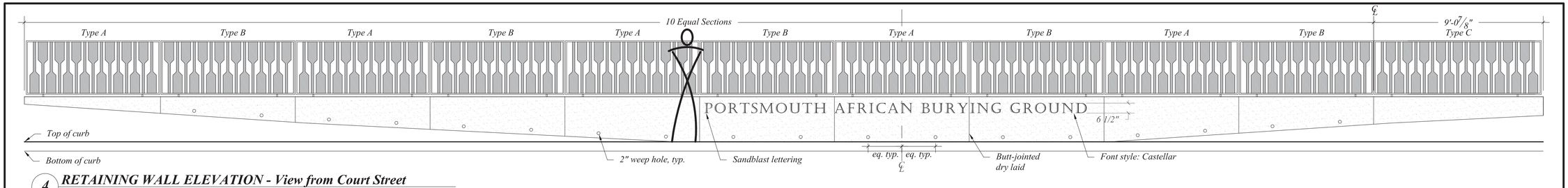
Note:
Refer to Detail 4: L-12 to see pattern of railing panels.
One panel shall be fabricated exactly as shown in Detail 3.2: L-12
Five panels shall be fabricated exactly as shown in Detail 3.1: L-12
Five panels shall be fabricated as show in Detail 3.1:L-12, but flipped 180° vertically (new leg position show in detail)



3 RAILING LAYOUT - VIEW FROM PLAZA
Scale: 1-½"=1'-0"

3.1 ELEVATION (Type A)

3.2 ELEVATION (Type C)



4 RETAINING WALL ELEVATION - View from Court Street
Scale: ⅜"=1'-0"

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground
Retaining Wall & Railing Details
Portsmouth, New Hampshire

