TOWN OF READFIELD – Town Manager

8 OLD KENTS HILL ROAD, READFIELD, MAINE 04355
Office (207) 685-4939 • Cell (207) 242-5437
Email: manager@readfieldmaine.org
Website: www.readfieldmaine.org

To: Prospective Bidders - READFIELD PUBLIC LIBRARY ROOF REPLACEMENT & FIRE STATION EXPANSION
From: Eric Dyer, Town Manager
Date: 1/7/2020
Subject: Addendum 3

This memo, the attached revised PROPOSAL FORM 1/7/20, and attachments provided by Dirigo Architectural constitute Addendum 3 for the READFIELD PUBLIC LIBRARY ROOF REPLACEMENT & FIRE STATION EXPANSION.

Please review all of the information carefully.

The revised PROPOSAL FORM 1/7/20 must be used in submitting a responsive bid in lieu of the original.

The due date for proposals and opening has been extended to Thursday, January 16th, 2020 at 2:00pm at the Readfield Town Office.

PROPOSAL FORM - 1/7/20

READFIELD PUBLIC LIBRARY ROOF REPLACEMENT
& FIRE STATION EXPANSION

Company Information

Company Name: _____

Company Address: _____

Primary Contact: _____

Telephone: _____ Email: _____

Proposal

Readfield Library Roof Replacement			
	General	$	
	Bonding (or LOC) & Insurance	$	
	Demolition	$	
	Truss system	$	
	Sheathing, underlayment, and membranes	$	
	Standing seam metal roof cladding	$	
	Trim and finish work	$	
	Insulation	$	
	Sub-Total	**$**	
Readfield Fire Station Expansion			
	General	$	
	Bonding (or LOC) & Insurance	$	
	Demolition	$	
	Concrete - (forms, concrete, reinforcing metal, etc.)	$	
	Framing and Sheathing - (framing, trusses, exterior sheathing, fasteners, etc.)	$	
	Thermal - (rigid & blanket insulation, etc.)	$	
	Moisture - (vapor barriers, membranes, sealants, siding, metal roofing, etc.)	$	
	Openings - (frames, doors, windows, etc.)	$	
	Finishes - (gypsum wallboard, paint, trim, flooring, acoustic ceiling, etc.)	$	
	Specialties - (cabinets & countertops, wall mount dispensers, signs, etc.)	$	
	Internal Plumbing - (water heater, supply lines, fixtures, drains, trim, etc.)	$	
	HVAC - (duct, fans, vents, heat pump/condenser, hydronic system, etc.)	$	
	Electrical - (panels, wiring, lighting, AV, etc.)	$	
	Safety & Security - (smoke and CO detectors, alarms, controls, etc.)	$	
	Earthwork - (grubbing, excavation, grading, fill, paving, etc.)	$	
	Subsurface Wastewater System - (lines, tanks, field, fill, loam/seed, etc.)	$	
	Sub-Total	**$**	
	TOTAL	**$**	

Add Alternates

#	Description		
1	Add a layer of 5/8" impact resistant drywall on the W4 wall type – Fire Station	$	
2	Add a Coiling Counter Door (Marker 15) in the kitchen – Fire Station	$	
3	Furnish and install .044" Vinyl siding in place of the existing siding thickness. Work to be done on the proposed construction only – Fire Station	$	
4	Remove existing lower roofing, Furnish and Install metal roof to match upper proposed roofing – Library	$	
5	Replace the existing FACP and integrate the existing zoning and devices with new devices - Fire Station	$	

Addenda Acknowledgement

Addendum No.	Addendum Summary	Date Received
1	HHE-200 Subsurface Wastewater Application	
2	Clarifications, Markups, and revised Proposal Form	
3	Clarifications, Details, and revised Proposal Form	

Checklist (some items may be submitted after contract award, as noted)

✓	Item
	Completed Proposal Form
	List of Subcontractors *(at time of proposal, subject to change)*
	List of Equipment
	List of References *(municipal or institutional preferred)*
	List of Variances, Deviations, or Proposed Substitutions
	Irrevocable Letter of Credit or Performance & Payment Bond *(may be submitted after award)*
	Certificates of Insurance *(may be submitted after award)*

Signature

Authorized Signature: _____

Name: _____

Title: _____

Date: _____

DIRIGO ARCHITECTURAL
ENGINEERING ▲ CONSTRUCTION MANAGEMENT

Bid Addendum #3

Project:	Building Projects RFP		
Owner:	Town of Readfield	**Date of Issuance:**	January 06, 2020
From Engineer:	Dirigo Architectural Engineering, LLC	**Contract and Date: TBD**	
To:	Prospective Bidders	**DAE Project Number:**	19-006

This Addendum forms a part of the Contract Documents and modifies the original Bid Documents and Specifications dated November 11th, 2019. Portions of the bid and contract documents not altered by this Addendum remain in full force.

Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

This Addendum consists of the following:

FIRE STATION - CLARIFICATIONS

1. The site plans show a walk from the handicap parking space, all around the meeting hall addition to the far side of it. The architectural and structural plans show individual landings at the doors, not a continuous walk. Please clarify.
    - **Response: See detail 3/S1.0. The intent is to have a paved walkway up to and in between the entrance slabs.**

2. Will the appliances be provided by the owner?
    - **Response: Yes, Owner to provide appliances.**

3. VT Industries has several lines of wood doors. Please provide a model or spec.
    - **Response: VT Industries – Heritage Collection – Flush Wood Veneer**

4. On Sheet S1.0, there's a note that mentions cutting the existing foundation for a door would it be acceptable to use the existing door location instead of a creating a new door?
    - **Response: Yes for Door #16 that is acceptable, and would be the preferred method.**

5. Vapor Barrier Questions:
   5.1 – Is it possible to use a thinner barrier then the specified 30 mil vapor barrier?
   Response: 15 mil Vapor Barrier is acceptable.
   5.2 – Does the barrier need to preform as a gas barrier as well?
   Response: No
   5.3 – Will the barrier be exposed to sunlight for any extended amount of time?
   Response: Contractor means and methods should sequence work within UV exposure limits, set forth by manufacturer.
   5.4 – Do the seams needed to be welded in the field by a certified professional? Or is taped seams allowed?
   Response: Taped seams per drawings.

6. On Sheet G0.1 it shows a tag for FACP. Is this a new FACP or are we extending the existing alarm panel?
   - **Response: Existing alarm panel.**

7. On Sheet E0.3 Note #2 do we need to bring the Existing FACP up to present code?
   - **Response: Contractor to provide Add Alt pricing to replace existing panel and integrate existing zoning and devices with new devices.**

8. On Sheet E0.3 Note #5 who is to stamp the drawings?
   - **Response: Intent of note to delegate design to fire alarm system manufacturer.**

9. On sheet E1.1 it shows 25 L1 lights. The Lighting schedule shows 6. Which is correct.
   - **Response: Please use the layout shown on Sheet E1.1.**

10. What brand is the Metered Disconnect? Is there 200 amps available in the existing disconnect as shown on plan E1.0.
    - **Response: Contractor to coordinate with CMP to upgrade meter and disconnect as required.**

11. Is there a spec related to Heater H-1 on the apparatus bay shown on sheet P1.1?
    - **Response: Dayton, Infrared Gas Tube Heater, 40', Model – 7D844**

12. Is there sizing for the Sink and Dishwasher to be provided by owner?
    - **Response: Please see attached Sheet P1.0. Updated plumbing schedule. Dishwasher to be residential size ADA compliant.**

13. The apparatus bay door is based upon an Overhead Door Products. Would you accept an alternate door that matches the same specifications?
    - **Response: Yes, this would be acceptable.**

14. Add Alternate #2 states the door is Model 665 made of wood from Overhead Door is this correct?
    - **Response: Yes, That is correct.**

15. On Sheet C2.1 the is a note on the page for temporary erosion control matting and permanent erosion control matting to be placed on certain areas of the proposed slopes. With there being no earthwork specifications and no details provided for this material, could you provide us with what type of material will need to be provided for temporary erosion control matting and permanent erosion control matting please?
    - **Response: Please see the attached Civil Specifications.**

16. Structural Drawings show Strong Wall as being WSW 24x13. According to Simpson the unit is 13’ tall. Plans show an overall height of the framed wall from the sill to the top of the top mounted 11’-1/4” LVL of 9'-7 5/8". Can a WSW 24x9 (9’ tall unit) be used in place of what is shown on the plans?
    - **Response: The member should be changed to a WSW 24x10, and trimmed down to the appropriate height.**

17. Section A4.1 - where does transition from 2" Styrofoam to 1-1/2" Zip-R sheathing occur? Is the 2" to cover all of the above grade concrete or will Zip-R cover it down to a point? If all concrete is to be covered with 2" styrofoam, what is to be used as a nailer for the attachment of the siding?
    - **Response: See attached SKA-1**

