REQUEST FOR PROPOSALS

FOR THE

Waterville Public Library
Ramp Demolition and New Egress Stairs

February 2022

CITY OF WATERVILLE
WATERVILLE, MAINE 04901

PROJECT

The City of Waterville is seeking proposals for removal of the Elm St ramp, the construction of new concrete stairs, door replacement, sitework and other incidental work at the Waterville Public Library. The project will generally follow the attached plans and specifications as prepared by OPAL. If this RFP contradicts the attached plans and specifications, this RFP will prevail.

PROPOSED SCOPE OF SERVICES

The successful General Contractor will perform the following scope of work:

1. Secure the site with a construction fence
2. Demolish the existing concrete ramp to the limits shown
3. Construct new cast in place concrete egress stairs
4. F&I new steel handrails
5. F&I new exterior door
6. All sitework as shown
7. All landscaping as shown as part of Base Bid
8. All miscellaneous and incidental work as shown on the project plans and specifications

PROJECT TIMELINE

January 12, 2022 Advertisement / Request for Proposals

January 20, 2022 **11:00 am.** A mandatory pre-bid meeting will be held on site on this date and time. Any general contractor not attending this meeting will not be allowed to bid on this project as a general contractor. Contractors will be allowed access to all areas that can be accessed without staging or an aerial lift. Contractors are welcome to provide their own access to areas of the building for further inspection. All questions asked at this meeting, whether answered on site or at a later date, will be issued to all bidders as an addendum and will become part of these contract documents.

January 26, 2022 Deadline to receive questions. All questions shall be submitted (in writing) to:

Andrew J. McPherson, P.E., City Engineer at: amcpherson@waterville-me.gov on or before this date.

February 2, 2022	**RFP proposals due by 2:00PM.** Proposals shall be sealed and either mailed or hand delivered to: City of Waterville 1 Common Street Waterville, Maine 04901 On the envelope, label: BID "RFP For Waterville Public Library Ramp Demolition and New Egress Stairs". Contract WAT2022-001."
February 8, 2022	**Contract recommendations will be presented to the Waterville City Council at the regular Council meeting for recommendation of award.**
February 10, 2022	**Contract to be issued based on Council's approval.**
February 17, 2022	**Contractor to provide certificates of insurance, Performance and Payment bonds, as well as two copies of the signed contract agreement to the City of Waterville.**
March 3, 2022	**A preconstruction meeting will be held with the General Contractor and the City of Waterville.**
March 4, 2022	**Contractor will be issued a "Notice to Proceed"**
September 30, 2022	**Contract Substantial Completion Date**
October 15, 2022	**Contract Final Completion Date** **The construction duration will be limited to 90 consecutive calendar days. The contractor will choose the 90-day on-site window in which they will work. This can be anytime between March 4th, 2022, and September 30th, 2022. Site visits for planning, submittals, and other office related work will not count towards the 90 consecutive calendar days.**

WARRANTY

The project shall have a minimum of a 1-year warranty, which shall commence on the date of final acceptance from the City. Other material warrantees will also apply.

BONDING & INSURANCE

BONDING – A bid bond is not required. The successful contractor will be required to furnish a 100% performance bond and a 100% payment bond for the full amount of the contract from an underwriter approved by the City of Waterville.

INSURANCE – The successful bidder shall furnish a Certificate of Insurance under the terms contained in the City of Waterville General Conditions section of this contract. The City of Waterville will be listed as additional insured.

CITY PROVIDED SERVICES

The City will provide access to the building as required and agreed upon by the City and the General Contractor (GC). The City will provide electricity and water, as needed, for the GC's use on this contract, according to the terms of the attached General Conditions. The General Contractor will be responsible for installing any temporary outlets or hose bibs needed for construction and will be responsible for removing the same and restoring the area to pre-construction condition.

The City of Waterville reserves the right to accept or reject any and all proposals for any reason and to award the contract to any contractor if the City feels the award is in the best interest of the City of Waterville.

Proposals shall be sent / delivered to:

Andrew J. McPherson, P.E.
City Engineer — Tel. 207-680-4232
Waterville City Hall — Fax. 207-680-4234
1 Common Street
Waterville, ME 04901 — amcpherson@waterville-me.gov

Proposal Submission & Due Date:

All proposals shall be received by the City of Waterville no later than **2:00 PM on February 2, 2022** at which time they will be opened and read aloud. Proposals received after the date and time specified above will not be considered.

- Faxed or E-mailed proposals will not be accepted.
- **Two (2) hard copies** of each bid proposal required with bid.
- A list of past, completed projects and a list of at least three (3) references shall be attached to each bid proposal.

Contact for questions:

Andrew J. McPherson, P.E., City Engineer
City of Waterville
1 Common Street
Waterville, Maine 04901

Tel. 207-680-4232
Fax. 207-680-4234
E-mail: amcpherson@waterville-me.gov

Bid Form:

The bidder will fill out the following bid form completely using numerals and written words for bid prices and totals. All bid items must be filled in completely. If any item is left blank the City may reject the bid as incomplete. The bidder will refer to the PROPOSED SCOPE OF SERVICES section of this document for the detailed bid item scope of work.

Item 1. Demolish existing library ramp, construct new egress stairs, replace door, landscape site as shown. – Lump Sum

Bid total in Words_____ Bid total in Figures _____

Item 2. Deduct Alternate. Deduct landscape plantings. Loam and seed site – Lump Sum

Bid total in Words _____Bid total in Figures_____

Contract award may be based on Bid Item 1 or the combination of Bid Item 1 and Bid Item 2.

Contract documents include this RFP, City of Waterville Construction Contract General Conditions, and the plans and specifications documents provided by project architect OPAL Global, LLC.

CONTRACTOR:

Name: _____

Signature: _____

Title: _____

Date: _____

OWNER: City of Waterville

Authorized Name: _____

Authorized Signature: _____

Title: _____

Date: _____

Construction Contract General Conditions

A. Insurance. The General Contractor will provide a signed, valid, and enforceable Certificate of Insurance for all construction projects on City property. All Certificates of Insurance will be by insurance companies licensed to do business in the State of Maine. All insurance policies must be approved by the City of Waterville before the GC is allowed to start work on any City projects on City of Waterville property. Policies will name the City of Waterville as "Additional Insured".

The General Contractor and all subcontractors shall carry a Workers' Compensation insurance policy acceptable to the City of Waterville.

All General Contractors and Subcontractors shall carry commercial general liability insurance in an amount not less than $1,000,000 per occurrence and $2,000,000 in aggregate. Other insurance or larger policies may be required on certain projects. These requirements will be spelled out in Supplemental General Conditions particular to certain construction projects.

B. Contractor furnished items. The General Contractor on all City of Waterville construction projects, unless otherwise noted in the Contract Specifications, shall furnish the following items and services:

1. Portable toilets in sufficient numbers to accommodate the number of employees working on site employed by the General Contractor and all of its subcontractors.
2. Electricity required beyond that readily available at the construction location. The GC and subcontractors will be allowed to access the City of Waterville's 110/220 electrical service if available on site. The GC will be responsible for all other electrical supply required during the course of construction including paying for service installation and removal and monthly electric bills.
3. Water. The GC will be allowed to use City water only to the extent that it is available from a City owned faucet or hose bib. Other water requirements will be furnished and paid for by the GC. If public water is required, the General Contractor will coordinate this with the Kennebec Water District.
4. Rubbish removal. The GC will be responsible for all trash and debris removal from the project. The GC will not be allowed to use any City owned dumpsters or garbage cans. All costs associated with trash and debris removal and project clean-up, on- going and final, will be the responsibility of the General Contractor.
5. Security. The General Contractor will be responsible for securing the jobsite and for securing the City owned premises from which they are working to provide a security system as secure or more secure than before the start of construction.
6. Snow removal. The GC shall be responsible for snow removal within the construction and staging limits of the project.
7. Landscape protection. The GC shall be responsible for protecting and maintaining all trees, shrubs, appurtenances, and grasses scheduled to remain. This includes adequate grass mowing within the construction and staging limits.
8. Storm Drainage. The GC shall be responsible for maintaining storm drainage throughout the project and staging limits for the duration of the project. The Contractor will follow the guidelines in the latest edition of the Maine DEP Best Management Practices for Erosion and Sedimentation Control.
9. Weather protection. The General Contractor will be responsible for the weather protection of all construction and staging areas, all construction materials stored on site, and all adjacent City property

impacted by the construction project. The Contractor shall maintain all existing structures and other facilities in a “water-tight” condition.

10. Workers and equipment. The General Contractor shall provide at all times during the construction process adequate workers and equipment to safely and efficiently complete the construction project within the time allotted by the construction contract.
11. Liquidated damages. The General Contractor shall pay the following Liquidated Damages for each calendar day the contract has not been completed per the original completion date or the new completion date as established by change order:

a. Contracts under $50,000.00 $200/calendar day
b. Contracts from $50,000 to $500,000 $350/calendar day
c. Contracts from $500,000 to $2,000,000 $500.00/calendar day
d. Contracts over $2,000,000 $1000/calendar day

Other supplemental liquidated damages may be applied to any project and will be spelled out in the bid documents.

C. Contractor Payments. The General Contractor will invoice the City of Waterville once per month for work completed. The City of Waterville will pay the GC no later than 30 days after receiving an approved invoice for work performed. Retainage will be held in the amount of 10% of each invoice until the project reaching substantial completion. Upon substantial completion, the retainage held will be reduced to 5%. The remaining retainage, 5% of the amount earned to date, will be paid to the contractor upon final completion.

D. Final Completion. Final completion will be determined when all the following, when applicable, have been completed or supplied to the City of Waterville:

1. All work is 100% complete
2. All warranties have been provided
3. All spare parts have been provided
4. Any required owner training has been provided
5. All required City departments have signed off including Fire, police, and code enforcement
6. All utilities have signed off
7. All required Release of Lien forms have been received from the General Contractor, subcontractors, and suppliers.

E. Change orders. No extra work will be performed by the contractor without a written change order from the City of Waterville.

F. As-built drawings. The Contractor will provide as-built drawings to the City of Waterville. The as-built drawings can be paper or electronic and will show, at a minimum, the work performed, dimensions of work, material used, all contractors and subcontractors that participated on the project, and other pertinent information typically listed on construction as-built drawings.

Waterville Public Library

73 Elm Street
Waterville, ME

FOR CONSTRUCTION **22-0112**

SCOPE OF WORK

THIS PROJECT CONSISTS OF THE DEMOLITION OF EXISTING EXTERIOR RAMP AND THE CONSTRUCTION OF NEW EXTERIOR STAIRS AS WELL AS IMPROVEMENTS TO BASEMENT RAMP ACCESS AND REPLACEMENT OF BASEMENT DOOR.

NOTES TO BIDDERS

CONTRACTOR, SUBCONTRACTOR, VENDOR, OR ANY OTHER PERSON PARTICIPATING IN BIDDING THIS PROJECT SHALL BE RESPONSIBLE FOR INFORMATION CONTAINED IN ANY AND ALL SHEETS OF DRAWINGS AND SPECIFICATIONS

DRAWING LIST

ARCHITECTURAL SHEET LIST

Sheet Number	Sheet Name	Sheet Set
Architectural Demo		
AD2.1	EXISTING/ DEMO FLOOR PLANS	Architectural Demo
AD3.1	EXISTING/ DEMO ELEVATIONS	Architectural Demo
AD4.1	EXISTING/ DEMO BUILDING SECTIONS	Architectural Demo
AD4.2	EXISTING / DEMO BUILDING SECTIONS	Architectural Demo
Architectural		
A0.1	DOOR SCHEDULES	Architectural
A0.2	GENERAL NOTES	Architectural
A0.3	CODE REVIEW INFORMATION	Architectural
A2.1	FLOOR PLANS	Architectural
A3.1	ELEVATIONS	Architectural
A4.1	BUILDING SECTIONS	Architectural
A5.1	VERTICAL CIRCULATION	Architectural
A9.1	DETAILS	Architectural

CIVIL SHEET LIST

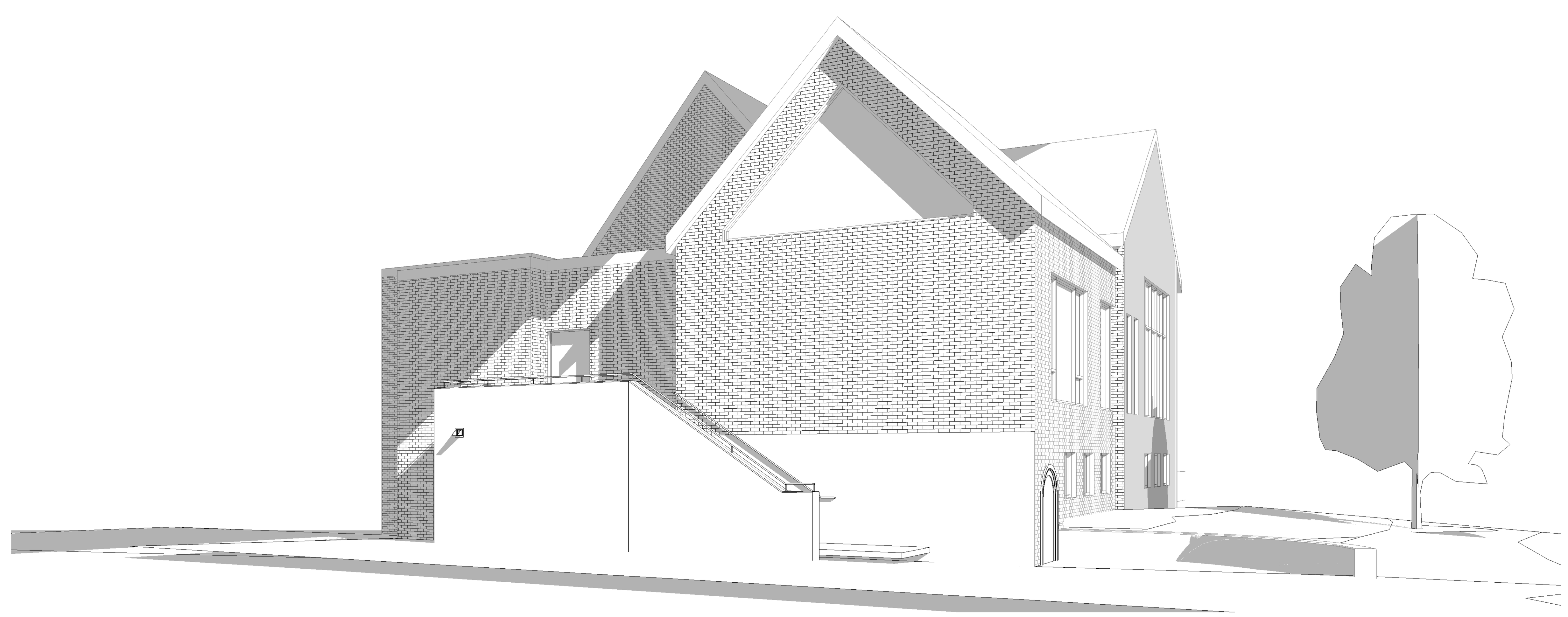
Sheet Number	Sheet Name	Sheet Set
Civil		
C-002	NOTES AND LEGEND	Civil
C-101	DEMOLITION PLAN	Civil
C-102	SITE AND LANDSCAPE PLAN	Civil
C-103	GRADING AND UTILITY PLAN	Civil
C-501	EROSION CONTROL NOTES	Civil
C-502	DETAILS	Civil
C-503	DETAILS	Civil
C-504	CONTRACTOR KEY PLAN	Civil

STRUCURAL SHEET LIST

Sheet Number	Sheet Name	Sheet Set
Structural		
S1.0	SITE WALLS	Structural

VICINITY MAP

RENDERING



DEFERRED SUBMITTALS

1. TBD

SPECIAL INSPECTION

1. TBD

WATERVILLE PUBLIC LIBRARY

ARCHITECT:
OPAL
137 High Street
Belfast, ME 04915
t: 207 640 6300
www.opalarch.us

CIVIL ENGINEER / SURVEYOR / LANDSCAPE ARCHITECT:
SEBAGO TECHNICS
75 JOHN ROBERTS RD., SUITE 4A
t: 207 200 2100
www.sebagotechnics.com

STRUCTURAL ENGINEER:
THORNTON TOMASETTI
14 York St. Suite 201
Portland, ME 04101
t: 207 245 6060
www.thorntontomasetti.com

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

LICENSED ARCHITECT
TIMOTHY A. LOCK
No. 3810
STATE OF MAINE

CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

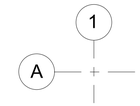
TITLE SHEET

A0.0

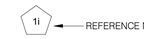
ABBREVIATIONS

&	And	F.O.C.	Face of Concrete	Q.T.	Quarry Tile
<	Angle	F.O.F.	Face of Finish		
@	At	F.O.M.	Face of Masonry	R	Riser
		F.O.S.	Face of Stud	RAD	Radius
℄	Centerline	FPRF	Fireproof	R.D.	Roof Drain
		FR	Frame	REF	Reference
ϕ	Diameter or Round	FS	Full Size	REFR	Refrigerator
⊥	Perpendicular	FT	Foot, Feet	REINF	Reinforced or Reinforcing
#	Number	FTG	Footing	REQ	Required
(E)	Existing	FURR	Furring, Furred	RESIL	Resilient
		FUT	Future	REV	Revised
AB	Anchor Bolt			RFG	Roofing
A/C	Air Conditioning	GA	Gauge	R.H.	Right Hand
A.C.	Asphaltic Concrete	GALV	Galvinized	RM	Room
ACT	Acoustical Tile	G.B.	Grab Bar	R.O.	Rough Opening
ACOUS	Acoustical	G.I.	Galvanized Iron	RWD	Redwood
ADJ	Adjustable	GL	Glass, Glazing		
A.F.F.	Above Finish Floor	GND	Ground	S	South
ALT	Alter or Alternate	GR	Grade	S.C.	Solid Core
ALUM	Aluminum	GYP	Gypsum	SCHED	Schedule
ANOD	Anodized			SECT	Section
A.P.	Access Panel	H	High	SEP	Separation, Separate
APPROX	Approximate	H.B.	Hose Bib	SH	Shelf
ARCH	Architectural	H.C.	Hollow Core	SHR	Shower
ASPH	Asphalt	HCP	Handicapped	SHT	Sheet
		HDWR	Hardware		
BD	Board	HDWD	Hardwood	SIM	Similar
BITUM	Bituminous	H.M.	Hollow Metal	SLDG	Siding
BLDG	Building	HORIZ	Horizontal	SPEC	Specification
BLK	Block	HR	Hour	SQ	Square
BLKG	Blocking	HT	Height	S.S.	Stainless Steel
BM	Beam	HVAC	Heating, Ventilation	SSK	Service Sink
BOT	Bottom		and Air Conditioning	STD	Standard
BR	Bedroom	H.W.	Hot Water	STL	Steel
BSMT	Basement			STOR	Storage
B.U.R.	Built Up Roofing	I.D.	Inside Diameter	STRUCT	Structrual
		INCL	Including	SUSP	Suspended
CAB	Cabinet	INSUL	Insulation	SW	Switch
CARP	Carpet	INT	Interior	SYM	Symmetrical
C.B.	Catch Basin			SYS	System
CEM	Cement	JAN	Janitor		
CER	Ceramic	JST	Joist	T	Tread
C.I.	Cast Iron	JT	Joint	T.B.	Towel Bar
CLG	Ceiling			T&G	Tongue and Groove
CLO	Closet	KIT	Kitchen	T.O.C.	Top of Curb
CLR	Clear			T.O.D.	Top of Drain
CMU	Concrete Masonry Unit	LAM	Laminate	TEL	Telephone
CNTR	Counter	LAV	Lavatory	TEMP	Tempered, Temperature
COL	Column	L.F.	Lineal Foot	TER	Terrazzo
CONC	Concrete	L.H.	Left Hand	THK	Thick, Thickness
CONN	Connection	L.R.	Living Room	THR	Threshold
CONST	Construction	LT	Light	TOIL	Toilet
CONT	Continuous	LVR	Louver	T.O.P.	Top of Pavement
CONTR	Contractor			T.O.S.	Top of Slab
CORR	Corridor	MATL	Material		
C.T.	Ceramic Tile	MAX	Maximum	T.P.D.	Toilet Paper Dispenser
CTR	Center	M.B.	Machine Ball	T.S.	Top of Steel
CTSK	Countersunk	MECH	Mechanical	TV	Television
C.W.	Cold Water	MEMB	Membrane	T.O.W.	Top of Wall
		MET	Metal	TYP	Typical
D	Deep, Depth	MFR	Manufacture		
DBL	Double	MH	Manhole	UNF	Unfinished
DET	Detail	MIN	Minimum	U.O.N.	Unless Otherwise Noted
D.F.	Drinking Fountain	MIR	Mirror	UR	Urinal
DIA	Diameter	MISC	Miscellaneous		
DIM	Dimension	M.O.	Masonry Opening	VERT	Vertical
DISP	Dispenser	M.R.	Moisture Resistant	VEST	Vestibule
DN	Down	MTD	Mounted	V.I.F.	Verifiy in Field
D.O.	Door Opening	MUL	Mullion	VOL	Volume
DR	Door				
DS	Downspout	N	North	W	West
D.S.P.	Dry Standpipe	N.I.C.	Not in Contract	W/	With
DWG	Drawing	NO	Number	W.H.	Water Heater
DWR	Drawer	NOM	Nominal	W/O	Without
		N.S.	No Scale	W.C.	Water Closet
E	East	N.T.S.	Not to Scale	WD	Wood
EA	Each			WP	Waterproof
EJ	Expansion Joint	O/	Over	WPM	Waterproof Membrane
EL	Elevation	OA	Overall	WSCT	Wainscot
ELEC	Electrical	OBSC	Obscure	W.S.P.	Wet Standpipe
ELEV	Elevation	O.C.	On Center	WT	Weight
EMER	Emergency				
ENCL	Enclosure	O.D.	Outside Diameter		
E.O.S.	Edge of Slab	OFCI	Owner Furnished,		
EQ	Equal		Contractor Installed		
EQUIP	Equipment	O.F.D.	Overflow Drain		
E.W.	Each Way	OFF	Office		
E.W.C.	Electric Water Cooler	O.H.	Overhang		
EXIST	Existing	OVHD	Overhead		
EXP	Expansion	OPNG	Opening		
EXPO	Exposed	OPP	Opposite		
EXT	Exterior				
		PC	Piece		
F.A.	Fire Alarm	P.D.	Planter Drain		
F.D.	Floor Drain	PL	Plate		
FDN	Foundation	P.L.	Property Line		
F.E.	Fire Extinguisher	PLMG	Plumbing		
F.E.C.	Fire Extinguisher Cab	PLAM	Plastic Laminate		
F.G.	Finish Grade	PLAS	Plaster		
F.H.C.	Fire Hose Cabinet	PLYWD	Plywood		
FIN	Finish	PR	Pair		
FLASH	Flashing	PT	Paint		
FLR	Floor	P.T.D.	Paper Towel Dispenser		
FLUOR	Fluorescent	PTN	Partition		

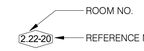
SYMBOLS



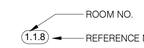
BUILDING GRID LINES



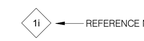
CURTAIN WALL & STOREFRONT SYMBOL



WINDOW SYMBOL

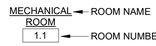


DOOR SYMBOL

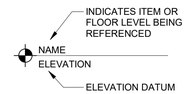


WALL SYMBOL

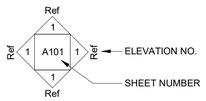
CEILING HEIGHT



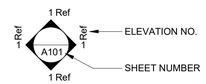
ROOM TAG



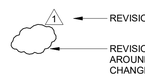
DATUM TAG



EXTERIOR ELEVATION TAG



INTERIOR ELEVATION TAG



REVISION CLOUD & TAG

KEYNOTE

CASEWORK TAG

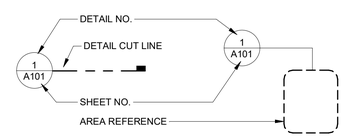
APPLIANCE TAG

PLUMBING FIXTURE TAG

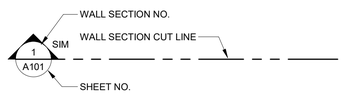
LIGHTING FIXTURE TAG

MATERIAL TAG

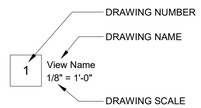
DETAIL TAG



WALL & BUILDING SECTION TAG



DRAWING TITLE



GENERAL NOTES

1 THE GENERAL CONTRACTOR SHALL HEREAFTER BE REFERRED TO AS "GENERAL CONTRACTOR" OR "GC". THE OWNER MAY HEREAFTER BE REFERRED TO AS "OWNER".

2 THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL WORK REGARDLESS OF THE LOCATION OF THE INFORMATION IN THE DOCUMENTS. THE GENERAL CONTRACTOR SHALL UTILIZE THE COMPLETE & ENTIRE CONSTRUCTION DRAWINGS AND WRITTEN SPECIFICATIONS FOR ALL REQUIRED INFORMATION TO PROVIDE COMPLETE CONSTRUCTION OF THIS PROJECT AND IS RESPONSIBLE TO COORDINATE ALL DRAWINGS AND SPECIFICATIONS WITH ALL SUBCONTRACTORS REGARDLESS OF LOCATION IN CONTRACT DOCUMENTS. ITEMS LISTED IN DRAWINGS MAY NOT BE INCLUDED IN SPECIFICATIONS. ITEMS LISTED IN SPECIFICATIONS MAY NOT BE INCLUDED IN DRAWINGS.

3 UNLESS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS AS BEING NOT IN CONTRACT (N.I.C.) OR EXISTING, ALL ITEMS, MATERIALS AND INSTALLATION OF SAME ARE PART OF THE CONTRACT AS DEFINED BY THE ENTIRE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS. THE GC SHALL PROVIDE AND INSTALL ALL ACCESSORIES, COMPONENTS AND ASSEMBLIES REQUIRED FOR THE WORK DEPICTED OR SPECIFIED.

4 THE GENERAL CONTRACTOR SHALL FIELD VERIFY ALL CONDITIONS AND DIMENSIONS PRIOR TO BEGINNING ANY WORK AND SHALL BE RESPONSIBLE FOR ALL WORK AND MATERIALS INCLUDING THOSE FURNISHED BY SUBCONTRACTORS. THE GC SHALL ACCEPT PREMISES AS FOUND. OWNER WILL MAINTAIN THE EXISTING CONDITION OF THE SITE AND EXISTING STRUCTURES AT THE TIME OF BIDDING.

5 DISCREPANCIES BETWEEN PORTIONS OF THE CONTRACT DOCUMENTS ARE NOT INTENDED. THE GENERAL CONTRACTOR IS TO CLARIFY WITH THE ARCHITECT ANY SUCH DISCREPANCIES DURING BIDDING AND PRIOR TO COMMENCING WORK.

6 DIMENSIONS TAKE PRECEDENCE OVER DRAWINGS: DO NOT SCALE DRAWINGS TO DETERMINE ANY LOCATIONS. THE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO CONTINUING WITH WORK. CHANGES IN THE WORK TO BE DOCUMENTED IN WRITING AND APPROVED IN WRITING PRIOR TO BEING STARTED - (IMPLEMENTED)

7 ALL PLAN DIMENSIONS ARE FROM GRIDLINE OR FACE OF STUD OR FACE OF BLOCK UNLESS OTHERWISE INDICATED.

8 THE CONTRACTOR SHALL REPORT TO THE ARCHITECT ALL CONDITIONS REQUIRING COORDINATION/ CHANGES WITH THE CONTRACT DOCUMENTS. COORDINATION / APPROVAL SHALL TAKE PLACE BEFORE THE WORK BEGINS. ALL CHANGES TO THE CONTRACT COST SHALL BE APPROVED THROUGH A CHANGE ORDER.

9 DETAILED DRAWINGS AND LARGER SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.

10 THE ARCHITECT WILL REVIEW SHOP DRAWINGS AND SAMPLES FOR CONFORMANCE WITH DESIGN CONCEPT OF THE PROJECT. THE ARCHITECT'S REVIEW OF A SEPARATE ITEM SHALL NOT INDICATE APPROVAL OF AN ASSEMBLY IN WHICH THE ITEM FUNCTIONS. THE ARCHITECT WILL NOT REVIEW SHOP DRAWINGS UNTIL THE GC HAS REVIEWED AND STAMPED THE SHOP DRAWING/SUBMITTAL. THE GC IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS SHOWN ON THE SHOP DRAWINGS. THE ARCHITECT'S REVIEW OF THE SHOP DRAWINGS SHALL NOT OVERRIDE THE CONDITIONS DESCRIBED IN THE CONTRACT DOCUMENTS UNLESS SPECIFICALLY NOTED OTHERWISE BY THE ARCHITECT. WORK SHALL NOT PROCEED WITHOUT RETURNED REVIEWED SUBMITTALS.

11 FOR CONSTRUCTION DETAILS NOT SHOWN, USE THE MANUFACTURER'S STANDARD DETAILS OR APPROVED SHOP DRAWINGS / DATA SHEETS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

12 FOR GRADING, TRENCHING ETC., CONTACT THE ARCHITECT FOR INSTRUCTIONS PRIOR TO THE CONTINUATION OF WORK SHOULD ANY UNUSUAL CONDITIONS BECOME APPARENT DURING GRADING OR FOUNDATION CONSTRUCTION. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED SHALL BE VERIFIED BY THE GENERAL CONTRACTOR BEFORE CONSTRUCTION.

13 ALL WORK, MATERIALS AND METHODS SHALL BE IN CONFORMANCE WITH THE CODES, ORDINANCES AND REGULATIONS OF ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION AT THE PROJECT LOCATION. THE GENERAL CONTRACTOR MUST COMPLY WITH THE CONTRACTOR REGISTRATION REQUIREMENTS OF ALL GOVERNING AUTHORITIES.

14 ALL PROJECT CONSTRUCTION SHALL CONFORM WITH ANSI A-117.1-2009, AND THE AMERICANS WITH DISABILITIES ACT (ADA).

15 THE GENERAL CONTRACTOR SHALL NOTIFY ALL APPLICABLE LOCAL GOVERNING AUTHORITIES AND UTILITIES PRIOR TO COVERING UP ANY WORK REQUIRING INSPECTION.

16 THE GENERAL CONTRACTOR SHALL MAINTAIN ALL REQUIRED EXITS AND FIRE LANES IN WORKING ORDER.

17 A GENERAL BUILDING PERMIT IS REQUIRED. ALL PERMITS AND CONNECTION FEES SHALL BE SECURED BY THE GENERAL CONTRACTOR AND REIMBURSED THROUGH THE OWNER.

18 THE GENERAL CONTRACTOR SHALL PROVIDE AND INSTALL FIRE EXTINGUISHERS WHERE SHOWN ON PLAN.

19 MINIMUM FLAME SPREAD CLASSIFICATION OF INTERIOR FINISH SHALL CONFORM TO THE BUILDING CODE AND LOCAL GOVERNING BUILDING CODES/ORDINANCES. SEE CODE SUMMARY, SHEET A0.3

20 THE GENERAL CONTRACTOR SHALL PROVIDE AND IS SOLELY RESPONSIBLE,AND LIABLE FOR PUBLIC AND EMPLOYEE PROTECTION AS NECESSARY AND AS REQUIRED BY THE CODES, INCLUDING EXTERIOR AND INTERIOR PEDESTRIAN TRAFFIC BARRIERS. ALL WORK SHALL CONFORM TO THE ORDINANCES AND REGULATIONS OF GOVERNMENTAL AGENCIES HAVING JURISDICTION AT THE PROJECT.

21 THE GENERAL CONTRACTOR SHALL PROVIDE TEMPORARY BARRICADES FOR DUST AND NOISE CONTROL, AND ALL REQUIRED ENVIRONMENTAL PROTECTION WHERE WORK JOINS EXISTING CONDITIONS.

22 ALL DEBRIS SHALL BE REMOVED FROM PREMISES AND ALL AREAS SHALL BE LEFT IN A CLEAN (BROOM) CONDITION DAILY.

23 IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO COORDINATE AND OR CALL BLUE STAKES TO LOCATE ALL EXISTING UTILITIES, WHETHER SHOWN HEREIN OR NOT, AND WHEN IDENTIFIED TO PROTECT THEM FROM DAMAGE. THE GENERAL CONTRACTOR SHALL BEAR ALL EXPENSE OF REPAIR OR REPLACEMENT OF IDENTIFIED UTILITIES OR OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE EXECUTION OF THE WORK.

24 APPROVED PLANS SHALL BE KEPT IN A PLAN BOX AND SHALL NOT BE USED BY WORKMEN. ALL CONSTRUCTION SETS SHALL REFLECT THE SAME INFORMATION. THE GENERAL CONTRACTOR SHALL ALSO MAINTAIN, IN GOOD CONDITION, ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA AND CHANGE ORDERS, ON THE PREMISES AT ALL TIMES. THESE ARE TO BE KEPT UNDER THE CARE OF THE JOB SUPERINTENDENT.

25 THE GENERAL CONTRACTOR IS TO PROVIDE BLOCKING AS REQUIRED FOR MOUNTING OF WALL MOUNTED SHELVES, CABINETS, HC GRAB BARS AND PARTITION BRACES AND ALL OTHER ITEMS IDENTIFIED ON THE EQUIPMENT OR ACCESSORY SCHEDULE. BLOCKING SHALL BE FIRE TREATED WHERE REQUIRED BY THE BUILDING CODE.

26 THE GENERAL CONTRACTOR IS RESPONSIBLE FOR RECEIVING, UNLOADING, UNCRATING, INSTALLATION AND HOOK-UP OF ALL OWNER FURNISHED ITEMS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

27 THE GENERAL CONTRACTOR IS TO ASSURE THAT NO REBAR OR REINFORCEMENT IS PRESENT PRIOR TO CORE DRILLING OR PLACING BOLTS OR ANY OTHER ITEM WHICH COULD DISTURB THE STRUCTURAL SLAB OR FOUNDATION WALLS.

28 PROVIDE GALVANIC PROTECTION BETWEEN DISSIMILAR MATERIALS WHERE REQUIRED.

29 PROVIDE METAL TRIM OR CASING AT ALL EDGES OF PLASTER AND DRYWALL SURFACES WHERE IT TERMINATES OR MEETS ANY OTHER MATERIAL, UNLESS NOTED OTHERWISE.

30 PROVIDE METAL CORNER TRIM AT ALL OUTSIDE CORNERS OF PLASTER AND DRYWALL SURFACES.

31 ALL PENETRATIONS THROUGH ANY SURFACE SHALL BE THOROUGHLY SEALED WITH APPROPRIATE SEALANT MATERIAL.

32 UNLESS OTHERWISE NOTED, ALL EXTERIOR AND INTERIOR METAL, TRIM, TREILLAGE, RAILINGS, MOLDINGS, FRAMES, CASTING ETC., SHALL BE PAINTED.

33 FOR PLUMBING, FIRE SPRINKLER AND ELECTRICAL SYSTEMS, PROVIDE APPROVED ASSEMBLIES WITH SELF CLOSING DEVICES FOR ANY PENETRATIONS IN RATED CONSTRUCTION.

34 THE GC SHALL VERIFY LOCATIONS OF ALL CEILING & WALL ACCESS PANELS WITH MECHANICAL, FIRE SPRINKLER AND PLUMBING PLANS. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED WITH A FIRE RATING EQUAL TO THE WALL OR CEILING ASSEMBLY INTO WHICH THEY ARE TO BE INSTALLED. FINISH AND LOCATION SHALL BE APPROVED BY THE ARCHITECT.

35 THE GC SHALL VERIFY DIMENSIONS OF ALL EQUIPMENT PADS & BASES WITH EQUIPMENT MANUFACTURERS & SHALL VERIFY ALL SIZES AND LOCATIONS OF DUCT OPENINGS ON ROOF AND INTERIOR SHAFTS.

WATERVILLE PUBLIC LIBRARY

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PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

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CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

GENERAL NOTES

A0.2

ZONING SUMMARY

BUILDING AUTHORITY:		CITY OF WATERVILLE MAINE BUILDING DEPARTMENT
ZONING:		ASSEMBLY GROUP A-3 (LIBRARIES)
BUILDING HEIGHT:		36' - 0"
SETBACKS:	FRONT	30' - 0"
	SIDE	50' - 0"
	REAR	50' - 0"
OTHER DEVELOPMENT PARAMETERS:		N/A
OVERLAY DISTRICTS:		N/A
LOT SIZE:		2 ACRES
BUILDING FOOTPRINT:		N/A
BUILDING SQUARE FOOTAGE:		N/A
LOT COVERAGE:		N/A
CLIMATE ZONE:		5 (A)

BUILDING CODE SUMMARY

BUILDING CODES
- MAINE UNIFORM BUILDING AND ENERGY CODE — 2015
- INTERNATIONAL BUILDING CODE (IBC) — 2015
- INTERNATIONAL EXISTING BUILDING CODE (IEBC) — 2015
- INTERNATIONAL ENERGY CONSERVATION CODE (IECC) — 2009
- NATIONAL ELECTRICAL CODE — 2017
- NFPA 101 LIFE SAFETY CODE -- CURRENT EDITION ADOPTED BY THE STATE OF MAINE
- STATE OF MAINE PLUMBING CODE

OCCUPANCY CLASSIFICATION - IBC CHAPTER 3
'A' - ASSEMBLY GROUP A-3 (LIBRARIES)

ALLOWABLE FLOOR AREA ALLOWANCE PER OCCUPANT BY FUNCTION OF SPACE - IBC 2015 TABLE 1004.1.2
'A' - ASSEMBLY GROUP A-3 (LIBRARIES)

ASSEMBLY	
EXHIBIT GALLERY AND MUSEUM	30 NET SQUARE FEET
BUSINESS AREAS	100 GROSS SQUARE FEET
EDUCATIONAL	
CLASSROOM AREA	20 NET SQUARE FEET
LIBRARY	
READING ROOMS	50 NET SQUARE FEET
STACK AREA	100 GROSS SQUARE FEET
ACCESSORY STORAGE AREAS, MECH./EQUIPMENT	300 GROSS SQUARE FEET

MINIMUM CORRIDOR WIDTHS - IBC TABLE 1020.1

	REQUIRED
STANDARD WIDTH	44"
'A' - ASSEMBLY	30"

TABLE 1020.1
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system[c]
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5
I-2[a], I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b]

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. For a reduction in the *fire-resistance rating* for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

TABLE 1020.2
MINIMUM CORRIDOR WIDTH

OCCUPANCY	MINIMUM WIDTH (inches)
Any facilities not listed below	44
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24
With an occupant load of less than 50	36
Within a *dwelling unit*	36
In Group E with a *corridor* having an occupant load of 100 or more	72
In *corridors* and areas serving stretcher traffic in occupancies where patients receive outpatient medical care that causes the patient to be incapable of self-preservation	72
Group I-2 in areas where required for bed movement	96

For SI: 1 inch = 25.4 mm.

NUMBER OF EXITS
- 2 EXITS REQUIRED WHEN OCCUPANCY OF A SPACE IS GREAT THAN 49
- 1 EXIT REQUIRED FROM THE STORY <49 OCCUPANTS

TABLE 1006.2.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet) Without Sprinkler System (feet) Occupant Load OL ≤ 30	OL > 30	With Sprinkler System (feet)
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	10	NP	NP	125[a]
R-3[e]	10	NP	NP	125[a]
R-4[e]	10	75	75	125[a]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

For SI: 1 foot = 304.8 mm. NP = Not Permitted.

TABLE 1006.3.1
MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

OCCUPANT LOAD PER STORY	MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY
1-500	2
501-1,000	3
More than 1,000	4

STAIRS / RAMPS - IBC CHAPTER 10

SECTION 1009.3.2; EXCEPTION 1 - CLEAR WIDTH OF 48 INCHES MINIMUM BETWEEN HANDRAILS IS NOT REQUIRED (SPRINKLER)

SECTION 1005.3.1 - THE CAPACITY, IN INCHES, OF MEANS OF EGRESS STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH STAIRWAYS BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.3 INCH PER OCCUPANT (PER FLOOR FOR THAT FLOOR)

BASEMENT LEVEL:	91 (OCCUPANTS) X 0.3 = 27.3 IN. MINIMUM
FIRST FLOOR:	94 (OCCUPANTS) X 0.3 = 28.2 IN. MINIMUM
SECOND FLOOR:	39 (OCCUPANTS) X 0.3 = 11.7 IN. MINIMUM

SECTION 1005.3.1 EXCEPTION 1 - THE WIDTH SHALL NOT BE LESS THAN 44 INCHES

SECTION 1009.3

EXCEPTION 1 - EXIT ACCESS STAIRWAYS PROVIDING MEANS FOR EGRESS FROM MEZZANINES ARE PERMITTED AS PART OF AN ACCESSIBLE MEANS OF EGRESS.

EXCEPTION 2 - THE CLEAR WIDTH OF 48 INCHES BETWEEN HANDRAILS IS NOT REQUIRED IN BUILDINGS EQUIPPED THROUGHOUT WITH AUTOMATIC SPRINKLER SYSTEMS.

EXCEPTION 3 - AREAS OF REFUGE ARE NOT REQUIRED AT STAIRWAYS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM.

DOORS

SECTION 1010.1.1 - SIZE OF DOORS: THE REQUIRED CAPACITY OF EACH DOOR OPENING SHALL BE SUFFICIENT FOR THE OCCUPANT LOAD THEREOF AND SHALL PROVIDE A MINIMUM CLEAR WIDTH OF 32 INCHES.

SECTION 1005.3.2 - THE CAPACITY, IN INCHES, OF MEANS OF EGRESS COMPONENTS OTHER THAN STAIRWAYS SHALL BE CALCULATED BY MULTIPLYING THE OCCUPANT LOAD SERVED BY SUCH COMPONENT BY A MEANS OF EGRESS CAPACITY FACTOR OF 0.2 INCH (5.1 MM) PER OCCUPANT.

BASEMENT LEVEL:	91 (OCCUPANTS) X 0.2 = 18.2 IN. MINIMUM
FIRST FLOOR:	94 (OCCUPANTS) X 0.2 = 18.8 IN. MINIMUM
SECOND FLOOR:	39 (OCCUPANTS) X 0.2 = 7.8 IN. MINIMUM

THE MINIMUM WIDTH SHALL NOT BE LESS THAN 32 INCHES AND THE MINIMUM HEIGHT SHALL NOT BE LESS THAN 80"

EGRESS THROUGH INTERVENING SPACES (SECTION 1016.2)

EXIT ACCESS THROUGH AN ENCLOSED ELEVATOR LOBBY IS PERMITTED. ACCESS TO NOT LESS THAN ONE OF THE REQUIRED EXITS SHALL BE PROVIDED WITHOUT TRAVEL THROUGH THE ENCLOSED ELEVATOR LOBBIES REQUIRED BY SECTION 3006. WHERE THE PATH OF EXIT ACCESS TRAVEL PASSES THROUGH AN ENCLOSED ELEVATOR LOBBY, THE LEVEL OF PROTECTION REQUIRED FOR THE ENCLOSED ELEVATOR LOBBY IS NOT REQUIRED TO BE EXTENDED TO THE EXIT UNLESS DIRECT ACCESS TO AN EXIT IS REQUIRED BY OTHER SECTIONS OF THIS CODE.

EGRESS FROM A ROOM OR SPACE SHALL NOT PASS THROUGH ADJOINING OR INTERVENING ROOMS OR AREAS, EXCEPT WHERE SUCH ADJOINING ROOMS OR AREAS AND THE AREA SERVED ARE ACCESSORY TO ONE OR THE OTHER, ARE NOT A GROUP H OCCUPANCY AND PROVIDE A DISCERNIBLE PATH OF EGRESS TRAVEL TO AN EXIT.

EXCEPTION: MEANS OF EGRESS ARE NOT PROHIBITED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES I NA GROUP H, S, OR F OCCUPANCY WHERE THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR A LESSER HAZARD OCCUPANCY GROUP. ELEVATORS - IBC SECTIONS 1009.4 AND 3006

AN EXIT ACCESS SHALL NOT PASS THROUGH A ROOM THAT CAN BE LOCKED TO PREVENT EGRESS

EGRESS SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, CLOSETS OR SPACES USED FOR SIMILAR PURPOSES.

EXIT ACCESS TRAVEL DISTANCE SHALL NOT EXCEED THE VALUES GIVEN BELOW:

TABLE 1017.2
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, M, R, S-1	200	250[b]
I-1	Not Permitted	250[b]
B	200	300[c]
F-2, S-2, U	300	400[c]
H-1	Not Permitted	75[d]
H-2	Not Permitted	100[d]
H-3	Not Permitted	150[d]
H-4	Not Permitted	175[d]
H-5	Not Permitted	200[c]
I-2, I-3, I-4	Not Permitted	200[c]

For SI: 1 foot = 304.8 mm.

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CODE REVIEW INFORMATION

A0.3

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	DEED LINE/R.O.W.	
	TIE LINE	
	SETBACK	
	EASEMENT	
	BUFFER	
	FLOODPLAIN	
	FLOODWAY	
	CENTERLINE	
⊡	MONUMENT	■
◎	IRON PIPE/ROD	●
◎	DRILL HOLE	◉
C1/L1	DEED CALL	
C1/L1	CURVE/LINE NO.	C1/L1
	SOILS	
	ZONE LINE	
	ZONE LINE ON PL	
BENCHMARK DESCRIPTION WITH ELEVATION	BENCHMARK	
△	SURVEY CONTROL	
TP-1	TEST PIT	
MW	MW-1 MONITORING WELL	
B-1	BORING	
	BUILDING	
	DECK/STEPS/ OVERHANG	
	EDGE WETLAND	
	WETLANDS	
	UPLANDS	
	STREAM	
	LEDGE	
	EDGE PAVEMENT	
	PAVEMENT SAWCUT	
	EDGE CONCRETE	
	PAVEMENT PAINT	
	EDGE GRAVEL	
	CURB LINE	
	EDGE OF WATER	
	TREELINE	
120 118	CONTOURS	120
×120.00	SPOT GRADE	+120.00
O	CHAIN LINK FENCE	O
X	BARB WIRE FENCE	X
⊡	STOCKADE FENCE	⊡
	GUARD RAIL	
	STONE WALL	
	RETAINING WALL	
	DECIDUOUS TREE	X
	CONIFEROUS TREE	X
	MULCH LINE	
○	BOLLARD	●
	SIGN	
	RAILROAD	
G	GAS	G
GV	GAS GATE VALVE	GV
GM	GAS METER	
G	GAS MANHOLE	
W	WATER	W
WV	WATER GATE VALVE	WV
	WATER SHUT OFF	
	HYDRANT	
W	WATER MANHOLE	
W	WELL	W
S	SANITARY SEWER	S
FM	FORCE MAIN	FM
S	SANITARY MANHOLE	●
SD	STORM DRAIN	SD
UD	UNDER DRAIN	UD
D	DRAINAGE MANHOLE	●
▤	CATCH BASIN	■
OHU	OVERHEAD UTILITY	OHU
UGU	UNDERGROUND UTILITY	UGU
T	TRANSFORMER PAD	T
E	ELECTRICAL MANHOLE	E
EM	ELECTRIC METER	
H	HVAC UNIT	
T	TELEPHONE MANHOLE	
	LIGHT POLE	
	UTILITY POLE	
	GUY WIRE	
	DRAINAGE DITCH	
	EROSION CONTROL BLANKET	
	FILTER BARRIER	FB
	RIPRAP	
	CHECK DAM	
	INLET PROTECTION	
	BOULDER	
	STREAM	

GENERAL NOTES

1. THE RECORD OWNER OF THE PARCEL IS THE CITY OF WATERVILLE BY DEED DATED JULY 31, 1906 AND RECORDED AT THE KENNEBEC COUNTY REGISTRY OF DEEDS KCRD IN BOOK 463, PAGE 545.
2. THE PROPERTY IS SHOWN AS LOT 320 ON THE CITY OF WATERVILLE TAX MAP 48 AND IS LOCATED IN THE COMMERCIAL DISTRICT.
3. ACCORDING TO LAND USE ORDINANCE DATED APRIL 20, 2021 NO SPACE AND BULK CRITERIA IS LISTED FOR THE COMMERCIAL DISTRICT.
   * SEE ORDINANCE FOR MORE PARTICULAR INFORMATION.
4. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON FIELD WORK PERFORMED BY SEBAGO TECHNICS, INC. IN JUNE, 2021.
5. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83. ELEVATIONS DEPICTED HEREON ARE NAVD88, BASED ON DUAL FREQUENCY GPS OBSERVATIONS.
6. BENCHMARK:
   BM-1 CORNER OF CONCRETE PAD ELEVATION: 110.80 (NAVD88)
7. UTILITY INFORMATION DEPICTED HEREON, UNLESS OTHERWISE NOTED, IS OF QUALITY LEVEL D PER AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD CI/ASCE 38-02. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES WITHIN THE PROJECT AREA PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
8. THE LOCUS PROPERTY AS DEPICTED HEREON DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR WATERVILLE, MAINE, KENNEBEC COUNTY, COMMUNITY-PANEL NUMBER 23011C0167D, HAVING AN EFFECTIVE DATE OF JUNE 16, 2011. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
9. ALL WORK SHALL CONFORM TO APPLICABLE CODES AND ORDINANCES.
10. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIM OR HERSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIM OR HERSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
11. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND IN THE FIELD.
12. PROVIDE ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OWNER'S REQUIREMENTS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
13. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
14. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC. STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.
15. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES, AND MAINTAIN SITE STABILITY DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL AREAS TO ORIGINAL CONDITION AND AS DIRECTED BY DESIGN DRAWINGS.
16. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
17. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY UTILITY COMPANIES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (811) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
18. CONTRACTOR SHALL BE AWARE THAT DIG SAFE ONLY NOTIFIES ITS "MEMBER" UTILITIES ABOUT THE DIG. WHEN NOTIFIED, DIG SAFE WILL ADVISE CONTRACTOR OF MEMBER UTILITIES IN THE AREA, CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING NON-MEMBER UTILITIES DIRECTLY. NON-MEMBER UTILITIES MAY INCLUDE TOWN OR CITY WATER AND SEWER DISTRICTS AND SMALL LOCAL UTILITIES, AS WELL AS USG PUBLIC WORKS SYSTEMS.
19. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRSA 3360-A. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITIES TO OBTAIN AUTHORIZATION PRIOR TO RELOCATION OF ANY EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS. IF A UTILITY CONFLICT ARISES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER, THE MUNICIPALITY AND APPROPRIATE UTILITY COMPANY PRIOR TO PROCEEDING WITH ANY RELOCATION.
20. ALL PAVEMENT MARKINGS AND DIRECTIONAL SIGNAGE SHOWN ON THE PLAN SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS.
21. ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.
22. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.
23. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AND AS SPECIFIED ON PLANS.
24. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR THE REMOVAL, REPLACEMENT AND RECTIFICATION OF ALL DAMAGED AND DEFECTIVE MATERIAL AND WORKMANSHIP IN CONNECTION WITH THE CONTRACT WORK. THE CONTRACTOR SHALL REPLACE OR REPAIR AS DIRECTED BY THE OWNER ALL SUCH DAMAGED OR DEFECTIVE MATERIALS WHICH APPEAR WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.
25. WHERE THE TERMS "APPROVED EQUAL", "OTHER APPROVED", "EQUAL TO", "ACCEPTABLE" OR OTHER GENERAL QUALIFYING TERMS ARE USED IN THESE NOTES, IT SHALL BE UNDERSTOOD THAT REFERENCE IS MADE TO THE RULING AND JUDGEMENT OF SEBAGO TECHNICS, INC.
26. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THE WORK UNTIL TURNED OVER TO THE OWNER.
27. THE CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DRAWINGS ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE OF ALL TRADES.
28. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR CLIENT/OWNER.
29. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. ANY MODIFICATION TO SUIT FIELD DIMENSION AND CONDITION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY WORK.
30. BEFORE THE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS, REPAIR OR REPLACE PRIVATE OR PUBLIC PROPERTY WHICH MAY HAVE BEEN DAMAGED OR DESTROYED DURING CONSTRUCTION, CLEAN THE AREAS WITHIN AND ADJACENT TO THE PROJECT WHICH HAVE BEEN OBSTRUCTED BY HIS/HER OPERATIONS, AND LEAVE THE PROJECT AREA NEAT AND PRESENTABLE.