Drawn By:	VB, WSA
Checked By:	RW
Scale:	as noted
Date:	2009-07-21
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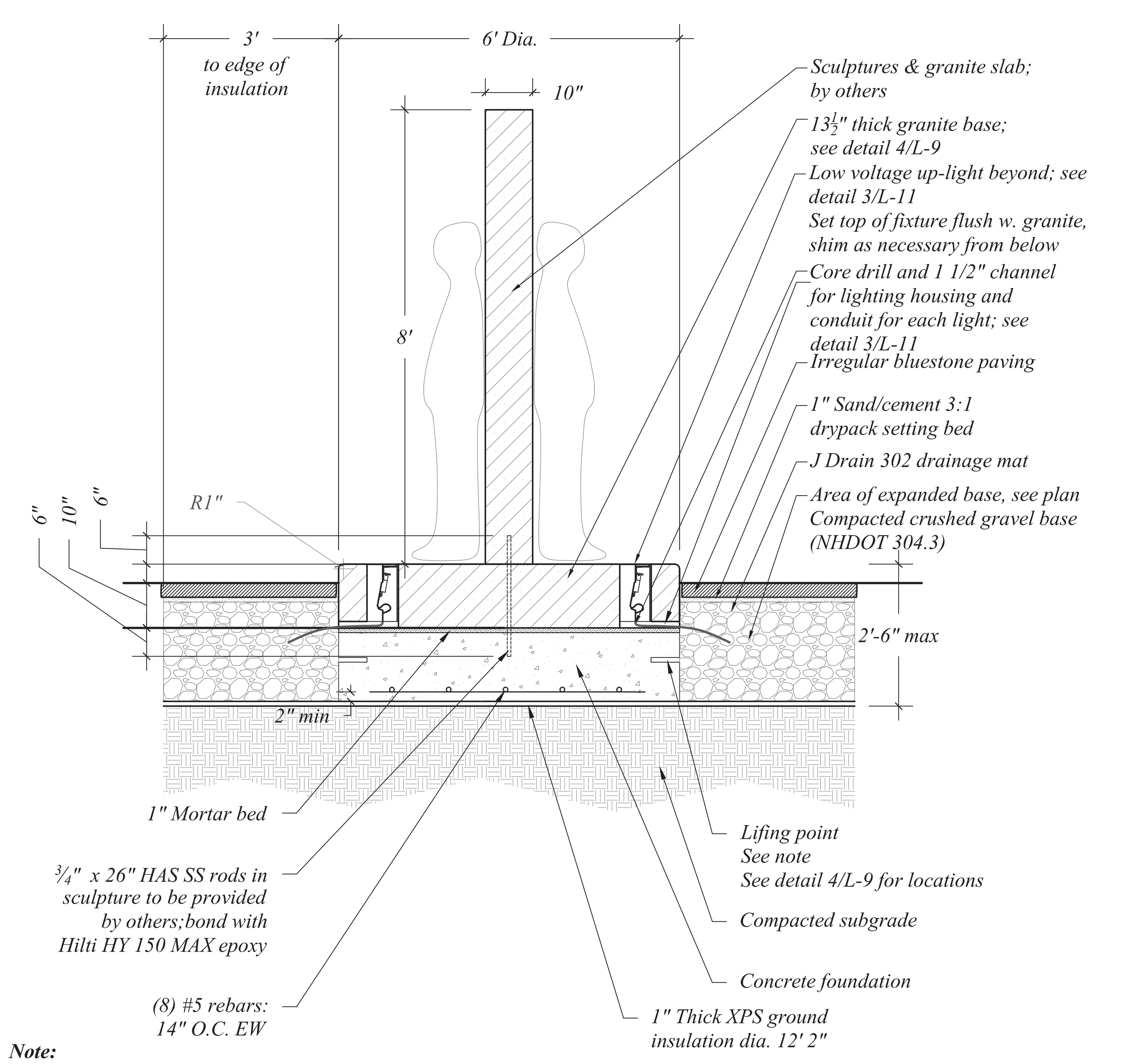
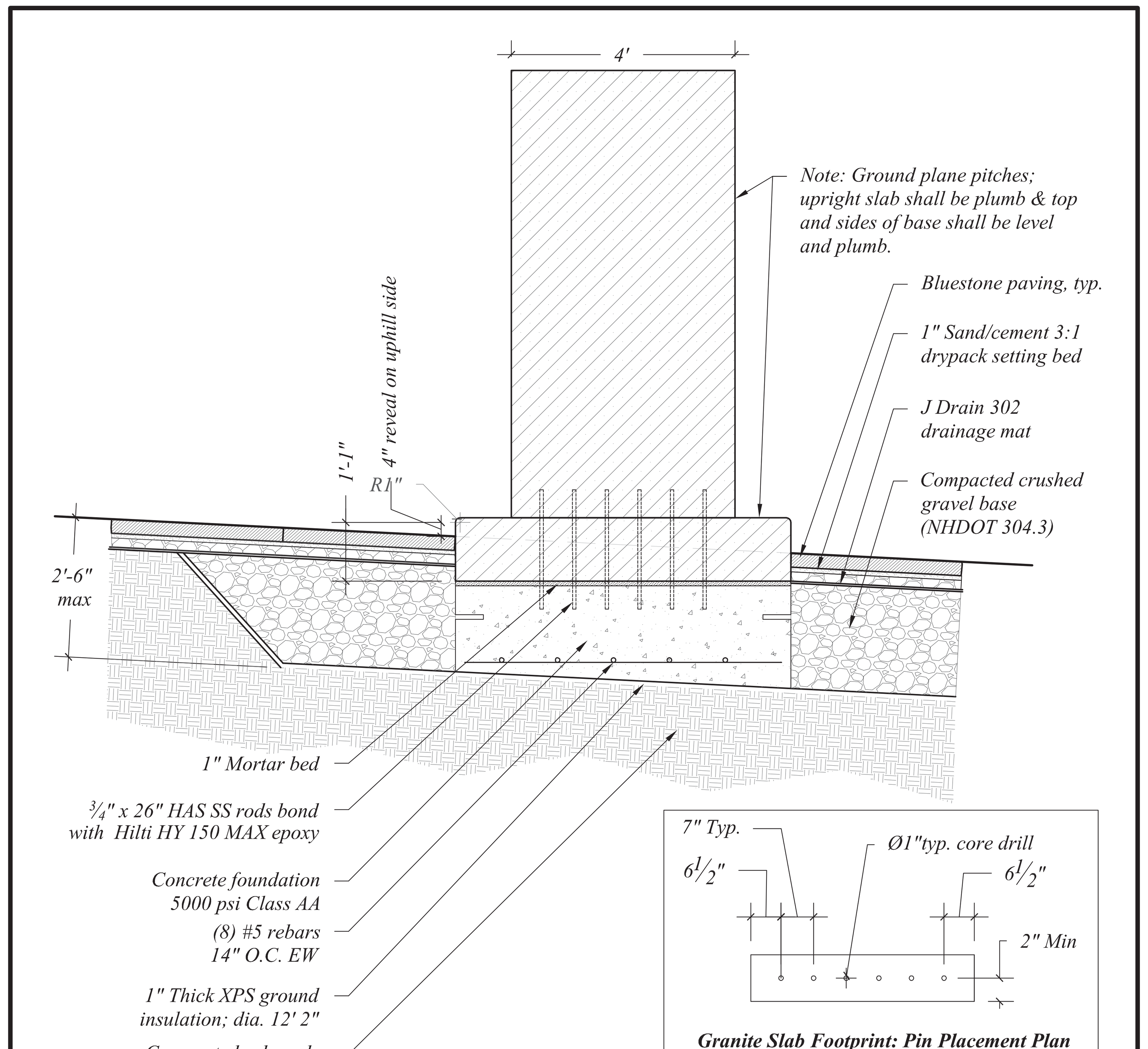