18. No framing specifications are provided is OSB acceptable for roof sheathing?
    - **Response: Roof sheathing to be Huber Zip System or Equal for metal roofing. 5/8” thick.**

19. No framing or trim details are provided for the canopy roof outside Meeting room 101. Please provide.
    - **Response: See updated sheet S1.2 and detailing. See detail 1/A5.0 similar for eave detail.**

20. Elevation 2/A2.1 show "4x4 PT W / 3/4" Azek wrap" - the elevation seems to show the Azek to only be at the bottom 3' of the post - is that the intent with the remaining PT post to be exposed, or is the Azek to be full height of the post?
    - **Response: Azek wrap to continue entire length along PT post.**

21. Section 1/A4.1 shows painted metal flashing as a cover for the exposed rigid insulation above grade. What are the requirements for that flashing material?
    - **Response: .040 Break metal to match roofing trim. See attached SKA – 1.**

22. Regarding the proposed roofing section over the apparatus bay.
    - **Given the warranty implications, contractors are to remove and replace all of the roofing on the proposed apparatus bay side to the ridge vent.**

23. Drawing C2.1 depicts a new Mechanical Concrete Pad and refers us to the structural drawings for detail. We do not see this pad detailed in the structural drawings.
    - **See detail 3/S1.0.**

LIBRARY - CLARIFICATIONS

1. At the Pre-Bid meeting it was mentioned as well as the drawings show the intent to save the existing ceiling on the second floor. Is it acceptable to remove the ceiling and install a new drywall ceiling?
    - **Response: Temporary shoring and protection of the existing ceiling such that it can be restored at the end of the project are part of the project requirements. Contractors are to do what’s necessary to complete the project scope.**

2. Can we use a formed on-site double lock standing seam roof in place of the ATAS roof that is shown?
    - **Response: Yes, provided similar written warranty is included.**

3. Is OSB an acceptable sheathing for the roof decking?
    - **Response: Roof sheathing to be Huber Zip System or Equal for metal roofing. 5/8" thick.**