UTILITY DEMOLITION NOTES

1. PROTECT EXISTING BOUNDARY LINE MONUMENTATION. IF DISTURBED, EXISTING MONUMENTATION TO BE RESET BY A PROFESSIONAL LAND SURVEYOR.
2. DEMOLITION OF UTILITIES REQUIRING TREE REMOVAL SHALL BE COORDINATED WITH THE OWNER AND IN ACCORDANCE WITH PROJECT PLANS.
3. UTILITY DEMOLITION SHALL BE COMPLETED IN COORDINATION WITH NEW INFRASTRUCTURE. CONTRACTOR SHALL ENSURE EXISTING SURFACE DRAINAGE IS MAINTAINED DURING CONSTRUCTION.
4. EXISTING SEWER AND STORM DRAINAGE INFRASTRUCTURE TO REMAIN ACTIVE DURING CONSTRUCTION AND UPON COMPLETION OF PROJECT. DEMOLITION/CONSTRUCTION ACTIVITIES SHALL NOT INTERFERE OR IMPEDE EXISTING FLOWS. CONTRACTOR SHALL PROVIDE BYPASS PUMPING AS REQUIRED DURING SEWER AND STORM DEMOLITION AND NEW CONSTRUCTION. DAMAGE TO EXISTING SEWER INFRASTRUCTURE SHALL BE REPAIRED BY CONTRACTOR AT THEIR EXPENSE.
5. DEMOLITION SHOWN IS FOR MAJOR SITE ELEMENTS TO BE DEMOLISHED. OTHER MINOR DEMOLITION MAY BE REQUIRED AS PART OF CONSTRUCTION AND SHALL BE CONSIDERED INCIDENTAL TO THE COST OF CONSTRUCTION. COORDINATE ALL DEMOLITION WORK WITH SITE AND BUILDING DRAWINGS.
6. PRIOR TO ANY DEMOLITION, THE CONTRACTOR SHALL SUBMIT A SEQUENCE OF DEMOLITION PLANS TO THE OWNER. THIS PLAN SHALL DEPICT LOCATIONS OF PROPOSED TERMINATIONS AND ANY TEMPORARY SERVICES THAT WILL BE NEEDED.
7. CONTRACTOR REQUIRED TO CONFIRM/MAINTAIN BENCHMARKS. IF IMPACTED CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION/RELOCATION AND COORDINATION WITH PROJECT TEAM.

GRADING & EROSION NOTES

1. SIDESLOPES SHALL NOT BE STEEPER THAN 3:1 (H:V) EXCEPT AS OTHERWISE IDENTIFIED ON THIS PLAN. ALL SIDESLOPES STEEPER THAN 3:1 (H: V) SHALL BE LINED WITH EROSION CONTROL BLANKET, OR ADDITIONAL MEASURES AS INDICATED.
2. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENT CONTROL BMPS" MANUAL PUBLISHED BY BUREAU OF LAND AND WATER QUALITY MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.
3. ALL AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE LOAM AND SEED PER DETAIL.
4. SEE GRADING AND UTILITY PLAN FOR PIPE AND STRUCTURE DATA.

UTILITY NOTES

1. ALL GRAVITY CONDUIT PIPES SHALL BE INSTALLED USING A PIPE LASER AND TARGET SYSTEM THROUGH THE PIPE. ON PIPE RUNS 50 FEET OR LESS, THE CONTRACTOR SHALL REQUEST ENGINEER'S APPROVAL TO USE OR NOT USE A GROUND LASER.
2. MAINTAIN MINIMUM 10 FEET HORIZONTAL SEPARATION BETWEEN WATER SERVICES AND OTHER UTILITIES. MAINTAIN MINIMUM 18 INCHES VERTICAL SEPARATION BETWEEN WATER SERVICES AND OTHER UTILITIES.
3. LOWER OR RAISE WATER SERVICES AS REQUIRED TO MAINTAIN MINIMUM 12 INCH VERTICAL SEPARATION FROM OTHER UTILITIES. WATER SERVICES CROSSING SEWERS SHALL BE PROVIDE 12 INCH MINIMUM SEPARATION BETWEEN THE BOTTOM OF WATER LINE AND TOP OF SEWER UNLESS NOTED OTHERWISE ON THE PLANS.
4. PIPE:
   - SEWER PIPE SHALL BE SDR 35 PVC OR APPROVED EQUAL.
   - STORMDRAIN SHALL BE ADS N-12 DUAL WALL HDPE PIPE WITH SMOOTH-WALLED INTERIOR OR APPROVED EQUAL UNLESS NOTED OTHERWISE ON THE UTILITY PLANS.
5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY GRADE CHANGES THAT WILL IMPACT STORM DRAINAGE INFRASTRUCTURE OR OTHER UTILITIES.
6. UTILITIES WITHIN 5 FEET FROM FACE OF BUILDING ARE COORDINATED ON RELEVANT M.E.P. DRAWINGS. CONTRACTOR SHALL COORDINATE INVERTS, CONNECTIONS AND MATERIALS WITH ALL DRAWINGS.
7. CONTRACTOR SHALL FURNISH AND INSTALL TRENCHING, MATERIALS AND BACKFILL FOR ALL UTILITIES. ELECTRICAL AND TELECOM/DATA PROVIDERS WILL PULL PRIMARY SERVICE TO TRANSFORMER AND PANEL. CONTRACTOR RESPONSIBLE FOR TIMING AND COORDINATION WITH UTILITIES AND DRAWINGS. COORDINATE WITH ELECTRICAL DRAWINGS FOR CONDUIT SCHEDULE, TYPE AND SIZES.
8. UTILITY CONTACTS:
   ELECTRIC:
   CENTRAL MAINE POWER (CMP)
   DAN BEGIN, ENERGY SERVICES SPECIALIST (207) 629-4517
   WATER:
   KENNEBEC WATER DISTRICT
   JEFFERSON LONGFELLOW, DISTRICT ENGINEER (207) 872-2763
   SEWER / STORM:
   WATERVILLE SEWERAGE DISTRICT
   JOHN J. JANSEN, SUPERINTENDENT (207) 873-5191

CONSTRUCTION PLAN

1. PROVIDE EROSION CONTROL MEASURES PRIOR TO SITE DISTURBANCE.
2. GRADING AND CLEARING LIMITS SHALL NOT ENCROACH ON ADJACENT PROPERTIES UNLESS NOTED OTHERWISE ON THE PLANS.
3. OPEN AREAS SHALL BE LIMITED TO AREAS BEING WORKED IN. THE AREA STRIPPED OF EXISTING VEGETATION AT ANY GIVEN TIME SHALL BE MINIMIZED AND BE PHASED WHERE PRACTICAL SO THAT AREAS ARE REVEGETATED AND PERMANENTLY STABILIZED BEFORE ADDITIONAL AREAS ARE STRIPPED OF EXISTING VEGETATION. CONSTRUCTION BY USE OF RIPRAP, SEED, MULCH, OR OTHER GROUND COVER WITHIN ONE WEEK FROM THE TIME IT WAS ACTIVELY WORKED.

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THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
t: 207 245 6060

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

STATE OF MAINE
AARON C. HUNTER
No. 16326
REGISTERED PROFESSIONAL ENGINEER
2021-01-12

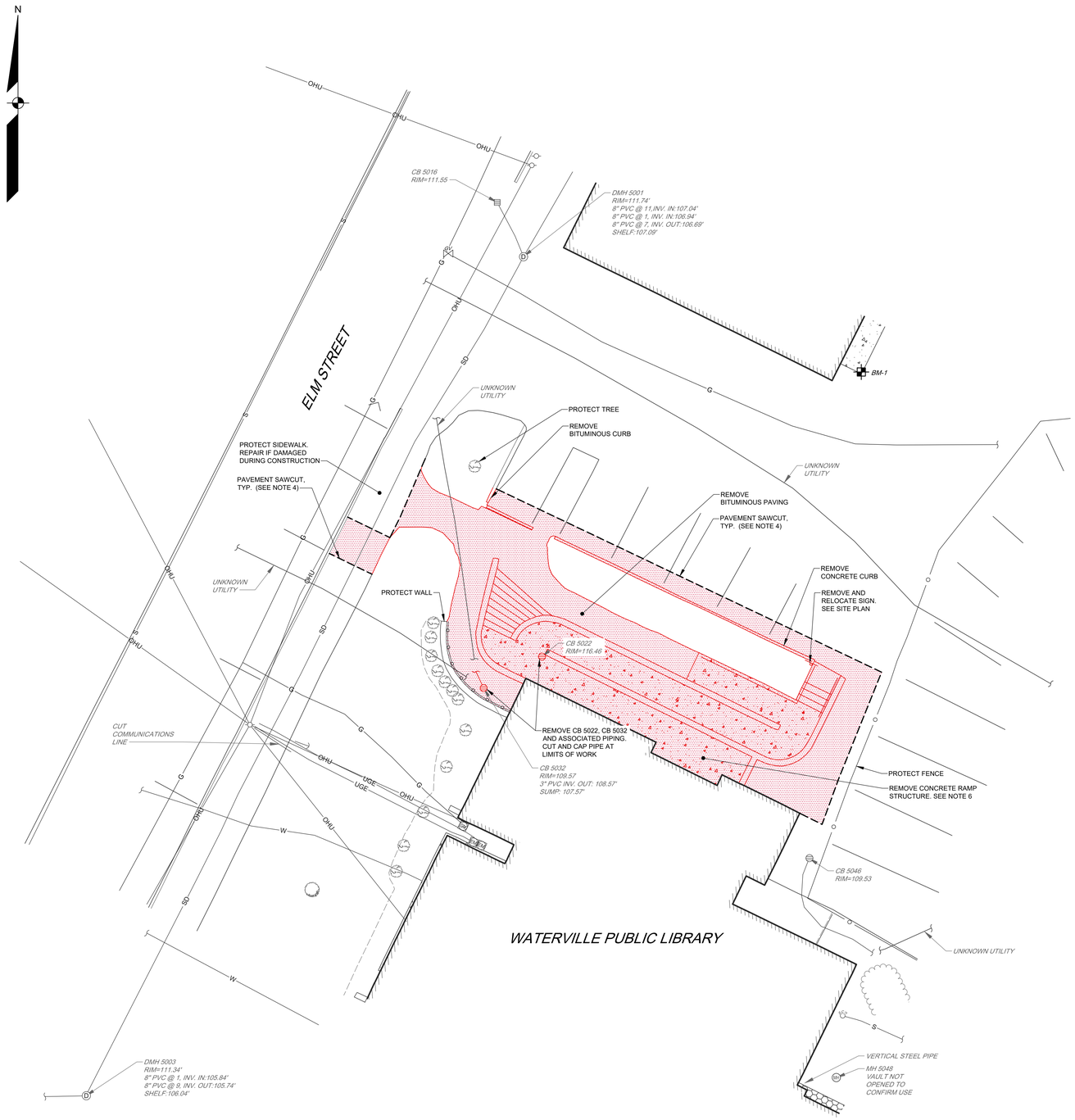
CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

NOTES AND LEGEND

C-002



GRAPHIC SCALE

10 0 5 10 20

(IN FEET)
1 INCH = 10 FT.

NOTES:

1. ALL SITE FEATURES COLORED RED ARE TO BE DEMOLISHED AND/OR REMOVED FROM THE SITE.
2. CONTRACTOR SHALL NOTIFY DIGSAFE FOR UTILITY LOCATIONS PRIOR TO EXCAVATION.
3. ALL DEMOLITION WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.
4. REMOVE ALL ASPHALT AND CONCRETE WITHIN SAW CUT LIMITS.
5. SIGNS NOT NEEDED FOR NEW CONSTRUCTION SHALL BE SALVAGED AND CAREFULLY STOCKPILED FOR REMOVAL FROM THE SITE BY THE CITY.
6. REFER TO DEMO PLANS INCLUDED IN ARCHITECTURAL DRAWINGS FOR WORK RELATED TO WATERVILLE PUBLIC LIBRARY BUILDING AND CONCRETE RAMP.

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No. 16326
REGISTERED PROFESSIONAL ENGINEER
2021-01-12

CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

DEMOLITION PLAN

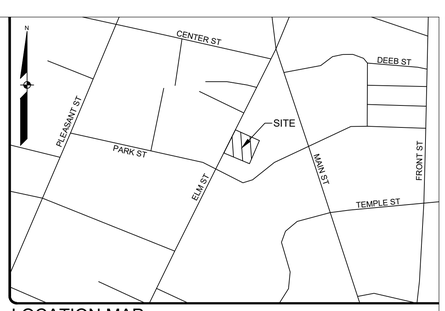
C-101

LANDSCAPE NOTES

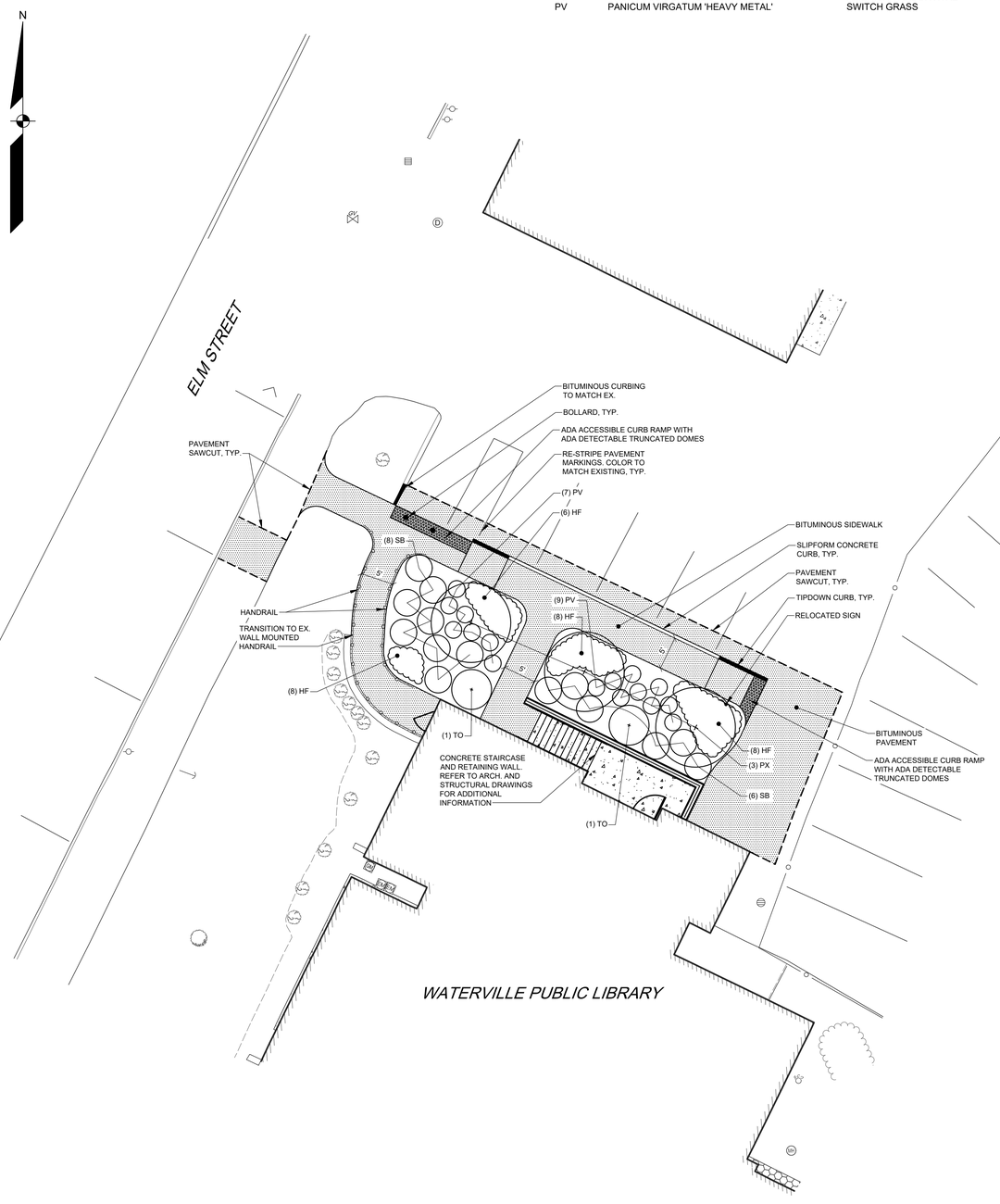
1. PLANT QUANTITIES SHOWN ON PLANS ARE FOR CONVENIENCE TO THE CONTRACTOR ONLY. THE CONTRACTOR IS RESPONSIBLE FOR ALL PLANT MATERIAL INSTALLATION AS SHOWN ON PLANS.
2. SIZE AND GRADING STANDARDS OF PLANT MATERIALS SHALL CONFORM TO THE LATEST EDITION OF "U.S.A. STANDARD FOR NURSERY STOCK," BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
3. ALL PLANT MATERIAL SHALL BE FREE FROM INSECTS AND DISEASE.
4. ALL PLANTING SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES. THIS IS TO INCLUDE PROPER PLANTING MIX, PLANT BED AND TREE PIT PREPARATION, PRUNING, STAKING OR GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE UNTIL ACCEPTANCE BY THE OWNER.
5. PLANT MATERIAL SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR BY THE CONTRACTOR AND A PERIOD OF TWO YEARS THEREAFTER BY THE OWNER FROM DATE OF INSTALLATION. DURING THE ONE YEAR GUARANTEE PERIOD, DEAD PLANT MATERIAL SHALL BE REPLACED AT NO COST TO THE OWNER. AT THE END OF THE ONE YEAR PERIOD, THE CONTRACTOR SHALL OBTAIN FINAL ACCEPTANCE FROM THE OWNER.
6. ALL GRASS, OTHER VEGETATION AND DEBRIS SHALL BE REMOVED FROM ALL PLANTING AREAS PRIOR TO PLANTING.
7. EXISTING TREES TO BE PRESERVED WILL BE PROTECTED DURING CONSTRUCTION AND SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
8. THE LANDSCAPE CONTRACTOR IS ADVISED OF THE PRESENCE OF THE UNDERGROUND UTILITIES AND SHALL VERIFY THE EXISTENCE AND LOCATION OF SAME BEFORE COMMENCING AND DIGGING OPERATIONS. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR UTILITIES, PAVING, WALKS, CURBING, ETC. DAMAGED IN PERFORMANCE OF THIS JOB AT NO ADDITIONAL COST TO THE OWNER.
9. ALL SHRUB BEDS SHALL BE MULCHED WITH 3" CLEAN SHREDDED DARK BROWN BARK MULCH.
10. THE CONTRACTOR SHALL PROVIDE 4" LOAM FOR ALL AREAS TO BE SODDED OR SEEDED. PLANTING AREAS SHALL RECEIVE 12" ROLLED THICKNESS OF LOAM. THE LANDSCAPE CONTRACTOR SHALL COORDINATE SUBGRADE PREPARATION WITH THE GENERAL CONTRACTOR PRIOR TO PLACING LOAM.
11. ANY DEVIATION FROM THE LANDSCAPE PLAN, INCLUDING PLANT LOCATION, SELECTION, SIZE, QUANTITY OR CONDITION SHALL BE REVIEWED AND APPROVED BY THE OWNER AND LANDSCAPE ARCHITECT (AND MUNICIPAL AUTHORITY, IF APPLICABLE) PRIOR TO INSTALLATION ON SITE.
12. WHERE INDICATED ON PLAN, PLANTING SOIL MIXTURE FOR PERENNIAL AND ANNUAL FLOWER BED AREAS SHALL CONSIST OF FOUR PARTS TOPSOIL, TWO PARTS SPHAGNUM PEAT MOSS, AND ONE PART HORTICULTURAL PERLITE BY VOLUME. PEAT MOSS MAY BE SUBSTITUTED WITH WELL-ROTTED OR DEHYDRATED MANURE OR COMPOST. ROTOTILL BEDS TO A DEPTH OF 8 INCHES.
13. DURING CLEANING OF SITE AND PRIOR TO TREE AND SHRUB INSTALLATION, CONTRACTOR SHALL REMOVE INVASIVE PLANTS. AREAS WHERE INVASIVE PLANTS ARE REMOVED AND NOT OTHER PLANTING IS PROPOSED, AREA SHALL BE LOAM AND SEEDED.

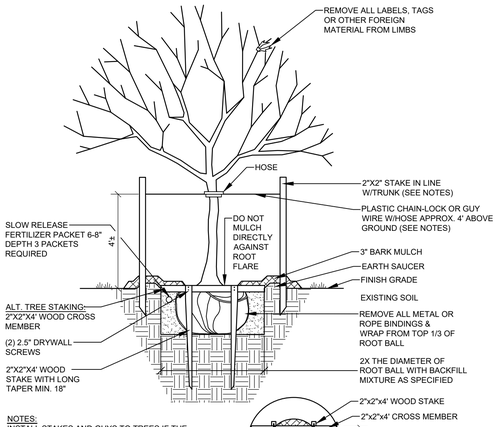
PLANTING SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE/COMMENT
HF	HEMEROCALLIS FULVA 'STELLA D' ORO'	DAYLILY	#1 CONT. @ 18" O.C.
PX	PRUNUS 'ACCOLADE'	ACCOLADE CHERRY TREE	2.5" CAL. (8-10' HGT. MIN.)
SB	SPIRAEA BETULIFOLIA 'TOR'	ASHLEAF SPIREA	#5 CONT.
TO	THUJA OCCIDENTALLIS 'SMARAGD'	AMERICAN ARBORVITAE	5'-6' HGT.
PV	PANICUM VIRGATUM 'HEAVY METAL'	SWITCH GRASS	#1 CONT.



LOCATION MAP N.T.S.

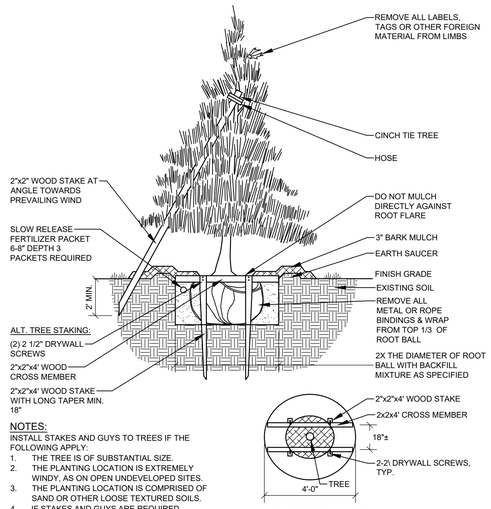




NOTES:
INSTALL STAKES AND GUYS TO TREES IF THE FOLLOWING APPLY:
1. THE TREE IS OF SUBSTANTIAL SIZE.
2. THE PLANTING LOCATION IS EXTREMELY WINDY, AS ON OPEN UNDEVELOPED SITES.
3. THE PLANTING LOCATION IS COMPRISED OF SAND OR OTHER LOOSE TEXTURED SOILS.
4. IF STAKES AND GUYS ARE REQUIRED, REMOVE AFTER ONE YEAR TIME.

ALT. TREE STAKING PLAN
NOT TO SCALE

DECIDUOUS TREES
NOT TO SCALE



NOTES:
INSTALL STAKES AND GUYS TO TREES IF THE FOLLOWING APPLY:
1. THE TREE IS OF SUBSTANTIAL SIZE.
2. THE PLANTING LOCATION IS EXTREMELY WINDY, AS ON OPEN UNDEVELOPED SITES.
3. THE PLANTING LOCATION IS COMPRISED OF SAND OR OTHER LOOSE TEXTURED SOILS.
4. IF STAKES AND GUYS ARE REQUIRED, REMOVE AFTER ONE YEAR TIME.

ALT. TREE STAKING PLAN
NOT TO SCALE

EVERGREEN TREES
NOT TO SCALE

GRAPHIC SCALE
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(IN FEET)
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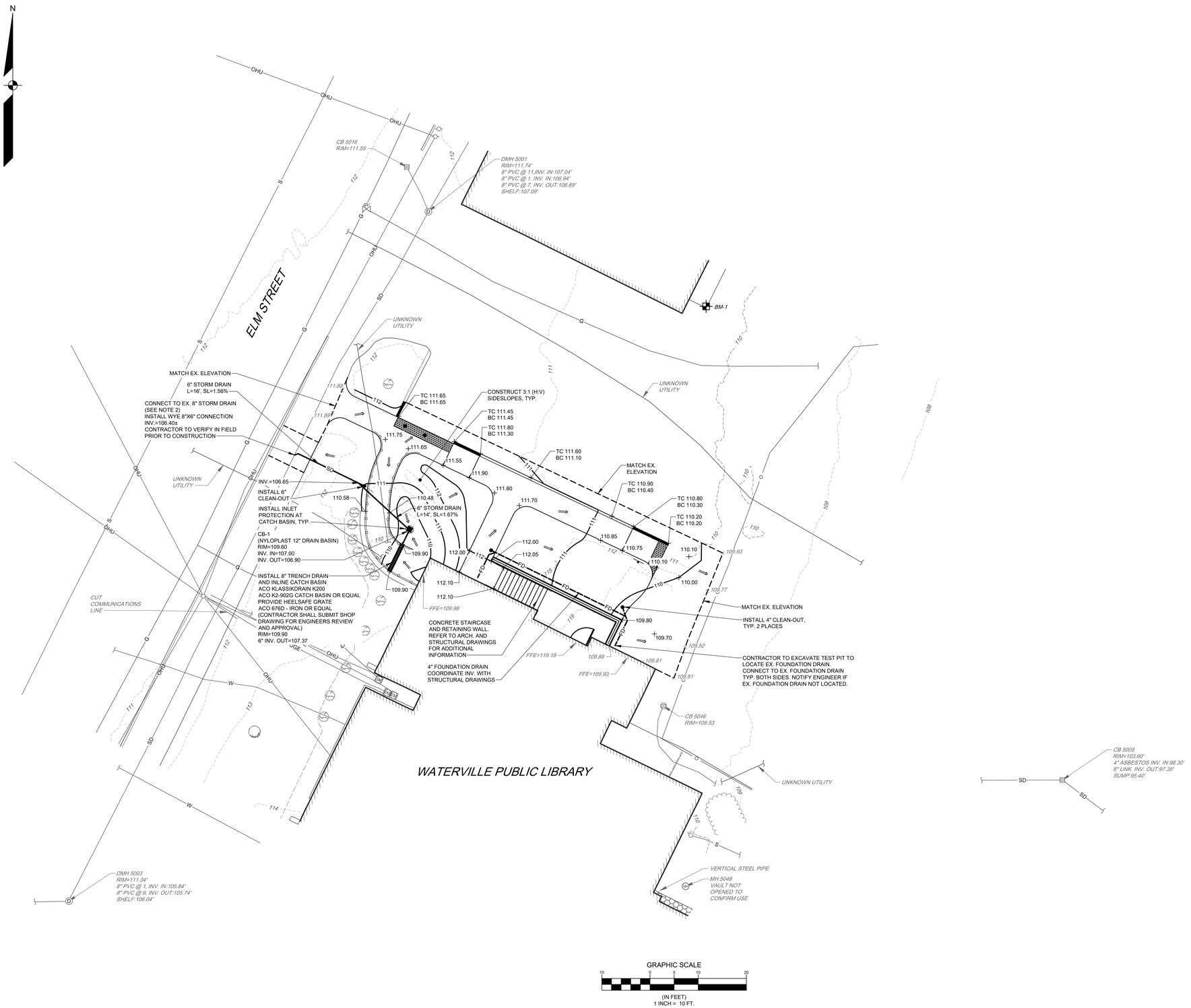
STATE OF MAINE
AARON C. HUNTER
No. 16326
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
2021-01-12

CURRENT ISSUE:
22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:
SITE AND LANDSCAPE PLAN

C-102



NOTES:

1. CONTRACTOR SHALL ENSURE SMOOTH TRANSITION TO EXISTING BITUMINOUS SURFACE.
2. CONTRACTOR SHALL COORDINATE WITH CITY OF WATERVILLE AND WATERVILLE SEWERAGE DISTRICT TO OBTAIN ANY NECESSARY PERMITS.
3. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL DRAWINGS TO ENSURE THAT ALL DOWNSPOUTS DISCHARGING ONTO NON PAVED AREAS ARE PROVIDED WITH A MINIMUM 12"X24" CONCRETE SPLASH BLOCK.

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CIVIL
2021-01-12

CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

GRADING AND
UTILITY PLAN

C-103

EROSION CONTROL MEASURES

PRE-CONSTRUCTION PHASE

PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS (SILT FENCE) WILL BE STAKED/INSTALLED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT PROPERTY LINE OR WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. THE PLACEMENT OF SEDIMENT BARRIERS SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES AND IN ACCORDANCE WITH THIS EROSION CONTROL PLAN AND DETAILS IN THIS PLAN SET. THIS NETWORK IS TO BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED.

PRIOR TO ANY CLEARING OR GRUBBING, A CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED AT THE INTERSECTION OF THE PROPOSED ENTRANCES AND EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM THE SITE.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE A DETAILED SCHEDULE AND MARKED UP PLAN INDICATING AREAS AND COMPONENTS OF THE WORK AND KEY DATES SHOWING DATE OF DISTURBANCE AND COMPLETION OF THE WORK. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE MUNICIPAL STAFF. THREE COPIES OF THE SCHEDULE AND MARKED UP PLAN SHALL BE PROVIDED TO THE MUNICIPALITY THREE DAYS PRIOR TO THE SCHEDULED PRE-CONSTRUCTION MEETING. SPECIAL ATTENTION SHALL BE GIVEN TO THE 14 DAY LIMIT OF DISTURBANCE IN THE SCHEDULE ADDRESSING TEMPORARY AND PERMANENT VEGETATION MEASURES.

CONSTRUCTION AND POST-CONSTRUCTION PHASE

AREAS UNDERGOING ACTUAL CONSTRUCTION SHALL ONLY EXPOSE THAT AMOUNT OF MINERAL SOIL NECESSARY FOR PROGRESSIVE AND EFFICIENT CONSTRUCTION. AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED WITH PAVEMENT, VEGETATION, MULCHING, EROSION CONTROL MATS, RIPRAP OR GRAVEL BASE ON A ROAD, SUCH AS ACTIVE EXCAVATION AND ACTIVE GRADING. LIMIT THE EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS ACTIVELY OCCURRING OR CAN BE MULCHED IN THE SAME DAY. OPEN AREAS SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROL AS SHOWN ON THE DESIGN PLANS AND AS DESCRIBED WITHIN THIS EROSION CONTROL PLAN WITHIN SEVEN (7) DAYS OF DISTURBANCE. AREAS LOCATED WITHIN 100 FEET OF STREAMS SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROL WITHIN SEVEN (7) DAYS. REFER TO WINTER EROSION CONTROL NOTES FOR THE TREATMENT OF OPEN AREAS AFTER OCTOBER 1ST OF THE CONSTRUCTION YEAR.

THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.

EROSION CONTROL APPLICATIONS & MEASURES
THE PLACEMENT OF EROSION CONTROL MEASURES SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES AND IN ACCORDANCE WITH THE EROSION CONTROL PLAN AND DETAILS IN THE PLAN SET.

1. TEMPORARY MULCHING:

ALL DISTURBED AREAS SHALL BE MULCHED WITH MATERIALS SPECIFIED BELOW PRIOR TO ANY STORM EVENT. ALL DISTURBED AREAS NOT FINAL GRADED WITHIN 14 DAYS SHALL BE MULCHED. DISTURBED AREAS ADJACENT TO NATURAL RESOURCES THAT ARE NOT GRADED WITHIN SEVEN (7) DAYS SHALL BE MULCHED. ALSO, AREAS, WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED, SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING. EROSION CONTROL BLANKETS ARE RECOMMENDED TO BE USED AT THE BASE OF GRASSED WATERWAYS AND ON SLOPES GREATER THAN 33%. MULCH ANCHORING SHOULD BE USED ON SLOPES GREATER THAN 5% AFTER SEPTEMBER 15TH OF THE CONSTRUCTION YEAR (SEE WINTER EROSION CONTROL NOTES).
TYPES OF MULCH:

HAY OR STRAW: SHALL BE APPLIED AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE).

EROSION CONTROL MIX: SHALL BE PLACED EVENLY AND MUST PROVIDE 100% SOIL COVERAGE. EROSION CONTROL MIX SHALL BE APPLIED SUCH THAT THE THICKNESS ON SLOPES 3:1 OR LESS IS 2 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THE THICKNESS ON SLOPES BETWEEN 3:1 AND 2:1 SHALL BE 4 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THIS SHALL NOT BE USED ON SLOPES GREATER THAN 2:1.

EROSION CONTROL BLANKET: SHALL BE INSTALLED SUCH THAT CONTINUOUS CONTACT BETWEEN THE MAT AND THE SOIL IS OBTAINED. INSTALL BLANKETS AND STAPLE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. SOIL STOCKPILES:

STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED WITH HAY OR STRAW AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL. ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES. SEDIMENT BARRIERS SHALL BE INSTALLED DOWNGRADIENT OF STOCKPILES, AND STORMWATER SHALL BE PREVENTED FROM RUNNING ONTO THE STOCKPILE.

3. NATURAL RESOURCES PROTECTION:

ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES SHALL BE MULCHED USING TEMPORARY MULCHING (AS DESCRIBED IN PART 1 OF THIS SECTION) WITHIN 7 DAYS OF EXPOSURE OR PRIOR TO ANY STORM EVENT. SEDIMENT BARRIERS (AS DESCRIBED IN PART 4 OF THIS SECTION) SHALL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA. PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE.

4. SEDIMENT BARRIERS:

PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS SHALL BE STAKED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT PROPERTY LINE OR WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. SEDIMENT BARRIERS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION.

SILT FENCE: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE EFFECTIVE HEIGHT OF THE FENCE SHALL NOT EXCEED 36 INCHES. IT IS RECOMMENDED THAT SILT FENCE BE REMOVED BY CUTTING THE FENCE MATERIALS AT GROUND LEVEL SO AS TO AVOID ADDITIONAL SOIL DISTURBANCE.

HAY BALES: SHALL NOT BE INSTALLED ADJACENT TO WETLAND. INSTALL PER THE DETAIL ON THE PLANS. BALES SHALL BE WIRE-BOUND OR STRING-TIED AND THESE BINDINGS MUST REMAIN PARALLEL WITH THE GROUND SURFACE DURING INSTALLATION TO PREVENT DETERIORATION OF THE BINDINGS. BALES SHALL BE INSTALLED WITHIN A MINIMUM 4 INCH DEEP TRENCH LINE WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

EROSION CONTROL MIX: SHALL NOT BE USED ADJACENT TO WETLANDS. INSTALL PER THE DETAIL ON THE PLANS. THE MIX SHALL CONSIST PRIMARILY OF ORGANIC MATERIAL AND CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4 INCHES IN DIAMETER. THE MIX COMPOSITION SHALL MEET THE STANDARDS DESCRIBED WITHIN THE MDEP BEST MANAGEMENT PRACTICES. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER. EROSION CONTROL MIX BERMS SHALL NOT BE USED AT THE BOTTOM OF STEEP SLOPES (>8%) OR SLOPES WITH FLOWING WATER.

CONTINUOUS CONTAINED BERM: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THIS SEDIMENT BARRIER IS EROSION CONTROL MIX PLACED WITHIN A SYNTHETIC TUBULAR NETTING AND PERFORMS AS A STURDY SEDIMENT BARRIER THAT WORKS WELL ON HARD GROUND SUCH AS FROZEN CONDITIONS, TRAVELED AREAS OR PAVEMENT. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER.

5. TEMPORARY CHECK DAMS:

SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. CHECK DAMS ARE TO BE PLACED WITHIN DITCHES/ SWALES AS SPECIFIED ON THE DESIGN PLANS IMMEDIATELY AFTER FINAL GRADING. CHECK DAMS SHALL BE 2 FEET HIGH. TEMPORARY CHECK DAMS MAY BE REMOVED ONLY AFTER THE ROADWAYS ARE PAVED AND THE VEGETATED SWALE ARE ESTABLISHED WITH AT LEAST 90% OF VIGOROUS PERENNIAL GROWTH. THE AREA BENEATH THE CHECK DAM MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER REMOVAL OF THE CHECK DAM.

STONE CHECK DAMS: STONE DAMS SHOULD BE CONSTRUCTED OF 2 TO 3 INCH STONE AND PLACED SUCH THAT COMPLETE COVERAGE OF THE SWALE IS OBTAINED AND THAT THE CENTER OF THE DAM IS 6 INCHES LOWER THAT THE OUTER EDGES.

HAY BALE CHECK DAMS: BALES SHALL BE WIRE-BOUND OR STRING-TIED. BALES SHALL BE INSTALLED WITHIN A MINIMUM 4 INCH DEEP TRENCH LINE WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER. HAY BALES SHALL BE PLACED SUCH THAT COMPLETE COVERAGE OF THE SWALE IS OBTAINED AND THAT THE CENTER OF THE DAM IS 6 INCHES LOWER THAT THE OUTER EDGES.

MANUFACTURED CHECK DAMS: MANUFACTURED CHECK DAMS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF AUTHORIZED BY THE PROPER LOCAL, STATE OR FEDERAL REGULATING AGENCIES. THESE UNITS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS.

6. STORMDRAIN INLET PROTECTION:

INLET PROTECTION SHALL BE PLACED AROUND A STORMDRAIN DROP INLET OR CURB INLET PRIOR TO PERMANENT STABILIZATION OF THE IMMEDIATE AND UPSTREAM DISTURBED AREAS. THEY SHALL BE CONSTRUCTED IN A MANNER THAT WILL FACILITATE CLEAN-OUT AND DISPOSAL OF TRAPPED SEDIMENTS AND MINIMIZE INTERFERENCE WITH CONSTRUCTION ACTIVITIES. ANY RESULTANT PONDING OF WATER FROM THE PROTECTION METHOD MUST NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.

HAY BALE DROP INLET PROTECTION: WE DO NOT RECOMMEND THE USE OF HAY BALES AS INLET PROTECTION.

CONCRETE BLOCK AND STONE INLET SEDIMENT FILTER (DROP OR CURB INLET): SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE HEIGHT OF THE CONCRETE BLOCK BARRIER CAN VARY BUT MUST BE BETWEEN 12 AND 24 INCHES TALL. A MINIMUM OF 1 INCH CRUSHED STONE SHALL BE USED.

MANUFACTURED SEDIMENT BARRIERS AND FILTER (DROP OR CURB INLET): MANUFACTURED FILTERS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

7. STABILIZED CONSTRUCTION ENTRANCE/EXIT:

PRIOR TO CLEARING AND/OR GRUBBING THE SITE A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED WHEREVER TRAFFIC WILL EXIT THE CONSTRUCTION SITE ONTO A PAVED ROADWAY IN ORDER TO MINIMIZE THE TRACKING OF SEDIMENT AND DEBRIS FROM THE CONSTRUCTION SITE ONTO PUBLIC ROADWAYS. THE ENTRANCES AND ADJACENT ROADWAY AREAS SHALL BE PERIODICALLY SWEPT TO FURTHER MINIMIZE THE TRACKING OF MUD, DUST OR DEBRIS FROM THE CONSTRUCTION AREA. THE TERM "SWEEP" IS UNDERSTOOD TO MEAN REMOVAL AND RECOVERY OF TRACKED SEDIMENT WITH A STREET SWEEPER, NOT BRUSHING THE MATERIAL INTO SWALES OR STRUCTURES WITH A MECHANICAL BROOM. STABILIZED CONSTRUCTION EXITS SHALL BE CONSTRUCTED IN AREAS SPECIFIED ON THE PLANS AND AS DETAILED ON THE PLANS. THE CONTRACTOR SHALL MAINTAIN THE STABILIZED CONSTRUCTION ENTRANCE UNTIL ALL DISTURBED AREAS ARE STABILIZED.

DUST CONTROL:

DUST CONTROL DURING CONSTRUCTION SHALL BE ACHIEVED BY THE USE OF A WATERING TRUCK TO PERIODICALLY SPRINKLE THE EXPOSED ROADWAY AREAS AS NECESSARY TO REDUCE DUST DURING THE DRY MONTHS. APPLYING OTHER DUST CONTROL PRODUCTS SUCH AS CALCIUM CHLORIDE OR OTHER MANUFACTURED PRODUCTS ARE ALLOWED IF AUTHORIZED BY THE PROPER LOCAL, STATE AND/OR FEDERAL REGULATING AGENCIES. HOWEVER, IT IS THE CONTRACTOR'S ULTIMATE RESPONSIBILITY TO MITIGATE DUST AND SOIL LOSS FROM THE SITE. IF OFFSITE TRACKING OCCURS, PUBLIC ROADS SHOULD BE SWEPT IMMEDIATELY AND NOT LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS.

TEMPORARY VEGETATION:

TEMPORARY VEGETATION SHALL BE APPLIED TO DISTURBED AREAS THAT WILL NOT RECEIVE FINAL GRADING FOR PERIODS UP TO 12 MONTHS. THIS PROCEDURE SHOULD BE USED EXTENSIVELY IN AREAS ADJACENT TO NATURAL RESOURCES. SEEDBED PREPARATION AND APPLICATION OF SEED SHALL BE CONDUCTED AS INDICATED IN THE PERMANENT VEGETATION SECTION OF THIS NARRATIVE. SPECIFIC SEEDS (FAST GROWING AND SHORT LIVING) SHALL BE SELECTED FROM THE MAINE EROSION AND SEDIMENT CONTROL BMP MANUALS FOR CONTRACTORS AND ENGINEERS, 2016 OR LATEST REVISION. ALTERNATIVE EROSION CONTROL MEASURES SHOULD BE USED IF SEEDING CAN NOT BE DONE BEFORE SEPTEMBER 15TH OF THE CONSTRUCTION YEAR.

PERMANENT VEGETATION:

REVEGETATION MEASURES SHALL COMMENCE IMMEDIATELY UPON COMPLETION OF FINAL GRADING OF AREAS TO BE LOAMED AND SEEDED. THE APPLICATION OF SEED SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR, PLEASE REFER TO THE WINTER EROSION CONTROL NOTES FOR MORE DETAIL. REVEGETATION MEASURES SHALL CONSIST OF THE FOLLOWING:

SEEDBED PREPARATION:

A. FOUR (4) INCHES OF LOAM SHALL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE. LOAM SHALL BE FREE OF SUBSOIL, CLAY LUMPS, STONES AND OTHER OBJECTS OVER 2 INCHES OR LARGER IN ANY DIMENSION, AND WITHOUT WEEDS, ROOTS OR OTHER OBJECTIONABLE MATERIAL.

B. SOILS TESTS SHALL BE TAKEN AT THE TIME OF SOIL STRIPPING TO DETERMINE FERTILIZATION REQUIREMENTS. SOILS TESTS SHALL BE TAKEN PROMPTLY AS TO NOT INTERFERE WITH THE 14-DAY LIMIT ON SOIL EXPOSURE. BASED UPON TEST RESULTS, SOIL AMENDMENTS SHALL BE INCORPORATED INTO THE SOIL PRIOR TO FINAL SEEDING. IN LIEU OF SOIL TESTS, SOIL AMENDMENTS MAY BE APPLIED AS FOLLOWS:

ITEM	APPLICATION RATE
10-20-20 FERTILIZER (N-P205-K20 OR EQUAL)	18.4 LBS./1,000 S.F.
GROUND LIMESTONE (50% CALCIUM & MAGNESIUM OXIDE)	138 LBS./1,000 S.F.

C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH PROPER EQUIPMENT. ROLL THE AREA TO FIRM THE SEEDBED EXCEPT ON CLAY OR SILTY SOILS OR COARSE SAND.

APPLICATION OF SEED:

A. SEEDING: SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR. GENERALLY A SEED MIXTURE MAY BE APPLIED AS FOLLOWS: (MDEP SEED MIX 2 IS DISPLAYED)

SEED TYPE	APPLICATION RATE
CREEPING RED FESCUE	0.46 LBS/1,000 S.F. (20 LBS/ACRE)
REDTOP	0.05 LBS/1,000 S.F. (2 LBS/ACRE)
TALL FESCUE	0.46 LBS/1,000 S.F. (20 LBS/ACRE)
TOTAL:	0.97 LBS/1,000 S.F. (42 LBS/ACRE)

NOTE: A SPECIFIC SEED MIXTURE SHOULD BE CHOSEN TO MATCH THE SOILS CONDITION OF THE SITE. VARIOUS AGENCIES CAN RECOMMEND SEED MIXTURES. MDEP RECOMMENDED SEED MIXTURES ARE IN THE EROSION AND SEDIMENT CONTROL BMP MANUAL DATED 2016 OR LATEST REVISION.

B. HYDROSEEDING: SHALL BE CONDUCTED ON PREPARED AREAS WITH SLOPES LESS THAN 2:1. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. RECOMMENDED SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

C. MULCHING: SHALL COMMENCE IMMEDIATELY AFTER SEED IS APPLIED. REFER TO THE TEMPORARY MULCHING SECTION OF THIS NARRATIVE FOR DETAILS.

SODDING:
FOLLOWING SEEDBED PREPARATION, SOD CAN BE APPLIED IN LIEU OF SEEDING IN AREAS WHERE IMMEDIATE VEGETATION IS MOST BENEFICIAL SUCH AS DITCHES, AROUND STORMWATER DROP INLETS AND AREAS OF AESTHETIC VALUE. SOD SHOULD BE LAID AT RIGHT ANGLES TO THE DIRECTION OF FLOW, STARTING AT THE LOWEST ELEVATION. SOD SHOULD BE ROLLED OR TAMPED DOWN TO EVEN OUT THE JOINTS ONCE LAID DOWN. WHERE FLOW IS PREVALENT THE SOD MUST BE PROPERLY ANCHORED DOWN. IRRIGATE THE SOD IMMEDIATELY AFTER INSTALLATION. IN MOST CASES, SOD CAN BE ESTABLISHED BETWEEN APRIL 1ST AND NOVEMBER 15TH OF THE CONSTRUCTION YEAR, HOWEVER, REFER TO THE WINTER EROSION CONTROL NOTES FOR ANY ACTIVITIES AFTER OCTOBER 1ST.

STANDARDS FOR TIMELY STABILIZATION:

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES -- THE CONTRACTOR WILL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE MDEP WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.

A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS -- BY OCTOBER 1 THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT WILL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM 2(C.) OF THIS STANDARD OR WITH STONE RIPRAP AS DESCRIBED IN ITEM 2(D.) OF THIS STANDARD.
B. STABILIZE THE SLOPE WITH SOD -- THE CONTRACTOR WILL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT WILL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).
C. STABILIZE THE SLOPE WITH WOOD WASTE COMPOST -- THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE APPLICANT WILL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
D. STABILIZE THE SLOPE WITH STONE RIPRAP -- THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS -- BY SEPTEMBER 15 THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.

A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION -- BY OCTOBER 1 THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE APPLICANT WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM 3(C.) OF THIS STANDARD.
B. STABILIZE THE SOIL WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
C. STABILIZE THE SOIL WITH MULCH -- BY NOVEMBER 15 THE APPLICANT WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

1. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, AND AT LEAST EVERY SEVEN (7) DAYS, THE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES. THE CONTRACTOR SHALL PERFORM REPAIRS NO LATER THAN THE END OF THE NEXT WORKDAY, TO ALLOW CONTINUED PROPER FUNCTIONING OF THE EROSION CONTROL MEASURE. THE CONTRACTOR SHALL PROVIDE THE NECESSARY REGULATING AGENCIES WITH WRITTEN DOCUMENTATION DESCRIBING DATES OF INSPECTIONS AND NECESSARY FOLLOW-UP WORK TO MAINTAIN EROSION CONTROL MEASURES MEETING THE REQUIREMENTS OF THIS PLAN WITHIN SEVEN (7) DAYS.

2. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDINGS, THE CONTRACTOR SHALL INSPECT THE WORK AREA SEMIMONTHLY UNTIL THE SEEDINGS HAVE BEEN ESTABLISHED. ESTABLISHED MEANS A MINIMUM OF 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH. RESEEDING SHALL BE CARRIED OUT BY THE CONTRACTOR WITH FOLLOW-UP INSPECTIONS IN THE EVENT OF ANY FAILURES UNTIL VEGETATION IS ADEQUATELY ESTABLISHED.