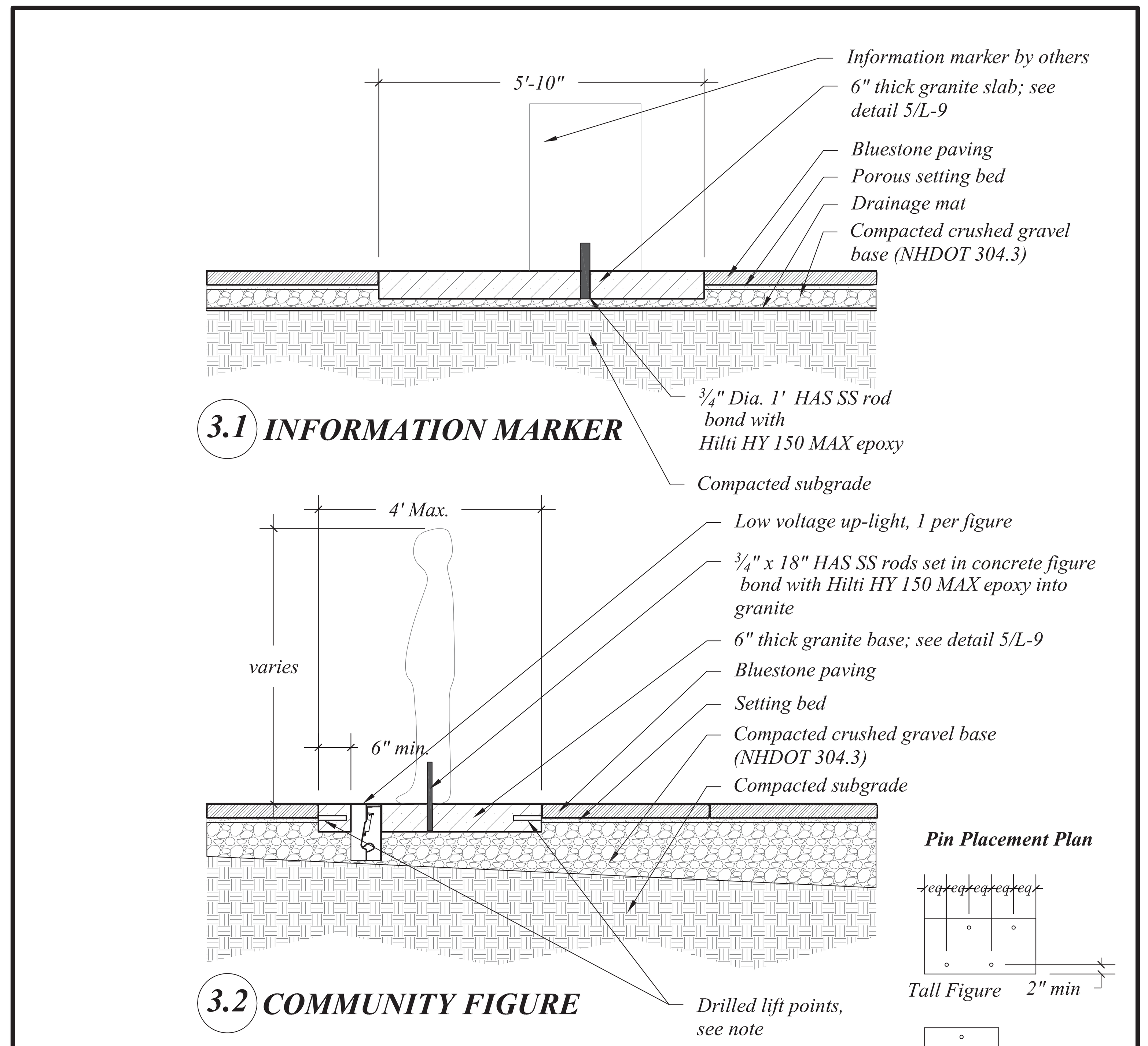
Note:
HAS SS rods to be provided by and affixed to granite slab by the sculptor.
Contractor shall drill holes, at the direction of the sculptor, at time of installation of sculptures.
Contractor shall provide & install lifting system along with shop drawings for approval by sculptor & engineer prior to fabrication.