Attachments

1. Drawings Sheets – S1.2 & P1.0
2. SKA – 1
3. Civil Specifications

END OF ADDENDUM #3

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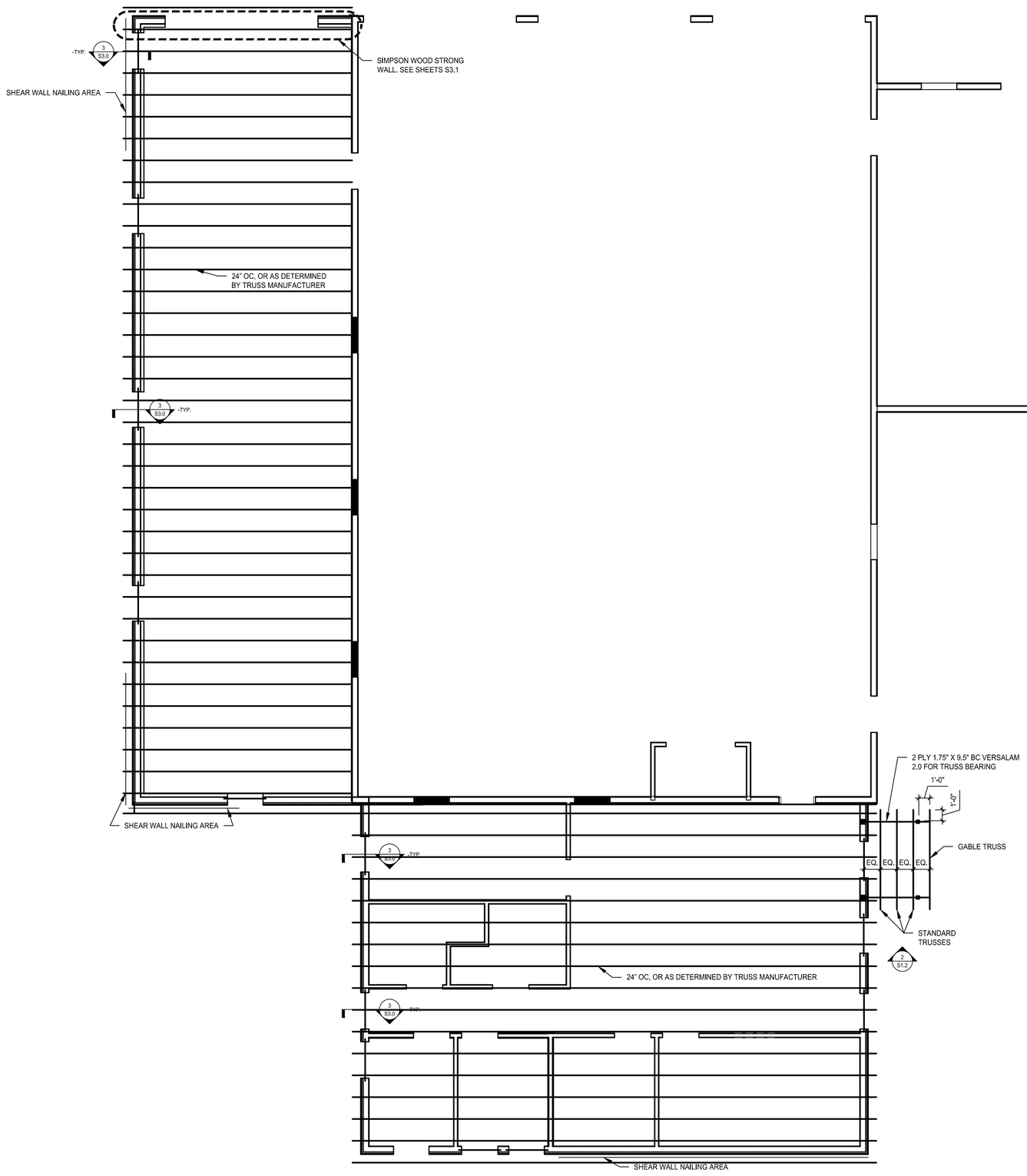
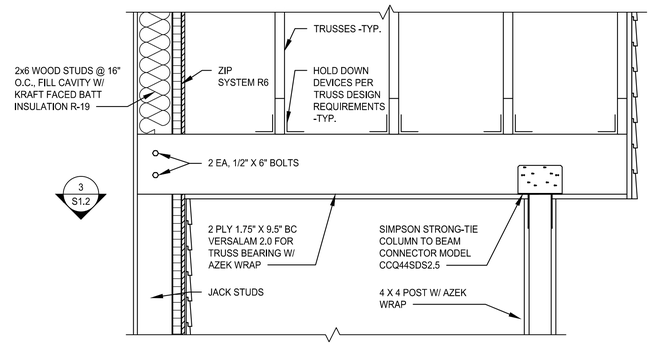
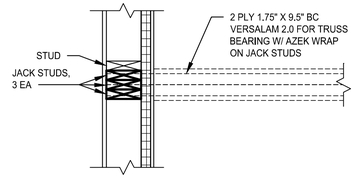


1 S1.2 FRAMING PLAN
22X34 SCALE: 3/16" = 1'-0"
11X17 SCALE: HALF SCALE



2 S1.2 FRAMING ELEVATION
22X34 SCALE: 1" = 1'-0"
11X17 SCALE: HALF SCALE



3 S1.2 ENLARGED FRAMING PLAN
22X34 SCALE: 1" = 1'-0"
11X17 SCALE: HALF SCALE

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READFIELD FIRE STATION ADDITIONS
1154 MAIN STREET
READFIELD MAINE

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DRAFT

NOT FOR CONSTRUCTION

1/6/20

FRAMING PLAN

REV.	DATE	DESCRIPTION
1	9/11/19	75% DESIGN DEVELOPMENT
2	11/4/19	ISSUED FOR BID
3	1/6/20	ISSUED FOR BID ADDENDUM #3

DRAWN BY: CGC | CHECKED BY: TWP

PH: (207) 225 - 3040
7 Cobblestone Way,
Suite 2
Turner, ME 04282

DIRIGO ARCHITECTURAL
ENGINEERING • CONSTRUCTION MANAGEMENT

DATE: 1/6/20

PROJECT: 19-006

SHEET NO.