HOUSEKEEPING:

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM CONSTRUCTION AND WASTE MATERIALS STORED ON SITE TO ENTER STORMWATER, WHICH INCLUDES STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER. THE SITE CONTRACTOR OR OPERATOR MUST DEVELOP, AND IMPLEMENT AS NECESSARY, APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING MEASURES.

2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS. ANY PROJECT PROPOSING INFILTRATION OF STORMWATER MUST PROVIDE ADEQUATE PRE-TREATMENT OF STORMWATER PRIOR TO DISCHARGE OF STORMWATER TO THE INFILTRATION AREA, OR PROVIDE FOR TREATMENT WITHIN THE INFILTRATION AREA, IN ORDER TO PREVENT THE ACCUMULATION OF FINES, REDUCTION IN INFILTRATION RATE, AND CONSEQUENT FLOODING AND DESTABILIZATION.

3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MAY NOT BE USED FOR DUST CONTROL, BUT OTHER WATER ADDITIVES MAY BE CONSIDERED AS NEEDED. A STABILIZED CONSTRUCTION ENTRANCE (SCE) SHOULD BE INCLUDED TO MINIMIZE TRACKING OF MUD AND SEDIMENT. IF OFF-SITE TRACKING OCCURS, PUBLIC ROADS SHOULD BE SWEPT IMMEDIATELY AND NO LESS THAN ONCE A WEEK AND PRIOR TO SIGNIFICANT STORM EVENTS. OPERATIONS DURING DRY MONTHS, THAT EXPERIENCE FUGITIVE DUST PROBLEMS, SHOULD WET DOWN UNPAVED ACCESS ROADS ONCE A WEEK OR MORE FREQUENTLY AS NEEDED WITH A WATER ADDITIVE TO SUPPRESS FUGITIVE SEDIMENT AND DUST.

4. DEBRIS AND OTHER MATERIALS. MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDING AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

5. EXCAVATION DE-WATERING. EXCAVATION DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT AND SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.

6. AUTHORIZED NON-STORMWATER DISCHARGES. IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES. WHERE ALLOWED NON-STORMWATER DISCHARGES EXIST, THEY MUST BE IDENTIFIED AND STEPS SHOULD BE TAKEN TO ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORMWATER COMPONENT(S) OF THE DISCHARGE. AUTHORIZED NON-STORMWATER DISCHARGES ARE:
   A. DISCHARGES FROM FIREFIGHTING ACTIVITY;
   B. FIRE HYDRANT FLUSHINGS;
   C. VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE AND TRANSMISSION WASHING IS PROHIBITED);
   D. DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS;
   E. ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
   F. PAVEMENT WASHWATER (WHERE SPILLS/LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED, UNLESS ALL SPILLED MATERIAL HAD BEEN REMOVED) IF DETERGENTS ARE NOT USED;
   G. UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
   H. UNCONTAMINATED GROUNDWATER OR SPRING WATER;
   I. FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
   J. UNCONTAMINATED EXCAVATION DEWATERING;
   K. POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
   L. LANDSCAPE IRRIGATION.

7. UNAUTHORIZED NON-STORMWATER DISCHARGES. THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES. SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:
   A. WASTEWATER FROM THE WASHOUT OR CLEAN OUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
   B. FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
   C. SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
   D. TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

WINTER EROSION CONTROL MEASURES

THE WINTER CONSTRUCTION PERIOD IS FROM NOVEMBER 1 THROUGH APRIL 15. IF THE CONSTRUCTION SITE IS NOT STABILIZED WITH PAVEMENT, A ROAD GRAVEL BASE, 75% MATURE VEGETATION COVER OR RIPRAP BY NOVEMBER 1 THEN THE SITE NEEDS TO BE PROTECTED WITH OVER-WINTER STABILIZATION. AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED WITH PAVEMENT, VEGETATION, MULCHING, EROSION CONTROL MATS, RIPRAP OR GRAVEL BASE ON A ROAD. LIMIT THE EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDER TAKEN DURING THE PROCEEDING 15 DAYS AND THAT CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT. ALL AREAS SHALL BE CONSIDERED TO BE DENUDED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN ROADWAY AREAS OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH RATE SHALL BE A MINIMUM OF 150 LBS./1,000 S.F. (3 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED. THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.

1. SOIL STOCKPILES

   STOCKPILES OF SOIL OR SUBSOIL WILL BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR AT 150 LBS/1,000 S.F. (3 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL. ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.

2. NATURAL RESOURCES PROTECTION

   ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES, IF NOT STABILIZED WITH A MINIMUM OF 75% MATURE VEGETATION CATCH, SHALL BE MULCHED BY DECEMBER 1 AND ANCHORED WITH PLASTIC NETTING OR PROTECTED WITH EROSION CONTROL MATS. DURING WINTER CONSTRUCTION, A DOUBLE LINE OF SEDIMENT BARRIERS (I.E. SILT FENCE BACKED WITH HAY BALES OR EROSION CONTROL MIX) WILL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA.

   PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE. EXISTING PROJECTS NOT STABILIZED BY DECEMBER 1 SHALL BE PROTECTED WITH THE SECOND LINE OF SEDIMENT BARRIER TO ENSURE FUNCTIONALITY DURING THE SPRING THAW AND RAINS.

3. SEDIMENT BARRIERS

   DURING FROZEN CONDITIONS, SEDIMENT BARRIERS SHALL CONSIST OF WOOD WASTE FILTER BERMS AS FROZEN SOIL PREVENTS THE PROPER INSTALLATION OF HAY BALES AND SEDIMENT SILT FENCES.

4. MULCHING

   ALL AREA SHALL BE CONSIDERED TO BE DENUDED UNTIL AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH SHALL BE APPLIED AT A RATE OF 150 LB. PER 1.000 SQUARE FEET OR 3 TONS/ACRE (TWICE THE NORMAL ACCEPTED RATE OF 75-LBS./1,000 S.F. OR 1.5 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED. MULCH SHALL NOT BE SPREAD ON TOP OF SNOW. THE SNOW WILL BE REMOVED DOWN TO A ONE-INCH DEPTH OR LESS PRIOR TO APPLICATION. AFTER EACH DAY OF FINAL GRADING, THE AREA WILL BE PROPERLY STABILIZED WITH ANCHORED HAY OR STRAW OR EROSION CONTROL MATTING. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR HAY AT A RATE OF 150 LB. PER 1.000 SQUARE FEET (3TONS/ACRE) AND ADEQUATELY ANCHORED THAT GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.

   BETWEEN THE DATES OF SEPTEMBER 1 AND APRIL 15, ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION CHEMICAL, TRACK OR WOOD CELLULOSE FIBER. WHEN GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH THEN COVER IS SUFFICIENT.
   AFTER NOVEMBER 1ST, MULCH AND ANCHORING OF ALL BARE SOIL SHALL OCCUR AT THE END OF EACH FINAL GRADING WORK DAY.

5. MULCHING ON SLOPES AND DITCHES

   SLOPES SHALL NOT BE LEFT EXPOSED FOR ANY EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY MULCHED AND ANCHORED WITH PEG AND NETTING OR WITH EROSION CONTROL BLANKETS. MULCHING SHALL BE APPLIED AT A RATE OF 230 LBS/1,000 S.F. ON ALL SLOPES GREATER THAN 8%. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 5%. EROSION CONTROL BLANKETS SHALL BE USED IN LIEU OF MULCH IN ALL DRAINAGE WAYS WITH SLOPES 8%. EROSION CONTROL MIX CAN BE USED TO SUBSTITUTE EROSION CONTROL BLANKETS ON ALL SLOPES EXCEPT DITCHES.

6. SEEDING

   BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES FINISHED AREAS SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOOMED, FINAL GRADED WITH A UNIFORM SURFACE, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. DORMANT SEEDING MAY BE SELECTED TO BE PLACED PRIOR TO THE PLACEMENT OF MULCH AND FABRIC NETTING ANCHORED WITH STAPLES. IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4' OF LOAM AND SEED AT AN APPLICATION RATE OF 5LBS/1000 S.F. ALL AREAS SEEDED DURING THE WINTER WILL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS SUFFICIENTLY VEGETATED (LESS THAN 75% CATCH) SHALL BE REVEGETATED BY REPLACING LOAM, SEED AND MULCH. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING. SEED TYPE SHALL BE WINTER RYE.

7. INSPECTION AND MONITORING

   MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AT A MINIMUM, AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION.
   FOLLOWING THE TEMPORARY AND OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL IN THE SPRING INSPECT AND REPAIR ANY DAMAGES AND/ OR UNESTABLISHED SPOTS. ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

STANDARDS FOR TIMELY STABILIZATION OF CONSTRUCTION SITES DURING WINTER

1. STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS -- THE APPLICANT WILL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE APPLICANT WILL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 15. IF THE APPLICANT FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 15, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.

   INSTALL A SOD LINING IN THE DITCH -- THE APPLICANT WILL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.
   INSTALL A STONE LINING IN THE DITCH --THE APPLICANT WILL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE APPLICANT WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.

2. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES -- THE APPLICANT WILL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE APPLICANT WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE APPLICANT FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.

   STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS -- BY OCTOBER 1 THE APPLICANT WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT WILL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM III OF THIS CONDITION OR WITH STONE RIPRAP AS DESCRIBED IN ITEM IV OF THIS CONDITION.

   STABILIZE THE SLOPE WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT WILL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).

   STABILIZE THE SLOPE WITH WOOD WASTE COMPOST -- THE APPLICANT WILL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE APPLICANT WILL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.

   STABILIZE THE SLOPE WITH STONE RIPRAP -- THE APPLICANT WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

3. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS -- BY SEPTEMBER 15 THE APPLICANT WILL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE APPLICANT FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
   STABILIZE THE SOIL WITH TEMPORARY VEGETATION -- BY OCTOBER 1 THE APPLICANT WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE APPLICANT WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
   STABILIZE THE SOIL WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
   STABILIZE THE SOIL WITH MULCH -- BY NOVEMBER 15 THE APPLICANT WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

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THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
t: 207 245 6060

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

STATE OF MAINE
AARON C. HUNTER
No. 16326
PROFESSIONAL ENGINEER
LICENSED
2021-01-12

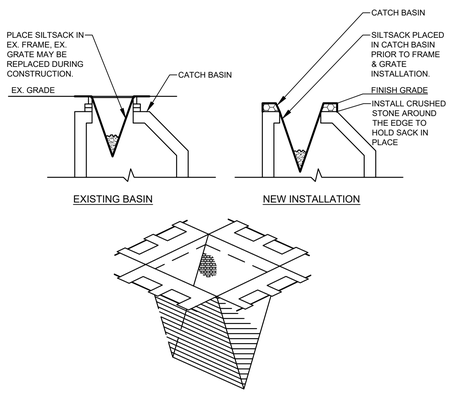
CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

EROSION CONTROL NOTES

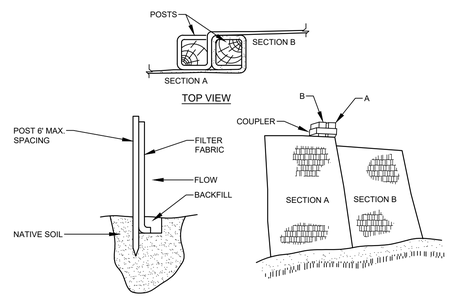
C-501



NOTES:
PRIOR TO FINAL GRADING AND PAVING OPERATIONS BEGIN A CATCH BASIN INSERT (SUCH AS A SILT SACK OR A DANDY BAG II) MUST BE INSTALLED IN EACH BASIN PER MANUFACTURES INSTRUCTIONS. HAY BALES SHOULD BE REMOVED ONCE INSERTS ARE INSTALLED.

CATCH BASIN PROTECTION DETAIL (FOR PAVED AREAS)

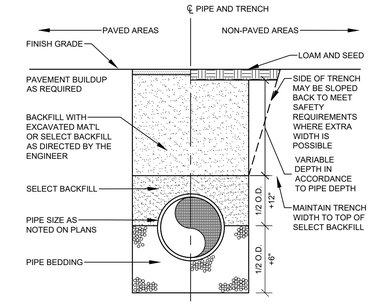
NOT TO SCALE



INSTALLATION:
1. EXCAVATE A 6"x 6" TRENCH ALONG THE LINE OF PLACEMENT FOR THE FILTER BARRIER.
2. UNROLL A SECTION AT A TIME AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH.
3. DRIVE POSTS INTO THE GROUND UNTIL APPROXIMATELY 2" OF FABRIC IS LYING ON THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL. TOE-IN CAN ALSO BE ACCOMPLISHED BY LAYING THE FABRIC FLAP ON UNDISTURBED GROUND AND PILING AND TAMPING FILL AT THE BASE, BUT MUST BE ACCOMPANIED BY AN INTERCEPTION DITCH.
5. JOIN SECTION AS SHOWN ABOVE.
6. BARRIER SHALL BE MIRAFI SILT FENCE OR EQUAL.
7. THE FENCE SHOULD BE ANCHORED TO RESIST PULL-OUT AND BE STRETCHED TIGHTLY BETWEEN STAKES TO PREVENT SAGGING
8. IN AREAS WHERE FLAP CANNOT BE KEYED PROPERLY (DUE TO FROZEN GROUND, BEDROCK, STONY SOILS, ROOTS NEAR A PROTECTED NATURAL RESOURCE, ETC.) THE SILT FENCE SHOULD BE ANCHORED WITH AGGREGATE, CRUSHED STONE, EROSION CONTROL MIX OR OTHER MATERIAL.
9. FILTER BARRIER NEEDS TO BE REMOVED WHEN THE AREA IS STABILIZED.

FILTER BARRIER

NOT TO SCALE

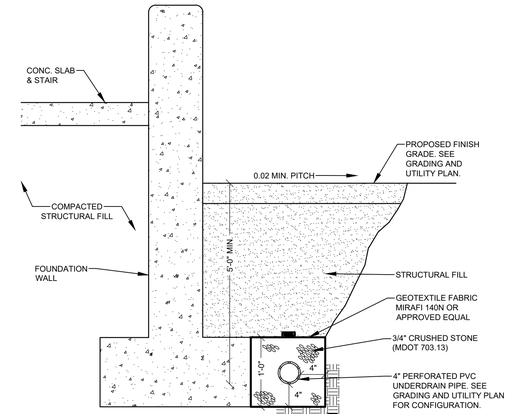


TRENCH BACKFILL SCHEDULE		
PIPE TYPE	PIPE BEDDING MATERIAL	SELECT BACKFILL
PVC-SDR 35 HDPE	MDOT 703.13 3/4" CRUSHED STONE	MDOT 703.22 TYPE B UD BACKFILL, OR MDOT 703.13 3/4" CRUSHED STONE
PERFORATED PVC-SDR 35 HDPE	MDOT 703.13 3/4" CRUSHED STONE	MDOT 703.22 TYPE B UD BACKFILL, OR MDOT 703.13 3/4" CRUSHED STONE

NOTE:
ALL BRACING AND SHEETING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL MEET ALL STATE AND O.S.H.A. SAFETY STANDARDS.

TYPICAL TRENCH SECTION

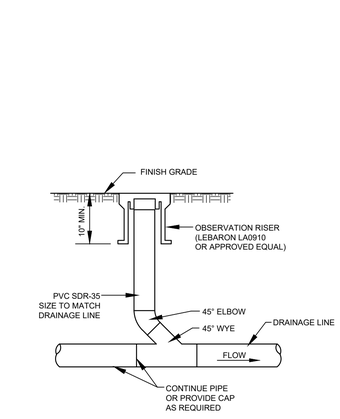
NOT TO SCALE



NOTES:
1. FOUNDATION DRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS SHALL BE COORDINATED WITH THE GEOTECHNICAL REPORT.
2. THIS DETAIL FOR PURPOSES OF THE FOUNDATION DRAIN AND BUILDING BACKFILL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY. CONSTRUCTION OF THE FOUNDATION DRAIN, FOOTING AND ASSOCIATED MATERIALS SHALL BE COORDINATED WITH THE STRUCTURAL DRAWINGS.

FOUNDATION DRAIN SECTION

NOT TO SCALE



CLEANOUT IN GRASSED AREAS

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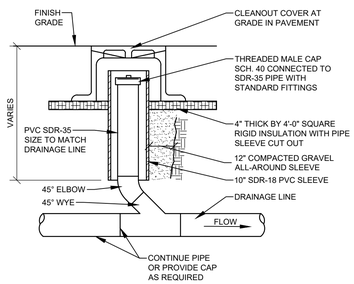

CLEANOUT IN PAVEMENT AREAS

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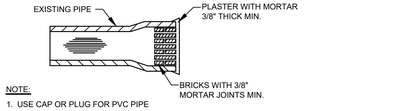
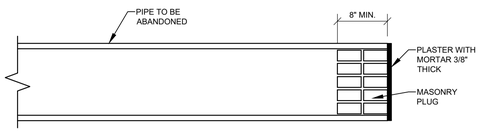


NOTE:
1. USE CAP OR PLUG FOR PVC PIPE

MASONRY PLUG DETAIL

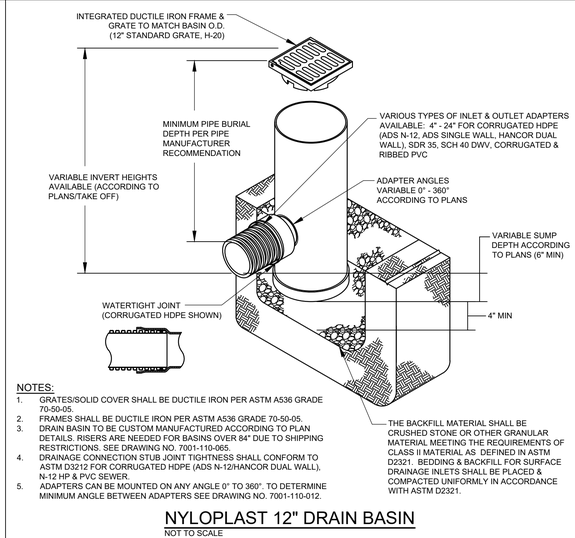
NOT TO SCALE



NOTES:
1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE CITY ENGINEER AND SEWER DISTRICT.
2. BACKFILL IS TO BE EITHER FLOWABLE BACKFILL OR FINE AGGREGATE.
3. CAP PVC PIPE.

ABANDONED PIPE PLUG DETAIL

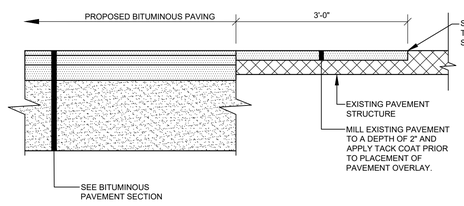
NOT TO SCALE



NOTES:
1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP & PVC SEWER.
5. ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

NYLOPLAST 12" DRAIN BASIN

NOT TO SCALE



PAVEMENT JOINT

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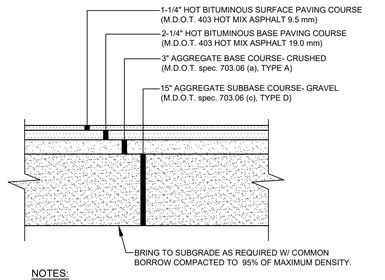
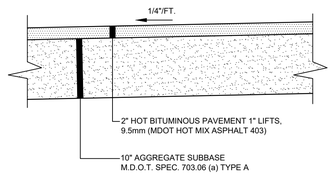


NOTES:
1. COMPACT GRAVEL SUBBASE, BASE COURSE TO 95% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.
3. ALL MATERIALS AND PAVEMENT OPERATIONS SHALL MEET THE MINIMUM REQUIREMENTS OF M.D.O.T. STANDARD SPECIFICATIONS

BITUMINOUS PAVING

NOT TO SCALE



BITUMINOUS SIDEWALK

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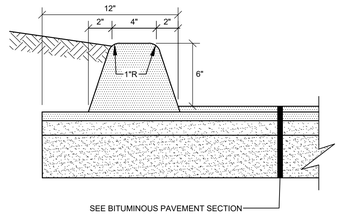

BITUMINOUS CURB SECTION

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THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
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PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

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Waterville, ME

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STATE OF MAINE
AARON C. HUNTER
No. 16326
PROFESSIONAL LICENSED ENGINEER
2021-01-12

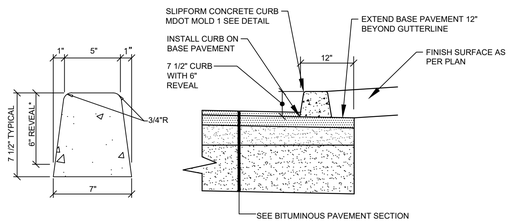
CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

DETAILS

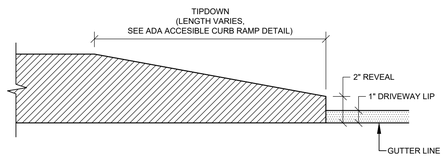
C-502



NOTES:

1. CONTRACTOR SHALL SUBMIT MOLD DIMENSIONS FOR APPROVAL BY ENGINEER PRIOR TO CONSTRUCTION
* CURB REVEAL TYPICAL UNLESS OTHERWISE INDICATED WITHIN PLAN SET.

CONCRETE SLIPFORM CURB
NOT TO SCALE



TIPDOWN CURB INSTALLATION
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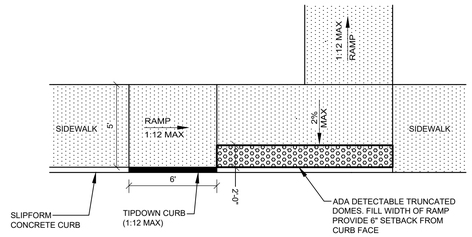
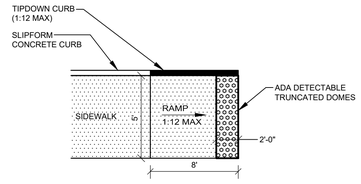
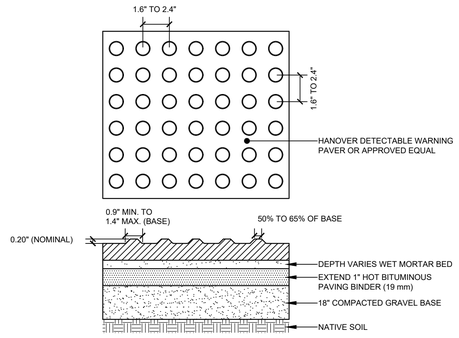




ADA ACCESSIBLE CURB RAMPS
NOT TO SCALE



NOTES

1. PAVERS ARE INSTALLED IN A WET MORTAR BED OVER HOT BITUMINOUS OR COMPACTED FILL BASE. THE WET MORTAR BED IS REQUIRED TO LEVEL THE PAVERS.
2. SPACING REQUIREMENTS:
   A. TRUNCATED DOME PAVERS HAVE A BASE DIAMETER OF 0.9" (23 MM) MINIMUM TO 1.4" (36 MM) MAXIMUM, A TOP DIAMETER OF 50% OF THE BASE DIAMETER MINIMUM TO 65% OF THE BASE DIAMETER MAXIMUM, AND A NOMINAL DOME HEIGHT OF 0.2" (5 MM).
   B. TRUNCATED DOME PAVERS IN A DETECTABLE WARNING SURFACE HAVE A CENTER-TO-CENTER SPACING OF 1.6" (41 MM) MINIMUM AND 2.4" (61 MM) MAXIMUM, AND A BASE-TO-BASE SPACING OF 0.65" (16 MM) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON THE SQUARE GRID.
   C. DETECTABLE WARNING SURFACES COLOR: TO BE COORDINATED WITH ARCHITECT.

ADA DETECTABLE TRUNCATED DOME DETAIL
NOT TO SCALE

METAL DOMED CONCRETE BOLLARD
NOT TO SCALE

NOTES:
1. ALL POSTS TO BE PNEUMATICALLY DRIVEN 4' BELOW GRADE.

TYPICAL PROFILE - RAMP
NOT TO SCALE

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PROJECT NO **20-15**

PROJECT ADDRESS

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DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

STATE OF MAINE
AARON C. HUNTER
No. 16326
PROFESSIONAL ENGINEER
LICENSED
2021-01-12

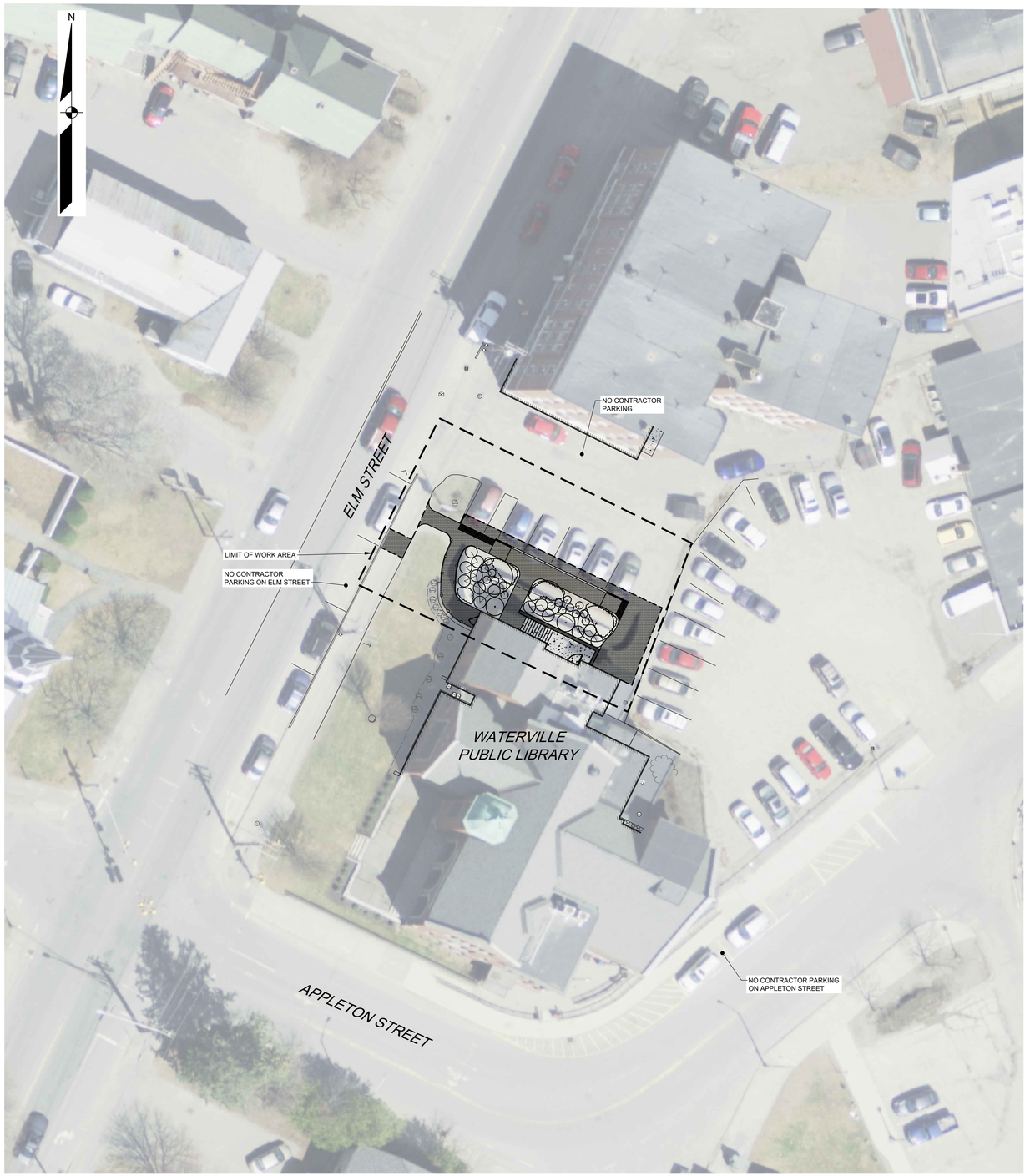
CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

DETAILS

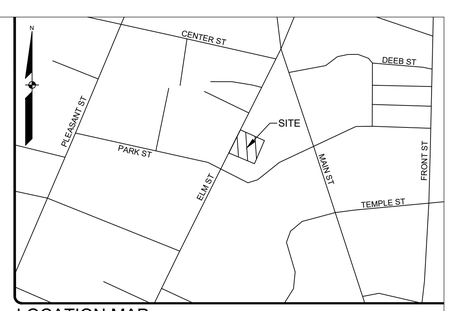
C-503



GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 INCH = 20 FT.



LOCATION MAP N.T.S.

NOTES:

1. CONTRACTOR SHALL STORE ALL EQUIPMENT AND MATERIALS WITHIN THE LIMIT OF WORK AREA.
2. CONTRACTOR SHALL COORDINATE WITH CITY OF WATERVILLE TO DETERMINE OFFSITE PARKING AREA AS REQUIRED.

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AARON C. HUNTER
No. 16326
PROFESSIONAL ENGINEER
LICENSED
2021-01-12

CURRENT ISSUE:

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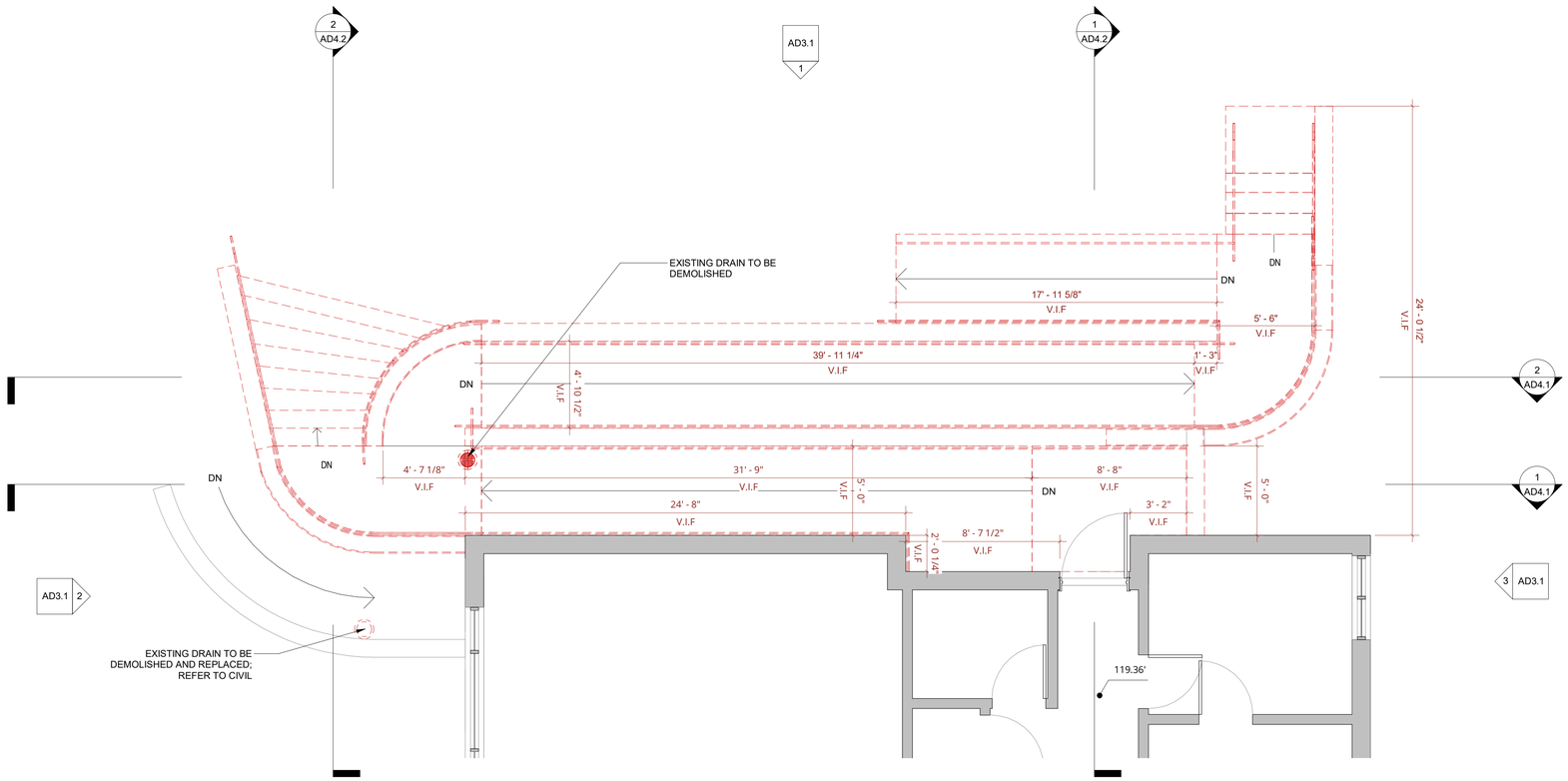
CONTRACTOR KEY PLAN

C-504

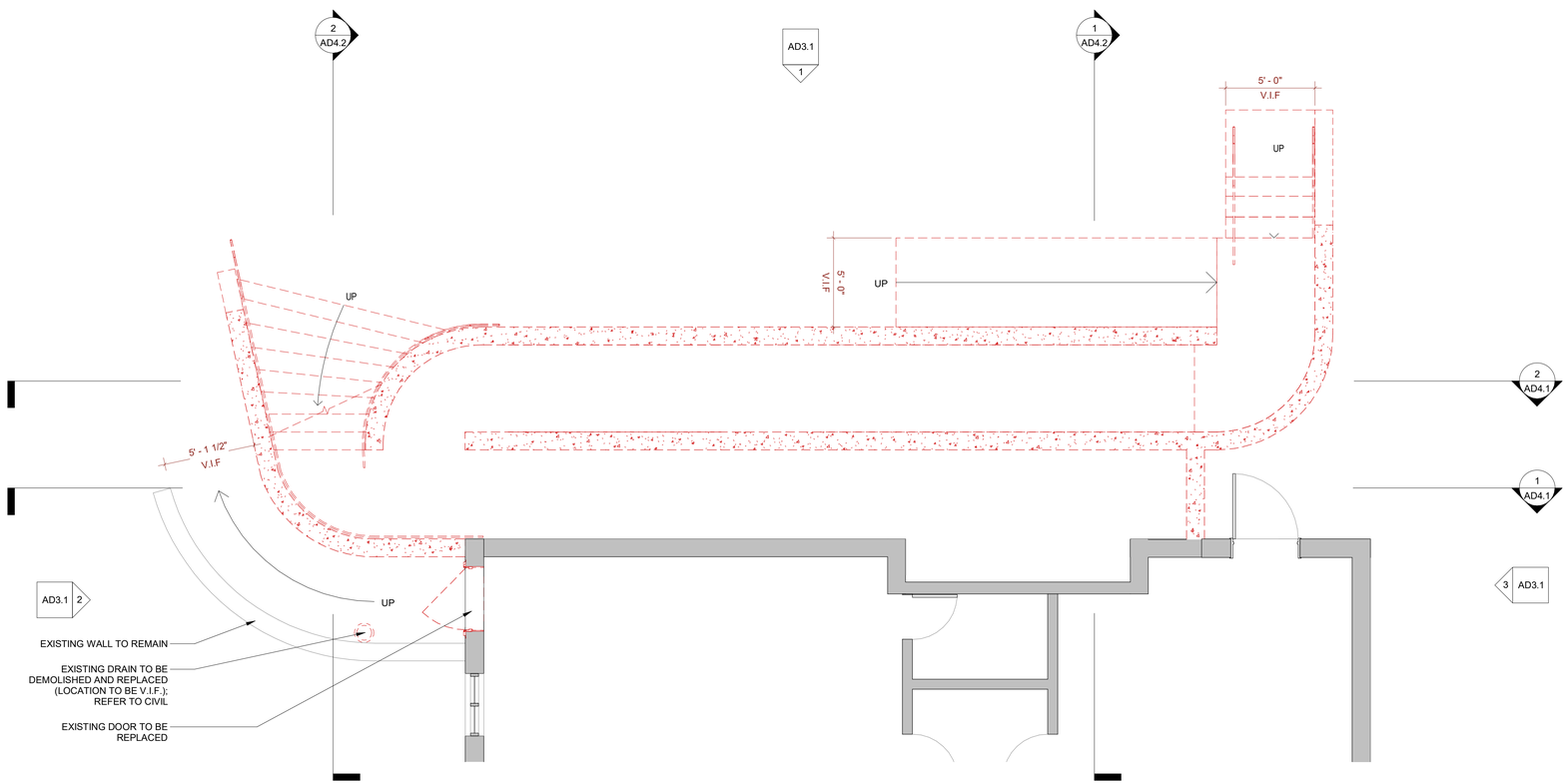
DEMOLITION DRAWING LEGEND

LINE INDICATES ITEM TO BE DEMOLISHED

EXISTING TO REMAIN



2 LEVEL 1 - DEMOLITION PLAN
1/4" = 1'-0"



1 BASEMENT STACKS LEVEL - DEMOLITION PLAN
1/4" = 1'-0"

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SHEET NO. AND NAME:

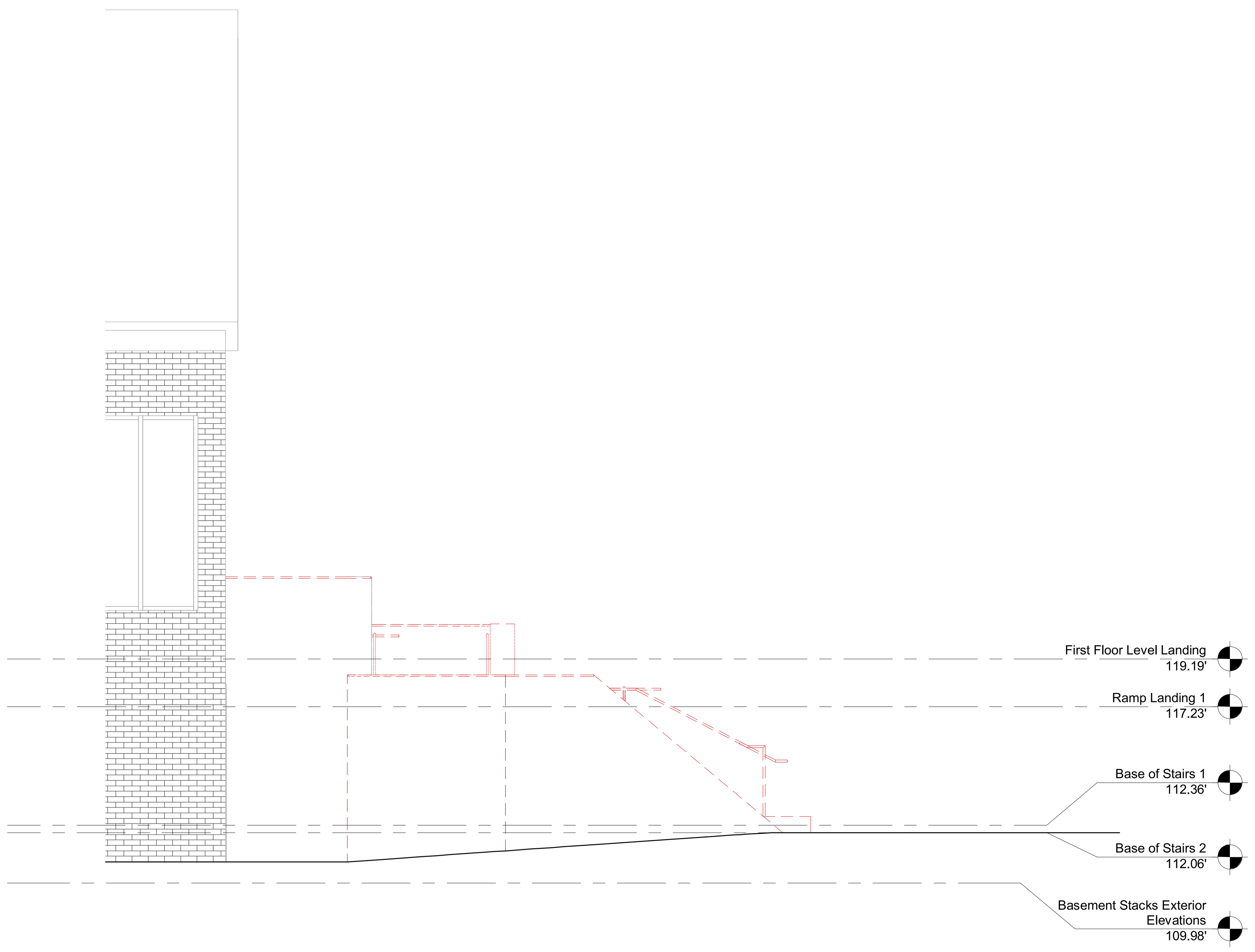
EXISTING/ DEMO FLOOR PLANS

AD2.1

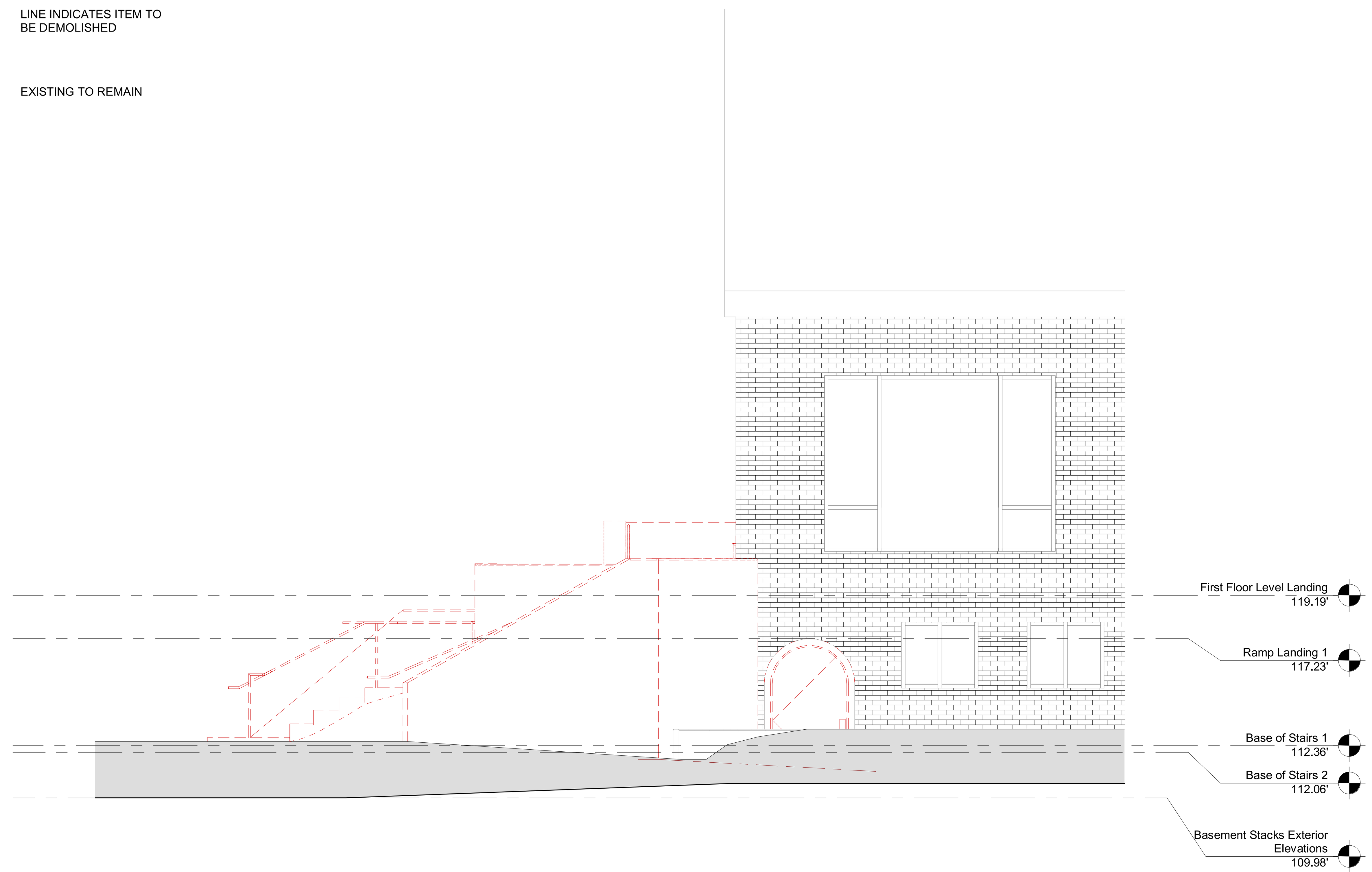
DEMOLITION DRAWING LEGEND

LINE INDICATES ITEM TO BE DEMOLISHED

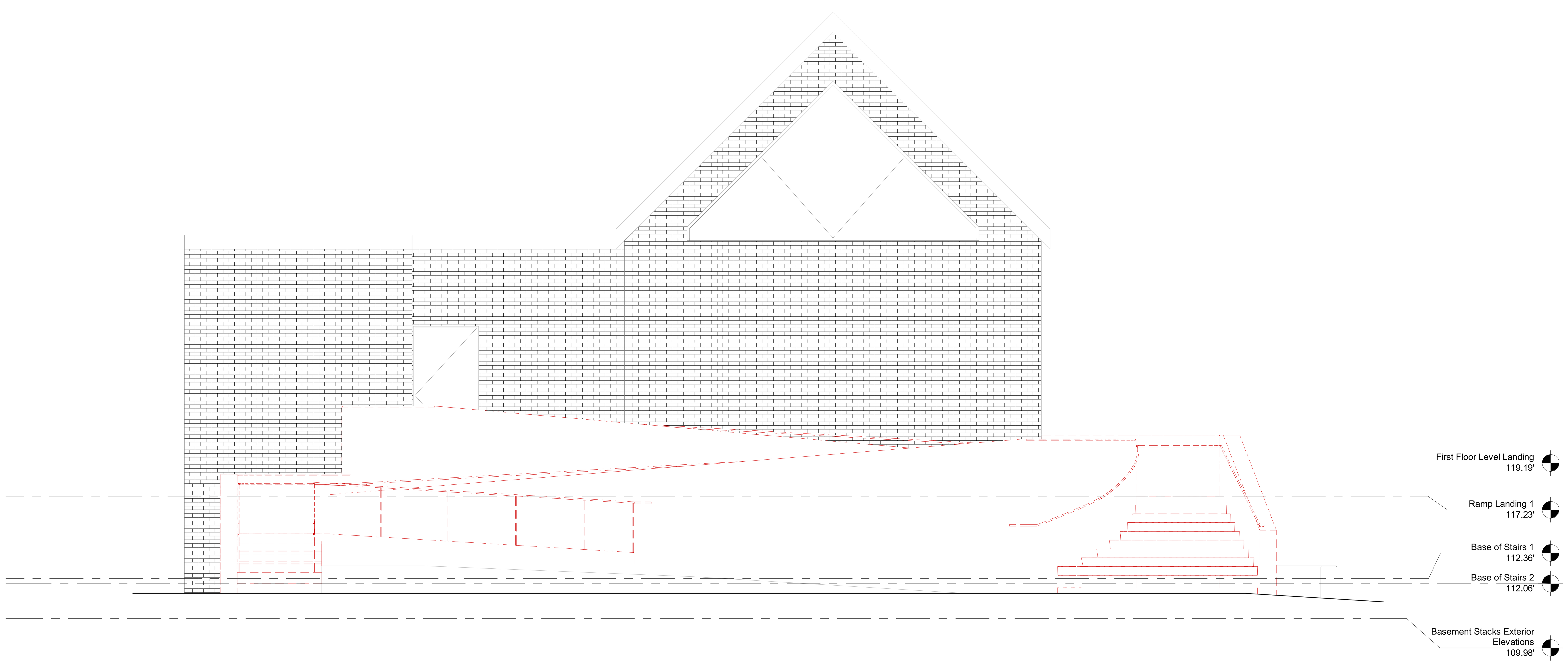
EXISTING TO REMAIN



3 EAST ELEVATION - DEMOLITION
1/4" = 1'-0"



2 WEST ELEVATION - DEMOLITION
1/4" = 1'-0"



1 NORTH ELEVATION - DEMOLITION
1/4" = 1'-0"

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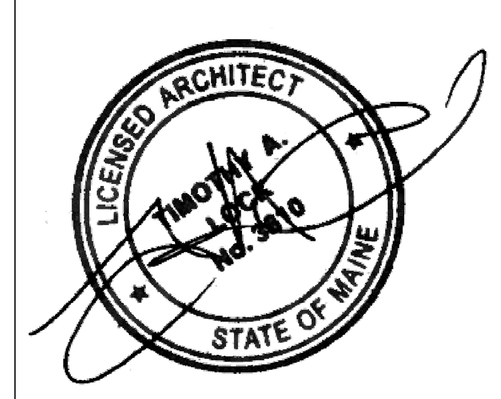