1 ENTRY SCULPTURE
Scale: 1/2"=1'-0"



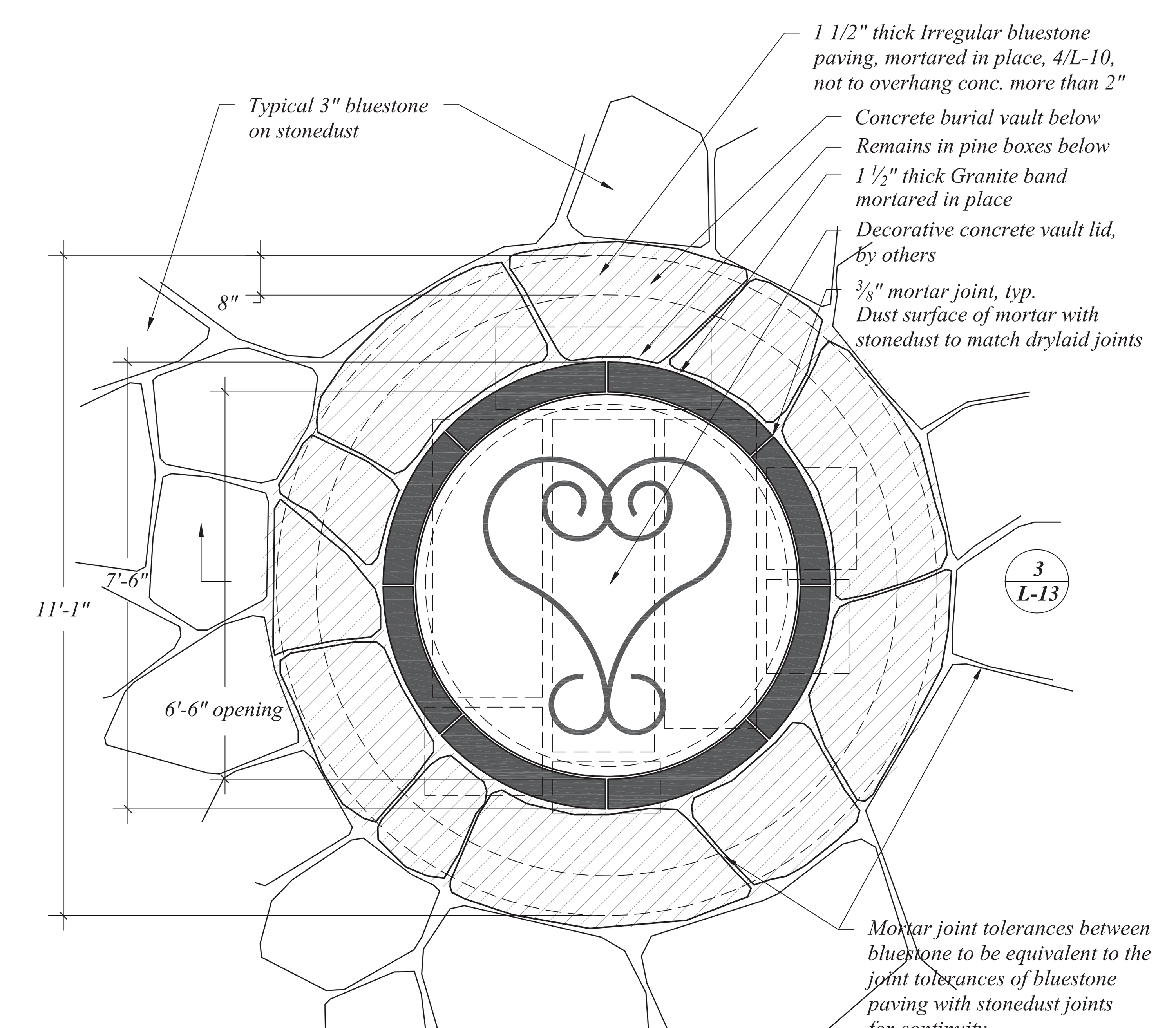
Note:
HAS SS rods to be provided by and affixed to granite slab by the sculptor.
Contractor shall drill holes, at the direction of the sculptor, at time of installation of sculptures.
Contractor shall provide & install lifting system along with shop drawings for approval by sculptor & engineer prior to fabrication.

2 ENTRY SCULPTURE
Scale: 1/2"=1'-0"



Note:
HAS SS rods to be provided by and affixed to granite slab by the sculptor.
Contractor shall drill holes, at the direction of the sculptor, at time of installation of sculptures.
Contractor shall provide & install lifting system along with shop drawings for approval by sculptor & engineer prior to fabrication.

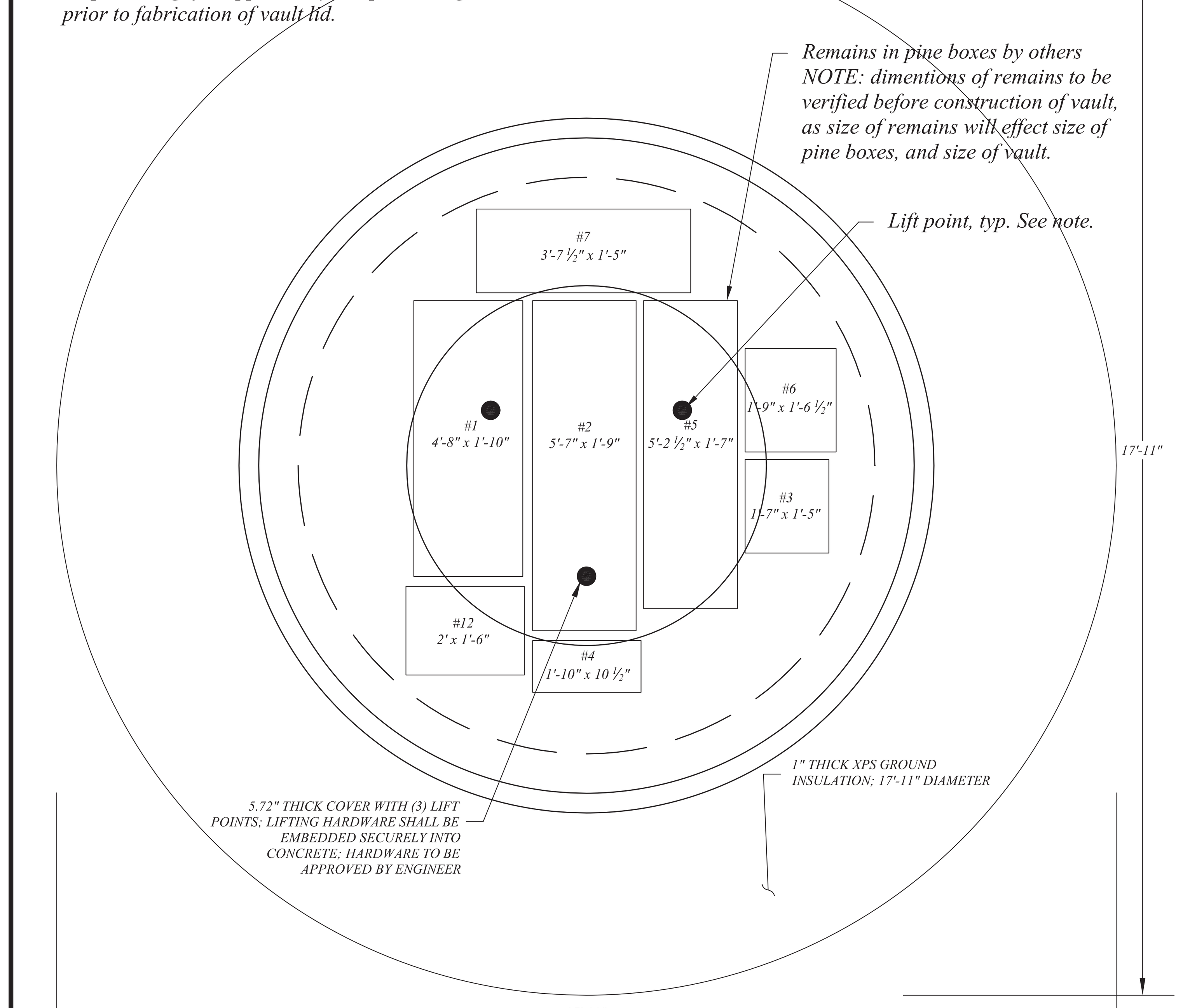
3 INFORMATION MARKER / COMMUNITY FIGURE
Scale: 1/2"=1'-0"



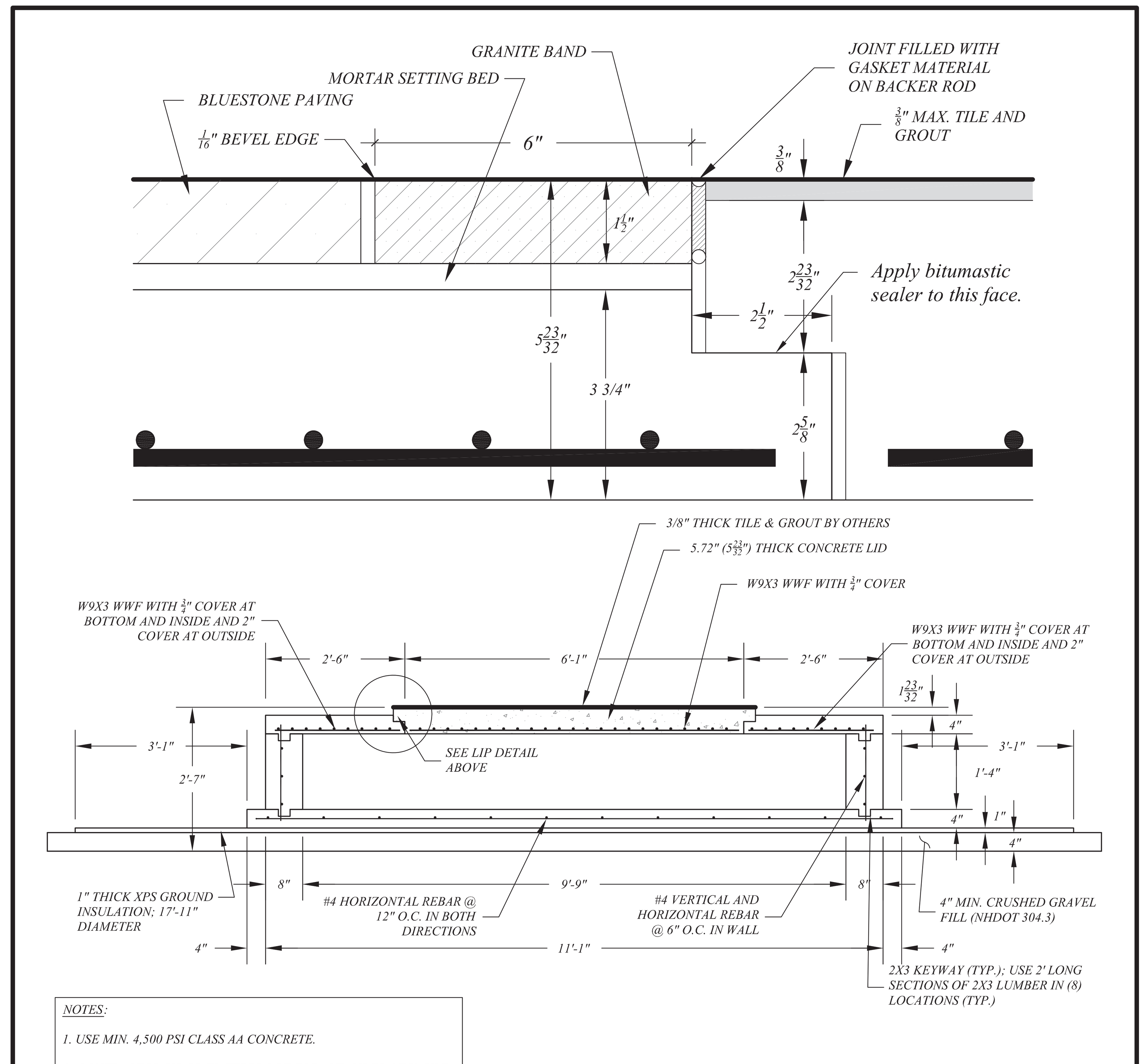
Note:
Extend bluestone paving irregularly beyond concrete foundation to disguise location of foundation as much as possible.
Do not exceed a 3" overhang.