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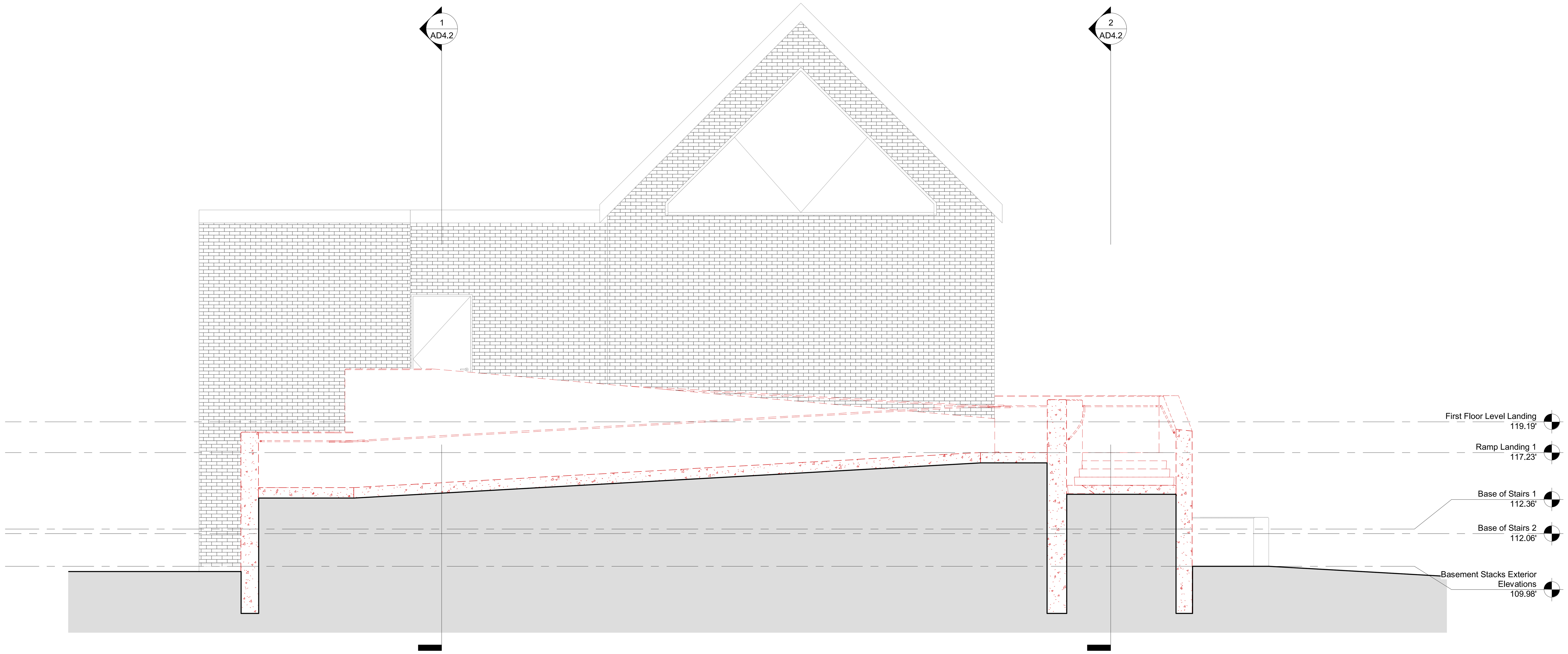
EXISTING/ DEMO ELEVATIONS

AD3.1

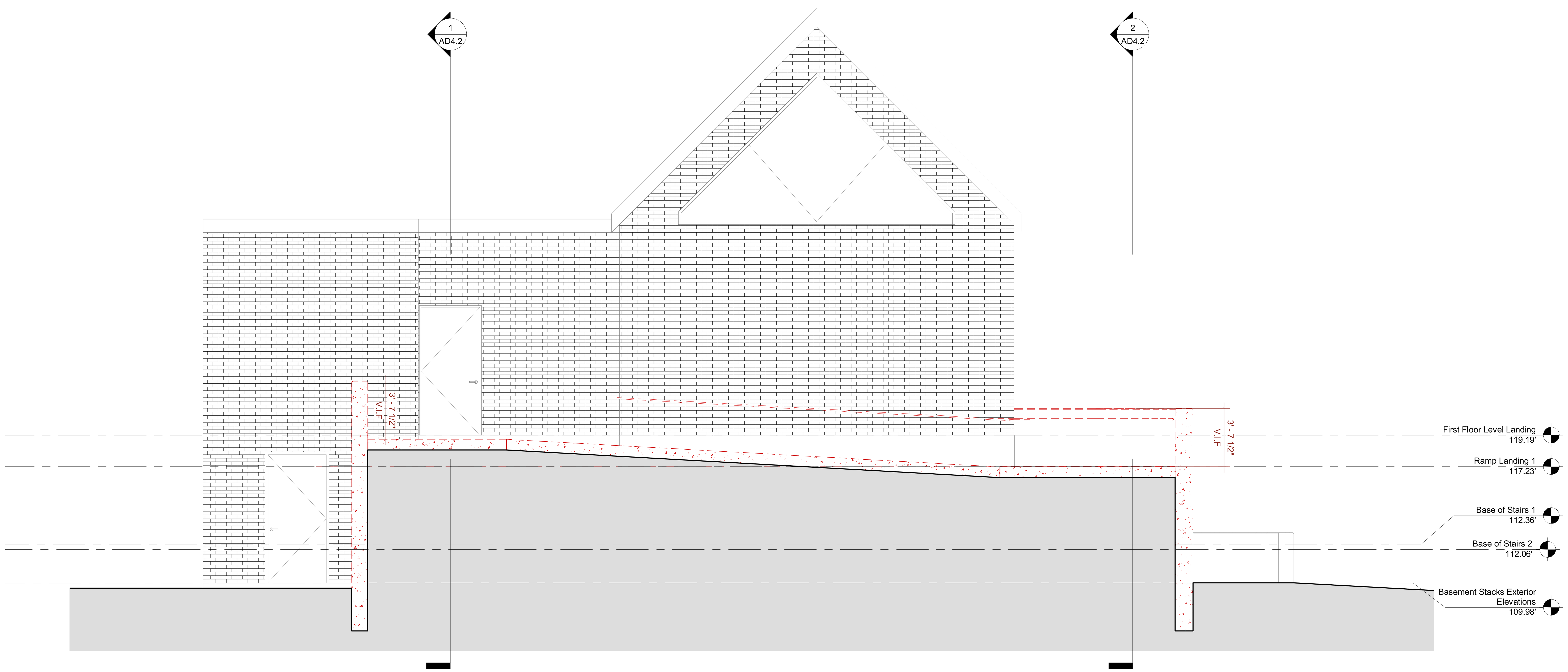
DEMOLITION DRAWING LEGEND

LINE INDICATES ITEM TO BE DEMOLISHED

EXISTING TO REMAIN



2 BUILDING SECTION 2 - DEMOLITION
1/4" = 1'-0"



1 BUILDING SECTION 1 - DEMOLITION
1/4" = 1'-0"

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SHEET NO. AND NAME:

EXISTING/ DEMO BUILDING SECTIONS

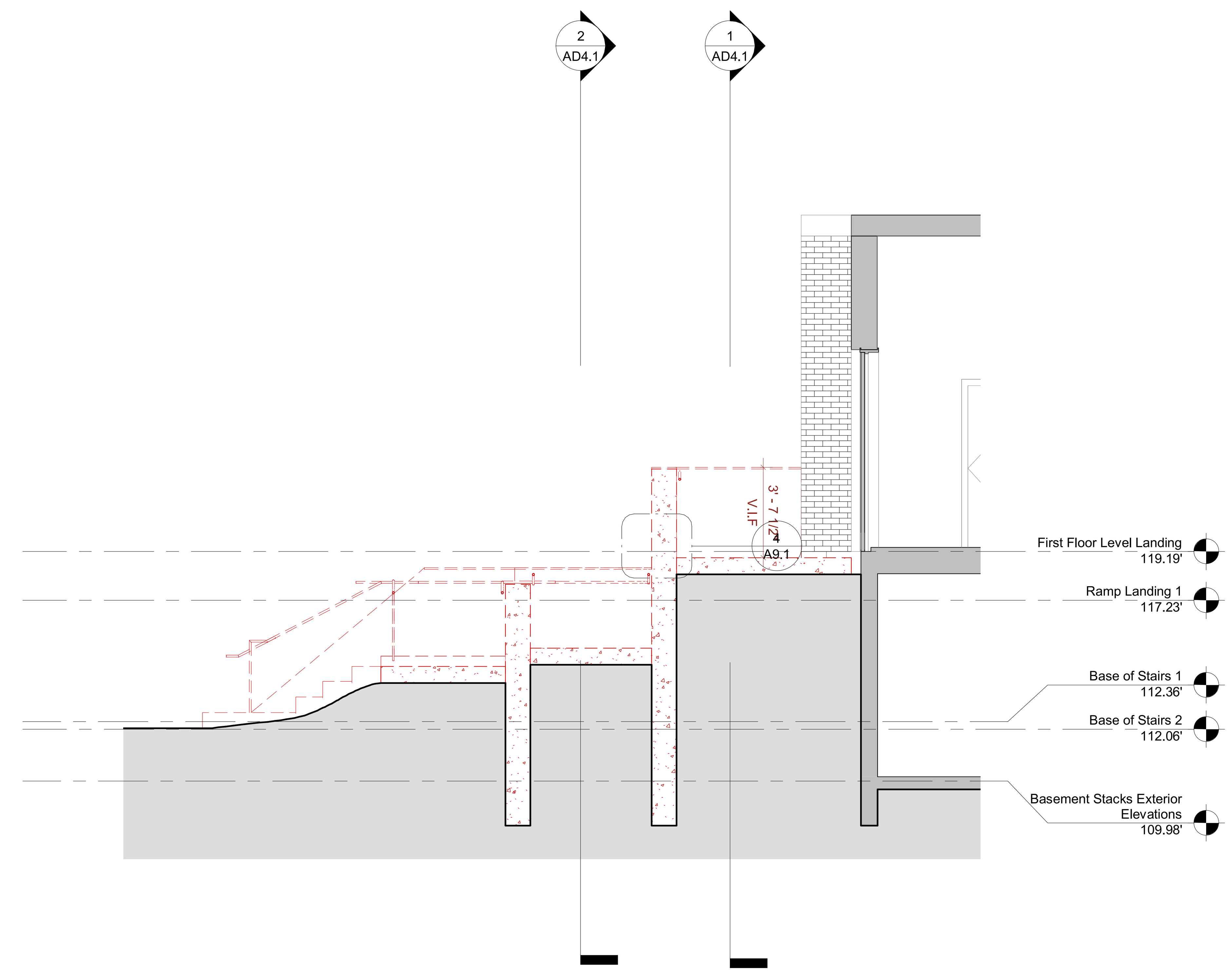
AD4.1

DEMOLITION DRAWING LEGEND

LINE INDICATES ITEM TO BE DEMOLISHED

EXISTING TO REMAIN

2 BUILDING SECTION 4 - DEMOLITION
1/4" = 1'-0"



1 BUILDING SECTION 3 - DEMOLITION
1/4" = 1'-0"

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EXISTING / DEMO BUILDING SECTIONS

AD4.2

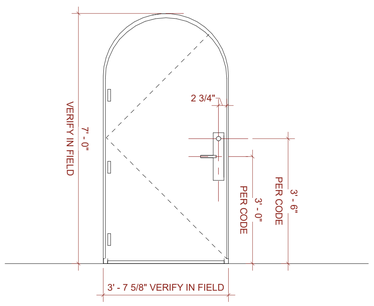
EXTERIOR DOOR SCHEDULE										
				UNIT SIZING (VERIFY IN FIELD)		UNIT INFORMATION				
							FINISH			
MARK	TYPE	DOOR DESCRIPTION	MANUFACTURER	WIDTH	HEIGHT	PERFORMANCE VALUES	INTERIOR	EXTERIOR	EGRESS	HARDWARE/LOCKSET
Basement Stacks Exterior Elevations										
001.1	OUTSWING SINGLE	CUSTOM BUILT ROUNDTOP POLYURETHANE INSULATED DOOR WITH THERMALLY BROKEN HOLLOW METAL FRAME & EGRESS ADA COMPLIANT THRESHOLD	EXACTITUDE ; OR SIM. APPROVED EQUAL	3' - 7 5/8"	7' - 0"	INSULATED DOOR PANEL; THERMALLY BROKEN HOLLOW METAL FRAME	FACTORY PAINTED; COLOR TBD	FACTORY PAINTED; COLOR TBD	YES	A

DOOR HARDWARE SCHEDULE								
HARDWARE GROUP	HARDWARE DESCRIPTION	MANUFACTURER	HANDLE MODEL	LOCK/LATCH	BACKSET	HARDWARE FINISH	HINGES/TRACK	ACCESSORIES
A	EXTERIOR EGRESS DOOR	ASSA ABLOY - ADAMS RITE; WATERSON OR SIM. APPROVED EQUAL	ADAMS RITE 3080 ENTRY TRIM WITH AVENTURA SERIES MI LEVER	ADAMS RITE MS1850 SN SERIES DEADLOCK; ADAMS RITE STANDARD DEADLATCH STRIKE	2 3/4"	STAINLESS STEEL - SATIN BRUSHED FINISH	WATERSON K51M SERIES 3 IN 1 CLOSER HINGES IN SATIN BRUSHED FINISH	ADAMS RITE EX89 PULLMAN RIM EXIT DEVISE (PUSH BAR); PROVIDE STAINLESS STEEL KICK PLATE; PEMKO BARRIER FREE THERMAL BARRIER THRESHOLD

GENERAL NOTES - EXTERIOR DOOR & HARDWARE SCHEDULE

1. ALL DIMENSIONS TO BE FIELD VERIFIED.
2. SUBSTITUTIONS MUST BE SUBMITTED TO ARCHITECT FOR REVIEW.

DOOR LEGEND



FINISH SCHEDULE				
TYPE	DESCRIPTION	MANUFACTURER	MODEL	FINISH/COLOR
C1	CAST-IN PLACE CONCRETE	N/A	N/A	
ST1	STAINLESS STEEL	N/A	N/A	BRUSHED FINISH
STU1	ACRYLIC BASED STUCCO	STO OR SIMILAR	STOLIT 1.0	FINE FINISH; COLOR TBD

GENERAL NOTES - FINISH SCHEDULE

1. ALL SUBSTITUTIONS MUST BE SUBMITTED FOR REVIEW BY ARCHITECT - SEE SPECIFICATIONS.
2. CONRACTOR TO PROVIDE SAMPLE OR CUT SHEETS OF ALL FINISHES FOR APPROVAL BY ARCHITECT PRIOR TO PURCHASE.

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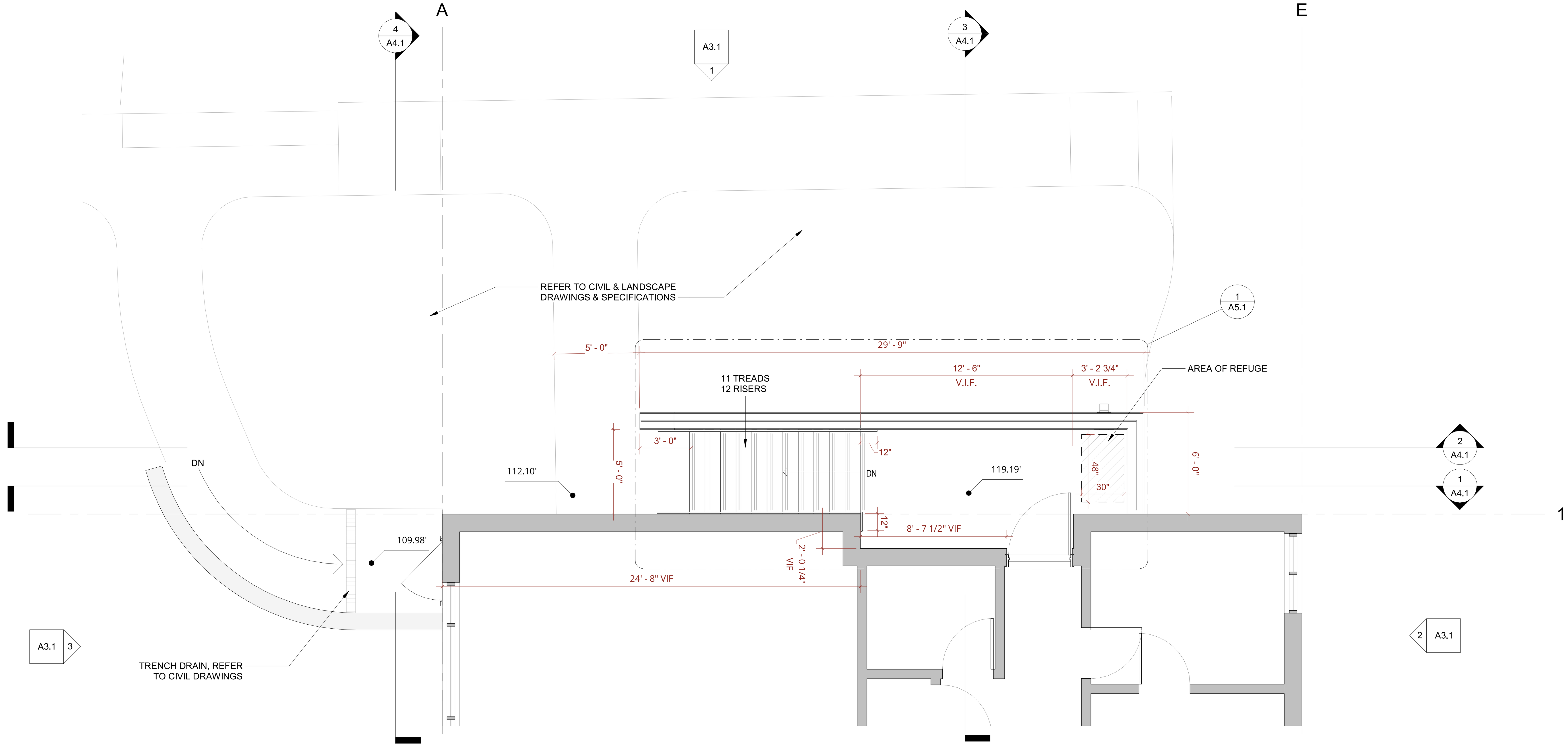
DOOR SCHEDULES

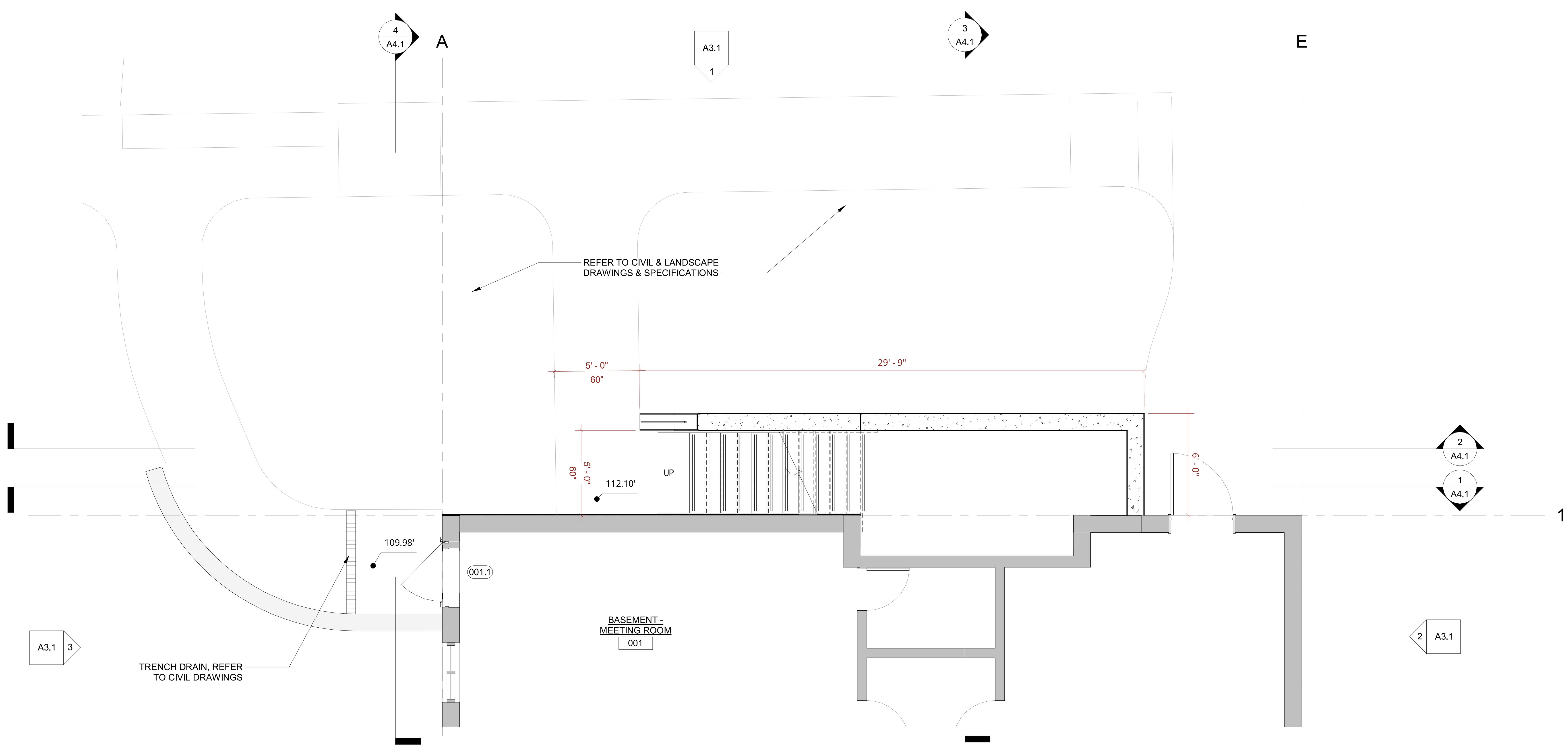
A0.1

PLAN LEGEND

EXISTING WALL TO REMAIN



2 LEVEL 1 FLOOR PLAN
1/4" = 1'-0"



1 BASEMENT STACKS LEVEL
1/4" = 1'-0"

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CURRENT ISSUE:

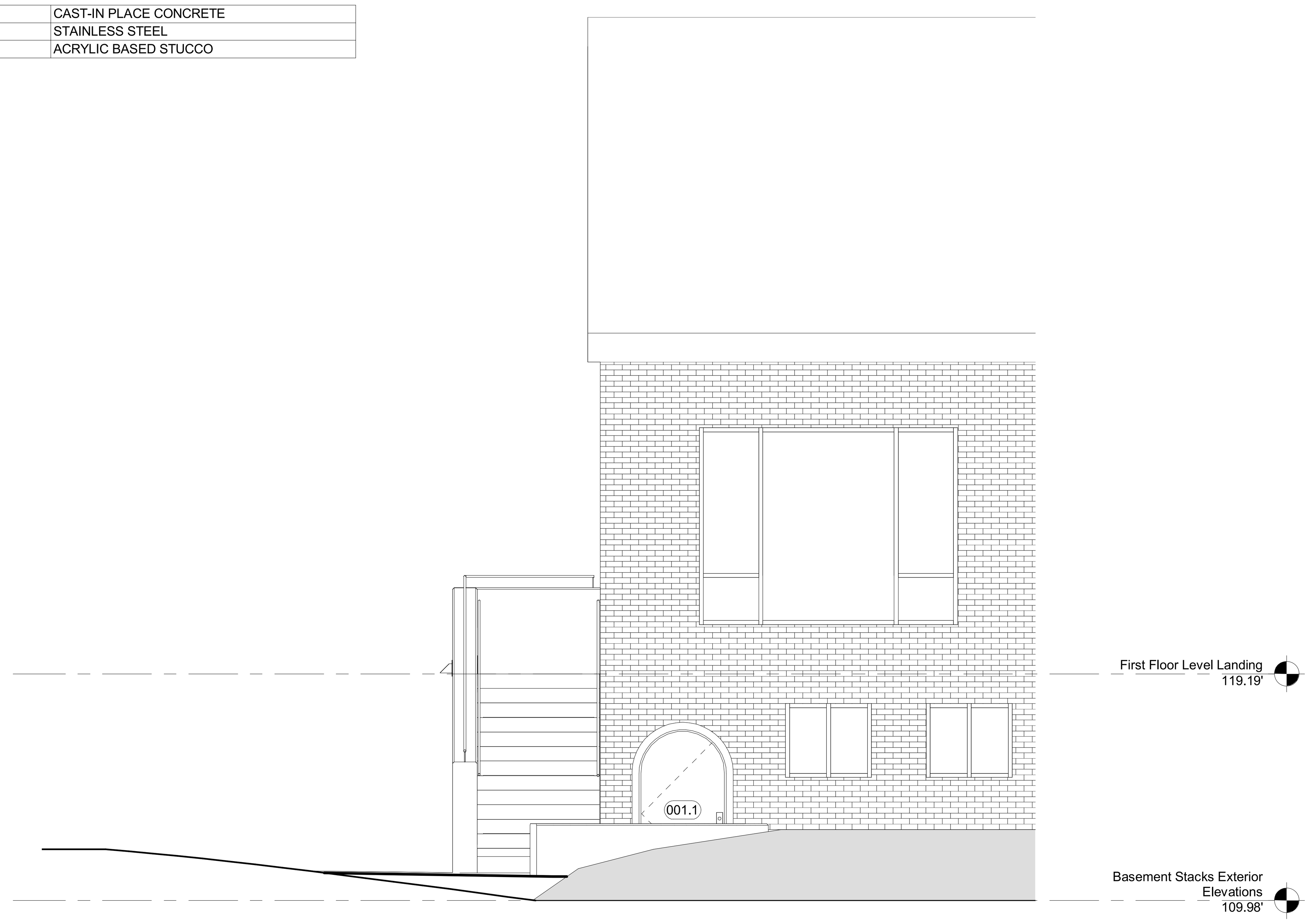
22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

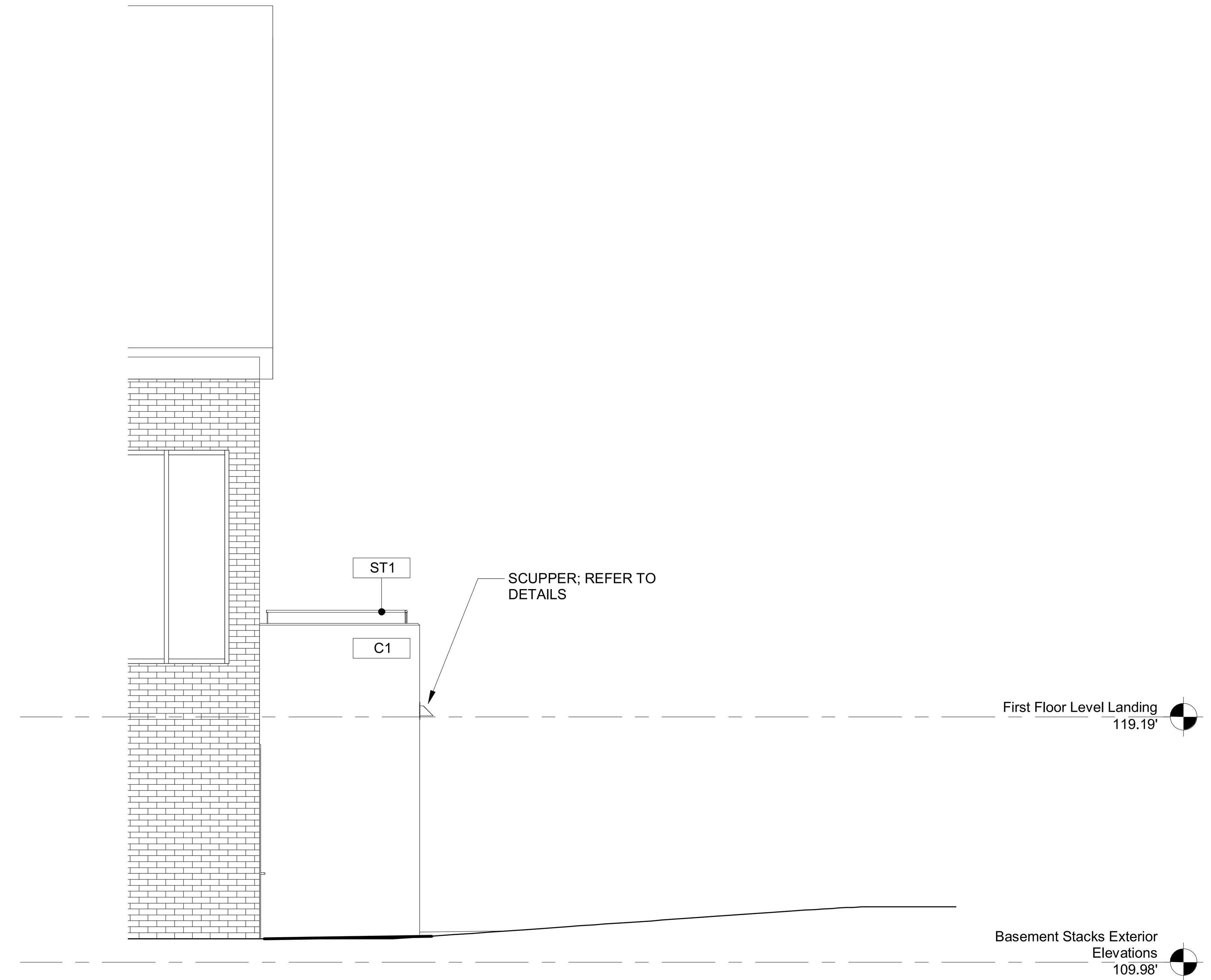
FLOOR PLANS

A2.1

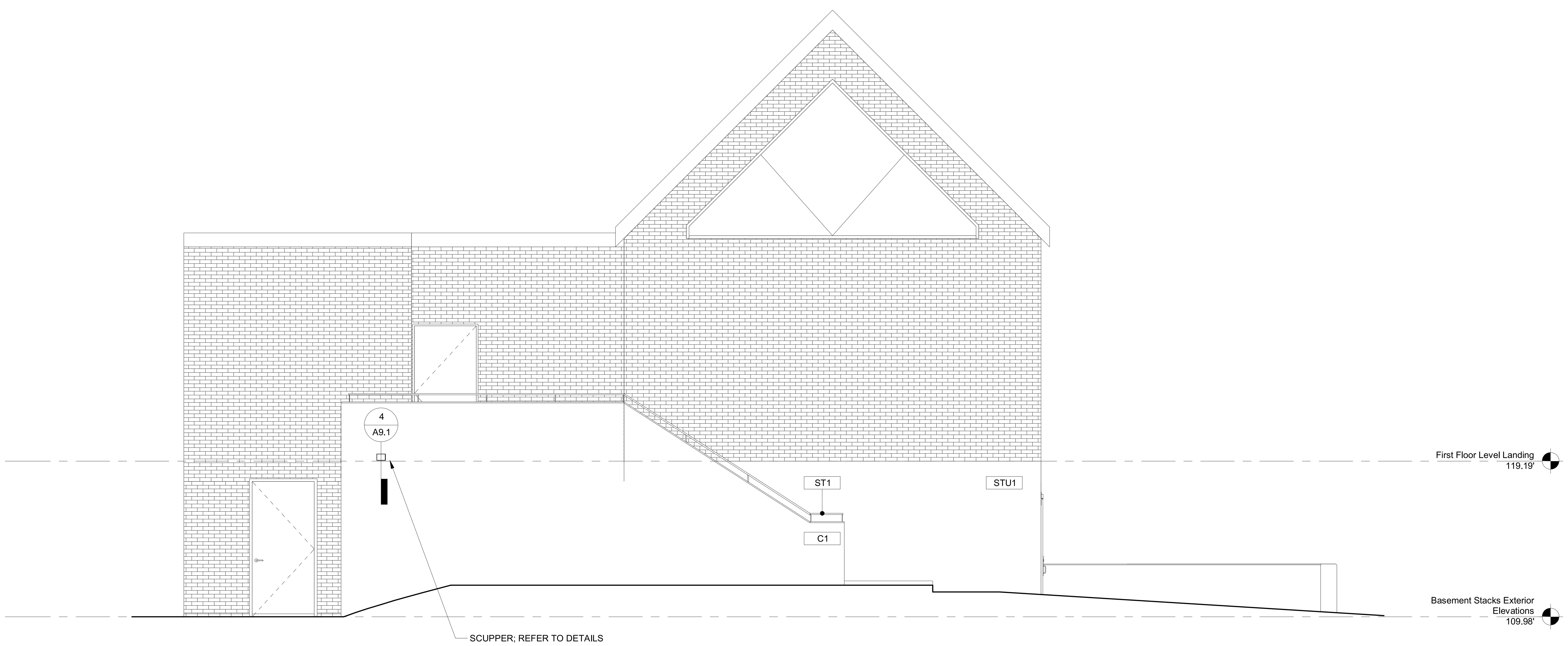
EXTERIOR FINISH SCHEDULE	
MATERIAL TYPE	MATERIAL DESCRIPTION
C1	CAST-IN PLACE CONCRETE
ST1	STAINLESS STEEL
STU1	ACRYLIC BASED STUCCO



3 WEST ELEVATION
1/4" = 1'-0"



2 EAST ELEVATION
1/4" = 1'-0"



1 NORTH ELEVATION
1/4" = 1'-0"

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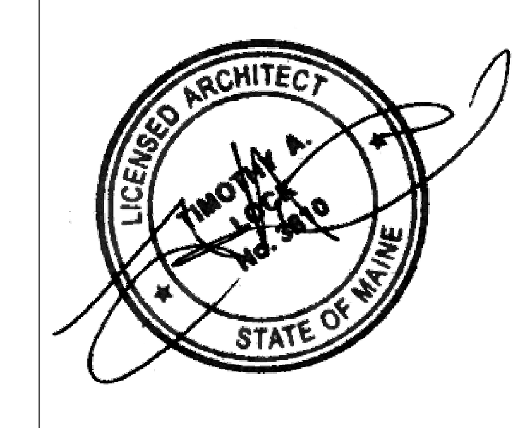

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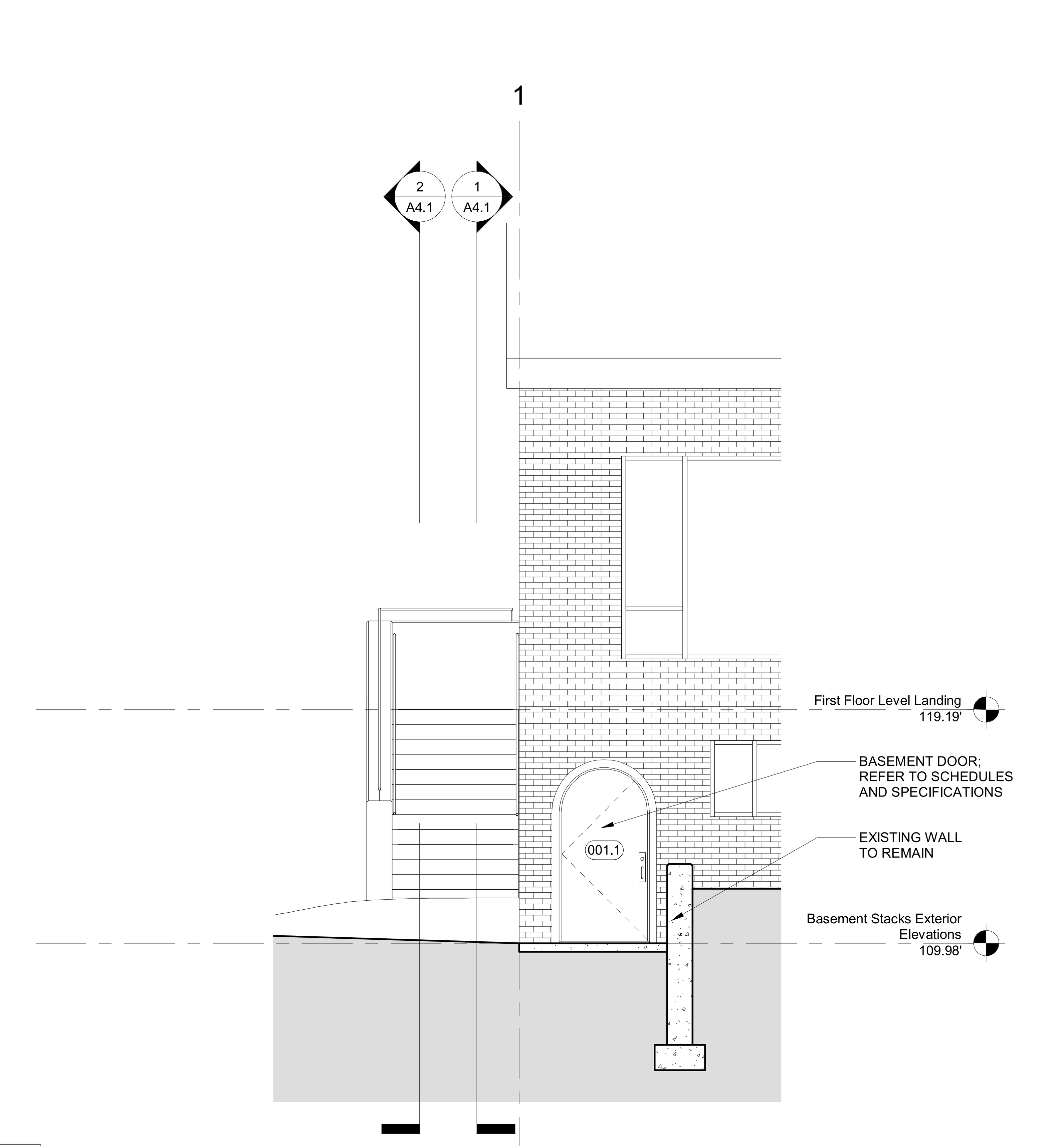
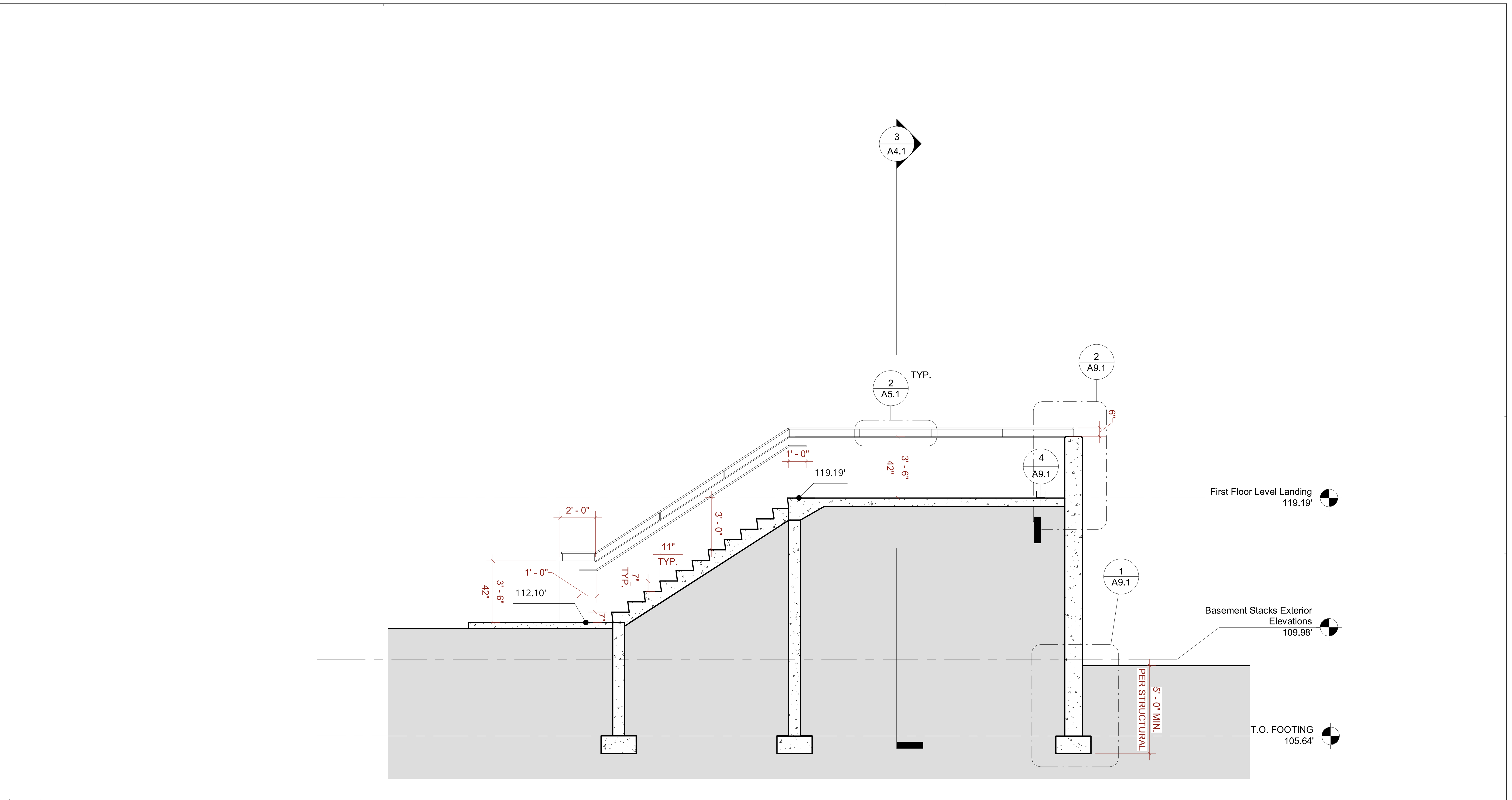
ELEVATIONS

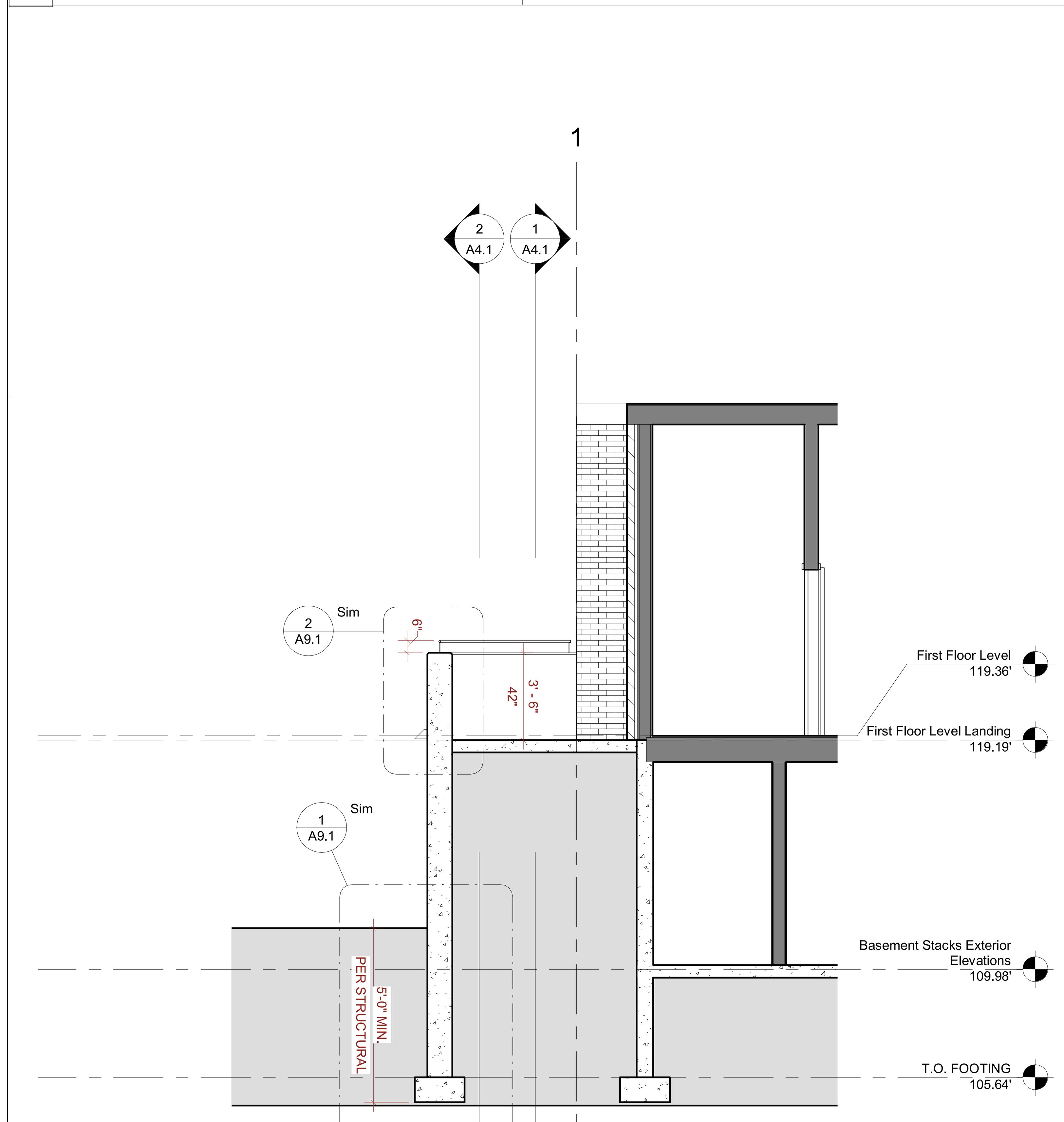
A3.1



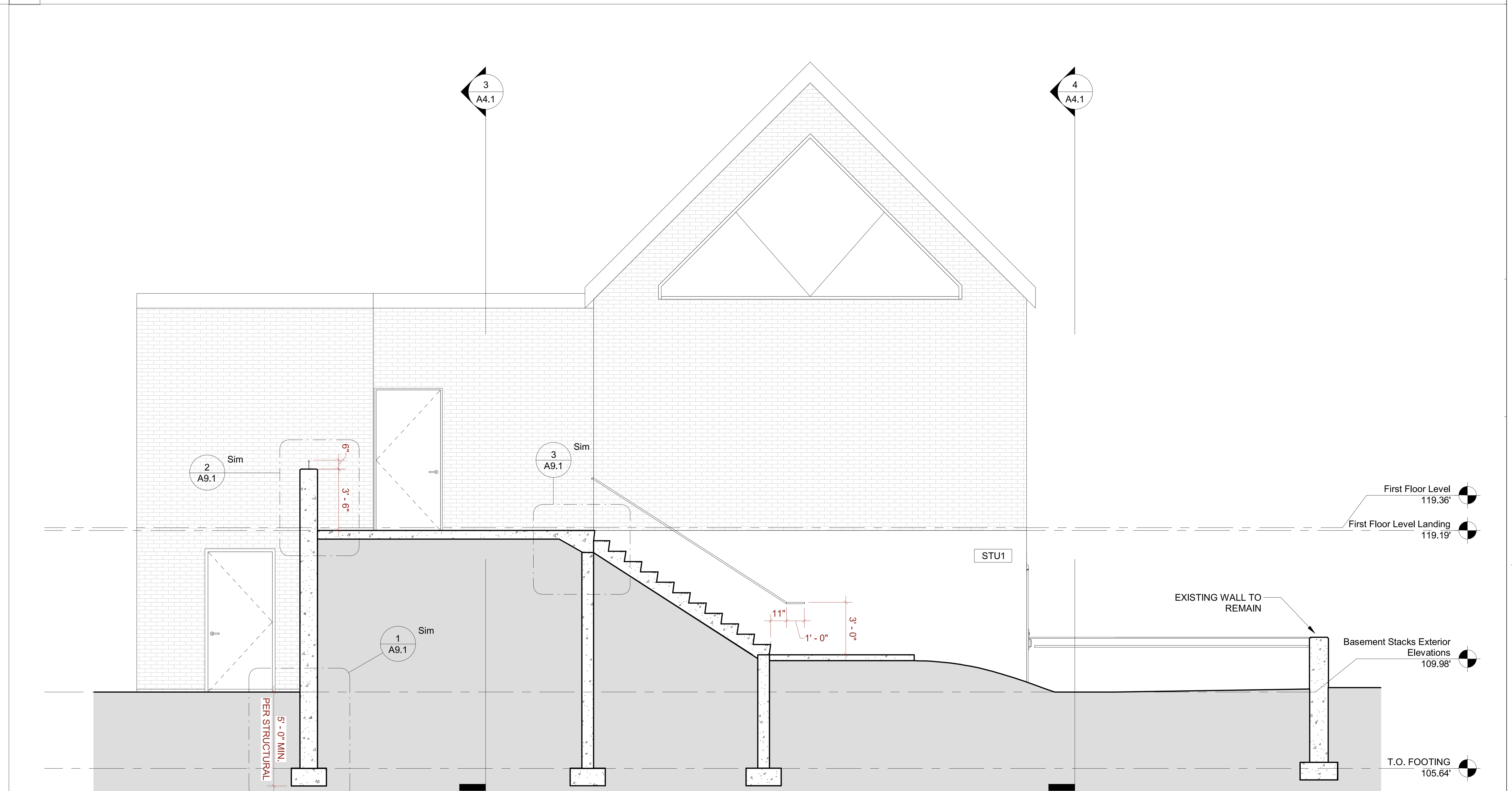
4 BUILDING SECTION 4
1/4" = 1'-0"



2 BUILDING SECTION 2
1/4" = 1'-0"



3 BUILDING SECTION 3
1/4" = 1'-0"



1 BUILDING SECTION 1
1/4" = 1'-0"

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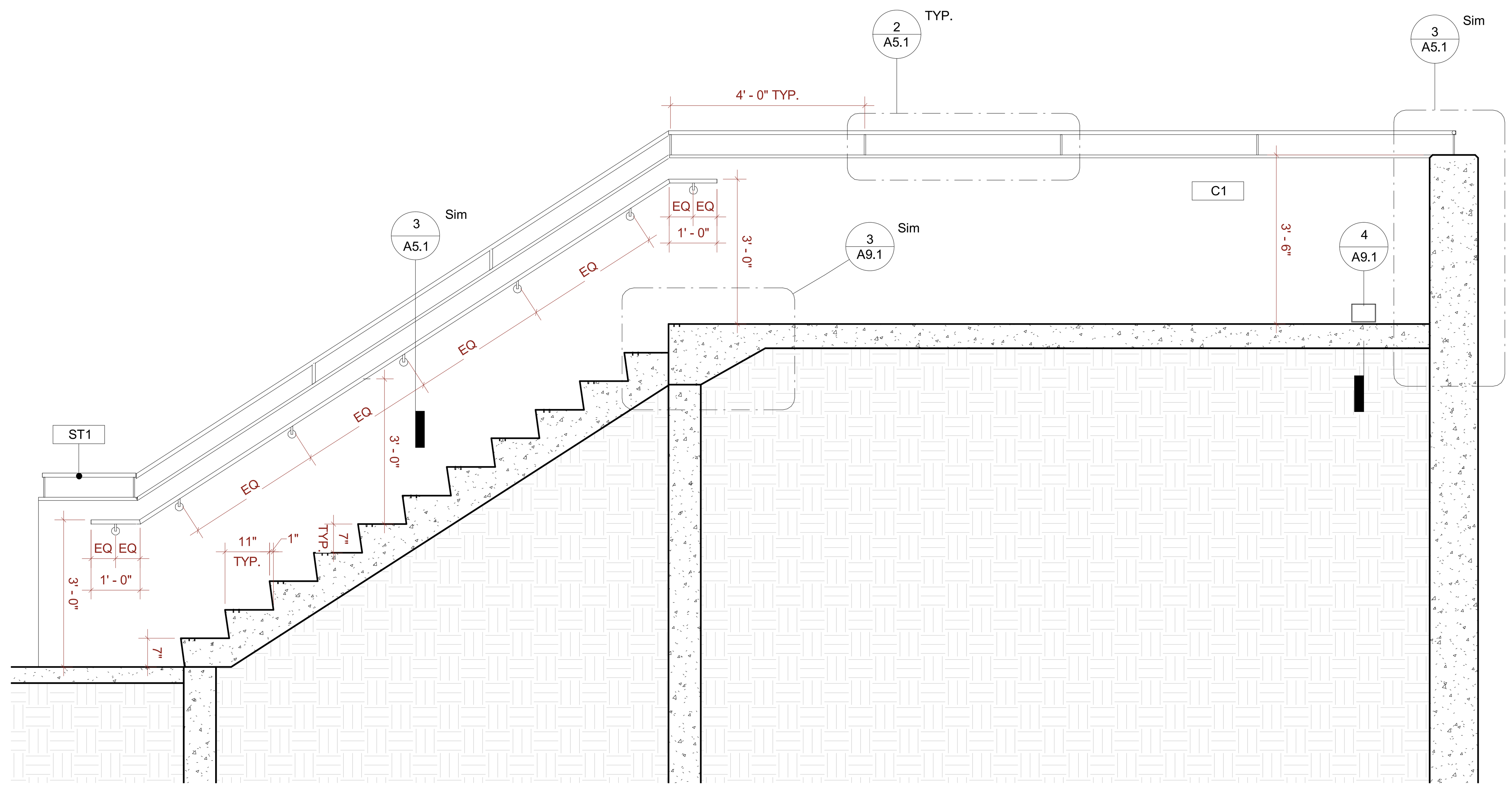
BUILDING SECTIONS

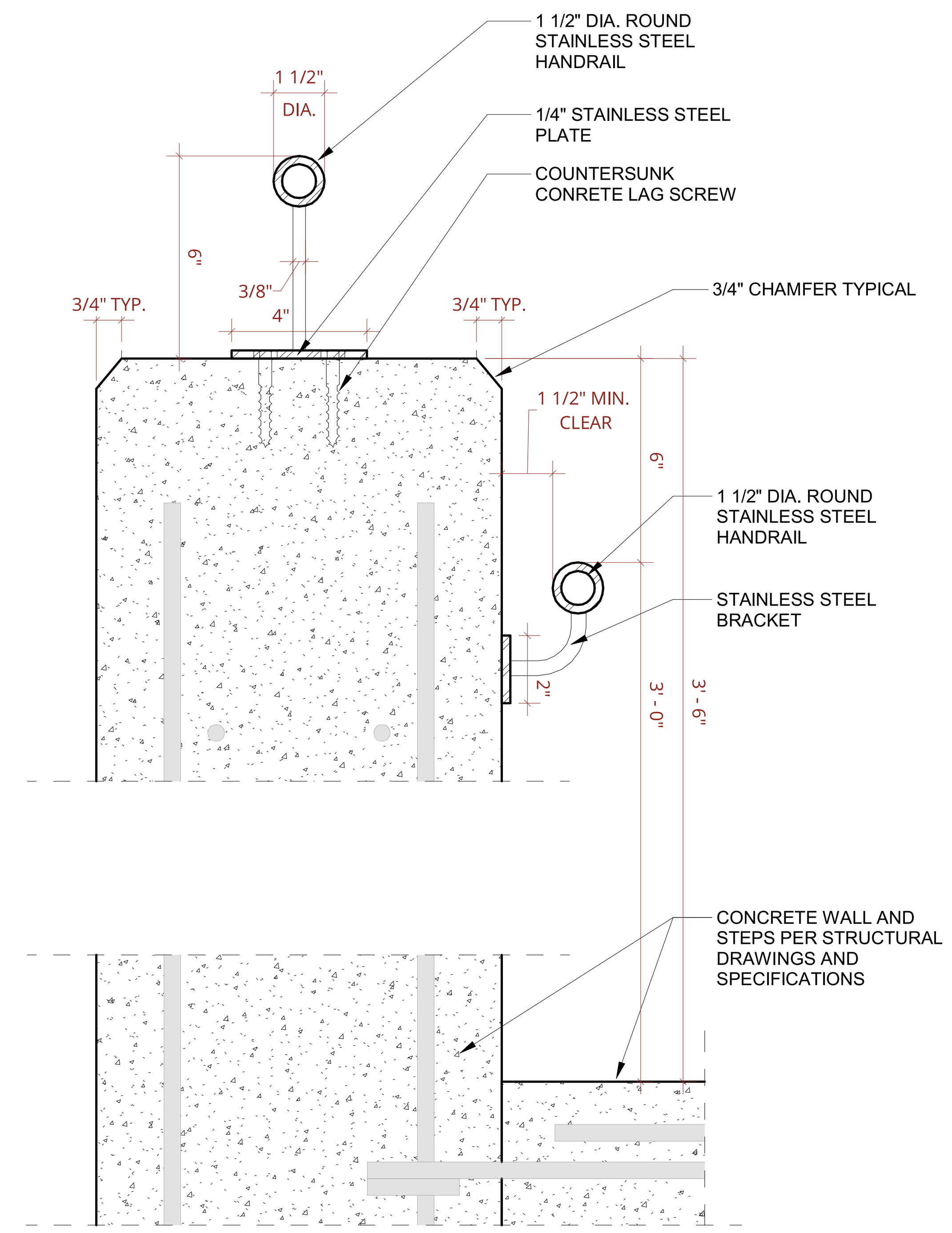
A4.1

EXTERIOR FINISH SCHEDULE

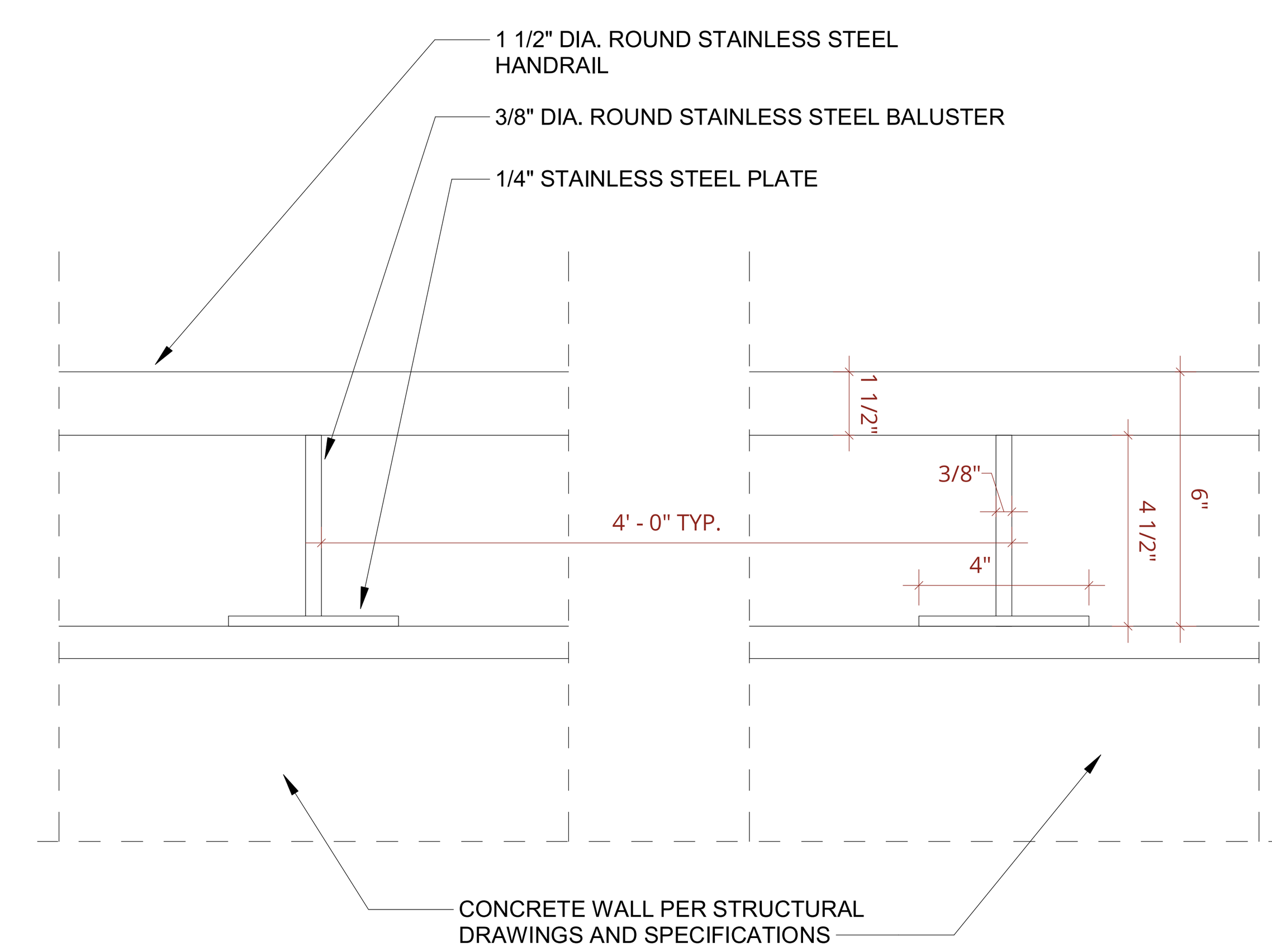
MATERIAL TYPE	MATERIAL DESCRIPTION
C1	CAST-IN PLACE CONCRETE
ST1	STAINLESS STEEL
STU1	ACRYLIC BASED STUCCO



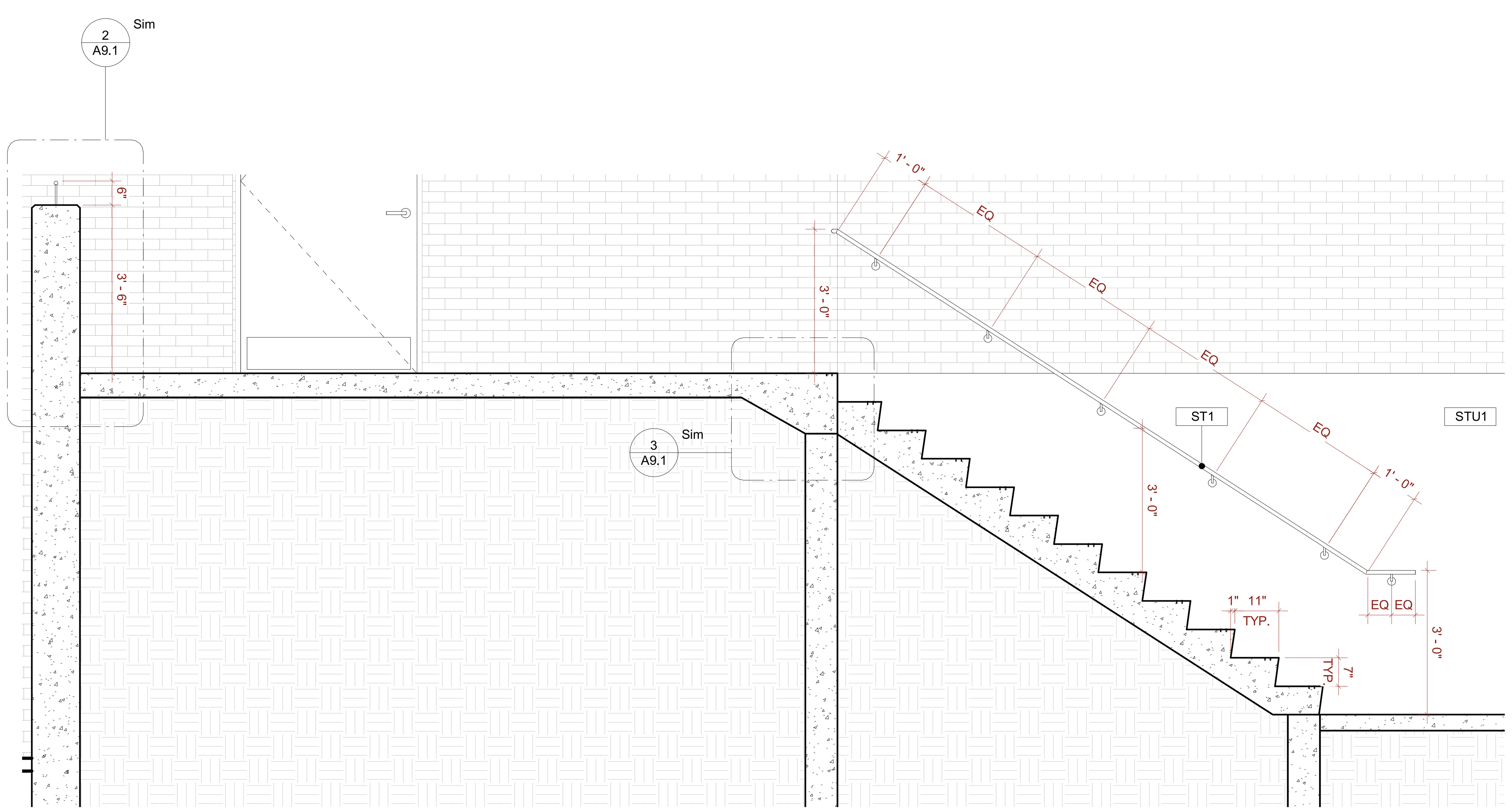
5 STAIR SECTION LOOKING NORTH
1/2" = 1'-0"



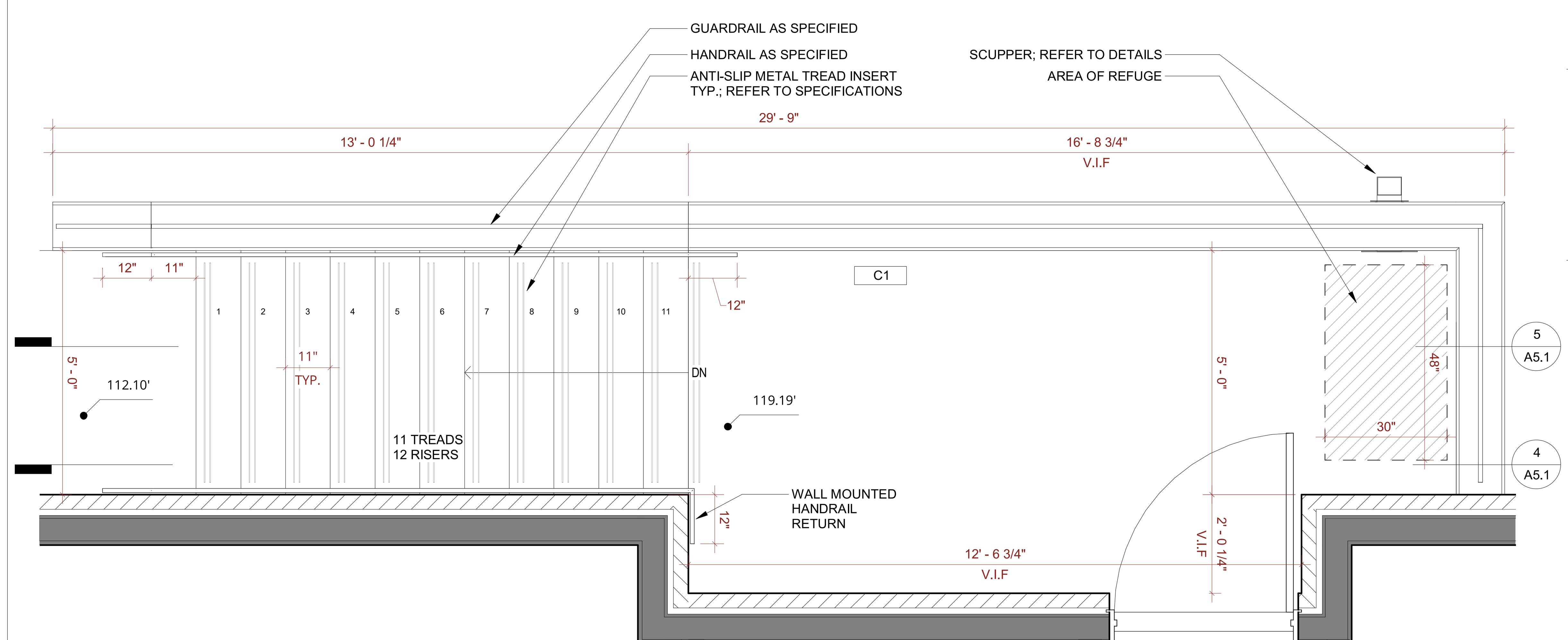
3 RAILING DETAIL CROSS SECTION
3" = 1'-0"



2 RAILING DETAIL ELEVATION
3" = 1'-0"



4 STAIR SECTION LOOKING SOUTH
1/2" = 1'-0"



1 ENLARGED PLAN - STAIR
1/2" = 1'-0"

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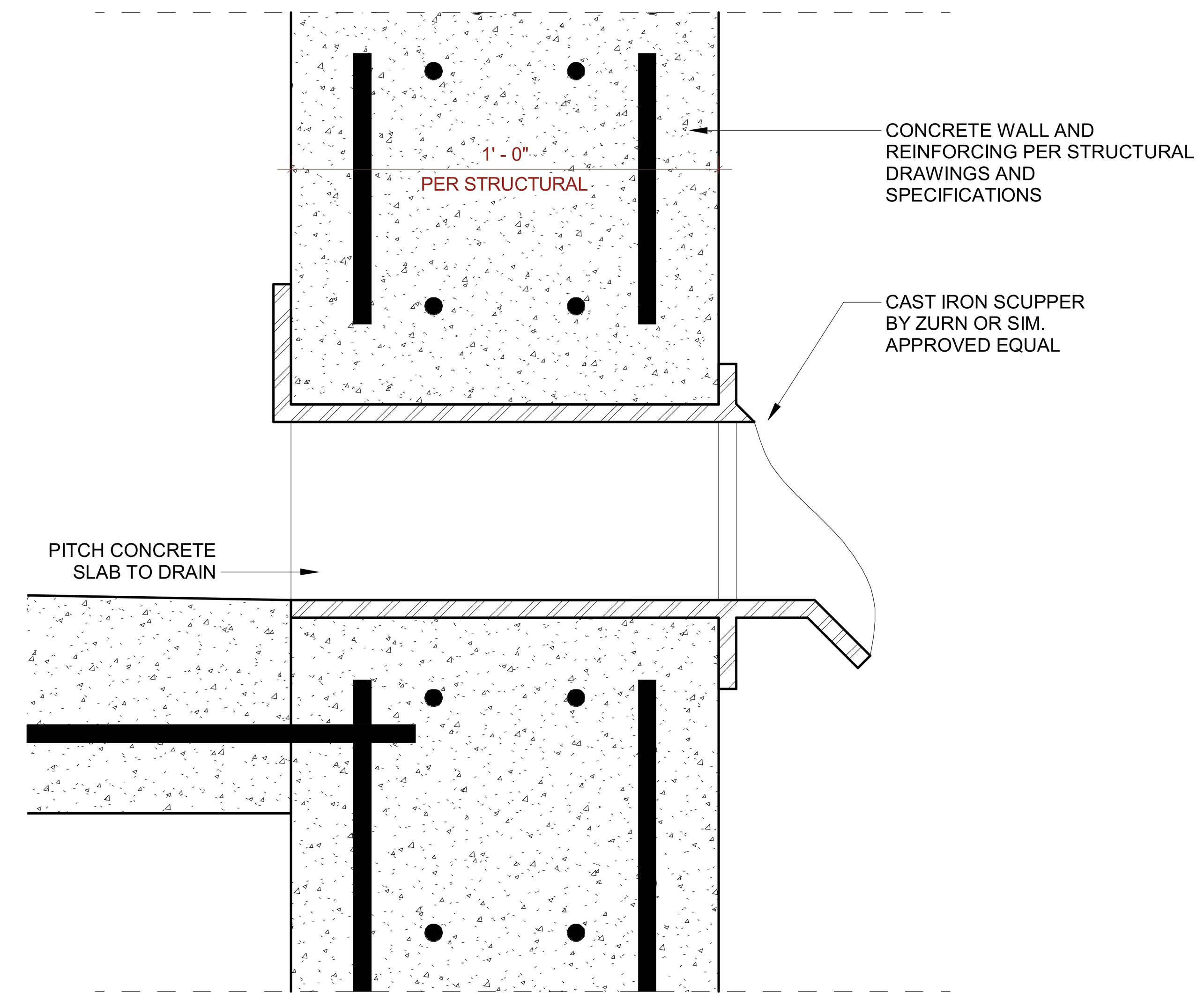
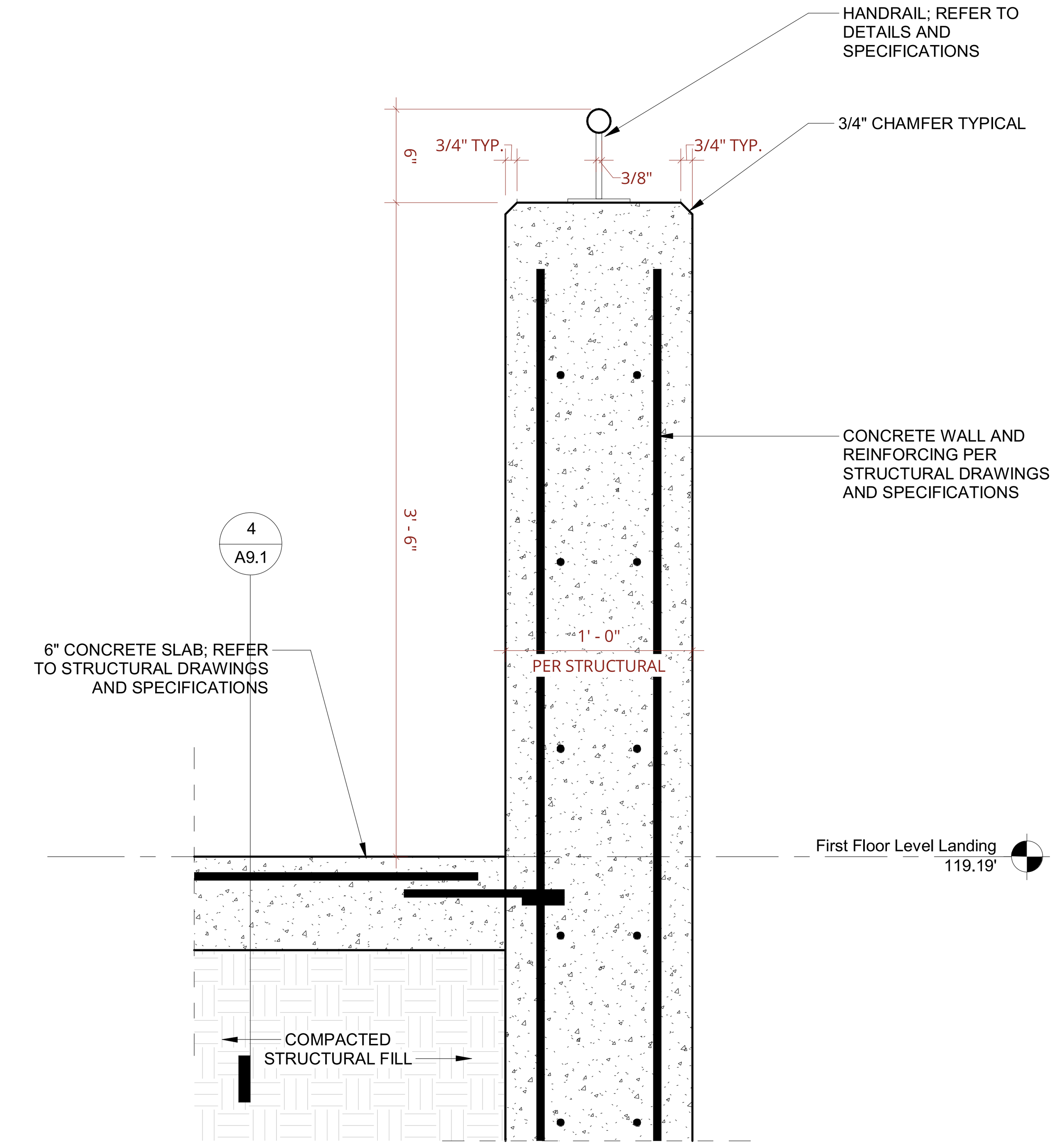
VERTICAL CIRCULATION

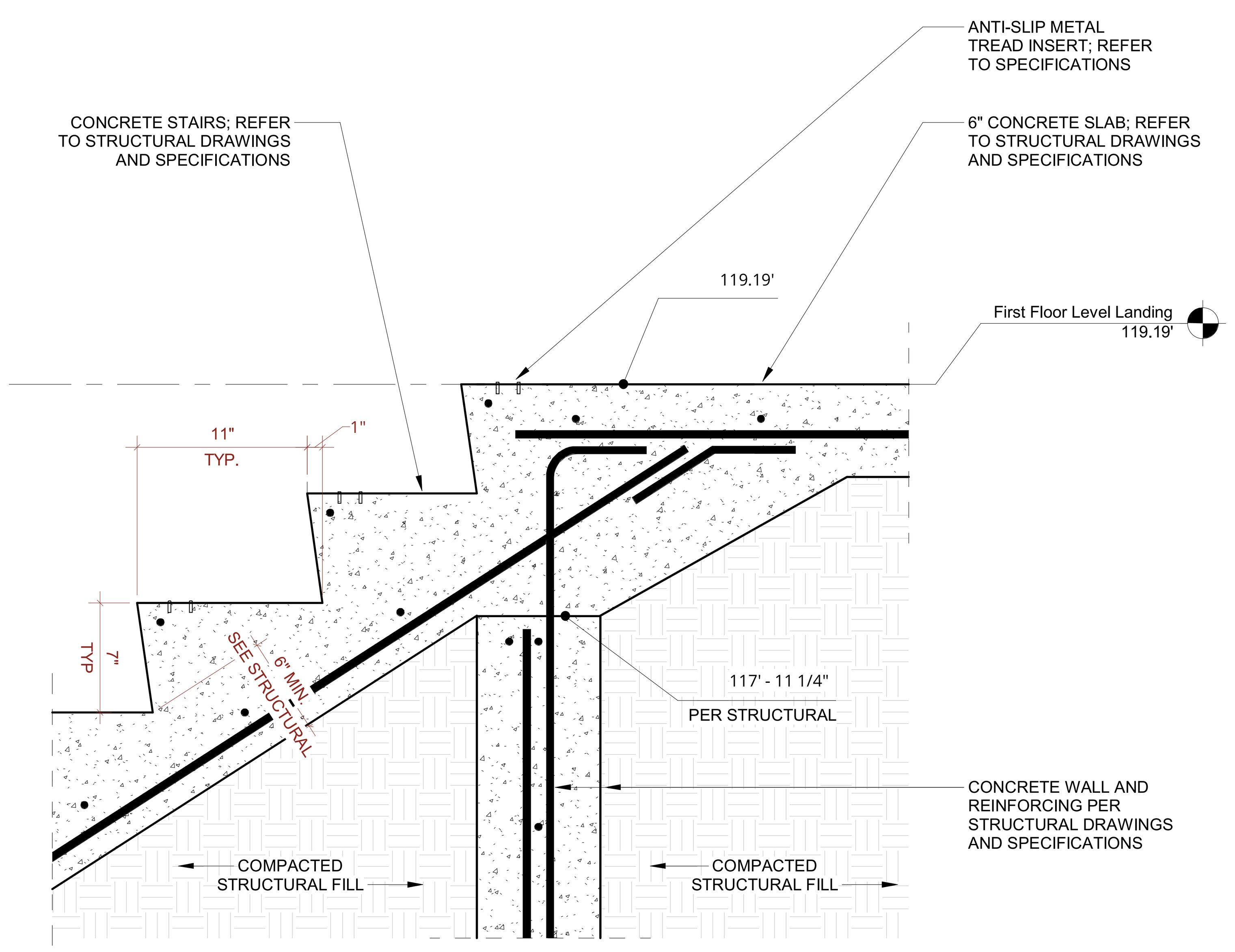
A5.1



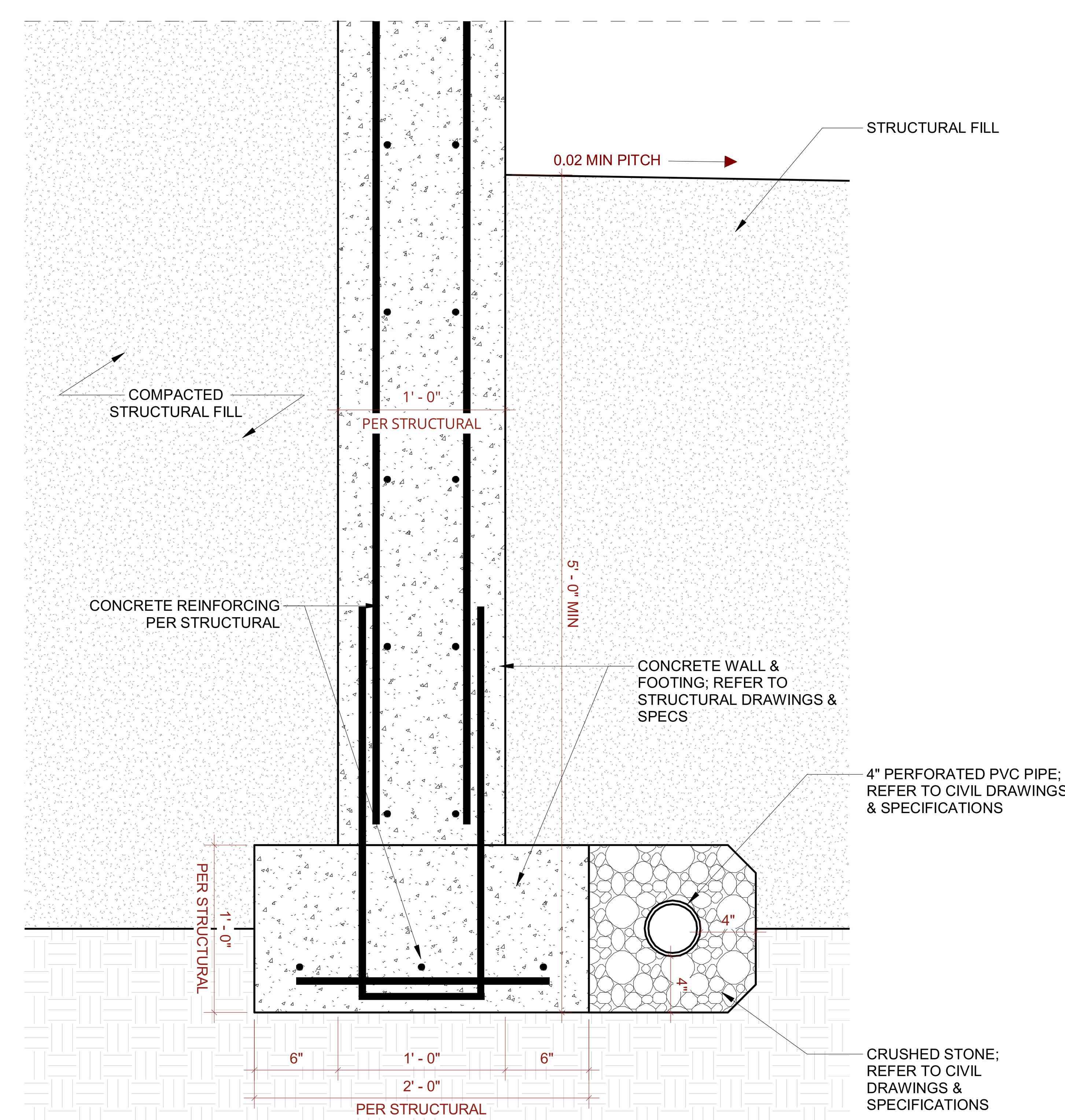
4 SCUPPER DETAIL
3" = 1'-0"



2 LANDING WALL
1 1/2" = 1'-0"



3 SLAB EDGE DETAIL
1 1/2" = 1'-0"



1 TYPICAL FOUNDATION
1 1/2" = 1'-0"

WATERVILLE PUBLIC LIBRARY

OPAL
137 High St.
Belfast, ME 04915
t: 207.338.1566

SEBAGO TECHNICS
75 John Roberts Rd., Suite 4A
South Portland ME 04106
t: 207 200 2100

THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
t: 207 245 6060

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

LICENSED ARCHITECT TIMOTHY A. LOCK No. 2410 STATE OF MAINE

CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

DETAILS

A9.1

FOUNDATION NOTES (SOIL SUPPORTED)

1. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO VERIFY EXISTING SOIL CONDITIONS AND TO BRING ANY DISCREPANCIES TO THE ATTENTION OF THE ARCHITECT PRIOR TO COMMENCING PLACEMENT OF FOUNDATIONS.
2. PRESUMPTIVE BEARING CAPACITY 3,000 PSF
3. EXTEND BOTTOM OF EXTERIOR FOOTINGS AT LEAST 5'–0" FEET BELOW THE FINAL EXTERIOR GRADE FOR PROTECTION AGAINST FROST.
4. REMOVE INADEQUATE LEDGE, DEBRIS, CLAY, AND ORGANIC MATERIAL FOR FOOTING BEARING.
5. COMPACTED STRUCTURAL FILL SHALL BE USED TO BACKFILL TO THE DESIGN FOOTING SUBGRADE AND BENEATH ALL SLABS ON GRADE. STRUCTURAL FILL SHALL BE A CLEAN SAND–GRAVEL MIXTURE MEETING THE FOLLOWING GRADATION:

SCREEN OR SIEVE SIZE	PERCENT PASSING
6 INCH	100
3 INCH	90–100
1/4 INCH	25–90
NO. 40	0–30
NO. 200	0–5

6. STRUCTURAL FILL SHALL BE PLACED IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS AND SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY PER ASTM D1557, MODIFIED PROCTOR TEST. COMPACT ADJACENT TO FOUNDATION WALLS SUPPORTING UNBALANCED FILL (RETAINING WALLS) TO 94 TO 96 PERCENT OF MAXIMUM DRY DENSITY PER ASTM D1557. HAND OPERATED EQUIPMENT SHALL BE USED FOR COMPACTION WITHIN 8 FEET OF NEW FOUNDATION WALL.
7. PROVIDE PVC DRAINPIPE AROUND THE PERIMETER OF THE STRUCTURE. LOCATE AT THE BOTTOM OF THE FOUNDATION WALLS AND PROVIDE POSITIVE GRAVITY FLOW TO PROPERLY DESIGNED OUTLET. REFER TO SITE DRAWINGS FOR ADDITIONAL INFORMATION.
8. BACKFILL RETAINING WALLS AFTER CONCRETE HAS PROPERLY CURED AND ATTAINED DESIGN STRENGTH.
9. SOILS EXPOSED AT THE BASE OF ALL SATISFACTORY FOUNDATION EXCAVATIONS SHALL BE PROTECTED AGAINST ANY DETRIMENTAL CHANGE IN CONDITION, SUCH AS DISTURBANCE FROM RAIN OR FROST. SURFACE RUNOFF SHALL BE DRAINED AWAY FROM THE EXCAVATIONS AND NOT BE ALLOWED TO POND. FOUNDATION EXCAVATIONS SHALL BE ADEQUATELY PROTECTED FROM RAINFALL OR FREEZING CONDITIONS. GROUNDWATER SHOULD BE ANTICIPATED FOR EXCAVATIONS AND APPROPRIATE DEWATERING MEASURES SHALL BE EMPLOYED.

REBAR LAP SPLICE TABLE

BAR SIZE	LAP LENGTH	
	3,500 PSI	5,000 PSI
#4	24"	30"
#5	28"	34"

CONCRETE NOTES

1. CONCRETE WORK SHALL CONFORM TO THE ACI "MANUAL OF CONCRETE PRACTICE," INCLUDING, BUT NOT LIMITED TO, ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE."
2. CONCRETE SHALL BE READY–MIXED CONCRETE, PROPORTIONED, MIXED, AND PLACED IN ACCORDANCE WITH THE PROVISIONS SET FORTH IN ACI 318.
3. CONCRETE MIX DESIGN:

   FOOTINGS:
   A. STRENGTH: 3,500 PSI @ 28 DAYS
   B. AGGREGATE: 3/4"
   C. W/C RATIO: 0.55 MAX
   D. ENTRAINED AIR: 6% ± 1 1/2%
   E. SLUMP: 4" MAX

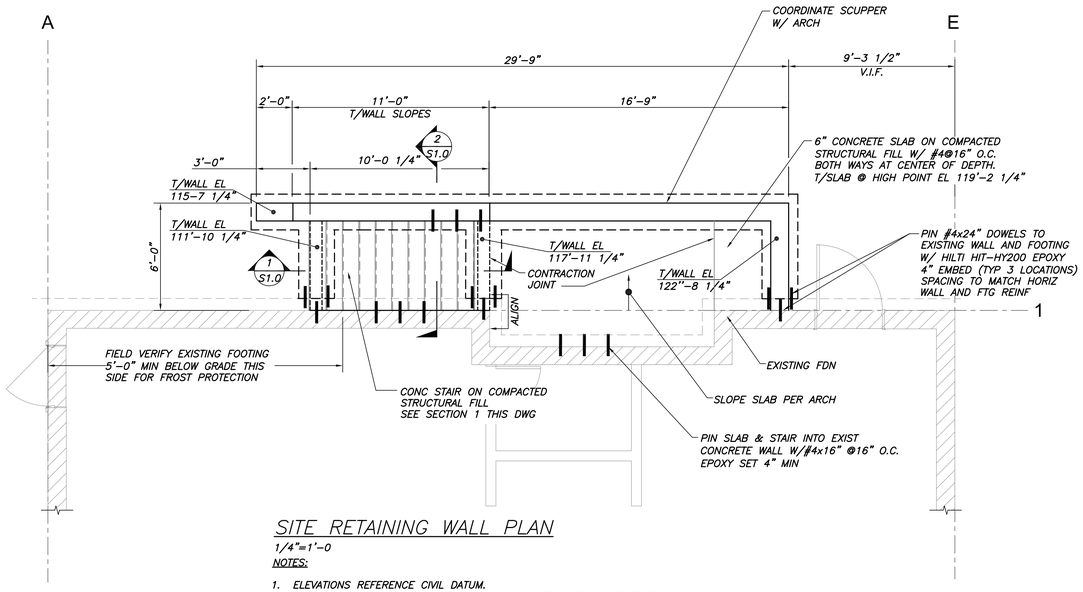
   EXTERIOR SLAB AND FOUNDATION WALLS:
   A. STRENGTH: 5,000 PSI @ 28 DAYS
   B. AGGREGATE: 3/4"
   C. W/C RATIO: 0.40 MAX
   D. ENTRAINED AIR: 6% ± 1 1/2%
   E. SLUMP: 4" MAX

   NOTES:
   A. ADD AIR ENTRAINING ADMIXTURE AT MANUFACTURER'S PRESCRIBED RATE TO RESULT IN CONCRETE AT POINT OF PLACEMENT HAVING THE ABOVE NOTED AIR CONTENT.
   B. ADDITIONAL SLUMP MAY BE ACHIEVED BY THE ADDITION OF A MIDRANGE OR HIGH RANGE WATER REDUCING ADMIXTURE. MAXIMUM SLUMP AFTER ADDITION OF ADMIXTURE SHALL BE 6" AND 8" RESPECTIVELY.

4. ADJUSTMENT TO CONCRETE MIXES: MIX ADJUSTMENTS MAY BE REQUESTED BY THE CONTRACTOR, WHEN CHARACTERISTICS OF THE MATERIALS, JOB CONDITIONS, WEATHER OR OTHER CIRCUMSTANCES WARRANT, AT NO ADDITIONAL COST TO THE OWNER AS ACCEPTED BY THE ENGINEER. LABORATORY TEST DATA FOR THE REVISED MIX DESIGN AND STRENGTH DATA MUST BE SUBMITTED AND ACCEPTED BY THE ENGINEER BEFORE INCORPORATING INTO THE WORK.

   NOTES:
   A. WATER MAY BE ADDED AT THE PROJECT ONLY IF THE MAXIMUM SPECIFIED WATER–CEMENT RATIO AND SLUMP ARE NOT EXCEEDED. CONTRACTOR SHALL HAVE BATCH TICKET INDICATING WATER AND CEMENT MIXED IN THE PLANT, AND SHALL RECORD THE WATER ADDED AS EVIDENCE THAT THE WATER–CEMENT RATIO HAS NOT BEEN EXCEEDED.
   B. ADDITIONAL DOSES OF SUPER PLASTICIZER SHOULD BE USED WHEN DELAYS OCCUR AND REQUIRED SLUMP HAS NOT BEEN MAINTAINED. A MAXIMUM OF TWO ADDITIONAL DOSAGES ARE PERMITTED PER ACI 212.3R RECOMMENDATIONS.

5. CONCRETE MIXING:
   A. JOB–SITE MIXING OF CONCRETE WILL NOT BE PERMITTED.
   B. READY–MIX CONCRETE MUST COMPLY WITH THE REQUIREMENTS OF ASTM C94, AND AS SPECIFIED HEREIN. PROVIDE BATCH TICKET FOR EACH BATCH DISCHARGED AND USED IN WORK, INDICATING PROJECT NAME, MIX TYPE, MIX TIME, BATCH QUANTITY, AND PROPORTIONS OF INGREDIENTS.
6. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.
7. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 DEFORMED BARS AND SHALL BE DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH ACI 315.
8. MINIMUM CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   A. SURFACES CAST AGAINST AND PERMANENTLY IN CONTACT WITH EARTH, 3"
   B. FORMED SURFACES IN CONTACT WITH EARTH OF EXPOSED TO WEATHER:
      #5 BARS AND SMALLER, 1 1/2"
      #6 THROUGH #11 BARS, 2"
   C. SURFACES NOT IN CONTACT WITH EARTH OR EXPOSED TO WEATHER:
      WALLS, SLABS, AND JOISTS #11 AND SMALLER, 1"
      BEAMS, GIRDERS, AND COLUMNS; ALL REINFORCEMENT, 1 1/2"
11. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE LAPPED BARS AT NECESSARY SPLICES OR HOOKED BARS AT DISCONTINUOUS ENDS. SEE SCHEDULE FOR REQUIRED REBAR LAP SPLICE LENGTHS.
12. WELDING OF REINFORCEMENT IS NOT PERMITTED, UNLESS SPECIFICALLY INDICATED.
13. PROVIDE PVC SLEEVES WHERE PIPES PASS THROUGH WALLS. ADJACENT SLEEVES SHALL BE SPACED A MINIMUM OF THREE DIAMETERS APART. OPTION: CORED HOLES. NO PENETRATIONS SHALL BE MADE THROUGH FOOTINGS WITHOUT WRITTEN PERMISSION FROM ENGINEER.

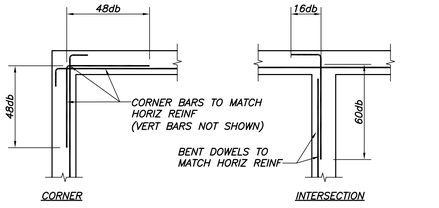


SITE RETAINING WALL PLAN

1/4"=1'–0"

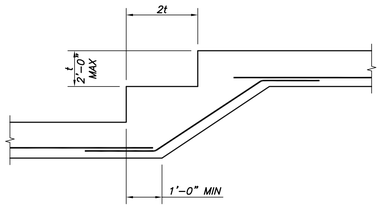
NOTES:

1. ELEVATIONS REFERENCE CIVIL DATUM.
2. BOTTOM OF NEW FOOTINGS TO BE 5'–0" MIN BELOW FINAL GRADE FOR FROST PROTECTION
3. DO NOT UNDERMINE EXISTING FOUNDATION. STEP FOOTING AS REQUIRED TO ALIGN W/ BOTTOM OF EXISTING FOOTING.
4. PROVIDE DRAINAGE SYSTEM OUTLETS AND DISCHARGE LOCATIONS (COORDINATE W/CIVIL).
5. REF ARCH FOR STAIR RISER GEOMETRY.
6. ARCHITECTURALLY EXPOSED CONCRETE WALLS. PROVIDE PLASTIC CONE AT FORM TIES AND PATCH VOIDS.



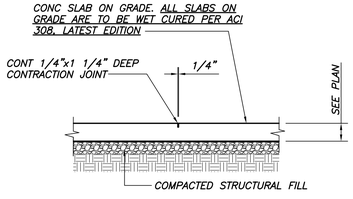
SINGLE LAYER TYP WALL REINF DETAILS

N.T.S.



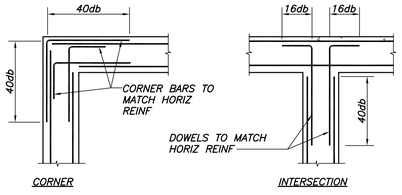
TYP STEP FOOTING DETAIL

N.T.S. t = FOOTING THICKNESS



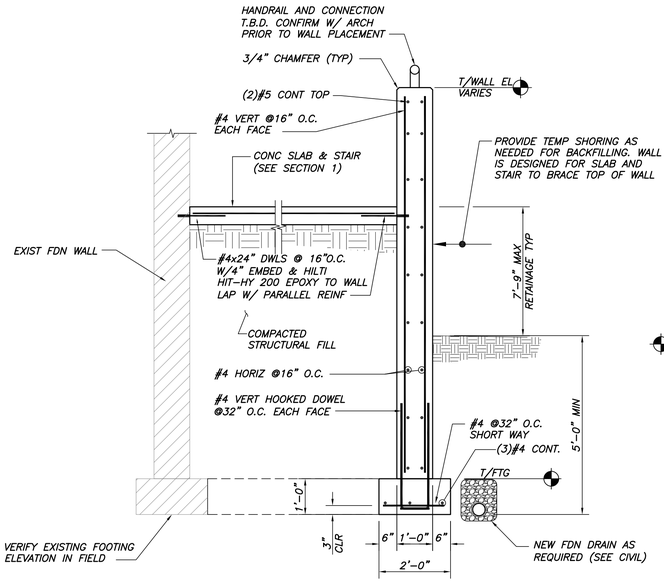
TYP SLAB ON GRADE & CONTRACTION JOINT DETAIL

N.T.S.



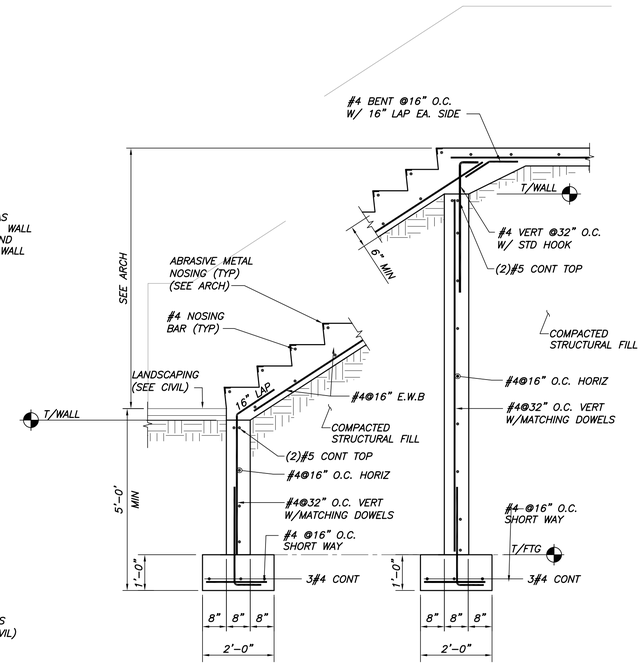
TWO LAYER TYP WALL REINF DETAILS

N.T.S.



SECTION 2 S1.0

1/2"=1'–0"



SECTION 1 S1.0

1/2"=1'–0"

WATERVILLE PUBLIC LIBRARY

OPAL
137 High St.
Belfast, ME 04915
t: 207.338.1566

SEBAGO TECHNICS
75 John Roberts Rd., Suite 4A
South Portland ME 04106
t: 207 200 2100

THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
t: 207 245 6060

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

STATE OF MAINE · ETHAN A. RHILE · NO.10266 · REGISTERED PROFESSIONAL ENGINEER

CURRENT ISSUE:

22-0112 FOR CONSTRUCTION

SHEET NO. AND NAME:

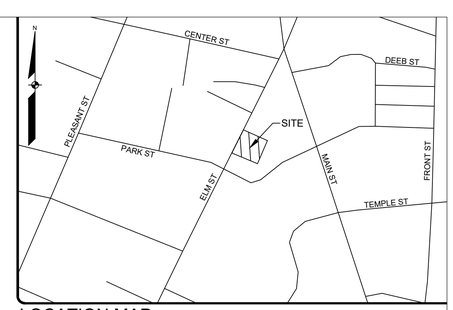
SITE WALLS

S1.0

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 INCH = 20 FT.



LOCATION MAP N.T.S.

NOTES:

1. CONTRACTOR SHALL STORE ALL EQUIPMENT AND MATERIALS WITHIN THE LIMIT OF WORK AREA.
2. CONTRACTOR SHALL COORDINATE WITH CITY OF WATERVILLE TO DETERMINE OFFSITE PARKING AREA AS REQUIRED.

WATERVILLE PUBLIC LIBRARY

OPAL

ARCHITECTURE / RESEARCH / DESIGN
137 High Street Belfast ME 04915
t: 207 640 6300 www.opallarch.us

SEBAGO TECHNICS
75 John Roberts Rd., Suite 4A
South Portland ME 04106
t: 207 200 2100

THORNTON TOMASETTI
14 York Street, Suite 201
Portland, ME 04101
t: 207 245 6060

PROJECT NAME

Waterville Public Library

PROJECT NO **20-15**

PROJECT ADDRESS

73 Elm Street
Waterville, ME

REVISIONS:

DATE & DESCRIPTION:

PAST ISSUES:

DATE & DESCRIPTION:

CURRENT ISSUE:

21-0813 FOR CONSTRUCTION

SHEET NO. AND NAME:

CONTRACTOR KEY PLAN

C-504

SECTION 000102
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: Waterville Public Library, located at:

73 Elm Street,

Waterville, Maine

B. The Owner, hereinafter referred to as Owner: Waterville Public Library

C. Owner's Project Manager: Tammy Rabideau.
   1. E-mail: trabideau@watervillelibrary.org.

1.02 NOTICE TO PROSPECTIVE BIDDERS

A. These documents constitute an Invitation to Bid to General Contractors for the construction of the project described below.