4 BURIAL VAULT PAVING PLAN
Scale: 1/2"=1'-0"

NOTE:
Contractor shall provide lifting system along with shop drawings for approval by sculptor & engineer prior to fabrication of vault lid.



5 BURIAL VAULT REMAINS PLAN
Scale: 1/2"=1'-0"



6 BURIAL VAULT SECTION
Scale: 1/2"=1'-0"

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground
Sculptural Elements Details
Portsmouth, New Hampshire

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Checked By:	RW
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MJS ENGINEERING, PC
Civil
Environmental
Consulting Engineering
5 Railroad Street, P.O. Box 359
Newmarket, NH 03857
Phone: (603) 659-4979, Fax: (603) 659-4627
E-mail: mjs@mjs-engineering.com

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A. AREA OF DISTURBANCE/STABILIZATION:

1. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION.
2. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
   E. TREE CLEARING HAS TAKEN PLACE, BUT STUMPS AND UNDERLYING VEGETATION REMAIN UNDISTURBED.
   3. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS.

B. EROSION CONTROL:

1. CONTRACTOR SHALL COORDINATE WITH CITY PRIOR TO SELECTING OR INSTALLING EROSION CONTROLS.
2. INSTALLATION, INSPECTION, AND MAINTENANCE:
   A. INSTALL ALL EROSION CONTROLS AS SHOWN ON THE GRADING PLAN AND PER TYPICAL DETAILS.
   B. INSPECT ALL EROSION CONTROLS WEEKLY AND AFTER EVERY RAIN EVENT OF 0.5 INCHES OR GREATER.
   C. MAINTAIN EROSION CONTROLS PER REQUIREMENTS NOTED IN TYPICAL CONSTRUCTION DETAILS.
3. EROSION CONTROL MEASURES/DRAINAGE STRUCTURES:
   A. PERIMETER CONTROLS (SEDIMENT FILTER BAG AND SILT SOCK)
      1. INSTALL PRIOR TO BEGINNING EARTH MOVING OPERATIONS.
4. REMOVAL
   A. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE 85% VEGETATIVE COVER HAS BEEN ESTABLISHED AND PAVED, BRICK AND BLUESTONE AREAS COMPLETED, INCLUDING DRAINAGE FIXTURES.
   B. AFTER REMOVAL, ALL DISTURBED AREAS SHALL BE REGRADED, FERTILIZED, AND RESEEDED. MONITOR TO ENSURE VEGETATIVE GROWTH IS ESTABLISHED AND REPAIR AS NEEDED UNTIL MINIMUM OF 85% VEGETATIVE COVER IS ESTABLISHED.

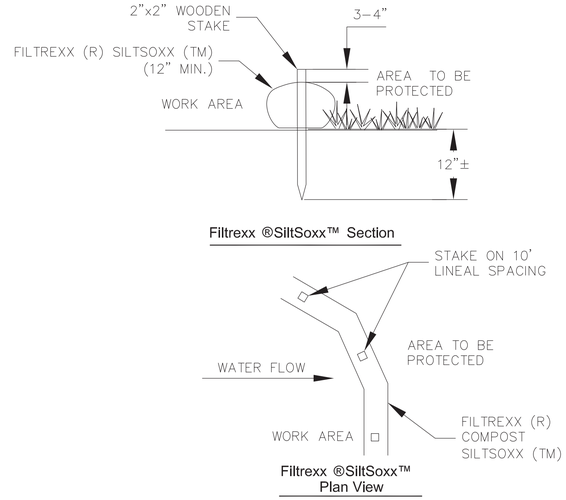
C. CONSTRUCTION SEQUENCING:

1. INSTALL ALL SEDIMENT AND EROSION CONTROL FACILITIES AS LISTED ABOVE.
   A. THESE SHALL BE INSTALLED BEFORE ANY MAJOR EARTH MOVING OPERATIONS.
2. CONSTRUCTION SHALL FOLLOW THIS GENERAL SEQUENCING TO THE EXTENT POSSIBLE. ALL CONSTRUCTION SHALL BE COMPLETED PER THE CONSTRUCTION PLANS AND SPECIFICATIONS.
   A. CONSTRUCTION SHALL BEGIN AT THE LOW END OF THE SITE AT THE INTERSECTION OF CHESTNUT STREET AND COURT STREET AND PROGRESS UP TOWARD STATE STREET.
   B. REMOVE ALL PAVEMENT, BRICK, AND GRANITE CURBING TO THE LIMITS OF WORK SHOWN ON THE PLANS. STOCKPILE BRICK AND GRANITE CURB FOR REUSE ON-SITE OR OFF-SITE, AS NECESSARY.
   C. INSTALL DRAINAGE STRUCTURES AND PIPING. UPON COMPLETION OF EACH DRAINAGE STRUCTURE, SEDIMENT FILTER BAGS SHALL BE INSTALLED IMMEDIATELY IN EACH PROPOSED CATCH BASIN.
   D. AT END OF WORK DAY SIDEWALKS AND STREETS SHALL BE CLEAR OF DEBRIS AND PASSABLE FOR SAFE ACCESS TO RESIDENCES AND BUSINESSES.
   E. ROUGH GRADE SITE TO LIMITS OF WORK. PLACE SUBGRADE PER THE APPLICABLE DETAILS. FINE GRADE AREAS AS NEEDED PRIOR TO INSTALLING PAVEMENT, BRICK SIDEWALKS, GRANITE CURBS, SEATWALLS, AND BLUESTONE. ROADWAY CONSTRUCTION SHALL MEET THE REQUIREMENTS OF SECTION C.4 BELOW.
   F. SET GRANITE RETAINING WALL, GRANITE CURBS, GRANITE SEAT WALLS, AND GRANITE PETITION LINE PER SPECIFICATIONS AND DETAILS.
   G. CONSTRUCT BRICK SIDEWALKS TO ESTABLISH GRADES AT LIMITS OF WORK AS SHOWN ON PLANS.
   H. INSTALL BLUESTONE IN AREAS SHOWN ON PLANS AND PER SPECIFICATIONS.
   I. PAVE TO LIMITS AND GRADES SHOWN ON PLANS.
3. ROADWAY CONSTRUCTION
   A. CUTS AND FILLS:
      1. REMOVE EXISTING ASPHALT AND PROPERLY DISPOSE OF OFF-SITE.
      2. FINE GRADE EXISTING BASE MATERIALS TO THE GRADES SHOWN ON THE PLANS.
   B. BASE MATERIALS:
      1. IN FILL AREAS, PLACE AND COMPACT CRUSHED GRAVEL AS NECESSARY TO ACHIEVE GRADES.
   C. PAVEMENT
      1. PLACE AS SOON AS POSSIBLE AFTER THE SELECT MATERIALS ARE INSTALLED AND ACCEPTED TO ELIMINATE SOIL EROSION.
      2. STABILIZE ALL ROADWAYS AND DRIVES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
4. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AS STATED IN PARAGRAPH B.4 ABOVE.

D. ADDITIONAL NOTES:

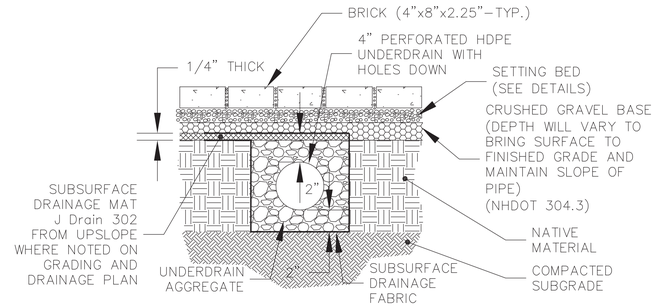
1. NO FUEL SHALL BE STORED ON SITE DURING CONSTRUCTION.
2. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
3. ALL CONSTRUCTION MATERIALS THAT ARE SPILLED OR DEPOSITED ON THE PUBLIC ROADWAYS SHALL BE REMOVED BY THE CONTRACTOR.
4. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