B. Notice Date: January 12, 2022.

1.03 PROJECT DESCRIPTION

A. Summary Project Description: Demolition of existing exterior ramp and construction of new exterior stairs as well as improvements to Basement ramp access and replacement of Basement door.

B. Contract Scope: Construction and demolition.

C. Contract Terms: Cost plus a fee, with a guaranteed maximum price (GMP).

1.04 PROJECT CONSULTANTS

A. The Architect, hereinafter referred to as Architect: Timothy Lock, AIA, OPAL Global, LLC.
   1. Address: 137 High St..
   2. City, State, Zip: Belfast, ME, 04915.
   3. Phone/Fax: 207.640.6300.
   4. E-mail: tim@opalarch.us.

1.05 PROCUREMENT TIMETABLE

A. Documents Available: on January 12, 2022.

B. Pre-Bid Site Meeting: January 20, 2022.

C. Last Request for Information Due: 7 days prior to due date of bids.

D. Bid Due Date: February 2, 2022, before 5 PM local time.

E. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.06 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:
   1. From Owner at the Project Manager's address listed above.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 000110
TABLE OF CONTENTS

END OF SECTION

SECTION 011000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Waterville Public Library

B. Owner's Name: Waterville Public Library.

C. Architect's Name: OPAL Global, LLC.

D. The Project consists of the construction of Demolition of existing exterior ramp and construction of new exterior stairs and improvement to Basement ramp access and door.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on the Cost of the Work plus a fee as described in Document 005200 - Agreement Form.

1.03 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:

1.04 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Work by Others.
   3. Use of site and premises by the public.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Existing building spaces may not be used for storage.

E. Utility Outages and Shutdown:
   1. Limit shutdown of utility services to eight hours at a time, arranged at least 24 hours in advance with Owner.
   2. Prevent accidental disruption of utility services to other facilities.

END OF SECTION

SECTION 012100
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

B. Contingency allowance.

C. Inspecting and testing allowances.

1.02 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts .

B. Architect Responsibilities:
   1. Consult with Contractor for consideration and selection of products, suppliers , and installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.

C. Contractor Responsibilities:
   1. Assist Architect in selection of products, suppliers , and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.
   3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences in costs will be adjusted by Change Order.

1.03 CONTINGENCY ALLOWANCE

A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.

B. Funds will be drawn from the Contingency Allowance only by Change Order.

C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 INSPECTING AND TESTING ALLOWANCES

A. Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.

B. Costs Not Included in the Inspecting and Testing Allowances:
   1. Costs of incidental labor and facilities required to assist inspecting or testing agency.
   2. Costs of testing services used by Contractor separate from Contract Document requirements.
   3. Costs of retesting upon failure of previous tests as determined by Architect.

C. Payment Procedures:
   1. Submit one copy of the inspecting or testing firm's invoice with next application for payment.
   2. Pay invoice on approval by Architect.

D. Differences in cost will be adjusted by Change Order.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 002113 - Instructions to Bidders: Restrictions on timing of substitution requests.

B. Section 012100 - Allowances, for cash allowances affecting this section.

C. Section 012300 - Alternates, for product alternatives affecting this section.

D. Section 013000 - Administrative Requirements: Submittal procedures, coordination.

E. Section 016000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

F. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Restrictions on emissions of indoor substitute products.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.04 REFERENCE STANDARDS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

D. Limit each request to a single proposed substitution item.

3.02 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

B. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.

2. Without a separate written request.
3. When acceptance will require revisions to Contract Documents.

3.03 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.04 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

END OF SECTION

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Contractor's daily reports.
G. Progress photographs.
H. Number of copies of submittals.
I. Requests for Interpretation (RFI) procedures.
J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 016000 - Product Requirements: General product requirements.
B. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect:
    1. Requests for Interpretation (RFI).
    2. Requests for substitution.
    3. Shop drawings, product data, and samples.
    4. Test and inspection reports.
    5. Design data.
    6. Manufacturer's instructions and field reports.
    7. Applications for payment and change order requests.
    8. Progress schedules.
    9. Coordination drawings.
    10. Correction Punch List and Final Correction Punch List for Substantial Completion.
    11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
    1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
    2. Contractor and Architect are required to use this service.
    3. It is Contractor's responsibility to submit documents in allowable format.
    4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
    5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat,

www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.

6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Submittal Service: To Be Determined.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:
1. Owner.
2. Architect.
3. Contractor.

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract, [_____] and .
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Contractor's superintendent.
5. Major subcontractors.

B. Agenda:
1. Use of premises by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

C. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 013216

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

3.06 DAILY CONSTRUCTION REPORTS

A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.

B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
   1. Date.
   2. General weather conditions.
   3. Safety, environmental, or industrial relations incidents.
   4. Meetings and significant decisions.
   5. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
   6. Testing and/or inspections performed.
   7. Signature of Contractor's authorized representative.

3.07 PROGRESS PHOTOGRAPHS

A. Submit new photographs every week, within 3 days after being taken.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Completion of site clearing.
   2. Excavations in progress.
   3. Foundations in progress and upon completion.
   4. Structural framing in progress and upon completion.
   5. Enclosure of building, upon completion.

6. Final completion, minimum of ten (10) photos.

E. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: via shared cloud service.
   2. File Naming: Include project identification, date and time of view, and view identification.

3.08 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare in a format and with content acceptable to Owner.
   3. Prepare using software provided by the Electronic Document Submittal Service.
   4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

3.10 SUBMITTAL PROCEDURES

A. General Requirements:

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Contractor's construction-related professional design services.
F. Contractor's design-related professional design services.
G. Control of installation.
H. Mock-ups.
I. Tolerances.
J. Manufacturers' field services.
K. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 012100 - Allowances: Allowance for payment of testing services.
B. Section 013000 - Administrative Requirements: Submittal procedures.
C. Section 016000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants 2008 (Reapproved 2019).
B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.
C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2019.
D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.
E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.
F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.
G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components 2016.
H. IAS AC89 - Accreditation Criteria for Testing Laboratories 2020.

1.04 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

1.05 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
B. Base design on performance and/or design criteria indicated in individual specification sections.
    1. Submit a Request for Interpretation to Architect if the criteria indicated are not sufficient to perform required design services.
C. Scope of Contractor's Professional Design Services include but are not limited to the following:
    1. Concrete Mix Design: As described in Section 033000 - Cast-in-Place Concrete. No specific designer qualifications are required.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.08 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.09 TESTING AND INSPECTION AGENCIES AND SERVICES

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:
   1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D3740, and [_____].
   2. Inspection agency: Comply with requirements of ASTM D3740, ASTM E329, and [_____].
   3. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
   4. Laboratory: Authorized to operate in the State in which the Project is located.
   5. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
   6. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 3 EXECUTION

2.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

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

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

C. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

D. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.

E. Accepted mock-ups shall be a comparison standard for the remaining Work.

F. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

G. Where possible salvage and recycle the demolished mock-up materials.

2.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

2.04 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment, and [_____] as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

2.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 014100
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:

B. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.

C. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

D. 29 CFR 1910 - Occupational Safety and Health Standards current edition.

E. State of Maine amendments to some or all of the following.

F. City of Waterville amendments to some or all of the following.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

H. NFPA 1 - Fire Code 2018.

I. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. ICC (IPC) - International Plumbing Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. ICC (IPSDC) - International Private Sewage Disposal Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. ICC (IECC) - International Energy Conservation Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering

B. Temporary utilities.

C. Temporary telecommunications services.

D. Temporary sanitary facilities.

E. Temporary Controls: Barriers, enclosures, and fencing.

F. Security requirements.

G. Vehicular access and parking.

H. Waste removal facilities and services.

I. Project identification sign.

J. Field offices.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

1.03 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.

1.04 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. New permanent facilities may be used.

1.05 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Internet Connections: Minimum of one; DSL modem or faster.
   3. Email: Account/address reserved for project use.

1.06 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 FENCING

A. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.09 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.10 SECURITY - SEE SECTION 013553

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.11 VEHICULAR ACCESS AND PARKING - SEE SECTION 015500

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Designated existing on-site roads may be used for construction traffic.

F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.12 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.13 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.

B. Erect on site at location indicated.

C. No other signs are allowed without Owner permission except those required by law.

1.14 FIELD OFFICES - SEE SECTION 015213

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Sustainable design-related product requirements.

C. Re-use of existing products.

D. Transportation, handling, storage and protection.

E. Product option requirements.

F. Substitution limitations.

G. Procedures for Owner-supplied products.

H. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Lists of products to be removed from existing building.

B. Section 011000 - Summary: Identification of Owner-supplied products.

C. Section 012500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

E. Section 017419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.04 QUALITY ASSURANCE

A. GreenScreen Chemical Hazard Analysis: Ingredients of 100 parts-per-million or greater evaluated using GreenScreen (METH).
   1. Good: GreenScreen (LIST) evaluation to identify Benchmark 1 hazards; a Health Product Declaration includes this information.
   2. Better: GreenScreen Full Assessment.
   3. Best: GreenScreen Full Assessment by GreenScreen Licensed Profiler.
   4. Acceptable Evidence: GreenScreen report.

B. Health Product Declarations (HPD): Complete, published declaration with full disclosure of known hazards, prepared using one of the HPDC (HPD-OLT) online tools.

C. Sustainably Harvested Wood: Solid wood, wood chips, and wood fiber certified or labeled by the following:
   1. Acceptable Evidence: Copies of invoices bearing the primary source location of wood framing products.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1. Made of wood from newly cut old growth timber.
   2. Containing lead, cadmium, or asbestos.

C. Where other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 016116.
   2. If wet-applied, have lower VOC content, as defined in Section 016116.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Are made of recycled materials.
   6. Have a published Health Product Declaration (HPD).
   7. Have a published GreenScreen Chemical Hazard Analysis.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

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

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 012500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

A. See Section 011000 - Summary for identification of Owner-supplied products.

B. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5. Arrange for manufacturers' warranties, inspections, and service.

C. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

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

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Provide protection of stored materials and products against theft, casualty, or deterioration.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 017419.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Do not store products directly on the ground.

J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

L. Prevent contact with material that may cause corrosion, discoloration, or staining.

M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Perform dewatering activities, as required, for the duration of the project.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

G. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

H. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

I. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

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

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
   4. Controlling lines and levels required for mechanical and electrical trades.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 078400, to full thickness of the penetrated element.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and Owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

A. Execute final cleaning prior to Substantial Completion.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and site.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.14 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood.
   5. Land clearing debris, including brush, branches, logs, and stumps; see Section 311000 - Site Clearing for use options.
   6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
   7. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
   8. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   9. Gypsum drywall and plaster.
   10. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.

E. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

F. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

E. Section 311000 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Incinerator Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
      c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   5. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.

c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

6. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards (cubic meters).
   c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

A. See Section 016000 - Product Requirements for substitution submission procedures.

B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 016000:
   1. Relative amount of waste produced, compared to specified product.
   2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Price.
   3. Proposed disposal method for waste product.
   4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Prebid meeting.
   2. Preconstruction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of

identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 017800
CLOSEOUT SUBMITTALS

ART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data.

C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are

used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 024100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 011000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 016000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

G. Section 312323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Remove the existing ramp and stairs on the north side fo the building. Refer to civil and architectural plans for extent of demolition.

B. Remove paving and curbs as required to accomplish new work.

C. Remove other items indicated, for salvage, relocation, recycling, and [_____].

D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 312200.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.

5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
7. Do not close or obstruct roadways or sidewalks without permit.
8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Do not begin removal until built elements to be salvaged or relocated have been removed.

D. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

F. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

G. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Comply with requirements of Section 017419 - Waste Management.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.

D. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 034100
PRECAST STRUCTURAL CONCRETE

PART 2 PRODUCTS

1.01 PRECAST UNITS

A. Precast Structural Concrete Units: Comply with PCI MNL-116, PCI MNL-120, PCI MNL-123, PCI MNL-135, ACI 318 and applicable codes.
   1. Design components to withstand dead loads and design loads in the configuration indicated on drawings and as follows:
   2. Calculate structural properties of framing members in accordance with ACI 318.
   3. Design system to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.

1.02 MATERIALS

1.03 REINFORCEMENT

1.04 FABRICATION

A. Comply with fabrication procedures specified in PCI MNL-116.

1.05 FINISHES

A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.

END OF SECTION

SECTION 055213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted handrails.

B. Stair railings and guardrails.

1.02 RELATED REQUIREMENTS

A. Section 055100 - Metal Stairs: Handrails other than those specified in this section.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.

F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

B. Allow for expansion and contraction of members and building movement without damage to connections or members.

C. Dimensions: See drawings for configurations and heights.

D. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

E. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, painted finish.

C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/16 inch (1.5 mm).

C. Maximum Out-of-Position: 1/8 inch (3 mm).

END OF SECTION

SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.

B. Section 099113 - Exterior Painting: Field painting.

C. Section 099123 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2018.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

H. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

J. ITS (DIR) - Directory of Listed Products current edition.

K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

M. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2007.

N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

Q. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2013.

R. UL (DIR) - Online Certifications Directory Current Edition.

S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one

copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Manufacturer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
1. Exactitude, a division of The Cook & Boardman Group: www.cookandboardman.com/division/exactitude
2. Ceco Door, an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
3. Curries, an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
4. Republic Doors, an Allegion brand; [____]: www.republicdoor.com/#sle.
5. Steelcraft, an Allegion brand; [____]: www.allegion.com/#sle.
6. Technical Glass Products; SteelBuilt Window & Door Systems: www.tgpamerica.com/#sle.
7. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. [____] , Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 1 - Standard-duty.
   b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 20 gage, 0.032 inch (0.8 mm), minimum.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

C. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 1 - Standard-duty.
   b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 20 gage, 0.032 inch (0.8 mm), minimum.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   a. Attach fire rating label to each fire rated unit.
4. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Knock-down type.
1. Weatherstripping: Separate, see Section 087100.

C. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.

D. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

E. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.06 ACCESSORIES

A. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

B. Astragals and Edges for Double Doors: Pairs of door astragals, and door edge sealing and protection devices.

C. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 087100.

E. Comply with glazing installation requirements of Section 088000.

F. Coordinate installation of electrical connections to electrical hardware items.

G. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 087100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for hollow metal doors.

B. Hardware for fire-rated doors.

C. Thresholds.

1.02 RELATED REQUIREMENTS

A. Section 080671 - Door Hardware Schedule: Schedule of door hardware sets.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. BHMA A156.1 - Butts and Hinges 2021.

C. BHMA A156.3 - Exit Devices 2020.

D. BHMA A156.4 - Door Controls - Closers 2019.

E. BHMA A156.6 - Architectural Door Trim 2021.

F. BHMA A156.7 - Template Hinge Dimensions 2016.

G. BHMA A156.13 - Mortise Locks & Latches Series 1000 2017.

H. BHMA A156.16 - Auxiliary Hardware 2018.

I. BHMA A156.18 - Materials and Finishes 2020.

J. BHMA A156.21 - Thresholds 2019.

K. DHI (H&S) - Sequence and Format for the Hardware Schedule 1996.

L. ITS (DIR) - Directory of Listed Products current edition.

M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

N. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

O. UL (DIR) - Online Certifications Directory Current Edition.

P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
   1. Architect.
   2. Installer's Architectural Hardware Consultant (AHC).
   3. Hardware Installer.
   4. Owner's Security Consultant.

C. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

D. Keying Requirements Meeting:
   1. Schedule meeting at project site prior to Contractor occupancy.
   2. Attendance Required:
      a. Contractor.
      b. Owner.
      c. Architect.
   3. Agenda:
      a. Establish keying requirements.
      b. Verify locksets and locking hardware are functionally correct for project requirements.
      c. Verify that keying and programming complies with project requirements.

d. Establish keying submittal schedule and update requirements.

4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
6. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
a. Submit in vertical format, refer to Section 08 0671.
3. List groups and suffixes in proper sequence.
4. Provide complete description for each door listed.
5. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
6. Include account of abbreviations and symbols used in schedule.

D. Keying Schedule:
1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

1.06 QUALITY ASSURANCE

A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
1. Closers: Five years, minimum.
2. Exit Devices: Three years, minimum.
3. Locksets and Cylinders: Three years, minimum.
4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:

1. Applicable provisions of federal, state, and local codes.
2. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
3. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), testing firm acceptable to authorities having jurisdiction, or [_____] as suitable for application indicated.

2.02 HINGES

A. Manufacturers:
1. McKinney; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
2. Hager Companies; [_____]: www.hagerco.com/#sle.
3. Ives, an Allegion brand;[_____]: www.allegion.com/us/#sle.
4. Substitutions: See Section 016000 - Product Requirements.

B. Hinges: Comply with BHMA A156.1, Grade 1.
1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
   a. Provide hinge width required to clear surrounding trim.
2. Provide hinges on every swinging door.
3. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
4. Provide following quantity of butt hinges for each door:
   a. Doors up to 60 inches (1.5 m) High: Two hinges.
   b. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
   c. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.
   d. Doors over 120 inches (3 m) High: One additional hinge per each additional 30 inches (762 mm) in height.

2.03 EXIT DEVICES

A. Manufacturers:
1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
2. DORMA USA, Inc; 8000 Series: www.dorma.com/#sle.
3. Hager Companies; [_____]: www.hagerco.com/#sle.
4. Substitutions: See Section 016000 - Product Requirements.

B. Exit Devices: Comply with BHMA A156.3, Grade 1.
1. Lever design to match lockset trim.
2. Provide cylinder with cylinder dogging or locking trim.
3. Provide exit devices properly sized for door width and height.
4. Provide strike as recommended by manufacturer for application indicated.
5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.04 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
1. Provide cylinders from same manufacturer as locking device.
2. Provide cams and/or tailpieces as required for locking devices.

2.05 MORTISE LOCKS

A. Manufacturers:
1. Schlage, an Allegion brand; [_____]: www.allegion.com/us/#sle.
2. Substitutions: See Section 016000 - Product Requirements.

B. Mortise Locks: Comply with BHMA A156.13, Grade 1, Security, 1000 Series.
1. Latchbolt Throw: 3/4 inch (19 mm), minimum.
2. Deadbolt Throw: 1 inch (25.4 mm), minimum.
3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
   a. Finish: To match lock or latch.

2.06 DOOR PULLS AND PUSH PLATES

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. Hager Companies; [_____]: www.hagerco.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

B. Door Pulls and Push Plates: Comply with BHMA A156.6.
   1. Pull Type: Straight, unless otherwise indicated.
   2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
      a. Edges: Beveled, unless otherwise indicated.
   3. Material: Aluminum, unless otherwise indicated.

2.07 DOOR PULLS AND PUSH BARS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. Hager Companies; [_____]: www.hagerco.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

B. Door Pulls and Push Bars: Comply with BHMA A156.6.
   1. Bar Type: Bar set, unless otherwise indicated.
   2. Material: Aluminum, unless otherwise indicated.

2.08 COORDINATORS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. DORMA USA, Inc; TS93 GSR: www.dorma.com/#sle.
   3. Ives, an Allegion brand; [_____]: www.allegion.com/us/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Coordinators: Provide on doors having closers and self-latching or automatic flush bolts to ensure that inactive door leaf closes before active door leaf.
   1. Type: Bar, unless otherwise indicated.
   2. Material: Aluminum, unless otherwise indicated.
   3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.

2.09 CLOSERS

A. Manufacturers; Surface Mounted:
   1. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. DORMA USA, Inc; 7400 Series, 8600 Series, 8900 Series, and TS93: www.dorma.com/#sle.
   3. Hager Companies; [_____]: www.hagerco.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Manufacturers; Concealed - Overhead:
   1. DORMA USA, Inc; RTS88: www.dorma.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

C. Manufacturers; Concealed - Floor Mounted:
   1. DORMA USA, Inc; BTS75V and BTS80: www.dorma.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

D. Closers: Comply with BHMA A156.4, Grade 1.
   1. Type: Surface mounted to door.
   2. Provide door closer on each exterior door.

2.10 PROTECTION PLATES

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. Hager Companies; [_____]: www.hagerco.com/#sle.
   3. Ives, an Allegion brand; [_____]: www.allegion.com/us/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Protection Plates: Comply with BHMA A156.6.

C. Metal Properties: Stainless steel.
   1. Metal, Heavy Duty: Thickness 0.062 inch (1.57 mm), minimum.

D. Edges: Square, on four sides unless otherwise indicated.

E. Fasteners: Countersunk screw fasteners.

2.11 KICK PLATES

A. Manufacturers:
   1. Ives, an Allegion brand; [_____]: www.allegion.com/us/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
   1. Size: 8 inch (203 mm) high by 2 inch (51 mm) less door width (LDW) on push side of door.

2.12 DOOR HOLDERS

A. Manufacturers:
   1. McKinney or Rockwood; an Assa Abloy Group company; [_____]: www.assaabloydss.com/#sle.
   2. Hager Companies; [_____]: www.hagerco.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

B. Door Holders: Comply with BHMA A156.16, Grade 1.
   1. Type: Lever, or kick down stop, with rubber bumper at bottom end.
   2. Material: Stainless steel.

2.13 THRESHOLDS

A. Manufacturers:
   1. Zero International, Inc; [_____]: www.zerointernational.com/#sle.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Thresholds: Comply with BHMA A156.21.
   1. Provide threshold at each exterior door, unless otherwise indicated.
   2. Type: Flat surface.
   3. Material: Aluminum.
   4. Threshold Surface: Fluted horizontal grooves across full width.
   5. Field cut threshold to profile of frame and width of door sill for tight fit.
   6. Provide non-corroding fasteners at exterior locations.

2.14 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
   1. Primary Finish: 630; satin stainless steel, with stainless steel 300 series base material (former US equivalent US32D); BHMA A156.18.
   2. Secondary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
      a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

C. Use templates provided by hardware item manufacturer.

D. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list, unless noted otherwise on drawings.
   1. Mounting heights in compliance with ADA Standards:
      a. Locksets: 40-5/16 inch (1024 mm).
      b. Push Plates/Pull Bars: 42 inch (1067 mm).
      c. Deadlocks (Deadbolts): 48 inch (1219 mm).
      d. Exit Devices: 40-5/16 inch (1024 mm).

E. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 014000 - Quality Requirements.

B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.05 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

D. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

SECTION 024113

SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and removal of site improvements.
2. Removing below-grade construction.
3. Disconnecting, capping or sealing, and abandoning in-place site utilities as indicated.
4. Disconnecting, capping or sealing, and removing site utilities as indicated.
5. Salvaging items for reuse by Owner.

B. Related Sections include the following:

1. Division 31 Section "Site Clearing" for site clearing and removal of above-grade site improvements not part of site demolition.

1.3 DEFINITIONS

A. Demolish: Completely remove and legally dispose of off-site.

B. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.

C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

C. All items indicated on the drawings to be “Salvage” shall remain the property of the Owner and stored and delivered per direction of Owner’s Representative.

1.5 SUBMITTALS

A. Schedule of Site Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services. Coordinate with appropriate utility provider.
3. Shutoff and capping of utility services. Coordinate with appropriate utility provider.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

1.7 PROJECT CONDITIONS

A. Conduct site demolition so operations of adjacent occupied buildings will not be disrupted.

1. Provide not less than three days notice of activities that will affect operations of adjacent buildings or facilities.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

    a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction and Owner’s Representative.

B. Owner assumes no responsibility for building structures and utilities to be demolished.

1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered by the Contractor, do not disturb; immediately notify the Owner’s Representative for review of situation and development of remedial action required.

D. On-site storage of removed items or materials is not permitted without the permission of the Owner’s Representative.

PART 2 - PRODUCTS (Not Use)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

B. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

3.2 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings, structures, and utilities to be demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

B. Existing Utilities: Refer to Divisions 22 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

C. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to storage area indicated on Drawings or as directed by the Owner’s Representative.
5. Protect items from damage during transport and storage.

3.3 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings at all times.

B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner’s Representative and authorities having jurisdiction.

2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner's Representative and authorities having jurisdiction.

    a. Provide at least three days notice to occupants of affected buildings if shutdown of service is required during changeover.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 01 Section "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION, GENERAL

A. General: Demolish indicated existing site structures, and site improvements completely or to the limits indicated on the drawings. Use methods required to complete the Work within limitations of governing regulations and as follows:

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

D. Salvage: Items to be salvaged are indicated on Drawings.

3.5 UTILITIES

A. Excavate for and remove underground utilities indicated to be removed. Coordinate with utility owners.

3.6 SITE RESTORATION

A. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and legally dispose of them in an EPA-approved landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION

SECTION 055213

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Steel pipe and tube railings.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

D. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.

E. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. applied in any direction.
b. Concentrated load of 250 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

2.3 STEEL AND IRON

A. Tubing: ASTM A500 (cold formed) or ASTM A513.

B. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations.

C. Plates, Shapes, and Bars: ASTM A36/A36M.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

1. Available Products include the following or approved substitute:

a. Five Star Grout by Five Star Products, Inc.
b. Masterflow 928 Grout by Master Builders Technologies.
c. Sonogrout 10K by Sonneborn.
d. 14K Hy Flow by Sonneborn.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

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. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form Changes in Direction as Follows:

1. As detailed.

J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide inserts and other anchorage devices for connecting railings to concrete work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

M. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.6 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.

4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Primer: Provide one coat of the following or approved substitute.

   a. Devoe Coatings: Devran 203 or Devran 201H epoxy primers.
   b. PPG: Amerlock Sealer Penetrating Epoxy Primer/Sealer. (0 g/L)
   c. S-W: Macropoxy□ HS High Solids Epoxy Semi-Gloss.

2. Semi-Gloss Epoxy Finish: Provide two coats of the following or approved substitute.

   a. Devoe Coatings: Devran 224HS High Build Epoxy Coating. (212 g/L)
   b. PPG: Amerlock 2 VOC, High Solids Epoxy (100 g/L)
   c. SW: Macropoxy□ HS High Solids Epoxy Semi-Gloss.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

B. Adjust railings before anchoring to ensure matching alignment at abutting joints.

3.2 ANCHORING POSTS

A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.4 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION

SECTION 129300

SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Steel bollards.
2. Truncated dome pavers.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.

B. Provide submittals for the following:

1. Steel Bollards
2. Truncated Dome Pavers

PART 2 - PRODUCTS

2.1 STEEL BOLLARD

A. Steel Bollard: Heavy duty 6 5/8" OD schedule 40 hot dipped galvanized. color to be coordinated with Architect

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:

1. TrafficProtectors.com – 877-392-5766
2. Approved Equal

2.2 TRUNCATED DOME PAVERS

A. Hanover Detectable Warning Paver or approved equal, color to be coordinated with Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install furnishings according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated. Install all site improvement elements as indicated on Drawings.

3.2 ADJUSTING AND CLEANING

A. Adjust specialties for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

3.3 CLEANING

A. Clean surfaces prior to inspection. Replace damaged or defective items.

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees and grass to remain.
2. Removing existing trees, shrubs, groundcovers and plants.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.

B. Related Sections include the following:

1. Division 02 Section "Selective Site Demolition" for demolition of above and below grade site improvements and utilities.
2. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

A. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

1.6 PROJECT CONDITIONS

A. Prior to excavation, verify the underground utilities, pipes, structures, and facilities. Maine Dig-Safe law requires at least the following minimum measures:

1. Pre-mark the boundaries of your planned excavation with white paint, flags or stakes, so utility crews know where to mark their lines.
2. Call Dig Safe, at 1-888-DIGSAFE, at least three business days - but no more than 30 calendar days - before starting work. Don't assume someone else will make the call.
3. If blasting, notify Dig Safe at least one business day in advance.
4. Wait three business days for lines to be located and marked with color-coded paint, flags or stakes. Note the color of the marks and the type of utilities they indicate. Transfer these marks to the As-Built drawings.
5. Contact the landowner and other non-member@ utilities (water, sewer, gas, etc.), for them to mark the locations of their underground facilities. Transfer these marks to the As-Built drawings.
6. Re-notify Dig Safe and the non-member utilities if the digging, drilling or blasting does not occur within 30 calendar days, or if the marks are lost due to weather conditions, site work activity or any other reason.
7. Hand dig within 18 inches in any direction of any underground line until the line is exposed. Mechanical methods may be used for initial site penetration, such as removal of pavement or rock.
8. Dig Safe requirements are in addition to town, city and/or state DOT street opening permit requirements.
9. For complete Dig Safe requirements, call the PUC or visit their website.
10. If you damage, dislocate or disturb any underground utility line, immediately notify the affected utility. If damage creates safety concerns, call the fire department and take immediate steps to safeguard health and property.
11. Any time an underground line is damaged or disturbed, or if lines are improperly marked, you must file an Incident Report with the PUC. For an Incident Report form. Visit www.state.me.us/mpuc or call the PUC at 800-452-4699.

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

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

C. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

D. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

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

F. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Locate and clearly flag trees and 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 Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Drawings and Section 312500 “Erosion and Sedimentation Control.”

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Where trees are indicated to be left standing, stop topsoil stripping a sufficient distance to prevent damage to main root system.

D. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile topsoil in storage piles in areas shown, or where directed by Architect.
2. Limit height of topsoil stockpiles to 72 inches.
3. Do not stockpile topsoil within tree protection zones.
4. Dispose of excess topsoil as specified for waste material disposal.
5. Stockpile surplus topsoil to allow for respreading deeper topsoil

3.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion

3.7 DISPOSAL

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

1. 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.

END OF SECTION

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade walks, pavements, lawns and grasses and exterior plants.
2. Excavating and backfilling for buildings, site walls and structures.
3. Drainage course for slabs-on-grade.
4. Subbase and base course for concrete walks pavements.
5. Subbase and base course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling for utility trenches within the building excavation limits.
8. Excavating and backfilling for site utility trenches.
9. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.
10. Excavation and off-site disposal of all unsuitable and excess materials and stockpiling of all suitable onsite materials required for reuse.
11. Provision, transportation and placement of all required fill and backfill materials.

B. Related Sections include the following:

1. Division 31 Section "Dewatering" for lowering and disposing of ground water during construction.
2. Division 31 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength 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. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

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

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. 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 Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Geotechnical Engineer. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 2 cu. yd. for bulk excavation or 1 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp flywheel power and developing a minimum of 48,510-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course.

K. Subgrade: Uppermost surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

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

1.4 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Geotextile fabrics.
3. Controlled low-strength material, including design mixture.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 1557 for each on-site and borrow soil material proposed for fill and backfill.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

D. Earth Material Samples: Contractor shall be responsible for obtaining samples (50 lb. minimum) of earthwork materials proposed to be used and transporting them to the site seven calendar days in advance of the time planned for incorporating them into the work. Use of proposed materials by the Contractor prior to testing and approval or rejection shall be at the Contractor's risk. The following information shall be submitted with the samples.

1. Location of borrow source site.
2. Present and past usage of the source site and material.
3. Any previously existing report(s) associated with an assessment of the source site, as relates to the presence of oil or hazardous material.
4. Location within the source site from which the material will be obtained.

E. Up to three test series (gradation and laboratory compaction) will be completed by the geotechnical engineer or owner's agent for off-site borrow sources for each category of earth materials defined in Part 2 of this Section at the Owner's cost. Testing of additional samples or sources shall be at the Contractor's cost. Retesting of failed results as noted above shall be at the Contractor's cost.

1. Sieve analysis to be based on washed sieve analysis in accordance with appropriate ASTM Standard.

F. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

G. Flowable Fill Mix Design: Submit mix design with admixture information for review and approval a minimum of 15 days prior to start of Work.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

B. Earthwork Observation and Testing:

1. The owner and/or owner's agent will retain a qualified Geotechnical Engineer and/or testing agency to perform onsite observation and testing during work under this and

related sections and as indicated in the "Schedule of Special Inspections." The services of the geotechnical engineer/testing agency may include, but not be limited to, the following:

a. Observation during excavation, subgrade preparation and backfill for footings, slabs-on-grade, and subsurface drainage construction, etc.
b. Determination of requirements for additional excavation to remove unsuitable materials.
c. Observation and testing during placement and compaction of fill and backfill.
d. Laboratory testing and analysis of fill materials specified.
e. Review of submittals.

2. During the course of construction the Geotechnical Engineer/testing agency shall advise the owner's agent, in writing, with a copy to the Architect and Contractor, if at any time, in his opinion, the work is not in substantial conformity with the plans and specifications. The Geotechnical Engineer's and/or testing agency's presence does not include supervision of direction of the actual work by the Contractor, his employees, subcontractors or agents. Neither the presence of the geotechnical engineer and/or testing agency, nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
3. Testing equipment will be provided by and testing performed by the Geotechnical Engineer and/or testing agency, except as otherwise provided by contract. Upon request by the owner's agent, the Contractor shall provide such auxiliary personnel and services as needed to accomplish testing work and to repair damage caused thereby to permanent work.
4. References herein to observations, testing and determinations by the "Engineer" include services to be provided by the Geotechnical Engineer and/or testing agency when appropriate and when so authorized by the engineer or owner.

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

1. Before commencing earthwork, meet with representatives of the governing authorities, owner, architect, engineer, consultants, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least three working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

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

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

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

3. Contact utility-locator service for area where Project is located before excavating.

C. Existing Utilities:

1. Notify utility locator service for area where project is located before site clearing or excavating. Contact Dig Safe not less than 3 business days before starting the work. Dig Safe requirements are in addition to local and/or State DOT street opening permit requirements
2. Hire private utility markout service for areas not marked by utility companies. See the "General Conditions" of the construction contract.
3. Before starting excavation, establish location and extent of any underground utilities occurring in work area. Make arrangements with appropriate utility company for removal and relocation of lines which are in the way of excavation. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
4. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner immediately for direction. Cooperate with owner, owner's agent, and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
5. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped. The location of such utilities shall be noted on record drawings and reported in writing to owner's agent. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff services if lines are active.
6. Do not interrupt existing utilities serving facilities occupied and used by owner or others, during occupied hours, except when permitted in writing by owner's agency and then only after arranging to provided acceptable temporary utility services. Provide minimum of 48 hour notice to owner's agent and receive written notice to proceed before interrupting any utility. Do not proceed with utility interruptions without owner's written permission.
7. When in the course of the work it is necessary to connect a utility to a main in a public way, all the requirements of both the authorities governing the utility and those governing the public way shall be met. Pavement shall be temporarily and permanently replaced as directed by these authorities at no additional cost to the owner.

D. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS - GENERAL

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2. Unsuitable Materials also include material containing excessive plastic clay, vegetation, organic matter, debris, pavement, stones or boulders over 6 inches in greatest dimension, and frozen material. Material which, in the opinion of the Geotechnical Engineer, will not provide a suitable foundation or subgrade.

D. On-Site Material: Any suitable material from on-site excavation.

E. Common Borrow: Inorganic mineral soil suitable for embankment construction free from frozen material, perishable rubble, peat and other unsuitable material.

F. Backfill and Fill: Satisfactory soil materials.

G. Unless indicated otherwise, materials shall conform to the "Standard Specification for Highways and Bridges" revision of December 2014, Maine Department of Transportation (abbreviated as MDOT "Standard Specification").

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

I. Granular Borrow: Granular borrow shall be obtained from suitable excavated onsite soil or offsite borrow sources for use as fill and backfill below and interior to building areas except where other materials are specified or detailed, and as detailed on the drawings. Granular borrow shall consist of non-plastic naturally or artificially graded mixture of sound coarse and fine aggregates free of debris, waste, frozen materials and organics and conforming to Maine DOT 703.19

J. Structural fill: Use aggregate material for fill operations. Sieve analysis by weight

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
4 inch	100
3 inch	90-100
1/4 inch	25-90
No. 40	0-30
No. 200	0-6

K. 3/4 Inch Crushed Stone: Crushed stone shall be a quarry product 3/4 inch or washed gravel stone obtained from offsite sources for use as detailed on the drawings. Crushed stone shall consist of durable crushed rock or gravel stone essentially free of silt, clay, loam or other deleterious materials and shall conform to the requirements of 2020 MaineDOT Standard Specification 703.22 Underdrain Backfill Material Type C or 703.13. Use as detailed on the drawings and Geotech report.

L. 1-1/2 Inch Crushed Stone: Crushed stone shall be a quarry product or washed gravel stone obtained from offsite sources for use as detailed on the drawings. Crushed stone shall consist of durable crushed rock or gravel stone essentially free of silt, clay, loam or other deleterious materials and shall conform to the following gradation requirements for the nominal size indicated.

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
2 inch	100

1 □ inch	95-100
□ inch	35-70
3/8 inch	10-30
No. 4	0-5

M. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

N. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

O. Common Borrow: Fill to raise grades in landscape areas should be non-organic compactable earth meeting the requirements of 2014 MaineDOT Standard Specification 703.18 Common Borrow.

P. Soil Materials for Roadways and Parking lots

1. Aggregate Subbase Material: Shall meet the requirements of Maine Department of Transportation Standard Specifications Section 703.06(c), Type D.
2. Aggregate Base Materials: Shall meet the requirements of MDOT Standard Specifications Section 703.06(a), Type A.

2.2 SOIL MATERIALS FOR STRUCTURES

A. Structural fill: Use aggregate material for fill operations. Sieve analysis by weight

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
4 inch	100
3 inch	90-100
1/4 inch	25-90
No. 40	0-30
No. 200	0-6

2.3 PIPE BEDDING MATERIALS

A. Sand: ASTM C 33; fine aggregate.

B. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

C. Bedding Material: Sand or sandy soil free of debris, waste, frozen materials and organics with 100 percent passing a 3/8-inch sieve and not more than 10 percent passing a No. 200 sieve.

D. Granular Pipe Bedding Material: Shall be clean and free of organic matter, silt, or clay lamps, and deleterious materials. The material shall meet the following graduation requirements:

Sieve Designation	Percent by Weight Passing Square Mesh Sieve
1/2 inch	100
No. 4	95-100

No. 40	20-45
No. 200	0-5

E. Crushed Stone Pipe Bedding Material: Crushed Stone, used beneath basement slabs and for underdrain aggregate should be washed □-inch crushed stone meeting the requirements of 2020 MaineDOT Standard Specification 703.13 Underdrain Backfill Material Type.

2.4 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Basis-of-Design Product: Mirafi 140N by Tencate Geosynthetics Americas.
2. Survivability: Class 2; AASHTO M 288
3. Grab Tensile Strength: 157 lbf; ASTM D 4632.
4. Sewn Seam Strength: 142 lbf; ASTM D 4632.
5. Tear Strength: 56 lbf; ASTM D 4533.
6. Puncture Strength: 56 lbf; ASTM D 4833.
7. Apparent Opening Size: [No. 70] sieve, maximum; ASTM D 4751.
8. Permittivity: 0.2 per second, minimum; ASTM D 4491.
9. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Basis-of-Design Product: Mirafi 600 by Tencate Geosynthetics Americas
2. Survivability: Class 2; AASHTO M 288.
3. Grab Tensile Strength: 247 lbf; ASTM D 4632.
4. Sewn Seam Strength: 222 lbf; ASTM D 4632.
5. Tear Strength: 90 lbf; ASTM D 4533.
6. Puncture Strength: 90 lbf; ASTM D 4833.
7. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
8. Permittivity: 0.02 per second, minimum; ASTM D 4491.
9. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355

2.5 FLOWABLE FILL MATERIAL

A. Flowable Fill: Mixture of cement, GranCem, sand, water and admixtures to produce a flowable fill with a 100 psi minimum, 28 day minimum compressive strength.

B. Controlled Low-Strength Material: Low-density, self-compacting, flowable concrete material as follows:

1. Portland Cement: ASTM C 150, Type [I] [II] [or] [III].
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260.

C. Produce low-density, controlled low-strength material with the following physical properties:

D. Produce conventional-weight, controlled low-strength material with 140-psi compressive strength when tested according to ASTM C 495

2.6 RIGID INSULATION

A. Extruded closed – cell rigid foamed polystyrene, 2 inch thickness, width of trench, Styrofoam HI-60 by Dow Chemical, or approved equal.

2.7 ACCESSORIES

A. 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 as follows:

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 as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

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 earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.

D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

E. Provide protective construction fence around all landscaping in work area to remain.

F. Paved surfaces: Do not operate equipment on paved surfaces that will damage surface.

G. Preparation of Building Area for Foundations:

1. The Contractor's bid is to include the costs to excavate and legally dispose of from the site all materials within the building footprint to the subgrade elevations indicated on the drawings, including stripping of topsoil. The Contractor's bid is also to include all excavation of the area of proposed footings plus 2 feet horizontally (minimum) beyond the area of all footings as well as excavation of necessary transitional slopes per OSHA requirements, and backfill with compacted granular fill. The Contractor's bid is to include the removal of all previous construction including existing fill, pavement, foundations, walls, slabs and abandoned utilities from within the limits of the proposed building. Additionally, the Contractor's bid is to include the costs to furnish and place compacted Granular Borrow and base materials to the slab subgrade elevations indicated on the drawings.

H. Excavation of Unsuitable Material within the Influence of the Building Foundations and Slabs-On-Grade: Additional excavation to remove existing fill or other unsuitable material from within the areas of influence of the foundations and below slabs-on-grade shall be conducted when so directed by the Geotechnical Engineer. The horizontal limits of excavation below footing level shall be one foot beyond the outside perimeter of the footing plus an additional one foot for every foot of depth below the footing, unless otherwise directed by the engineer.

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches. The Contractor shall grade and ditch the site as necessary to direct surface runoff away from open excavations.
2. Install a dewatering system, specified in Division 31 Section "Dewatering," to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
3. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to keep all excavations and work sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction product or procedures nor cause excessive disturbance of underlying natural ground or footing and slab subgrades. Contractor shall similarly control water entering the excavation as a result of construction operations, such as washing of concrete equipment and tools and the like.
4. Water from trenches and excavations shall be disposed of in such a manner as will not cause injury to public health, nor damage to public or private property, existing work, or work in progress, nor to the surface of roads, walks and streets, nor cause any undue interference with the use of the same by the public. The Contractor shall comply with all applicable environmental protection and/or sediment/erosion control regulations.
5. Under no circumstances place concrete or fill, or lay piping or install appurtenances in excavations containing free water. Keep utility trenches free from water until pipe joint material has hardened.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 SHEETING, SHORING AND BRACING

A. Refer to Section 315000 "Excavation Support and Protection."

B. Provide sheeting, shoring and/or bracing at excavations as required to assure safety against collapse of earth or rock at sides of excavations; as required for support of adjacent structures, streets or utilities; or as required to comply with federal, state or local regulations, codes or ordinances.

C. Provide materials for sheeting, shoring and bracing, such as sheet piling, uprights, stringers and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down sheeting, shoring and bracing as excavation progresses.

D. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density.

3.4 EXPLOSIVES

A. Explosives: Do not use explosives.

3.5 EXCAVATION, GENERAL

A. Stability of Excavations:

1. Slope sides of excavations to comply with OSHA regulations and local codes. Shore and brace where sloping is not possible because of space restrictions or stability to material excavated.
2. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

B. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

    a. 24 inches outside of concrete forms other than at footings.
    b. 12 inches outside of concrete forms at footings.

c. 6 inches outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs on grade.
f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3.6 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. 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. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate with smooth edge buckets to subgrade, excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Spread Footing Subgrades:

1. Spread footing foundations shall bear on a minimum of 3-inches of compacted crushed stone overlying undisturbed natural inorganic soil or compacted Granular Borrow. The compacted crushed stone shall extend at least one foot horizontally beyond the limits of the footing.
2. Footing subgrades shall be prepared by excavating all existing material to the specified bottom of the footing elevation, 5 feet below proposed grades, or as indicated on the Contract Documents, whichever is lower. Allow the geotechnical engineer to view the excavated subgrade at this level. The geotechnical engineer shall determine whether authorized additional excavation is required to remove unsuitable material. Remove and replace such unsuitable material in accordance with paragraph 3.05 B.2 of this section or as otherwise directed by the engineer.
3. The Contractor shall take every precaution to minimize the disturbance of excavated subgrades in the natural soils. Such precautions shall include, but not be limited to, using excavation buckets without teeth and/or accomplishing excavation to final subgrade with hand tools. All materials disturbed during excavation shall be removed to undisturbed natural soils or re-compacted as directed by the engineer.
4. Refill excavation to the specified bottom of the footing elevation with Granular Borrow placed and compacted in accordance with the requirements of this Section.

C. Subgrade for Slabs-on-Grade:

1. Slabs-on-grade shall be supported on 12 inches of compacted structural fill placed over properly prepared subgrade.
2. Remove and replace excessively wet, disturbed or unstable material and proof compact the subgrade for the slab subbase/base course with at least six passes of a vibratory plate or vibratory roller compactor immediately prior to placement of slab base course material unless otherwise directed.
3. The final surface of the subgrade for the moisture retarder membrane and/or slabs-on-grade shall be proof rolled with at least four passes of an approved vibratory plate or vibratory drum compactor immediately prior to placing the membrane, reinforcing or concrete (as may be applicable).

3.7 EXCAVATION FOR WALKS AND PAVEMENTS

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

B. Saw cut pavement prior to excavation to provide a clean, uniform edge. Minimize disturbance of remaining pavement. Cut and remove the minimum amount of pavement required to do the work.

C. Use shoring and bracing where sides of excavation will not stand without undermining pavement.

3.8 EXCAVATION FOR UTILITY TRENCHES

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

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. 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: 12 inches each side of pipe or conduit, unless indicated otherwise.

C. 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. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.9 SUBGRADE INSPECTION

A. Notify Architect, Geotechnical Engineer and Owner’s agent when excavations have reached required subgrade.

B. If Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed and in accordance with Article “Excavation for Structures” of this section.

C. Proof-roll subgrade as directed by the Geotechnical Engineer and /or owner’s agent.

D. Proof-roll subgrade below pavements with a vibratory roller-compactor to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof-roll with weighing vibratory roller-compactor having a static weight no less than 10 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

E. Authorized Additional Excavation: In the case that unsuitable materials, as determined by the engineer, are encountered at the specified subgrade elevation, the engineer may direct the removal of the unsuitable material and refill with granular fill placed and compacted in accordance with the requirements of this Section. This work will be paid for according to Contract provisions for changes in the Work.

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

3.10 UNAUTHORIZED EXCAVATION

A. Unauthorized Excavation: Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the engineer or owner's agent. Unauthorized excavation, as well as remedial work specified by the engineer, shall be at the Contractor's expense.

1. In areas below structures, pavements and walks, backfill unauthorized excavation with granular fill placed and compacted in accordance with this Section, unless otherwise directed by the engineer.
2. Elsewhere, backfill and compact unauthorized excavations with general fill, compacted to the requirements of this Section.
3. Where the excavation of otherwise suitable materials is required due to these materials being rendered unsuitable due to disturbance, construction activity, freezing or lack of protection from the elements, the Contractor shall excavate these materials and provide remedial work as specified above at no additional cost to the owner.

B. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILL

A. Backfilling Prior to Acceptance of Work Installed:

1. Do not allow or cause the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests and acceptances.
2. Should any of the work be so enclosed or covered up before it has been accepted, uncover all such work at no additional cost to the owner.
3. After the work has been completed, tested, inspected and accepted, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the owner.

B. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

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

D. Unless otherwise specified or indicated on the drawings, the products specified in Part 2 of this Section shall be employed in the various fill and backfill applications indicated in that part. Place and compact fill material in layers to required elevations as follows:

1. Under steps and ramps, use structural fill material.
2. Under building slabs-on-grade, use Granular Borrow, crushed stone and structural fill. See Contract Documents for additional information.
3. Under footings and foundations, use Granular Borrow.
4. Against the interior face of foundation walls, use structural fill material. Use structural fill material to 5'-0" beyond the outside face of foundation walls. Use granular Borrow in paved areas and common borrow in landscaped areas beyond the 4 feet of granular fill. For entrance slabs adjacent to foundations, use Structural Fill for full width thereafter transitioning at a 3H:1V or flatter slope.
5. Against the interior face (retained soil side) of site retaining walls use structural fill material. Use structural fill material to 4’-0” beyond the inside (retained soil side) of site retaining walls. Use granular borrow in paved areas or common borrow in landscaped areas beyond the 4 feet of granular fill.
6. Under utilities, use either bedding material or crushed stone (see drawings).
7. Under equipment pads, use crushed stone.
8. Under grass and planted areas, use common borrow.
9. Under walks and pavements, use base and subbase material.

E. All vegetation, peat, organic topsoil or subsoil, trash, debris, roots, stumps, and any compressible or otherwise deleterious materials shall be stripped from the existing ground surface and removed from excavations prior to placement of fill or backfill.

F. All fill and backfill materials shall be placed in horizontal layers. Each layer shall be spread evenly and thoroughly mixed during spreading to ensure uniformity of material in each layer. Layer thickness shall not exceed 12-inches loose thickness and may be thinner as necessary for the compaction equipment being used.

G. Where horizontal fill layers meet a natural or excavated slope, the layer shall be keyed into the slope by cutting a bench. The surface of benches shall be compacted to the same requirements as apply to the area being filled.

H. In no instance place fill over materials that were permitted to freeze prior to compaction or over ice or snow. Removal of such materials will be required as directed by the engineer. In no case will frozen material be allowed for use in fill or backfill.

I. No fill shall be placed or compacted during unfavorable weather conditions. When work is interrupted by heavy rains or snow, fill operations shall not be resumed until the moisture content and density of previously placed fill are as specified hereinafter.

3.13 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. Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 03 Section "Cast-in-Place Concrete."

D. Backfill under all existing utility pipes crossed during construction operations with □-inch crushed stone. Crushed stone backfill shall extend continuously from the bedding of new utility pipes to the utility pipe crossed, including a 6-inch thick envelope of crushed stone all around the existing utility pipes. Crushed stone backfill shall stand at its own angle of repose. No “haunching” or “forming” with common fill will be allowed.

E. Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.

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

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

G. Electrical and Telecommunications Conduit:

1. Electrical Conduits: Bury beneath finish grade a minimum of 30 inches to top of conduit, or as required by the National Electrical Code or local utility company, whichever is deeper. Surround conduits by a minimum of 6 inches of sand or bedding material.
2. Telephone and Communication Conduits: Bury beneath finish grade a minimum of 30 inches to top of conduit, or as required by the local utility company, whichever is deeper. Surround conduits by a minimum of 6 inches of sand or bedding material.

H. Controlled Low-Strength Material: When directed by the Architect, place initial backfill of controlled low-strength material to a height of 12 inches over the utility pipe or conduit.

I. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

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

K. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

L. Coordinate backfilling with utilities testing.

3.14 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use common borrow.
2. Under walks and pavements, use granular Borrow.
3. Under steps and ramps, use structural fill.
4. Under building slabs, use Granular Borrow and structural fill.
5. Under footings and foundations, use Granular Borrow.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.15 SOIL MOISTURE CONTROL

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

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

B. Moisture Control:

1. Water shall be added to fill material which does not contain sufficient moisture to be compacted to the specified densities. Fill and backfill material containing excess moisture shall be required to dry prior to or during compaction to a moisture content not greater than two percentage points above optimum except that material which displays pronounced elasticity or deformation underfoot or under load shall be required to dry to optimum moisture content before it is placed and compacted, if that is required to achieve specified compaction. At the Contractor’s option, material which is too wet may be removed and replaced with satisfactory material at no additional cost to the owner.
2. The Contractor is alerted to the potential silty nature of the onsite soil which renders them sensitive to moisture. Onsite silty soils are difficult to handle and compact and are easily disturbed when wet. The Contractor shall plan and conduct his excavation and filling operations considering the nature of the onsite materials.

3.16 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12 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.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Vibrations from construction and compaction shall be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site.

D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

E. Allow the geotechnical engineer sufficient time to make necessary observations and tests. The degree of compaction shall be based on a maximum dry density as determined by ASTM Standard D1557 or AASHTO Standard T180. All fill and backfill placed in various areas shall be compacted in individual layers to minimum dry densities as follows:

1. Under Structures, within Building Foundation Backfill Limits, Equipment Pads, Building Slabs, Steps and Pavements: 95 percent.
2. Beside site retaining walls or tank walls: 95 percent
3. Top 2 feet under pavement: 95 percent
4. Below top 2 feet under pavement: 95 percent
5. Trenches through paved areas, top 2 feet: 95 percent
6. Trenches through paved areas, below top 2 feet: 95 percent
7. Trenches through unpaved areas: 92 percent
8. Embankments: 92 percent
9. Pipe Bedding: 92 percent
10. Under pipes through structural fills: 92 percent
11. Underdrain filter sand: 92 percent
12. Sand bedding for conduit: 95 percent
13. Grass and mulch areas: 90 percent
14. Uniformly graded crushed stone materials which are not suited to field density testing shall be compacted in accordance with the minimum compactive effort indicated below.

F. The term "under," as applied to building, structures and paved areas, shall be construed to include all materials immediately below the plan area of the building, as well as those materials within a line sloping at one vertical to one horizontal drawn downward and outward from the exterior of building foundation, structure foundation or paved area.

G. Compaction shall be by mechanical means designed specifically for compaction and approved by the engineer. The engineer reserves the right to disapprove any device or inadequate capacity or of type unsuited to the character of the material being compacted. In areas which are too restricted to permit the use of mechanical compactors, fill may be placed in 3 inch layers and compacted by hand rammer or pneumatic tools.

H. In addition to the stated degree of compaction, all fill and backfill shall receive at least the compactive effort given in the following table. Lift thickness shall not exceed that shown for the compaction method selected, except that the first lift of fill or backfill placed over natural ground in wet conditions may be as much as 12 inches thick. Application of the minimum compactive

effort does not relieve the contractor from his requirement to achieve the specified degree of compaction.

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness	Maximum Loose Lift Thickness	Minimum Number of Passes	Minimum Number of Passes
		Below Structures and Pavement	Less Critical Areas	Below Structures and Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	3”	6”	8”	6	4
Hand-operated vibratory drum rollers weighting at least 1,000 lbs	6”	8”	10”	6	4
Hand-operated vibratory drum rollers weighting at least 3,000 lbs	6”	8”	14”	6	4
Hand-operated vibratory drum rollers weighting at least 5,000 lbs	6”	8”	18”	6	4
Hand-operated vibratory drum rollers weighting at least 8,000 lbs	6”	8”	24”	6	4

I. Where the engineer determines that fill or backfill does not conform to the compacted density specified, or did not receive the minimum compactive effort specified, such fill shall be removed and replaced with conforming materials at the Contractor’s own cost.

J. Backfilling of Walls:

1. Do not backfill against walls until completion of slabs-on-grade, structural framing and suspended slabs which provide lateral support to these walls. In placing backfill, take special care to prevent any wedge action, eccentric loading or overloading by equipment used in backfilling and compaction. See Contract Documents for additional requirements.
2. Do not use equipment weighing more than 5,000 lbs. within 10 feet of all walls. Equipment weighing more than 5,000 lbs. shall not be used adjacent to walls, except as expressly approved by the engineer.
3. Backfill shall be placed concurrently on all sides of shafts, tunnel, and freestanding walls, each lift being compacted on all sides before successive lifts are placed. See Contract Documents for additional requirements.
4. Prevent damage to wall waterproofing or dampproofing when backfilling.

3.17 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.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

D. Maintenance:

1. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
2. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.18 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Division 33 Section "Subdrainage."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer with a minimum of two passes of a plate-type vibratory compactor.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with 1 layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.
2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

D. Drainage Backfill for Site Retaining Walls: Place and compact structural fill material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with 1 layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each granular fill material layer to specified compaction of soil backfills and fills requirements.
2. Place and compact impervious fill over drainage backfill in 6-inch thick compacted layers to final subgrade.

3.19 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade, where indicated on the plans, according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase and base course to required crown elevations and cross-slope grades.
4. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.20 DRAINAGE COURSE

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

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. 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 1557.

3.21 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

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

D. Footing Subgrade: At footing subgrades, each soil stratum will be verified by a Geotechnical Engineer to confirm subgrade preparation and ability to support design bearing capacities.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

1. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
2. When field in-place density tests are performed using nuclear methods, make calibration checks for both density and moisture gages at the beginning of work, on each different type of material encountered and at intervals as directed by the engineer.
3. Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
4. Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests along a wall face.
5. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
6. Pavement areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.22 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.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil 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.

3.23 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. If hazardous waste or special waste as defined by the U.S. Environmental Protection Agency or State Department of Environmental Protection is encountered during excavation, the Contractor shall avoid disturbance of that material, and shall notify the Architect immediately.

END OF SECTION

SECTION 312319

DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes construction dewatering.

B. Related Sections:

1. Division 31 Section "Earth Moving" for excavating, backfilling, site grading, and for site utilities.
2. Division 31 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

1.3 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Remove dewatering system when no longer required for construction.

1.4 ACTION SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.

2. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and professional engineer.

B. Field quality-control reports

C. Other Informational Submittals:

1. Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Pre-installation Conference: Conduct conference at the Project site.

1. Review methods and procedures related to dewatering including, but not limited to, the following:
   a. Inspection and discussion of condition of site to be dewatered including coordination with temporary erosion control measures and temporary controls and protections.
   b. Geotechnical report.
   c. Proposed site clearing and excavations.
   d. Existing utilities and subsurface conditions.
   e. Coordination for interruption, shutoff, capping, and continuation of utility services.
   f. Construction schedule. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   g. Testing and monitoring of dewatering system.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Architect / Owner no fewer than three days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Architect’s / Owner’s written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical report is referenced elsewhere in the Project Manual.

C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Use)

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 dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section "Erosion and Sedimentation Controls" and Division 31 Section "Site Clearing" during dewatering operations.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 FIELD QUALITY CONTROL

A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.

3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION

SECTION 312500

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. The Work of this Section is integral with the whole of the Contract Documents and is not intended to be interpreted outside that context.

C. Erosion control narrative and details shown on the project plans.

D. Maine Department of Transportation Standard Specifications March 2020 Edition.

E. Maine Department of Environmental Protection Erosion and Sediment Control Best Management Practices Manual (October 2016) and Field Guide for Contractors (2014).

1.2 SUMMARY

A. Provide all labor, materials, equipment, services and accessories necessary to furnish and install the Work of this Section, complete and functional, as indicated in the Contract Documents and as specified herein.

B. This Section includes but may not be limited to the following:

1. Temporary and permanent erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
2. Inspection, repair, and maintenance of erosion and sedimentation control measures during construction until permanent vegetation has been established.
3. Removal of erosion and sedimentation controls and restoration and stabilization of areas disturbed during removal.

C. Related Sections include the following:

1. Section 311000 “Site Clearing” for site stripping, grubbing, stripping and stockpiling topsoil.
2. Section 312000 "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

A. MDOT: Maine Department of Transportation.

B. MDEP: Maine Department of Environmental Protection.

1.4 PERFORMANCE REQUIREMENTS

A. Environmental Licensing Requirements: All construction is subject to review and/or inspection by local, State, and Federal agencies for adequacy of erosion and sedimentation control measures. Take necessary steps to prevent soil erosion. Refer to publications of the Maine DEP (MDEP) and the Maine Soil and Water Conservation Commission for additional prevention measures to stop soil erosion and follow MDEP "Best Management Practices."

B. Erosion and Sedimentation Control Guidelines: "Maine Erosion and Sediment Control BMPS," published by the Bureau of Land and Water Quality Maine Department of Environmental Protection, latest revision March 2015.

1.5 SUBMITTALS

A. Product Data: For each manufactured product indicated. Include manufacturer's instructions for installation.

B. Provide to the Engineer, in writing, a time schedule outlining the sequence of construction for site Work.

1.6 SEQUENCING AND SCHEDULING

A. Conduct operations in conformity with all Federal and State permit requirements. Plan the sequence of construction so that the smallest practical area of land is exposed at any one time during construction. Schedule the Work such that sedimentation barriers are installed early in the construction sequence, to prevent sediments from uphill areas reaching streams, wetlands, or property lines.

B. Provide to the Engineer, in writing, a time schedule outlining the sequence of construction for site Work.

C. See Plans for erosion and sedimentation control requirements.

D. See plans for fall and winter (September 15 or Later) stabilization requirements.

E. Stabilize exposed soils throughout the project site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed, Fertilizer and Lime: Shall be as specified under Erosion Control Notes on Drawings.

B. Mulch: Comply with the requirements of MDOT Standard Specification, Section 619.

C. Erosion Control Mesh: North American Green DS150 blanket conforming to MDOT Standard Specification, Section 613 or as approved by the Engineer

D. Siltation Fence:

1. Support Fence: 30 inch high livestock fence, or high strength plastic mesh.

2. Post: Rolled steel manufactured line post or 2 inch diameter hardwood post, 4.5 feet in length.

3. Fabric: Pervious sheet of synthetic polymer meeting the following minimum requirements.

a. Mirafi Silt Fence or approved equal.

4. Pre-manufactured Silt Fencing systems: Separate support fence may be eliminated if fabric is manufactured with reinforcement, including top cord,

a. ProPex Silt Stop; Amoco Fabrics and Fibers Co.

E. Crushed Stone: Durable, clean, angular rock fragments obtained by breaking and crushing rock material; 2 to 3-inch stone.

F. Erosion Control Mix: Mix may be manufactured on or off project site.

1. Mix shall consist primarily of organic material, separated at the point of generation, and may include shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems.

a. Wood chips, ground construction debris, reprocessed wood products, or bark chips shall not be acceptable as the organic component of the mix.

2. Mix shall contain well-graded mixture of particle sizes and may contain rocks less than 4 inches in diameter. Mix shall be free of refuse, physical contaminants, and material toxic to plant growth.

3. Mix composition shall meet the following standards.

a. Organic matter content shall be between 20 and 100 percent, dry weight basis.
b. Particle size by weight shall be 100 percent passing a 6-inch screen, and a minimum of 70 percent and a maximum of 85 percent passing a 0.75-inch screen.
c. Organic portion shall be fibrous and elongated.
d. Large portions of silts, clays or fine sands are not acceptable in the mix.
e. Soluble salts content shall be less than 4.0 mmhos/cm.
f. Mix pH shall fall between 5.0 and 8.0.

G. Catch Basin Inserts: SiltSacks or approved equal.

H. Hay Bales: Bales shall be at least 14" x 18" x 30" in size, staked twice per bale. Stakes shall be 1" x 1" x 36" wooden. Place bales with twine on sides of bale, not top and bottom.

I. Water, calcium chloride, or crushed stone for prevention of airborne dust.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Prior to grubbing, stripping, excavation, placement of fill, temporary or permanent placement of excavated materials, or other earthwork, the Contactor shall implement erosion and sedimentation control measures as specified herein and indicated on the plans.

B. A silt fence, filter berm, or stone sediment dam shall be installed along the down-slope side of the construction site, as necessary, to prevent soil sediment migration away from the site. Install silt fence or filter berm along the down-slope side of all top-soil and subsoil stockpiles.

C. Temporary measures for controlling erosion and sedimentation may include, but are not limited to, the following:

1. Siltation fencing around the downslope periphery of areas to be disturbed by construction.
2. Filter Berm around the downslope periphery of areas to be disturbed by construction.
3. Temporary seeding and mulching of soil stockpiles or disturbed areas.
4. Temporary sedimentation basins, siltation traps, stone check dams and other temporary practices as approved by the Engineer.

D. Permanent measures for controlling erosion and sedimentation shall be provided as shown on the drawings or required by these Specifications.

E. Where disturbed areas cannot be permanently stabilized within 14 days of exposure of the soil, the areas shall be temporarily seeded and mulched, or otherwise stabilized as approved by the Engineer.

F. Permanent soil stabilization measures for all slopes, channels, ditches, or any disturbed land area shall be completed within 7 calendar days after final grading has been completed. Where such permanent erosion control measures are not possible or practical to implement, and upon approval by the Engineer, temporary stabilization practices shall be applied as in 3.1.C above.

G. All temporary and permanent control measures shall be periodically inspected and maintained by the Contractor for the duration of the construction and warranty period of this Contract. Sediment collection devices shall be cleaned periodically as required, and the removed material reused or disposed of at an approved disposal area.

3.2 SURFACE WATER DIVERSION

A. Build, maintain, and operate all cofferdams, channels, flumes, sumps, and other temporary diversion and protection Works needed to divert streamflow and other surface water through or around the construction site and away from the construction Work while construction is in progress.

B. Outlet diverted stormwater and water from excavations to sedimentation trap or basin or other approved sedimentation control measure.

3.3 SILTATION FENCE

A. Construct siltation fences at the locations and to the dimensions indicated, and as required to meet specified criteria.

B. Set fence post 6 feet O.C. to a depth of 2 feet. Attach support fence to post with fencing staples or appropriate wire ties.

C. Overlap joints in support fence 12 inches. Apply fabric to full height of support fence and secure to prevent sagging, blow off, and loss. A 12-inch overlap of fabric for vertical piecing shall be maintained, folded to a 3 inch width and securely attached to supports.

D. No horizontal joints will be allowed.

E. The bottom of the fabric shall be trenched into the existing ground a minimum of 6 inches. In addition, hay bales or ditch checks shall be installed along the silt fence to create sedimentation pools in low areas where run-off concentrates.

F. Prior to removal of the silt fence, all retained soil or other material shall be removed and disposed of at an approved disposal area

3.4 FILTER BERM

A. Place un-compacted erosion control mix in a windrow at locations shown on the plan or as directed by the Engineer.

1. At a minimum the berm shall be 3 feet wide at the base and 2 feet high at the center of all points along its length.
2. Berm material, where the berm is still required, which has decomposed, clogged with sediment, eroded, or becomes ineffective, shall be replaced.
3. The berm shall be removed from the site when no longer required, as determined by the Engineer.

3.5 TEMPORARY SEEDING AND MULCHING

A. Topsoil stripped and stockpiled on site shall be immediately seeded with erosion control seed mix and mulched with hay.

B. Exposed earthwork areas, which will not be worked on for one week, shall be hay mulched. Unfinished areas which are not to be worked on for one month, or will be wintered, shall be seeded with erosion control mix at a rate of 4 pounds of seed per 1000 sq. ft. and mulched with hay. Apply hay mulch at the rate of 3 tons per acre such that no soil is exposed. Anchor mulch to prevent wind blown movement.

C. In sensitive areas (within 25 ft. of stream or wetland edge) temporary mulch must be applies within 7 days of initial disturbance and prior to any storm event.

D. Winter Mulch: If the catch of grass is less than 75 by November 15, apply additional hay mulch to achieve a protective layer of 5 tons per acre. Anchor mulch with mesh to prevent wind blown movement.

E. No fill shall be placed on hay mulch. Dispose of used hay mulch off site.

3.6 FALL AND WINTER STABILIZATION

A. Stabilize exposed soils throughout the project site with permanent seed and mulch by September 15, with the exception of areas undergoing active earthmoving operations. These construction areas are primarily in the immediate vicinity of the building. For proposed grass areas not stabilized by permanent seed and mulch by this date, provide the following stabilization measures at no additional cost to the Owner. Select the appropriate methods from the options listed and obtain approval from the Engineer prior to installation.

1. Stabilize the soil with temporary vegetation, except for ditches, by October 1. Place winter rye seed at the rate of 3 pounds per 1000 sq. ft. and lightly much with hay or straw at 75 pounds per 1000 sq. ft. Place erosion control mesh over mulch and anchor.
2. For slopes flatter than 3H:1V, place sod over the exposed soil by October 1. Roll the sod, anchor it with wire pins, and water it to promote growth.
3. For grassed areas flatter than 10H:1V, stabilize the disturbed soil by November 1 with temporary winter mulching by applying hay or straw at a rate of at least 150 pounds per 1000 sq. ft., such that no soil is visible through the mulch. An-chor mulch with erosion control mesh.
4. For slopes steeper than 10H:1V and flatter than 2H:1V, place a 6" layer of ero-sion control soil/bark mix on the disturbed soil by November 1. Remove snow accumulated on the slope prior to installation. If groundwater seeps are pre-sent, place stone rip rap to thickness shown on drawing details over non-woven geotextile.
5. For drainage ditches or channels, place a sod lining by October 1 or place a rip rap lining by November 1. Sod shall be rolled, fastened with wire pins, anchored with erosion control mesh, and watered. Rip rap shall be placed at the thickness shown on the drawing details over a layer of non-woven geotextile.

B. If the catch of permanent or temporary grass is less than 3" tall or covers less than 75 of the disturbed soil by November 1, apply additional hay mulch at a rate of 150 pounds per 1000 sq. ft. Anchor mulch with erosion control mesh.

3.7 DUST CONTROL

A. Provide dust control measures to prevent off-site damage, health hazard to humans, wildlife and plant life, or become a traffic safety hazard.

B. To the maximum extent as is practicable

1. Use traffic control to restrict traffic to predetermined routes.
2. Maintain as much natural vegetation as possible.
3. Use phasing of construction to reduce the area of land disturbed at any one time.
4. Use temporary mulching, permanent mulching, temporary vegetative cover, permanent vegetative cover, or seeding to reduce the need for dust control.
5. Use mechanical sweepers on paved surfaces where necessary to prevent dust buildup.
6. Stationary sources of dust, such as rock crushers, shall utilize fine water sprays to control dust.

C. Moisten exposed soil surface periodically with adequate water to control dust.

D. Where other methods are not practical, use of calcium chloride will be permitted. Spreader at a rate that will keep surface moist but not cause pollution or plant damage. To reduce potential for environmental degradation, use only when other methods are not practical. In areas adjacent to waterways and sensitive environmental areas, verify materials and procedures with governing authority.

E. Cover surface with crushed stone or coarse gravel. In areas adjacent to waterways, use chemically stable aggregate.

F. When temporary dust control measures are used, repetitive treatment shall be applied as needed to accomplish control.

3.8 CONSTRUCTION DEWATERING

A. Water from construction dewatering operations shall be cleaned of sediment before reaching wetlands, water bodies, streams, or site boundaries. Utilize temporary sediment basins, erosion control soil filter berms, silt fencing, block and gravel catch basin inlet protection, or other approved Best Management Practices (BMPS).

B. In sensitive areas, near streams or ponds, discharge the water from the de-watering operation into a temporary sediment basin created by a surrounding filter berm of uncompacted erosion control soil mix. Locate the temporary sediment basin at least 100 feet from the nearest water body, such that the filtered water will flow through undisturbed vegetated soil areas prior to reaching the water body or property line.

3.9 ADDITIONAL MEASURES

A. Areas outside the Contract Work limits shall be protected from lubricants, fuel, sediment and other pollutants.

B. Catch basin inlets in gravel or paved areas shall be surrounded by a sediment barrier of hollow concrete blocks 12" to 24" high covered with wire mesh of 1/4" opening. Pile well graded crushed stone of 1/2" to 2" stone size around the mesh to the top of the blocks.

C. Catch basin inlets in grassed areas shall be protected by hay bales or block and gravel sediment filter until permanent soil stabilization has been achieved.

D. Inspect erosion and sedimentation control weekly and after every storm and maintain in good working condition for project duration.

3.10 REMOVAL AND DISPOSAL

A. After permanent soil stabilization has been achieved, temporary materials and devices that are not readily degradable shall be removed and disposed of offsite. Silt fences, filter berms, and catch basin sediment filters shall be fully removed.

B. Repair areas disturbed by temporary materials and removal operations to match surrounding finished surfaces. At natural vegetation areas to remain, restore to match existing.

END OF SECTION

SECTION 315000

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes temporary excavation support and protection systems.

B. Related Sections:

1. Division 31 Section "Dewatering" for dewatering system for excavations.
2. Division 31 Section “Earth Moving” for excavating and backfilling, for controlling surface-water runoff and ponding, and for dewatering excavations.

1.3 PERFORMANCE REQUIREMENTS

A. Furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

A. Shop Drawings: For excavation support and protection system.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Other Informational Submittals:

1. Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.

2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.

    a. Note locations and capping depth of wells and well points.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:

    a. Geotechnical report.
    b. Existing utilities and subsurface conditions.
    c. Proposed excavations.
    d. Proposed equipment.
    e. Monitoring of excavation support and protection system.
    f. Working area location and stability.
    g. Coordination with waterproofing.
    h. Abandonment or removal of excavation support and protection system.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Architect / Owner no fewer than three days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Architect's / Owner's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
2. The geotechnical report is referenced elsewhere in the Project Manual.

C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Not used.

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 that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
2. Fill voids immediately with approved backfill compacted to density specified in Division 31 Section "Earth Moving."
3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems

END OF SECTION

SECTION 321216

ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cold milling of existing hot-mix asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt patching.
5. Asphalt surface treatments.

B. Related Sections:

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.
2. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants and fillers at paving terminations.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
2. Job-Mix Designs: For each job mix proposed for the Work.
3. Job Mix Designs: Contractor shall submit a mix design using either the “Marshall Stability” or “Superpave” Mix Design Submittal Forms, included in this specification, for each pavement course proposed for construction for the Owner’s review and approval 45 days prior to schedule production and placement of the mix.
4. “Marshall Stability” design mix submittals shall include type/name of mix, gradation analysis, grade of asphalt cement, Marshall Stability in pounds flow, effective asphalt content in percent ( ), and corresponding copies of the Maine Department of Transportation (MDOT) material specifications.
5. “Superpave” design mix submittals may be submitted in lieu of a “Marshall Stability” design mix, meeting the specifications of the Maine Department of Transportation.

6. Paving Geotextile

B. For qualified manufacturer and Installer.

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

D. Material Certificates: Contractor shall submit certificates stating that asphalt mix to be supplied complies with the specifications of the Maine Department of Transportation, as well as copies the regulatory specifications corresponding to the asphalt mix formula and material. The certificates shall be signed by the asphalt mix producer and the Contractor.

E. Material Test Reports: For each paving material.

F. Material Test Reports: Provide two copies of each test.

1. Aggregate Material: Submit laboratory test reports that aggregates used in the bituminous mix conform to Section 703 of the MDOT Specifications.
2. Asphalt Cement: Submit laboratory test reports that bituminous material used in the bituminous mix conforms to Section 702 of the MDOT Specifications.
3. In-Place, Compacted Bituminous Concrete Mix: Submit laboratory test reports of samples cut from the in-place, compacted pavement indicating the percentage of theoretical maximum density (TMD), based on laboratory specimens of the mix combined in the proportions of the job mix formula.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be registered with and approved by authorities having jurisdiction and the MDOT.

B. Qualifications of Bituminous Concrete Producer: Use only materials which are furnished by a bulk bituminous concrete producer regularly engaged in production of hot-mix, hot-laid bituminous concrete.

C. Paving Contractor: Paving contractor shall be listed in the MDOT prequalified contractor list for paving projects and shall be valid at time of paving operations.

D. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated

E. Testing Agency Qualifications: Use only recognized commercial testing laboratories with not less than 5 years of experience in conducting tests and evaluations of bituminous concrete materials and design.

F. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MaineDOT for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

G. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review condition of subgrade and preparatory work.
c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
e. Review required testing and acceptance of work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 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. Tack Coat and Prime Coat: Minimum ambient temperature in the shade is 40 degree F and rising, immediately prior to application;
2. Asphalt Base Course: Minimum surface temperature of 40 degree F and rising at time of placement;
3. Asphalt Binder (Intermediate) Course: Minimum surface temperature of 40 degree F and rising at the time of placement; and,
4. Asphalt Surface Course: Minimum surface temperature is above 50 degree F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Aggregates: Conform to Section 703 of MDOT Specifications.

2.2 ASPHALT MATERIALS

A. Asphalt Cement: Conform to Section 702 of MDOT Specifications.

B. Tack Coat - emulsified asphalt applications shall meet the requirements of AASHTO M140 and meet MDOT specifications.

C. Water: Potable.

D. Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.3 MIXES

A. Hot Mix Asphalt – Per MDOT approved mix.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

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

C. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

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

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.3 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 as indicated on the drawings.
2. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
3. Control rate of milling to prevent tearing of existing asphalt course.
4. The Contractor shall coordinate the adjustment of manholes, meter boxes, drainage inlets, and valve boxes with the milling operation.

5. Repair or replace curbs, manholes, and other construction damaged during cold milling.
6. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
7. Patch surface depressions deeper than 1 inch after milling, before wearing course is laid.
8. Transport milled hot-mix asphalt to asphalt recycling facility.
9. Keep milled pavement surface free of loose material and dust.

B. All milled material shall become the property of the Contractor and shall be disposed of off-site or used in conformance with Section 312000, Earthwork, or for utilization as Reclaimed Asphalt Pavement, in conformance with the specification provided above, as approved by the Owner.

3.4 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 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. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
3. For patching where base or intermediate pavement is present, provide horizontal tack coat.

D. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.5 REPAIRS

A. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess

3.6 SURFACE PREPARATION

A. Proofroll crushed aggregate base in conformance with Section 312000 Earthwork, immediately prior to paving.

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

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
3. Adequate traffic control shall be provided to prohibit traffic from traversing applied area.
4. Any foreign matter on tack coat is to be removed and area re-tacked before applying pavement.

3.7 HOT-MIX ASPHALT PLACING

A. Plant Mix Hot Bituminous Pavement: Produce and place in conformance with Section 401 of MDOT Specifications.

B. 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. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 275 deg F and maximum temperature of 325 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

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

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

D. 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.

3.8 PAVEMENT OVERLAY

A. Raise all utility structures to grade.

B. Sweep entire area clean of all sand, dirt and debris.

C. Apply tack coat to all existing paved surfaces which abut proposed pavement.

3.9 TEMPORARY TRENCH PAVEMENT REPAIR

A. After trenching operations are complete, the Engineer may order temporary pavement repair.

B. Material: As specified within Contract Documents, meeting MDOT specifications.

C. Clean surfaces of existing pavement which will be bonded to the temporary pavement. Apply tack coat.

D. Place material to a compacted depth of 2 inches.

E. Maintain temporary pavement smooth, free from potholes and to required grade.

F. Periodically inspect temporary pavement areas and repair as necessary, especially during the Winter months when the temporary pavement remains in place for an extended period. The Owner's Representative shall have the authority to order repair by the Contractor to areas which are, in his opinion, in unsatisfactory condition.

3.10 PERMANENT TRENCH PAVEMENT REPAIR

A. Saw edges of existing pavement to provide a vertical bonding face.

B. Remove temporary paving and sawn out existing paving.

C. Reset manhole frames and covers.

D. Apply a tack coat to the sawn edges.

E. Apply hot mix asphalt as directed by Contract Documents.

F. Roller compact both courses, compacting the final wear course to meet existing pavement surfaces exactly

3.11 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints as shown on Drawings.
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.12 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 95 percent of reference maximum theoretical density according to ASTM D 2041 for binder (intermediate) and surface courses.
2. Average Density: 95 □ 2.5 of reference maximum theoretical density according to ASTM D2041 for base courses.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.13 INSTALLATION TOLERANCES

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

1. Base Course: Plus or minus 1/4 inch.
2. Binder (Intermediate) Course: Plus or minus 1/4 inch.
3. Surface Course: Plus or minus 1/4 inch.

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

1. Base Course: 1/4 inch.
2. Binder (Intermediate) Course: 1/4 inch.
3. Surface Course: 1/4 inch.

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

C. Contractor's duties relating to testing include:

1. Notify Owner 72 hours prior to asphalt paving;
2. Notifying laboratory of conditions requiring testing; and
3. Coordinate with laboratory for field testing.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Testing agency shall be paid by the Owner.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples, at random locations, of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

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

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements at no cost to the Owner.

3.15 DISPOSAL

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

1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION 321613.19

CONCRETE SLIPFORM CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. State of Maine, Department of Transportation, Standard Specifications, Revision of November 2014, and all revisions/amendments thereto, hereafter designated as MDOT Specifications.

1.2 SUMMARY

A. This Section includes the following:

1. Slipform curbing.

B. Related Sections include the following:

1. Division 31 Section "Earth Moving" for excavation and compacted subgrade.

1.3 DESCRIPTION OF WORK

A. Provide all materials, equipment, and labor necessary for the placement of slipform concrete curbing as shown within the Contract Documents and as specified herein.

1.4 PROJECT CONDITIONS

A. Work on Public Ways: Comply with all regulations and requirements of local/state agencies having jurisdiction.

B. Weather Limitations: Comply with requirements in MDOT.

PART 2 - PRODUCTS

2.1 CONCRETE SLIPFORM CURBING

A. Concrete for slipform shall be Class A meeting the requirements of 502.05 of the MaineDOT Specifications with the exception that chloride permeability will be waived. This includes a minimum compressive strength of 4,000 psi. Entrained air will meet current requirements of 6.0-9.0 . Depending on aggregate source proposed use, the ASR requirement will be enforced and may require a pozzolan addition to the mix.

B. Apply salt guard penetrating sealant to all concrete curb.

C. Apply epoxy binding agent to surface of pavement to receive concrete curb.

D. Concrete shall include polyester fibers shall be uniformly incorporated into the dry mix at a rate of 0.25 percent of the total batch weight. Certification shall be provided from the supplier with each shipment meeting the following requirements:

1. Average Length 0.25 inches □ 0.005.
2. Average Diameter 0.0008 inches □ 0.0001.
3. Specific Gravity 1.32-1.40
4. Melting Temperature 480 □F Minimum

PART 3 - EXECUTION

3.1 PLACEMENT OF CURBING

A. Installation of Slipform Curb:

1. Set curb on a compacted HMA base paving.
2. Apply epoxy bonding agent.
3. Deposit, consolidate, and slip form the concrete to the required section.
4. Protect as specified for concrete pavement in Section 321313.
5. Concrete shall be placed with an approved slipform machine that will produce a finished product according to the design specified in the plans and will meet the same standards set for cast-in-place curbing. For cold weather slipforming, the outside temperature must be at least 36□F and rising. The curb shall be placed on a firm, uniform bearing surface, shall conform to the section profile specified in the plans and shall match the appropriate grade. Proper curing shall be insured through the use of a curing compound spray that meets AASHTO M 148, Type 2 Liquid Membrane-Forming Compounds for Curing Concrete. Expansion joints will be provided at ends of curve radii or wherever the curb meets rigid structures such as building foundations or fire hydrants. Contraction joints will be placed at 10 foot intervals using sawing methods, which cut 1-3" into the concrete. Joints shall be constructed perpendicular to the subgrade and match other joints in roadways, sidewalks or other structures when applicable. Construction joints will be used at the end of a day’s construction or when the placement of concrete is interrupted by more than 30 minutes. The use of an insert bar to create a plane of weakness will not be permitted, control joints will be used.
6. Slipform curbing must be adequately protected after placement. The concrete shall be allowed to cure for at least 72 hours. During cold weather conditions, when temperatures drop below the required temperature of 36□F after placement, curbing shall be protected by concrete blankets or a combination of plastic sheeting and straw. After any placement of slipform curbing, regardless of weather conditions, the placed curbing shall be adequately protected by traffic control devices and flagging as necessary.
7. Backfilling:

    a. Fill all remaining spaces under the curb with approved material and thoroughly hand tamped so the stones will have a firm uniform bearing on the foundation for the entire length and width.
    b. Fill any remaining excavated areas surrounding the curb to the required grade with approved materials. Place this material in layers not exceeding 8 inches in depth, loose measure and thoroughly tamped.

8. Finsihing:

a. Finished surface of the curb roughened by brooming lightly or other method acceptable to the Owner.
b. Membrane curing compounds shall be a Type 2, white pigmented product selected from Maine Department of Transportation's Qualified Products List of concrete curing compounds. Curing compound will be applied in two applications immediately after the final finishing. The second application will be perpendicular in direction to the first application to ensure complete coverage.
c. Any voids or surface irregularities shall be repaired using the concrete grout from the same concrete load and a float shall be used on the repaired areas prior to texturing.
d. All edges of concrete shall be rounded with an approved edging tool while the concrete is still plastic and shall leave a true smooth surface.

3.2 PROTECTION

A. Protect the curb and keep in good condition. Clean all exposed surfaces smeared or discolored and restored to a satisfactory condition or the curb stone removed and replaced.

END OF SECTION

SECTION 321613.33

ASPHALT CURBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Asphalt curbing.

B. Related Sections include the following:

1. Division 31 Section "Earth Moving" for excavation and compacted subgrade.

1.3 SUBMITTALS

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

1. Submit laboratory test reports of the stockpiled aggregates initially used in the mix and additional test reports for each change of source per MDOT Section 401.
2. Submit laboratory test reports for asphalt cement used in the initial mix and additional test reports for each change of source per MDOT Section 401.
3. Job-Mix Designs: Certification, by MDOT, of approval of each job mix proposed for the Work per MDOT Section 401.

1.4 QUALITY ASSURANCE

A. State of Maine Department of Transportation (MDOT): Standard Specifications for Highways and Bridges (Latest Edition).

1.5 PROJECT CONDITIONS

A. Hot bituminous mixtures used for curb or other incidentals are not subject to season limitations, except that weather conditions shall be satisfactory for proper handling and finishing of the mixture. Unless otherwise specified, bituminous plant mix shall not be placed on a wet surface or a frozen surface. The air temperature shall be a minimum of 40°F and rising.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The materials and their use shall conform to the requirements of Section 401 – Hot Mix Asphalt Pavement of the MDOT Standard Specifications.

2.2 MIXES

A. The materials and their use shall conform to the requirements of Section 401 – Hot Mix Asphalt Pavement of the MDOT Standard Specifications.

PART 3 - EXECUTION

3.1 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread mix at minimum temperature of 250 deg F.

1. Asphalt Mix: Same as pavement surface-course mix.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.2 PROTECTION

A. Protect the curb and keep in good condition. Clean all exposed surfaces smeared or discolored and restored to a satisfactory condition or the curb removed and replaced.

END OF SECTION

SECTION 321723

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pavement-marking paint.

B. Related Sections:

1. Division 32 Sections for other paving installed as part of crosswalks in asphalt pavement areas.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

A. Product Data: Provide data on paint products.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.6 PROJECT CONDITIONS

A. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Paint for Pavement Marking: White, yellow and blue as shown on Drawings meeting the requirements of AASHTO M248, Type N.

B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with MDOT Specifications, Section 708.03 (Type F).

1. Color: Match existing.

2.2 EQUIPMENT

A. Equipment used for the application of pavement striping shall be fully powered and of standard commercial manufacture. Truck mounted equipment may be approved is, in the opinion of the Owner's Representative, the quality of the work of the machine is satisfactory.

PART 3 - EXECUTION

3.1 PREPARATION

A. The use of white and yellow materials will require thorough cleaning of equipment so as not to mix the colors. Any mixture of colors will be deemed sufficient reason for rejection of the work be the Owner's Representative, and replacement by the Contractor.

3.2 LAYOUT

A. The transverse lines, established by the Contractor for control of striping, shall be chalked as a guide and shall be approved by the Owner's Representative before the application of any striping. The length of line shall be measured and marked by the Contractor for the locations listed below. All pavement markings shall be in accordance with the applicable sections of the Manual of Uniform Traffic Control Devices for Streets and Highways, 2001 edition, or most recent.

B. Stripe parking lot spaces and any other pavement graphics shown/detailed on Drawings with 4” wide striping. Fire lanes, crosswalks, etc. to be marked as shown on Drawings. The Universal Handicap Symbol, as detailed on Plans, shall be painted at the designated handicapped stalls. The drop-off strips between the handicapped stalls shall be painted solid blue with non-skid surfaces.

3.3 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Owner's Representative.

B. Allow paving to age for 48 hours before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint in accordance with MDOT Standard Specifications, Section 627.

E. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.4 PROTECTION

A. Place temporary barriers to keep traffic off paint throughout required drying time.

3.5 CLEANING

A. If for any reason, paint is spilled or tracked on the pavement, or any markings applied by the Contractor, in the Owner's Representative's judgment, fail to conform to the requirements of this Section, because of a deviation from the desired pattern, the Contractor shall remove such paint by a method that is not injurious to the pavement surface and is acceptable to the Owner's Representative, clean the pavement surface and prepare the surface for a reapplication of markings; and reapply the markings as directed without additional compensation for any of the foregoing corrective operations.

END OF SECTION

SECTION 329200

TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Sodding.

B. Related Sections:

1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
2. Division 31 Section "Earth Moving" for excavation, filling and backfilling, and rough grading.
3. Division 32 Section "Plants" for border edgings.
4. Division 33 Section "Subdrainage" for subsurface drainage.

1.3 DEFINITIONS

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

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

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

D. 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.

E. 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.

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

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

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

I. 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.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Qualification Data: For qualified landscape Installer.

D. Product Certificates: For soil amendments and fertilizers, from manufacturer.

E. Material Test Reports: For standardized ASTM D 5268 topsoil, and imported or manufactured topsoil.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

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. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network or Maine Nursery and Landscape Association:

    a. Certified Landscape Technician - Exterior, with installation, maintenance specialty areas, designated CLT-Exterior.
    b. Certified Turfgrass Professional, designated CTP.
    c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.
    d. Certified Horticulturist- Maine Nursery and Landscape Association

5. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

6. IPM Plan with anticipated timeline of applications, target pest species, and products
7. Pesticide Applicator: State licensed, commercial.

C. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

D. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for turf growth.

    a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

E. Preinstallation Conference: Conduct conference at project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in

TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, and soil amendments with appropriate certificates.

1.7 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Planting Completion.

1. Spring Planting: April 1st - July 20th
2. Fall Planting: September 5th – November 10th

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.8 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: 60 days from date of planting completion.

    a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 60 days from date of planting completion

B. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Grass Seed Mix: Proprietary seed mix as follows:

1. Products: Subject to compliance with requirements,

a. Johnathan Green- Black Beauty Cool-Season Mix

b. MDOT Park Mix

2.2 TURFGRASS SOD

A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

2.3 INORGANIC SOIL AMENDMENTS

A. Inorganic soil amendments may solely be justified by a soil test of the target soils
1. Following guidelines in the submittals section

B. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
1. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
2. Provide lime in form of ground dolomitic limestone or calcitic limestone depending on recommendations from the soil test

C. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.

D. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

E. Aluminum Sulfate: Commercial grade, unadulterated.

F. Perlite: Horticultural perlite, soil amendment grade.

G. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.

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

I. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

J. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.4 ORGANIC SOIL AMENDMENTS

A. Organic soil amendments may solely be justified by a soil test of the target soils
   1. Following guidelines in the submittals section

B. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through **1 2-inc (12.5-mm)** 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 as follows:

   1. Organic Matter Content: 50 to 60 percent of dry weight.

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

D. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

E. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

F. Manure: Well-rotted, un-leached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5 FERTILIZERS

A. Fertilizer shall contain available elements in conformity with the standards of the Association of Official Agricultural Chemists. The fertilizer shall indicate the weight, contents and guarantee analysis shown thereon or on a securely attached tag, as applicable.

   1. Water soluble fertilizer shall be completely soluble in water and contain the following percentages of available nutrients by weight. It shall contain a coloring agent.

      a. Nitrogen: 16 percent.
      b. Phosphoric Acid: 0 percent.
         1) Unless justified by Soil Test
      c. Potash: 16 percent.

B. 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: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.6 PLANTING SOILS

A. Planting Soil ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. With Amendments recommended by a Soil test following the standards set in the submittals section.

B. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, 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 surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. With Amendments recommended by a Soil test following the standards set in the submittals section.

C. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

1. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch (25 mm) or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes, grubs, other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled, pore-space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
2. Mix imported topsoil or manufactured topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. With Amendments recommended by a Soil test following the standards set in the submittals section.

2.7 MULCHES

A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

2.8 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.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.9 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

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

    a. Invisible Structures, Inc.; Slopetame 2.
    b. Presto Products Company, a business of Alcoa; Geoweb.
    c. Tenax Corporation - USA; Tenweb.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.
    a. Replace Grade stakes in kind if displaced or damaged

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted if recommended by soil test

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches (200 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

2. Spread planting soil to a depth of 6 inches (150 mm) but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.
    b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 6 inches (150 mm).
3. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches (100 mm) of soil. Till soil to a homogeneous mixture of fine texture.

4. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
5. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Preparation of Disturbed Areas:

1. Topsoil salvaged from the site or imported should be screened to remove all coarse fragments that would be objectionable for the proposed athletic field and lawn areas.
2. After spreading at least 4 inches of salvaged or imported topsoil over the new athletic fields and lawn areas, we recommend rototilling the topsoil to a depth that will penetrate 2 to 3 inches into the underlying substrate in order to create a transitional horizon between the substrate soils and topsoil. The rototilling should be done so that the topsoil is well mixed with the upper portion of the substrate soil. This may require several passes with the rototiller and some drying may be needed between passes to provide good mixing and proper consistence of the topsoil material.
3. After rototilling the topsoil to create a transitional horizon, we recommend adding organic matter (manure, composted leaves, or a mix of readily degradable organic matter) to increase organic matter content, cation exchange capacity, water holding capacity and general tilth of the soil, and this increase the ability of the soil to accept and grow grass. Specifically, we recommend rototilling 3 inches loose depth of organic material into the top 4 inches of topsoil. The area should then be carefully graded and prepared for seeding.
4. We recommend that new topsoil areas be fertilized according to the recommendations specified in the Maine Soil Testing Service reports.
5. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
6. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

E. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

F. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.
2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate recommended by Manufacturer

C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.

3.6 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre (15.6-kg/92.9 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.7 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.8 TURF RENOVATION

A. Renovate existing turf.

B. Renovate existing turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

I. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots and meet finish grades.

J. Apply seed and protect with straw mulch or sod as required for new turf.

K. Water newly planted areas and keep moist until new turf is established.

3.9 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet or rain forecasted the day of mowing. Schedule initial and subsequent mowings to maintain 3" Grass Height:

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen recommended by soil tests to turf area.

E. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
1. Do not apply herbicides of any kind to establishing turf for 1 month post establishment.

3.10 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
3. Satisfactory Plugged Turf: At end of maintenance period, the required number of plugs has been established as well-rooted, viable patches of grass, and areas between plugs are free of weeds and other undesirable vegetation.
4. Satisfactory Sprigged Turf: At end of maintenance period, the required number of sprigs has been established as well-rooted, viable plants, and areas between sprigs are free of weeds and other undesirable vegetation.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.11 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.
1. Do not apply to newly established turf for 1 month after germination.

3.12 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 329300

PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Planting soils.
3. Tree stabilization.

B. Related Sections:

1. Division 01 Section "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Division 12 Section "Site Furnishings" for exterior unit planters.
3. Division 31 Section "Site Clearing" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
4. Division 31 Section "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
5. Division 32 Section "Turf and Grasses" for turf (lawn) and meadow planting, hydroseeding, and erosion-control materials.
6. Division 33 Section "Subdrainage" for below-grade drainage of landscaped areas, paved areas, and wall perimeters.

1.3 DEFINITIONS

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

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than sizes indicated.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

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

G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

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

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

J. 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.

K. 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.

L. Planting Area: Areas to be planted.

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

N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

O. 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.

P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

Q. 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.

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

S. 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.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, including soils.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.
3. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 10 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:

1. Trees and Shrubs: Three samples of each variety and size delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
2. Organic Mulch: 1-quart (1-liter) volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Mineral Mulch: 2 lb (1.0 kg) of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
4. Weed Control Barrier: 12 by 12 inches (300 by 300 mm).
5. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

C. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

D. Certification:

1. For information only, submit 2 copies of certificates of inspection as required by governmental authorities, and manufacturer's or vendor's analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
2. Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

E. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

F. Material Test Reports: For standardized ASTM D 5268 topsoil, existing native surface topsoil, existing in-place surface soil, and imported or manufactured topsoil.

G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

H. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network and/or Maine Nursery and Landscape Association:

    a. Certified Landscape Technician - Exterior, with installation, maintenance specialty area(s), designated CLT-Exterior.
    b. Certified Landscape Technician - Interior, designated CLT-Interior.
    c. Certified Ornamental Landscape Professional, designated COLP.
    d. Certified Horticulturist, Maine Nursery and Landscape Association.

5. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Landscape Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.

    a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such

problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Landscape Architect, who will tag plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

G. Preinstallation Conference: Conduct conference at Project site.

H. Source Quality Control:

1. General: Ship landscape materials with certificates of inspection as required by governmental authorities. Comply with governing regulations applicable to landscape materials.
2. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis and approval by a Maine Certified Landscape Professional (207-225-3998).
3. Topsoil: Before delivery of topsoil, furnish written statement giving location of properties from which topsoil is to be obtained.
4. Plant Material:

    a. Plant materials shall mean trees, shrubs, ground covers, and plants of all descriptions, required to be furnished for the project and shall conform to all provisions of ANSI Z60.1.
    b. Substitutions: In the event that trees, shrubs, or other plant material specified in the plant list are in the opinion of the Contractor, impossible or unreasonably difficult to obtain, the Contractor shall immediately notify the Owner's Representative to discuss appropriate substitutions. No substitutions of plant material may be made without the prior approval of the Owner's Representative. When authorized, adjustment of Contract amount will be made.

5. Inspection: The Owner's Representative reserves the right to inspect any plant materials either at the place of growth or at the site before planting, for compliance with requirements for name, variety, size, quality and health.
6. All Work of planting shall be done by a proficient landscape Contractor with five years minimum experience.
7. The plant supplier/nursery shall be ALCA certified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable. Protect materials from deterioration during delivery, and while stored at the site.

B. Plant Materials:

1. In preparing plants for moving, all precautions customary in good trade practice shall be taken. All plants shall be dug immediately before moving unless otherwise specified. Broken, loose, or manufactured balls will be rejected.
2. All plants shall be packed, transported, and handled with utmost care to insure adequate protection against injury and drying. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.
3. Deliver plant materials after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set all plants in shade, protect from weather and mechanical damage, and keep roots moist.
4. Label all plant materials of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

D. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

E. 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.

F. Handle planting stock by root ball.

G. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

H. 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.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. Notify Landscape Architect, Construction Manager, Owner no fewer than two days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Landscape Architect's, Construction Manager's, Owner's written permission.

C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: April 10th – July 20th.
2. Fall Planting: September 10th – November 20th.

D. Planting and Seeding Seasons: Unless variance is requested in writing and approved by the Owner's Representative, planting and seeding shall be done within the following dates:

1. Lawns: April 1 - November 10.
2. Plant Materials:

    a. Potted and Container Spring: April 1 - July 15.
    b. Grown Plants Fall: Aug. 15 - Nov. 15.

3. Balled and Burlapped Spring: April 1 - June 15.
4. Plants Fall: Aug. 15 - Oct. 15.

E. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

F. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization

2. Warranty Periods from Date of Planting Acceptance:

a. Trees, Shrubs, Vines, and Ornamental Grasses: 24 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
c. Annuals: Three months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: 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: 12 months from date of planting completion.

B. Initial Maintenance Service for Ground Cover and Other Plants: 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: Three months from date of planting completion.

C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 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.

1. All plants shall be nursery grown unless otherwise stated, and shall have been growing under the same climatic conditions as the location of this project for at least two (2) years prior to award date of this contract.
2. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.
3. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. 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.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.
1. Contractor to remove all labels, tag tape, or other label after planting acceptance by Landscape Architect.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals and perennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom unless otherwise approved by Landscape Architect.

G. Deciduous Shrubs: Provide balled and burlapped (B&B) deciduous shrubs otherwise noted in plant list. Container grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs as approved by the Owner's Representative.

H. Coniferous and Broadleafed Evergreens: Provide balled and burlapped (B&B) evergreens. Container grown evergreens will be acceptable as approved by the Owner's Representative.

I. Deciduous Trees: Provide balled and burlapped (B&B) deciduous trees unless otherwise noted in plant list. Container grown deciduous trees will be accepted in lieu of balled and burlapped deciduous trees as approved by the Owner's Representative.

J. Ground Cover: Provide plants established and well-rooted in removable containers or integral peat pots and with no less than the minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed.

2.2 INORGANIC SOIL AMENDMENTS

Inorganic Soil amendments to be justified by Soil Tests provided as a submittal.

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

1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
3. Provide lime in form of ground dolomitic limestone, or calcitic limestone.
    a. Justified application by soil test data

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.

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

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3 ORGANIC SOIL AMENDMENTS

Organic Soil Amendments are to be justified by Soil Test data

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 6.5; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (13-mm) 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 as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

B. Peat Humus: Peat humus shall be a natural peat approved by the Owner's Representative consisting or sedge, sphagnum or reed peat of such physical condition as will pass through a 1

in. screen and will be readily incorporated with the topsoil. The peat humus shall be free from sticks, stones, roots and other objectionable matter.

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

D. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

E. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

2.4 FERTILIZERS

A. Fertilizer: Fertilizer shall contain available elements in conformity with the standards of the Association of Official Agricultural Chemists. The fertilizer shall indicate the weight, contents and guarantee analysis shown thereon or on a securely attached tag, as applicable.

1. Granular fertilizer shall be a commercial grade fertilizer containing the nutrients recommended by the soil test data.

2. Water soluble fertilizer shall be completely soluble in water and contain containing the nutrients recommended by the soil test data.

3. Slow release fertilizer packets shall be slow release fertilizer contained in a polyethylene perforated bag with micropore holes. Each bag shall contain 4 ounces of minimum water soluble fertilizer to be effective for 8 years. Packages shall contain the following percentage of available elements by weight.

    a. Nitrogen 20 percent
    b. Phosphoric Acid 0 percent
        1) Unless otherwise justified by Soil Test Data
    c. Potash 5 percent

B. The Owner's Representative may approve the use of other fertilizers providing they contain an equivalent amount of nutrients in an acceptable form.

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: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

E. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Size: 10-gram tablets.
2. Nutrient Composition: 20 percent nitrogen, 0 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

F. Bio-Stimulant- Liquid or Granular mycorrhizal stimulant.

2.5 TOPSOIL

A. Loam or approved topsoil removed within the confines of the project area shall be reused in accordance with Section 312000, Earthwork. If quantity of stockpiled topsoil is insufficient, provide new topsoil which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2 in. in any dimension, and other extraneous or toxic matter harmful to plant growth. Sand, silt, and clay contents comprising existing or new topsoil shall fall within the following ranges:

1. Sand 50 - 70
2. Silt 2 - 40
3. Clay 10 - 28

B. Submit representative soil samples of new topsoil from off-site sources as well as existing topsoil removed from within confines of site to qualified soil testing laboratory to ascertain what amendments may be necessary to obtain proper tilth, nutrient characteristics, and pH balance in accordance with the following. Provide amendments as necessary at rates indicated on the soil test.

1. Organic Matter: greater than 5 organic matter (by weight).
2. pH Range: 5.8 to 6.2.
3. Phosphorus/Potassium: medium to medium high range.
4. Soluble Salt: not greater than 500 ppm.

2.6 PLANTING SOILS

A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Recommendations based on Soil Test Data

B. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from agricultural land**,** bogs, or marshes.

1. Additional Properties of Imported Topsoil or Manufactured Topsoil: Screened and free of stones 1 inch (25 mm) or larger in any dimension; free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth; free of obnoxious weeds and invasive plants including quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass; not infested with nematodes; grubs; or other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration.

Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.

2. Mix imported topsoil or manufactured topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

    a. Amendment and Weight justified by Soil test Data

2.7 MULCHES

A. Planting Bed Mulch: Provide shredded bark mulch for planting beds. Do not use material that is decayed or mixed with soil, weeds or other foreign matter. Use material that is large enough in size to prevent it from drifting and blowing in normal wind storms. Submit samples to Owner's Representative for approval prior to delivery of bark mulch to site.

B. Anti-Erosion Mulch: Use "Erosionet" or similar mulch where slopes are too severe to be maintained by planting bed mulch alone.

C. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: **Groun or s re e bar**
2. Size Range: 2 inches (76 mm) maximum, 1/2 inch (13 mm) minimum.
3. Color: Natural.

2.8 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.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.9 TREE STABILIZATION MATERIALS

A. Wrapping: Wrapping material for tree trunks shall be furnished in strips approximately 4 to 6 inches wide consisting of first quality, 8 oz. per sq. yd. burlap, approved waterproof paper tape or polyethylene film, ASTM D 2103.

B. Stakes and Guys:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
2. Wood Deadmen: Timbers measuring 8 inches (200 mm) in diameter and 48 inches (1200 mm) long, treated with specified wood pressure-preservative treatment.
3. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.

4. Flags: Standard surveyor's plastic flagging tape, 6 inches (150 mm) long. To be removed after plant acceptance.
5. Proprietary Staking-and-Guying Devices: Proprietary stake and adjustable tie systems to secure each new planting by plant stem; sized as indicated and per manufacturer's written recommendations.

    a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

        1) Arborbrace; ArborBrace Tree Guying System.

C. Root-Ball Stabilization Materials:
1. Proprietary Root-Ball Stabilization Devices: Proprietary at- or below-grade stabilization systems to secure each new planting by root ball; sized per manufacturer's written recommendations unless otherwise indicated.

    a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

        1) Border Concepts, Inc.; Tomahawk Tree Stabilizers.
        2) Foresight Products, LLC; Duckbill Rootball Fixing System.
        3) Tree Staple, Inc.; Tree Staples.

2.10 MISCELLANEOUS PRODUCTS

A. Anti-Desiccant: Emulsion type, film-forming agent or Wilt-Pruf by Nursery Specialty Products, Inc., designed to permit transpiration but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

B. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

C. Burlap: Non-synthetic, biodegradable.

D. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8

E. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

F. Water: Water used for landscape work shall be free from oil, acids, alkalis, salts, or other substances harmful to plants.

G. Gator Bags or approved Equal for maintenance irrigation on trees

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Landscape Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

G. Preparation of Planting Soil: Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth. Mix specified soil amendments with topsoil at the rates specified. Unless otherwise specified or indicated on the Drawings, the following planting soil mixture (thoroughly mixed by volume) shall be used for

backfill around trees and shrubs: dehydrated processed manure 1 part; topsoil 8 parts; peat moss 3 parts.

3.3 PLANTING AREA ESTABLISHMENT

A. Preparation of Planting Beds: Loosen subgrade of planting bed areas to a minimum depth of 6 in. using a cultimulcher or similar equipment. Remove stones over 1 1/2 in. in any dimension, and sticks, stones, rubbish and other extraneous matter. Spread planting soil mixture to the 6" minimum depth and as required to meet lines, grades and elevations shown, after light rolling and natural settlement.

B. Loosen subgrade of planting areas to a minimum depth of 12 inches (300 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Thoroughly blend planting soil off-site before spreading
      a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
      b. Mix lime with dry soil before mixing fertilizer.
   2. Spread planting soil to a depth of 12 inches (300 mm) 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.
      a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches (100 mm) of subgrade. Spread remainder of planting soil.

C. 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.

D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

E. Application of Mycorrhizal Fungi: At time directed by Landscape Architect, broadcast dry product uniformly over prepared soil at application rate recommended by product label.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Excavate pits in accordance with Typical Planting Details with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation. For balled and burlapped (B&B) trees and shrubs, make excavations at least twice as wide as the ball diameter and a minimum of 1 ft. 6 in. wider than root spread.

B. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. With Hand tools trim perimeter of hole 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 with hand tools.
   1. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.

2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
3. If area under the plant was initially dug too deep, add soil with hand tools to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
4. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
5. Maintain supervision of excavations during working hours.
6. Keep excavations covered or otherwise protected after working hours.

C. Subsoil and topsoil removed from excavations may not be used as planting soil.

D. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

E. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

F. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

G. Use water to compact backfill of trees and shrubs. Do not use mechanical means to compact planting soils.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements. Do not damage crown of plant material.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.

1. Use planting soil for backfill.
2. 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. Backfill around root ball in layers, tamping or flooding with water 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.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process.

6. Water again after placing and tamping final layer of soil.

D. Set container-grown stock plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.

1. Use planting soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. 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.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. 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.

F. Dish completed planting pits to form shallow (4") saucer to collect water. Mulch pits, trenches and planted areas with at least 4 in. thickness of shredded bark or equivalent substitute approved by Owner's Representative.

G. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage. If deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting.

H. Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice. Remove dead, broken, or diseased branches. Prune trees to retain required height and spread. Unless otherwise directed by the Owner's Representative, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune shrubs to retain natural character and accomplish their use in the landscape design. Pruning cuts shall be made to outside the branch color or branch bark ridge; tree paint is not permitted. Required shrub sizes are the size after pruning. Remove and replace excessively pruned or misformed stock resulting from improper pruning.

I. Wrap tree trunks of 2 in. caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunks for injury, improper pruning and insect infestation and take corrective measures required before wrapping. Wrapping shall only be present from November 1st to April 1st.

J. Injuries on tree trunks may be treated according to standard horticultural practices. Multiple injuries on trunks of trees will not be accepted.

K. Immediately after planting, guy and stake trees of 1-1/2 in. caliper or larger or over 6 ft. in height on planting schedule. Allow plants to have normal sway to promote strong growth.

L. Plant labels shall be removed immediately by contractor after acceptance by Landscape Architect.

3.6 FERTILIZING TREES AND SHRUBS

A. Water Soluble Fertilizer:

1. The first liquid feeding will be permitted as the first watering only during backfilling of the plant, unless otherwise directed by the Owner's Representative. All seedlings will be liquid fed during planting. The second liquid feeding will be made the following spring season, no later than June 30th.
2. Liquid fertilizer shall be completely dissolved and mixed in water at the rate recommended on the product label.
3. The resulting solution shall be poured in the plant pit as directed by the Owner's Representative. A second application at the same rate shall be applied as directed by the Owner's Representative. The solution shall be applied at the following rates for each application:

    a. Plants up to 2 ft. in height shall receive 4 quarts.
    b. Plants above 2 ft. and up to 6 ft. shall receive 6 quarts.
    c. Plants above 6 ft. and up to 12 ft. shall receive 12 quarts.
    d. Plants above 12 ft. shall receive 16 quarts.

B. Slow Release Fertilizer Packets:
1. All woody plants except evergreen seedlings shall be fertilized with slow release fertilizer packets at the time of planting, unless otherwise directed by the Owner's Representative. Fertilizer packets shall be placed equidistantly within the planting pit adjacent to the ball or root mass, but not in direct contact with roots. Placement depth shall be 6 to 8 inches. Packets shall not be cut, ripped or damaged.
2. If it becomes necessary to remove and replace dead or unhealthy plants, damaged or broken packets shall be replaced with new packets. The application rates shall be as follows:

Type of Plants	No. of Packets
Evergreen Trees	
Under 18 inches height	1
18 inches to 3 ft. height	2
3 ft. to 6 ft. height	3
Over 6 ft. height	4
Deciduous Trees	
Under 6 ft. height	2
6 ft. to 12 ft. height or under 4 in. caliper	3
Over 4 inches caliper	4
Shrubs	
Under 2 ft. height or spread	1
2 ft. to 3 ft. height or spread	2
Over 3 ft. height or spread	3
Vines and Ground Covers	1

3.7 TREE, SHRUB, AND VINE PRUNING

A. 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 TREE STABILIZATION

A. Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

B. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated.

1. Proprietary Root-Ball Stabilization Device: Install root-ball stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.9 GROUND COVER AND PLANT PLANTING

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

B. Use planting soil for backfill.

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

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

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

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

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

3.10 PLANTING AREA MULCHING

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

1. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 2-inch (50-mm) average thickness, with 36-inch (900-mm) radius around trunks or stems. Do not place mulch within 6 inches (150 mm) of trunks or stems.

2. Organic Mulch in Planting Areas: Apply 3-inch (75-mm) average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches (75 mm) of trunks or stems.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, 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 integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 PLANT ACCEPTANCE

A. The acceptability of the plant material furnished and planted under this Contract shall be at the end of a period of establishment, during which the Contractor, as necessary, shall employ all possible means to preserve the plants in a healthy and vigorously growing condition and to insure their successful establishment. The establishment period shall extend for a period of one (1) calendar year from the date of final acceptance of the project. During this period, the Contractor shall water, cultivate and prune the plants, repair guy wires and stakes, mouse bait as may be required and do any other work necessary to maintain the plants in a healthy growing condition. This shall include seasonal spraying with approved insecticides or fungicides as may be required. The Contractor shall also be responsible for protecting the plants from mice and other rodents. All dead or rejected plants shall be promptly removed from the project and replaced by live healthy plants meeting the same specifications, if such plants are declared unacceptable during this planting season. Otherwise, they shall be replaced during the next subsequent planting season. No payment shall be made for unsatisfactory work during the establishment period.

B. The period of establishment shall commence at the date of final acceptance. Necessary replacements shall be made so that at the time of final acceptance all plants shall be in a healthy, vigorous growing condition and free from sizable die-back.

C. It shall be the sole responsibility of the Contractor to replace any unsatisfactory plants on the project regardless of whether they are specifically designated by the Owner's Representative. In the case of individual doubtful plants, the Contractor may call upon the Owner's Representative to make a determination as to their acceptability, but it shall not be incumbent on the Owner's Representative to furnish the Contractor with exact lists of replacements.

D. All replacements of plants shall be completed by the end of the planting season prior to the final acceptance date. Any small quantity of plants which fail between the end of the planting season and the final acceptance date shall be canceled from the list of accepted plants and the Contractor will receive no payment for them. If a sizable number fails, the Owner's Representative may extend the date of final acceptance to the subsequent planting season, in which case, the Contractor will be subject to liquidated damages, to be established by the Owner’s Representative. All replacement planting shall conform in every way to the

requirements of the original planting. The Owner's Representative may require that any replacement plants that are not dormant, or that are planted late in the season, be sprayed, as directed, with an approved anti-desiccant.

3.13 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.14 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. 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.

C. After installation and before Substantial Completion remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.15 RESTORATION

A. All pavements, seeded and planted areas, structures and substructures not specifically provided for in the contract disturbed by the Contractor during the execution of the work shall be restored by the Contractor, in a manner satisfactory to the Owner's Representative, to their original conditions at no additional cost to the Owner.

3.16 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 330513

MANHOLES AND CATCH BASINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes storm drainage structures outside the building, with the following components:

1. Precast catch basins.
2. Stormwater inlets.
3. Frames, covers and grates.

B. Related Sections include the following:

1. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.
2. Division 31 Section "Dewatering" for dewatering of excavations.
3. Division 31 Section "Excavation Support and Protection" for protection of excavations.

1.3 SUBMITTALS

A. Product Data: Manufacturers' product data and installation instructions for frames, covers, grates, precast items, manhole sleeves, joint sealants and frost barrier.

B. Shop Drawings: For the following:

1. Catch Basins: Include plans, elevations, sections, details, and frames, covers, and grates.
2. Stormwater Inlets: Include plans, pipe penetrations elevations, sections, details, and frames, covers, and grates.

C. Antifloatation Slab Design Certificate: The Contractor may provide the precast structures requiring antifloatation slabs as one complete unit. If provided as a monolithic unit, submit a certificate of design signed by a Professional Engineer licensed in the State of Maine, certifying that the structure including the slab has been designed to withstand all forces including soil, traffic and hydrostatic in accordance with all applicable laws, regulations, rules and codes.

D. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Provide complete catch basin and precast concrete structures capable of supporting AASHTO H20 loading.

B. All precast concrete shall comply with ASTM C913 “Standard Specification for Precast Concrete Water and Wastewater Structures.”

C. Precast Catch Basin Components: ASTM C478.

D. Average strength of 4,000 psi at 28 days.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Handle structures according to manufacturer's written rigging instructions.

B. Structure shall be stored in a manner that will not cause harm to the integrity of the structure of to the general public.

PART 2 - PRODUCTS

2.1 CATCH BASINS

A. Provide complete precast concrete structures capable of supporting AASHTO H-20 loading. Precast concrete shall comply with ASTM C913 "Standard Specification for Precast Concrete Water and Wastewater Structures

B. Base Sections: Precast monolithic construction. Drain manholes shall have steps.

C. Barrel Sections: Precast. Drain manholes shall have steps.

D. Top Sections: Precast concentric cone, eccentric, or flat cover if required by grade.

E. Steps: Conform to ASTM C478 for load carrying capacity and pull out resistance, installed at 12- inches on center forming a continuous ladder. Acceptable manufacturers: Reliable Steel Products, Inc., M.A. Industries, Inc. or equal to above.

F. Pipe to Manhole Connections:

1. Pipe to Manhole connections shall be flexible, watertight manhole sleeves.
2. Cast into the manhole base and sized to the type of pip being used
3. Type of flexible joint being used shall be approved by the Engineer. Install materials according to the Manufacturer’s instruction. Acceptable manufacturers; Lock Joint any Interpace Corporation, Kor N Seal by Trelleborg, Press Wedge II by Press-Seal Gasket Corporation, A-Lok Manhole Pipe Seal by A-Loc Corporation, or approved equivalent.

G. Joints between precast sections: Watertight, shiplap type, seal with two rings of 1-inch diameter butyl rubber sealant.

2.2 PRE-CAST CONCRETE RISERS

A. General: Reinforced Precast Concrete circular rings as shown within contract plans. Provide with four 1-inch vertical cast through holes

2.3 STORMWATER INLETS

A. Nyloplast Field Inlet: Basin diameter shall be a minimum of 12-inches.

1. Pipe outlet: Material to be HDPE or PVC pipe; install watertight joint adapter per manufacturer.

B. Frames and Grates: Dimensions, opening pattern, free area, and other attributes indicated.

2.4 CONCRETE

A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.5 MASONRY MATERIALS

A. Concrete Masonry Units: ASTM C139.

B. Mortar: Type M, ASTM C270. Use Type II Portland cement, Type S lime. Proportions for Mortar: 1 part Portland cement, 1/4 part hydrated lime,3 to 3 3/4 parts sand.

2.6 BRICK

A. Brick for structures shall meet the latest AASHTO Specification Designation M-91.

2.7 FRAMES, GRATES AND COVERS

A. Cast iron: ASTM A48 Class 30.

B. Castings shall be smooth with no sharp edges.

C. Constructed to support H-20 loading.

D. Catch Basin Frames and Grates: Castings shall be from East Jordan Foundry, refer to Contract Documents for casting model number and application.

2.8 MISCELLANEOUS

A. Joint Sealants: Butyl Rubber Sealant: One inch diameter strips as manufactured by Kent Seal, or Engineer approved equal.

B. Dampproofing: Bituminous coating to be Dehydrate No. 4 Dampproof by W.R. Grace of Bitumastic Super Service Black by Koppers Co. for field application, or Engineer approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.2 CATCH BASIN INSTALLATION

A. Placement: Place bases on compacted bedding material so catch basins structure is plumb and pipe inverts are at proper elevations. Place barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink grout.

B. Joints: Follow manufacturer’s instructions for sealing joints between precast sections. Provide two rings of 1-inch diameter butyl rubber sealant. Point joints inside and out with butyl caulk.

C. Frame and covers: Set to final grade as shown on the drawings. Use two rings of 1-inch diameter butyl rubber sealant between frame and chimney joints. Provide downward force to frame so as to compress the joint and provide a watertight seal and prevent future settlement. Point compressed joint with butyl rubber caulk sealant.

D. Inverts: See detail on drawings.

3.3 STORMWATER INLET INSTALLATION

A. Placement: The backfill material shall be crushed stone or other granular material meeting the requirement sf class II material as defined in ASTM D2321. Bedding and backfill for surface drainage inlets shall be placed and compacted uniformly in accordance with ASTM D2321.

B. Frame and covers: Set to final grade as shown on the drawings.

C. Inverts: See detail on drawings.

3.4 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318/318R.

3.5 ALTERING EXISTING MANHOLES AND CATCH BASINS

A. When altering existing manholes or catch basins, the structure shall be dismantled sufficiently to allow reconstruction in accordance with the applicable requirements as shown on the Drawings for complete manholes. Each altered manhole or catch basin shall be cleaned of all accumulated silt, debris or foreign matter prior to final acceptance of work.

3.6 CLOSING ABANDONED MANHOLES AND CATCH BASINS

A. Abandoned Manholes or Catch Basins: Excavate around manhole or catch basin as required and use either procedure below:

1. Remove manhole or catch basin and close open ends of remaining piping.
2. Remove top of manhole or catch basin down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted fill. Fill to top with concrete.

B. Backfill to grade according to Division 31 Section "Earth Moving."

3.7 FIELD QUALITY CONTROL

A. Testing and Acceptance: All sanitary sewer components shall comply with the testing requirements of the Waterville Sewerage District.

1. General:

   a. Perform either a vacuum test or combination of the exfiltration and infiltration tests on all manholes.
   b. All testing must be performed in the presence of the District
   c. Suitably plug all pipes entering each manhole and brace plugs to prevent blow out.

2. Exfiltration Tests After Backfilling:

   a. Fill each manhole with water to the top of the manhole frame.
   b. A period of up to 2 hours may be permitted, if the Contractor so wishes, to allow for absorption.
   c. At the end of the absorption period, refill each manhole with water to the top of the manhole frame and begin the 4-hour test period.
   d. At the end of the 4-hour test period, refill each manhole to the top of the manhole frame and measure the volume of water added. The leakage for each manhole shall not exceed 1/16 gallon per foot of diameter per vertical foot (above ground water) per 4-hour period.

3. Infiltration Tests:

   a. When the groundwater is above the bottom of the manhole, infiltration testing may be performed on that portion of the manhole below water level.

b. After a 15-minute period, if no water is visibly moving down the interior surfaces of a manhole, the portion of the manhole below groundwater may be considered to be satisfactorily watertight.
c. The remaining portion above the groundwater level must be tested for exfiltration as specified above.

4. Vacuum Test:

   a. The manhole shall be tested by a vacuum test after assembly of the manhole, connection piping and backfilling.
   b. Plug all lifting holes completely with non-shrink grout.
   c. Properly tighten all boot clamps and brace all plugs to prevent them from being sucked into the manhole.
   d. Install the testing equipment according to the manufacturer's instructions.
   e. A vacuum of 10 inches of Hg shall be drawn on the manhole and the loss of 1 inch of Hg vacuum timed. The manhole shall be considered to have passed the test if the time for the loss of 1 inch of Hg vacuum is two (2) minutes or longer.
   f. If the manhole fails the initial test, the Contractor shall locate the
   g. If the manhole fails the initial test, the Contractor shall locate the leak(s) and make repairs. The manhole shall be retested until a satisfactory test result is obtained.
   h. If a satisfactory vacuum test cannot be obtained, the manhole shall be water exfiltration tested and repaired as necessary.

5. Manhole Repairs:

   a. Correct leakage by reconstruction, replacement of gaskets and/or other methods as approved by the District.
   b. The use of lead-wood or expanding mortar will not be permitted.

6. After the manholes have been backfilled and prior to final acceptance, any signs of leaks or weeping visible inside the manholes shall be repaired and the manhole made watertight.

END OF SECTION

SECTION 334100

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes gravity-flow, nonpressure storm drainage outside the building, with the following components:

1. Storm drain piping.

1.3 DEFINITIONS

A. PE: Polyethylene plastic.

B. PVC: Polyvinyl chloride plastic.

1.4 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: 10-foot head of water. Pipe joints shall be at least silttight, unless otherwise indicated.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Storm drain piping.
2. Special pipe fittings.

B. Field quality-control test reports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than three days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

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

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.3 PE PIPE AND FITTINGS

A. Corrugated PE Drainage Pipe and Fittings NPS 10 and Smaller: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Product: N-12 ST by Advanced Drainage Systems, Inc. (ADS)
2. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
3. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

B. Corrugated PE Pipe and Fittings NPS 12 to NPS 48: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Product: N-12 ST by Advanced Drainage Systems, Inc. (ADS)
2. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
3. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.4 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings, NPS 15 (DN 375) and Smaller: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

2.5 NONPRESSURE-TYPE PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
   1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
   2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Nonpressure-Type Rigid Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.

   1. Available Manufacturers:

      a. ANACO.

2.6 POLYMER-CONCRETE, CHANNEL DRAINAGE SYSTEMS

A. Description, General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total lengths indicated.

B. Available Manufacturers:
   1. ACO Polymer Products, Inc. or Approved Equal

C. Sloped-Invert, Polymer-Concrete Systems: Include the following components:

   1. Channel Sections: Interlocking-joint, precast, modular units with end caps. Include 8-inch inside width and deep, rounded bottom, with built-in invert slope of 0.5 percent and with outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.

      a. Frame: Include gray-iron or steel frame for grate.

   2. Grates with manufacturer's designation "Load Class: B," with slots or perforations that fit recesses in channels.

      a. Material: Gray-iron or approved equal.

   3. Covers: Solid gray iron, if indicated.

   4. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

2.7 RIGID INSULATION

A. Extruded closed – cell rigid foamed polystyrene, 2-inch thickness, width of trench, Styrofoam HI-60 by Dow Chemical, or approved equal.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.2 PIPING APPLICATIONS

A. Pipe couplings and special pipe fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping, unless otherwise indicated.

a. Unshielded flexible or rigid couplings for same or minor difference OD pipes.

B. Special Pipe Fittings: Use for pipe expansion and deflection. Pipe couplings and special pipe fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

C. Gravity-Flow, Nonpressure Sewer Piping: Use the following pipe materials for each size range:

1. NPS 8 to NPS 12: Corrugated PE drainage pipe and fittings in NPS 8 and NPS 10 and corrugated PE pipe and fittings in NPS 12, silttight couplings, and coupled joints.
2. NPS 8 to NPS 12 (DN 200 to DN 300): PVC sewer pipe and fittings, gaskets, and gasketed joints.

3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

2. Install PE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

3.4 PIPE JOINT CONSTRUCTION

A. Basic pipe joint construction is specified in Division 33 Section "Common Work Results for Utilities." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

B. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join corrugated PE piping according to CPPA 100 and the following:

   a. Use silttight couplings for Type 2, silttight joints.
2. Join dissimilar pipe materials with nonpressure-type flexible or rigid couplings.
3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.

3.5 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Division 22 Section "Facility Storm Drainage Piping."

1. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.6 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.
2. Remove top of manhole or structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade according to Division 31 Section "Earth Moving."

3.7 IDENTIFICATION

A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

1. Use warning tape or detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.8 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

    a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
    b. Option: Test plastic piping according to ASTM F 1417.
    c. Option: Test concrete piping according to ASTM C 924.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.9 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

END OF SECTION

SECTION 334600

SUBDRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes subdrainage systems for the following:

1. Foundations.

1.3 DEFINITIONS

A. PE: Polyethylene plastic.

B. HDPE: High-density polyethylene plastic.

C. PVC: Polyvinyl chloride plastic.

D. Subdrainage: Drainage system that collects and removes subsurface or seepage water.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Perforated-wall pipe and fittings.
2. Solid-wall pipe and fittings.
3. Drainage conduits.
4. Geotextile filter fabrics.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

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

2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to the "Piping Applications" Article in Part 3 for applications of pipe, tube, fitting, and joining materials.

2.3 PERFORATED-WALL PIPES AND FITTINGS

A. Perforated PE Pipe and Fittings:

1. NPS 6 (DN 150) and Smaller: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.
2. Couplings: Manufacturer's standard, band type.

B. Perforated PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends, for loose joints.

2.4 SOLID-WALL PIPES AND FITTINGS

A. PE Drainage Tubing and Fittings: AASHTO M 252, Type S, corrugated, with smooth waterway, for coupled joints.

1. Couplings: AASHTO M 252, corrugated, band type, matching tubing and fittings.

B. PVC Sewer Pipe and Fittings: ASTM D 3034, SDR 35, bell-and-spigot ends, for gasketed joints.

1. Gaskets: ASTM F 477, elastomeric seal.

2.5 SPECIAL PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant metal tension band and tightening mechanism on each end.

1. Sleeve Materials:
   a. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
   b. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

2. Unshielded Flexible Couplings: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant metal tension band and tightening mechanism on each end.
3. Shielded Flexible Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant metal tension band and tightening mechanism on each end.

2.6 CLEANOUTS

A. Cast-Iron Cleanouts: ASME A112.36.2M; with round-flanged, cast-iron housing; and secured, scoriated, Medium-Duty Loading class, cast-iron cover. Include cast-iron ferrule and countersunk, brass cleanout plug.

B. PVC Cleanouts: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

2.7 SOIL MATERIALS

A. Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 31 Section "Earth Moving."

2.8 GEOTEXTILE FILTER FABRICS

A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. (4480 to 13 440 L/min. per sq. m) when tested according to ASTM D 4491.

1. Structure Type: Nonwoven, needle-punched continuous filament.
2. Style(s): Flat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.

B. If subdrainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.3 PIPING APPLICATIONS

A. Underground Subdrainage Piping:

1. Perforated PE pipe and fittings, couplings, and coupled joints.
2. Perforated PVC sewer pipe and fittings for loose, bell-and-spigot joints.

B. Header Piping:
1. PE drainage tubing and fittings, couplings, and coupled joints.
2. PVC sewer pipe and fittings, couplings, and coupled joints.

3.4 CLEANOUT APPLICATIONS

A. In Underground Subdrainage Piping:

1. At Grade in Earth: PVC cleanouts.
2. At Grade in Paved Areas: Cast-iron cleanouts.

3.5 FOUNDATION DRAINAGE INSTALLATION

A. Place impervious fill material on subgrade adjacent to bottom of footing after concrete footing forms have been removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches (150 mm) deep and 12 inches (300 mm) wide.

B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.

C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches (100 mm).

D. Install drainage piping as indicated in Part 3 "Piping Installation" Article for foundation subdrainage.

E. Add drainage course to width of at least 6 inches (150 mm) on side away from wall and to top of pipe to perform tests.

F. After satisfactory testing, cover drainage piping to width of at least 6 inches (150 mm) on side away from footing and above top of pipe to within 12 inches (300 mm) of finish grade.

G. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.

H. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches (100 mm).

I. Place initial backfill material over compacted drainage course . Place material in loose-depth layers not exceeding 6 inches (150 mm). Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

3.6 PIPING INSTALLATION

A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.

1. Foundation Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent, unless otherwise indicated and with a minimum cover of as shown on the details.
2. Lay perforated pipe with perforations down.
3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.

B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

C. Install PE piping according to ASTM D 2321.

D. Install PVC piping according to ASTM D 2321.

3.7 PIPE JOINT CONSTRUCTION

A. Join PE pipe, tubing, and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties."

B. Join perforated, PE pipe and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties"; or according to ASTM D 2321.

C. Join PVC pipe and fittings according to ASTM D 3034 with elastomeric seal gaskets according to ASTM D 2321.

D. Join perforated PVC pipe and fittings according to ASTM D 2729, with loose bell-and-spigot joints.

E. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

3.8 CLEANOUT INSTALLATION

A. Cleanouts for Foundation Subdrainage:

1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
2. In vehicular-traffic areas, use NPS 4 (DN 100) cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches (450 by 450 by 300 mm) in depth. Set top of cleanout flush with grade. Cast-iron pipe may also be used for cleanouts in nonvehicular-traffic areas.
3. In nonvehicular-traffic areas, use NPS 4 (DN 100) PVC pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches (300 by 300 by 100 mm) in depth. Set top of cleanout plug 1 inch (25 mm) above grade.

3.9 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect low elevations of subdrainage system to building's solid-wall-piping storm drainage system.

3.10 IDENTIFICATION

A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tapes directly over piping.

1. Install PE warning tape or detectable warning tape over ferrous piping.
2. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.11 FIELD QUALITY CONTROL

A. Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.12 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.

B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK:

A. Work included: Provide labor, materials, and equipment necessary to complete the work of this Section and, without limiting the generality thereof, furnish and include the following:

1. The extent of cast-in-place concrete work is shown on drawings and includes (but not by way of limitation) formwork, reinforcing, cast-in-place concrete, accessories, finishing, and casting in of items specified under other Sections of the Specifications or furnished by Owner that are required to be built-in with the concrete.

2. Equipment support pads indicated on mechanical drawings to be installed by the Building Contractor.

3. Cast-in-place retaining walls, exterior slabs on grade and other concrete shown on site drawings.

1.03 RELATED WORK:

A. Joint Sealants: Section 07 90 00

B. Underslab Vapor Retarders/Wall Waterproofing: Division 7

1.04 QUALITY ASSURANCE:

A. Codes and Standards: Comply with provisions of the latest edition of the following except where more stringent requirements are shown or specified:

1. ACI “Manual of Concrete Practice”.

2. ACI 117 “Standard Specifications for Tolerances for Concrete Construction and Materials”.

3. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete."

4. ACI 212.3R "Chemical Admixtures for Concrete."

5. ACI 301 "Specifications for Structural Concrete for Buildings."

6. ACI 302.1R "Guide for Concrete Floor and Slab Construction."

7. ACI 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete."

8. ACI 304.2R "Placing Concrete by Pumping Methods."

9. ACI 306 R "Cold Weather Concreting."

10. ACI 308 “Standard Practice for Curing Concrete."

11. ACI 309R "Guide for Consolidation of Concrete."

12. ACI 315 "ACI Detailing Manual."

13. ACI 318 "Building Code Requirements for Reinforced Concrete."

14. ACI 347R "Guide to Formwork for Concrete."

15. Concrete Reinforcing Steel Institute, "Placing Reinforcing Bars."

16. AISC “Code of Standard Practice for Steel Buildings and Bridges.”

17. “Code of Federal Regulations, Part 1926” per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

B. Materials and installed work may require testing and retesting, as directed by the Architect, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.05 SUBMITTALS:

A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Division 1.

B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.

C. All submittals shall be reviewed and returned to the Architect within 10 working days.

D. Incomplete submittals will not be reviewed.

E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with.

F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.

G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.

H. Electronic Submittals:

1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.

2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.

3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Bluebeam version 12 or later. Electronic files shall not be broken into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.

4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.

5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.

I. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Reinforcement certified mill reports covering chemical and physical properties and yield strength.

2. Patching products.

3. Non-shrink grout.

4. Curing compounds, where applicable.

5. Admixtures.

6. Expansion/Adhesive Anchors.

J. Shop Drawings:

1. Shop Drawing Preparation: Electronic files of structural drawings will not be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings is prohibited. Shop drawings created from reproduced Construction Documents will be returned without review. Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315, showing bar schedules, stirrup and tie spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required at openings through concrete elements. Include supplemental reinforcing and bar supports necessary to support reinforcing steel at proper location within forms or slabs.

a. Review of the shop drawings will be made for the size and arrangement of reinforcement. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.

b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided all items listed prior. **Incomplete submittals will not be reviewed.**

K. Mix designs: Submit all laboratory test reports and materials for each mix design listed within. Prepare mixes by the field experience method and/or trial mixtures per the requirements of chapter 5 of ACI 318. Include the calculation of average strength and standard deviation. Proportioning by water cement ratio method will not be permitted.

L. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

M. Hot and Cold Weather Concrete Procedures: Submit a detailed written procedures for placement of concrete at the temperatures anticipated for the project. Include, but not by limitation, subgrade protection and/or heating, production/ready mix methods, transportation and conveying methods, placement, protection, termination of protection, curing and quality control/monitoring procedures. Procedures shall meet the requirements of the latest edition of ACI 305.1 and ACI 306.1 for hot weather and cold weather concreting, respectively.

N. Curing Methods: Submit documentation of curing methods to be used for review. Account for anticipated project temperature ranges and conditions in curing methods.

O. Contraction/Construction Joints: Submit plan indicating proposed location of contraction and construction joints in walls and slabs.

P. Test Reports: Test reports shall be submitted to the Owner, Architect and Engineer within 48 hour after completion of each test.

PART 2 PRODUCTS

2.01 FORM MATERIALS:

A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with piece bearing legible inspection trademark.

B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.02 REINFORCING MATERIALS:

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. Provide welded wire fabric in flat sheets.

C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use plastic, wire bar type supports or concrete block supports complying with CRSI recommendations, unless otherwise specified. Wood, clay brick and other unspecified devices are not acceptable.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 2).

2.03 CONCRETE MATERIALS:

A. Single-Source Supplier: Ready-mix concrete shall be from one supplier unless specific written approval is received from the Structural Engineer.

B. Portland Cement: ASTM C 150, Type I or Type II, unless otherwise approved Use one brand of cement throughout project, unless otherwise acceptable to Architect.

C. Normal Weight Aggregates: ASTM C 33. Provide from a single source for exposed concrete. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, or ochre which can cause stains on exposed concrete surfaces.

D. Light Weight Aggregates: ASTM C 330.

E. Water: Potable.

F. Air-Entraining Admixture: ASTM C 260.

G. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G containing not more than 1% chloride ions.

H. Fiber reinforcement shall be Type III Synthetic Virgin Homopolymer Polypropylene Fibers conforming to ASTM C1116. Fiber reinforcing shall be added and distributed prior to incorporation of Super Plasticizer.

I. Normal range water reducing admixture: ASTM C 494 Type A containing no calcium chloride.

J. Accelerating Admixture: ASTM C 494, Type C or E.

K. Air Detraining Admixture: ASTM C494, Type S, Specific Performance Admixture

L. Blast Furnace Slag: ASTM C989

M. Fly Ash: ASTM C618, Class C or F

N. Calcium Chloride is not permitted.

2.04 RELATED MATERIALS:

A. Underslab Vapor Retarder: Provide vapor retarder over prepared sub base. Refer to architectural drawings, geotechnical report and/or division 7 specifications for additional requirements and vapor retarder location.

B. Non-Shrink Cement-based Grout: Provide grout consisting of pre-measured, prepackaged materials supplied by the manufacturer requiring only the addition of water. Manufacturer's instructions must be printed on the outside of each bag.

1. Non-shrink: No shrinkage (0.0%) and a maximum 4.0% expansion when tested in accordance with ASTM C-827. No shrinkage (0.0%) and a maximum of 0.3% expansion in the hardened state when tested in accordance with CRD-C-621.

2. Compressive strength: A minimum 28 day compressive strength of 5000 psi when tested in accordance with ASTM C-109.

3. Setting time: A minimum initial set time of 60 minutes when tested in accordance with ASTM C-191.

4. Composition: Shall not contain metallic particles or expansive cement.

C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M182, Class 2.

D. Moisture-Retaining Cover: One of the following, complying with ANSI/ASTM C 171.

1. Waterproof paper.

2. Polyethylene film.

3. Polyethylene-coated burlap.

E. Liquid Membrane-Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Curing compound shall not impair bonding of any material, including floor finishes, to be applied directly to the concrete. Demonstrate the non-impairment prior to use.

F. Preformed Expansion Joint Formers:

1. Bituminous Fiber Type, ASTM D 1751.

2. Felt Void, Poly-Styrene Cap with removable top as manufactured by SUPERIOR.

G. Slab Joint Filler: Multi-component polyurethane sealant (self-leveling type).

2.05 PROPORTIONING AND DESIGN OF MIXES:

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 318. Use material, including all admixtures, proposed for use on the project. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

B. Submit written reports to Architect of each proposed mix for each class of concrete. Do not begin concrete production until mixes have been reviewed by Architect.

C. Proportion design mixes to provide concrete with the following properties:

1. Footings

    a. Strength: 3,500 psi at 28 days.

    b. Aggregate: 3/4"

    c. Design Air Dry Density: 145 pcf Normal Weight

    d. W/C Ratio: 0.55 maximum

    e. Entrained Air: 6% +/- 1.5%

    f. Slump: 4" maximum

2. Exterior Slabs and Foundation Walls:

    a. Strength: 5,000 psi at 28 days

    b. Aggregate: 3/4"

    c. Design Air Dry Density: 145 pcf Normal Weight

    d. W/C Ratio: 0.40 maximum

    e. Entrained Air: 6% +/- 1.5%

    f. Slump: 4" maximum

3. Add air entraining admixture at manufacturers prescribed rate to result in concrete at point of placement having the above noted air contents.

4. Additional slump may be achieved by the addition of a mid-range or high-range water reducing admixture. Maximum slump after the addition of admixture shall be 6 or 8 inches for mid-range or high range water reducing admixtures, respectively.

D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor, when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Structural Engineer before using in work.

1. Water may be added at the project only if the maximum specified slump and design mix maximum water/cement ratio is not exceeded.

2. Additional dosages of superplastisizer should be used when delays occur and required slump has not been maintained. A maximum of two additional dosages will be permitted per ACI 212.3R recommendations.

2.06 CONCRETE MIXING:

A. Job-Site Mixing will not be permitted.

B. Ready-Mix Concrete: Must comply with the requirements of ASTM C 94, and as herein specified. Provide batch ticket for each batch discharged and used in work, indicating project name, mix type, mix time and quantity.

1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required by Structural Engineer.

2. When the air temperature is between 85 degrees F. and 90 degrees F., reduce the mixing and delivery time from 1 1/2 hours to 75 minutes, and when the air temperature is above 90 degrees F., reduce the mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 FORMS:

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

B. Design, construct, erect, maintain, and remove forms for cast-in-place concrete work in compliance with ACI 347.

C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

D. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, dovetail slots, reglets, recesses, and the like to prevent swelling and for easy removal.

F. Provide temporary openings where interior area of formwork is inaccessible for clean out, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

H. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

    1. Unless otherwise indicated, provide ties for concrete surfaces to be exposed to view in the final condition so portion remaining within concrete after removal is 1" (minimum) inside concrete.

    2. Form ties shall not leave holes larger than 1" diameter in concrete surface. Repair holes left by form ties after removal of formwork.

I. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

J. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.02 PLACING REINFORCEMENT:

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

1. Subgrade tolerance shall conform to a tolerance of +0/-1 1/2". Base tolerance (fine grading) for slabs shall conform to a tolerance of +0"/-3/4" in. Confirm compliance of above tolerances with surveyed measurements taken at 20 ft. intervals in each direction.

2. Concrete reinforcing and/or welded wire fabric shown on structural drawings is provided for structural purposes only; additional reinforcement may be necessary for reinforcing support, the anchorage of structural embedded items, and the anchorage of non-structural embedded items including but not by limitation radiant tubing. This reinforcing is not shown on the structural drawings as it is part of the contractor's means and methods and shall be included at no cost to the Owner.

3. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

4. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

5. Place reinforcement to obtain specified coverage for concrete protection within tolerances of ACI-318. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

6. Install welded wire fabric in flat sheets in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.03 JOINTS:

A. Construction Joints: Locate and install construction joints, which are not shown on drawings, so as not to impair strength and appearance of the structure, as acceptable to Architect. Submit plan indicating proposed location of construction joints for review prior to beginning work.

1. Provide keyways at least 1-1/2" deep in construction joints in walls, and slabs; bulkheads reviewed by the Engineer, designed for this purpose may be used for slabs.

2. Roughened surfaces shall be used between walls and footings unless shown otherwise on the drawings. The footing surface shall be roughened to at least an amplitude of 1/4" for the width of the wall before placing the wall concrete.

3. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.

4. Joints in slabs on grade shall be located and detailed as indicated on the drawings. If saw-cut joints are required, the early-entry dry-cut process shall be used. Refer to ACI 302, section 8.3.12.

3.04 INSTALLATION OF EMBEDDED ITEMS:

A. General: Set, securely anchor and build into work prior to concrete placement all anchorage devices and all other embedded items, including but not by limitation reinforcement, reinforcing dowels, embedded plates, anchor rods, anchor inserts, sleeves, load transfer plates, diamond dowels and shelf bulk heads required for other work that is attached to, bear upon, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto. Notify other trades to permit installation of their work. Templates to be utilized for setting of anchorage devices shall be constructed in a manner to allow mechanical consolidation of concrete without disturbance. Embedments shall be placed in a timely fashion to permit the inspection of embedments prior to concrete placement. **"Wet Setting" of embedded items into plastic concrete is strictly prohibited.**

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.

C. Provide PVC sleeves where pipes and/or conduit pass through exterior concrete or slabs. Sleeves or penetrations shall not be placed through footings, piers, pedestals, drop caps, columns or pilasters unless specifically noted.

D. Tolerances: Tolerances for Anchor Bolts/Rods, other embedded items and bearing surfaces shall meet the requirement set forth in the latest edition of the American Institute of Steel Construction "Code of Standard Practice for Steel Buildings and Bridges," and ACI 117. The more stringent criteria from these documents shall apply.

3.05 PREPARATION OF FORM SURFACES:

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating material manufacturer's directions. Do not allow excess form coating to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.06 CONCRETE PLACEMENT:

A. Preplacement Review: Footing bottoms are subject to review by the Geotechnical Engineer. Reinforcement and all concrete preparation work shall be subject to review by the Structural Engineer. Verify that reinforcing, ducts, anchors, seats, plates and other items cast into concrete are placed and securely held. Notify Engineer 48 hours prior to scheduled placement and obtain approval or waiver of review prior to placement. Be sure that all debris and foreign matter is removed from forms.

B. Concrete shall be placed in the presence of an approved testing agency.

C. General: Comply with ACI 304, and as herein specified.

1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.

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

3. Conveying equipment shall be approved and shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or work day. Conveying equipment and operations shall conform to the following additional requirements:

a. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An arrangement shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.

b. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long, and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

c. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete.

d. Concrete shall not be conveyed through pipe made of aluminum alloy. Standby equipment shall be provided on the site.

e. Tined rakes are prohibited as a means of conveying fiber reinforced concrete.

4. Do not use reinforcement as bases for runways for concrete conveying equipment or other construction loads.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment. Hand-spading, rodding or tamping as the sole means for the consolidation of concrete will only be permitted with special permission from the Engineer. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

2. Use vibrators designed to operate with vibratory equipment submerged in concrete, maintaining a speed of not less than 8000 impulses per minute and of sufficient amplitude to consolidate the concrete effectively. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine, generally at points 18 inches maximum apart. Place vibrators to rapidly penetrate placed layer and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion maintain the duration of vibration for the time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix, generally from 5 to 15 seconds. A spare vibrator shall be kept on the job site during all concrete placing operation.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

1. Consolidate concrete using internal vibrators during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. Do not sprinkle water on plastic surface.

3. Maintain reinforcing in proper position during concrete placement operations.

4. Slab thicknesses indicated on the drawings are minimums. Provide sufficient concrete to account for structure deflection, subgrade fluctuations, and to obtain the specified slab elevation at the flatness and levelness indicated here within.

5. Finish: See “Monolithic Slab Finishes” in this specification for slab finish requirements.

F. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

1. When air temperature has fallen to or is expected to fall below 40 degrees F (4 degrees C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F (10 degrees C), and not more than 80 degrees F (27degrees C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators.

4. All temporary heat, form insulation, insulated blankets, coverings, hay or other equipment and materials necessary to protect the concrete work from physical damage caused by frost , freezing action, or low temperature shall be provided prior to start of placing operations.

5. When the air temperature has fallen to or is expected to fall below 40 degrees F, provide adequate means to maintain the temperature in the area where concrete is being placed between 50 and 70 degrees F.

G. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control the concrete temperature provided the water equivalent of the ice is calculated to the total amount of mixing water.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

3. Wet forms thoroughly before placing concrete.

4. Do not use retarding admixtures without the written acceptance by the Architect.

3.07 FINISH OF FORMED SURFACES:

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This concrete surface shall have texture imparted by form facing material, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 in. in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This as-cast concrete surface shall be obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment. Combine one part Portland cement to 1-1/2 parts fine sand by volume and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will closely match adjacent surfaces.

1. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

D. Related Unformed Surfaces: At tops of walls and grade beams, horizontal offset surfaces occurring adjacent to formed surfaces, strike-off, smooth and finish with a texture matching adjacent unformed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.08 MONOLITHIC SLAB FINISHES:

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds, and as otherwise indicated.

1. After placing slabs, plane surface to a tolerance not exceeding 1/2 in. in 10 ft. when tested with a 10-ft. straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, and as otherwise indicated.

C. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.

D. Slab finishes for floor coverings not indicated or exposed to view in the final condition shall be coordinated with the Architect prior to slab placement.

E. Slab Joints: Where indicated, sawn slab contraction joints shall be “soft cut”, immediately after concrete surface is firm enough not to be torn or damaged by the blade.

3.09 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with the requirements of ACI 308 as herein specified.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified unless noted otherwise. Curing shall commence as soon as concrete surfaces are sufficiently hard as to withstand surface damage.

C. Curing of Slabs-on Grade:

1. Slabs-on-grade shall be cured by wet curing methods unless otherwise noted.

D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

E. Protection From Mechanical Injury: During the curing period and duration of construction, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

3.10 REMOVAL OF FORMS:

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as joints, slabs and other structural elements, may not be removed in fewer than 14 days or until concrete has attained design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and support.

3.11 REUSE OF FORMS:

A. Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and latency, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

3.12 MISCELLANEOUS CONCRETE ITEMS:

A. Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.13 CONCRETE SURFACE REPAIRS:

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to the Architect.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush coat the area to be patched with approved bonding agent. Place patching mortar after bonding compound has dried.

2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, form tie holes, cracks, spalls, air bubbles, honeycomb, rock pockets, fins, and other projections on surface and stains and other discolorations that cannot be removed by cleaning.

3.14 QUALITY CONTROL TESTING DURING CONSTRUCTION:

A. Testing Agency shall verify reinforcement, including foundation reinforcement and slab reinforcement (WWF or reinforcing bar). Agent shall verify WWF or reinforcement has been chair/placed with proper clearances.

B. The Owner shall employ a Testing Laboratory to inspect, sample and test the materials and the production of concrete and to submit test reports. Concrete testing shall be performed by technicians certified by the Maine Concrete Technician Certification Board and/or ACI Concrete Field Testing Technician Grade I.

C. Concrete shall be sampled and tested for quality control during placement. Quality control testing shall include the following, unless otherwise directed by the Architect.

D. See Submittals section for report requirements.

E. Sampling Fresh Concrete: ASTM C 172.

1. Slump: ASTM C143; One test for each set of compressive strength test specimens. Sample shall be taken from middle third of the load per ASTM C172. A slump test must be run prior to the incorporation of the CFP fibers per recommendations of ACI 544. A slump test must be run prior to and following the addition of a water reducer (superplasticizer) per recommendations of ACI 301.

2. Air Content: ASTM C231 "Pressure method for normal weight concrete." One test for each set of compressive strength specimens measured at point of discharge.

3. Concrete Temperature: Per ASTM C-1064; One test each time a set of compression test specimens are made.

4. Compression Test Specimen: ASTM C31; one set of 5 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

    a. An insulated Cure Box for specimen curing shall be supplied by Testing Agency for initial curing as defined in ACI C31.

    b. Means of heating or cooling the Cure Box shall be provided by the Inspection Agency if required in order to maintain a temperature between 60 and 80 degrees F. Contractor shall provide an electrical source to the Testing Agency when required for temperature control.

    c. A maximum-minimum thermometer shall be provided in the Cure Box by the Testing Agency to record the temperature range of the Cure Box during specimen curing. The Testing Agency shall record the maximum/minimum temperature of the Cure Box when transferring the specimens to the laboratory.

d. Test Specimens shall be moist cured.

e. Refer to ASTM C31 for additional requirements for Test Specimens.

5. Compressive Strength Tests: ASTM C39; one set for each 50 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 4,000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 3 specimens tested at 28 days, 1 specimen retained in reserve for later testing if required.

6. Pumped concrete shall be tested at point of discharge per ACI 301.

F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods, as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

END OF SECTION