1 CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES
Not to Scale

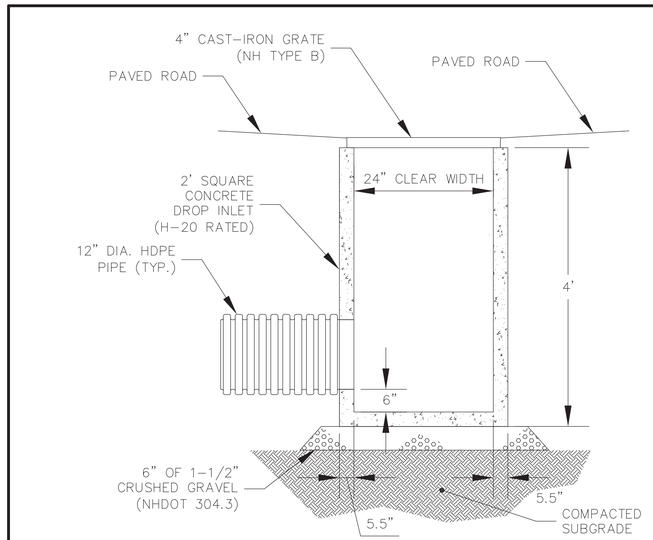


NOTES:
1. SILT SOCK TO BE FILTREXX (R) SILTSOXX (TM) OR APPROVED EQUAL.
1. ALL MATERIAL TO MEET FILTREXX (R) SPECIFICATIONS.
2. SILTSOXX (TM) COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE SILTSOXX(TM) ON 10 FT CENTERS, USING 2 IN BY 2 IN BY 3 FT WOODEN STAKES. IN THE EVENT STAKING IS NOT POSSIBLE SUCH AS WHEN SILTSOXX (TM) ARE USED ON PAVEMENT, HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE SILTSOXX (TM) TO HELP STABILIZE DURING RAINFALL/RUNOFF EVENTS.

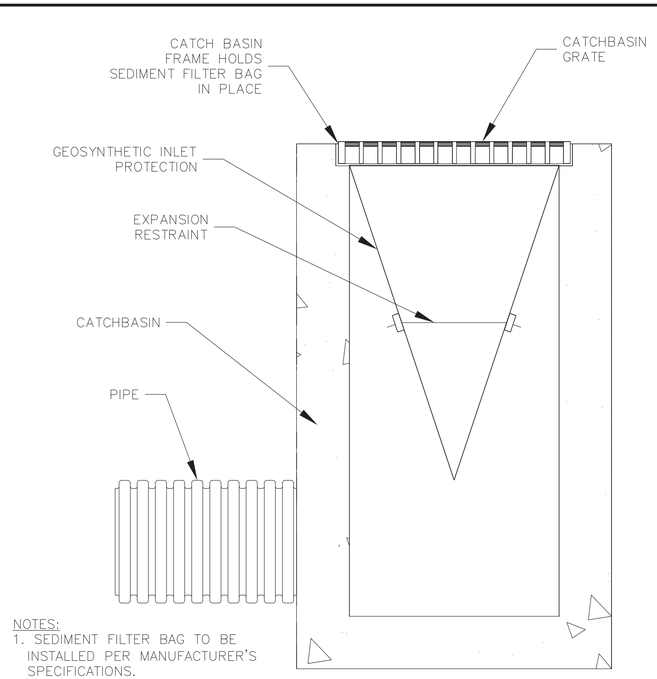
2 SILT SOCK
Not to Scale



3 UNDERDRAIN TRENCH DETAILS
Not to Scale

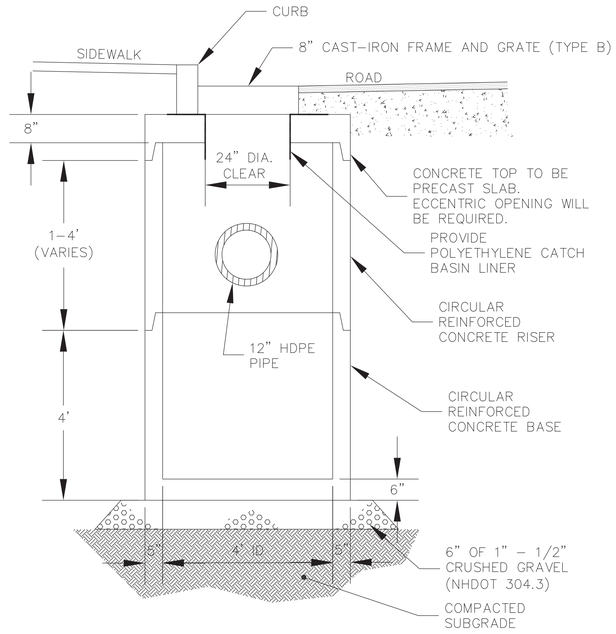


4 2' SQUARE CONCRETE DROP INLET
Not to Scale



NOTES:
1. SEDIMENT FILTER BAG TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

5 SEDIMENT FILTER BAG
Not to Scale



6 4' DIAMETER CONCRETE CATCHBASIN
Not to Scale

WOODBURN & COMPANY
Landscape Architecture, LLC
103 Kent Place
Newmarket, NH 03857
Tel 603.659.5949
Fax: 603.659.5939

African Burying Ground

Drainage Details

Portsmouth, New Hampshire

Drawn By:	*VB, WSA*
Checked By:	*RW*
Scale:	*as noted*
Date:	*2009-07-21*
	95% For Review
Revisions:	*2010-06-29*
	2010-11-29
Revisions for Bid	*2013-04-29*
Revisions for Bid	*2013-05-21*
Issued for RFQ	*2014-02-27*
Issued for RFP	*2014-04-07*
Issued for Addenda #1	*2014-04-21*

MJS ENGINEERING, PC

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