S1.2

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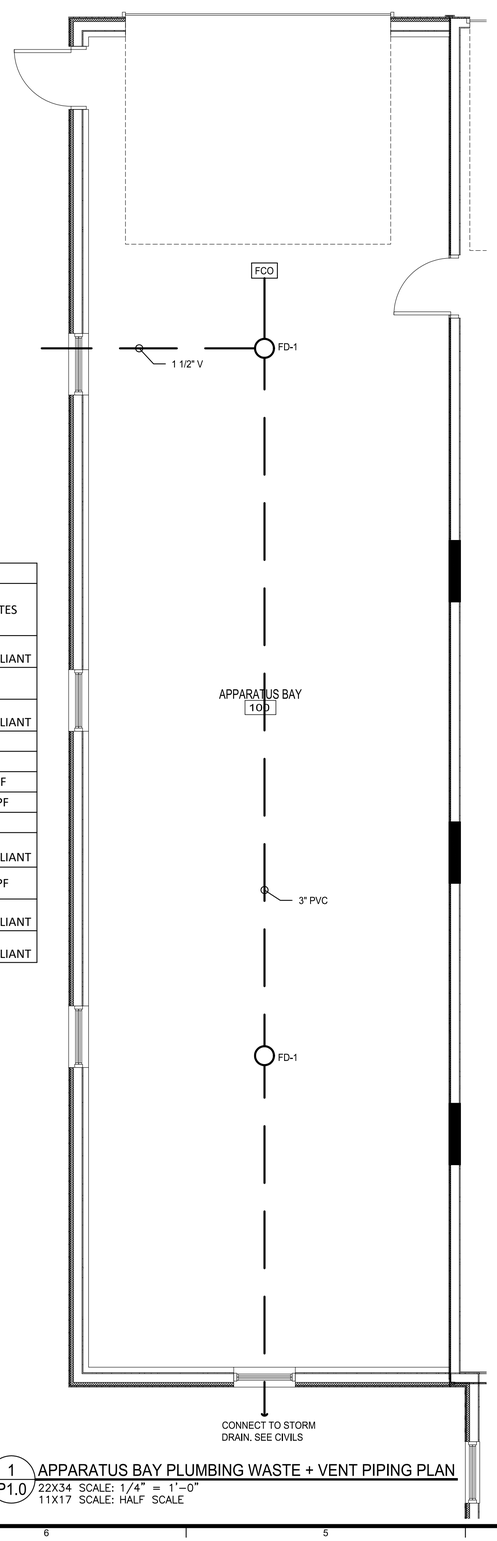
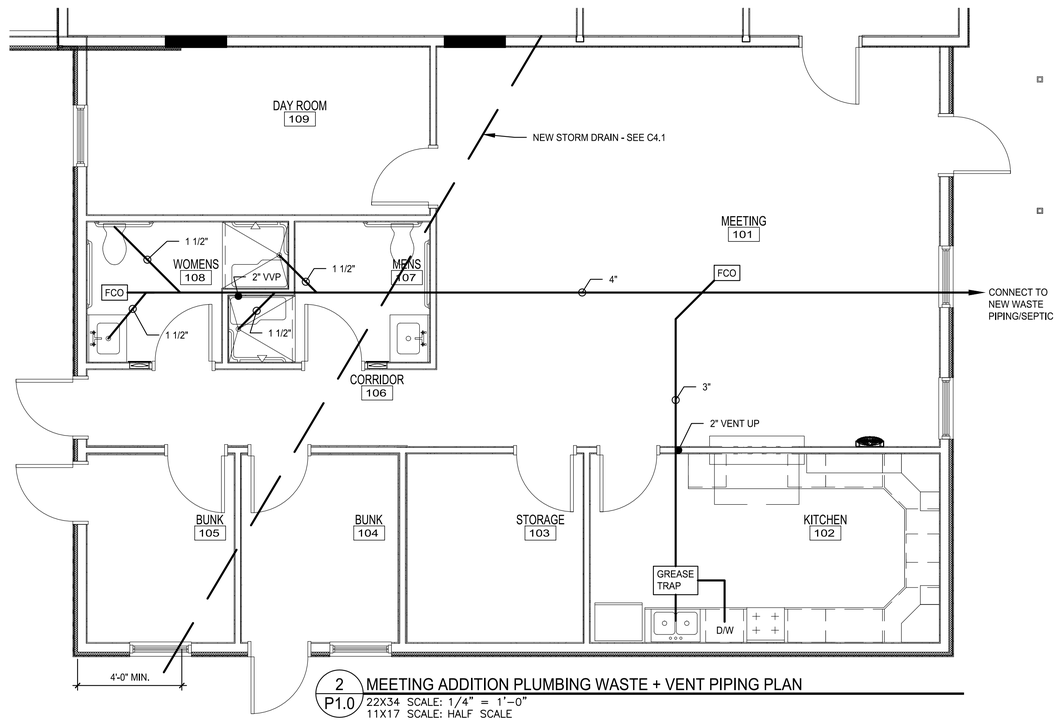
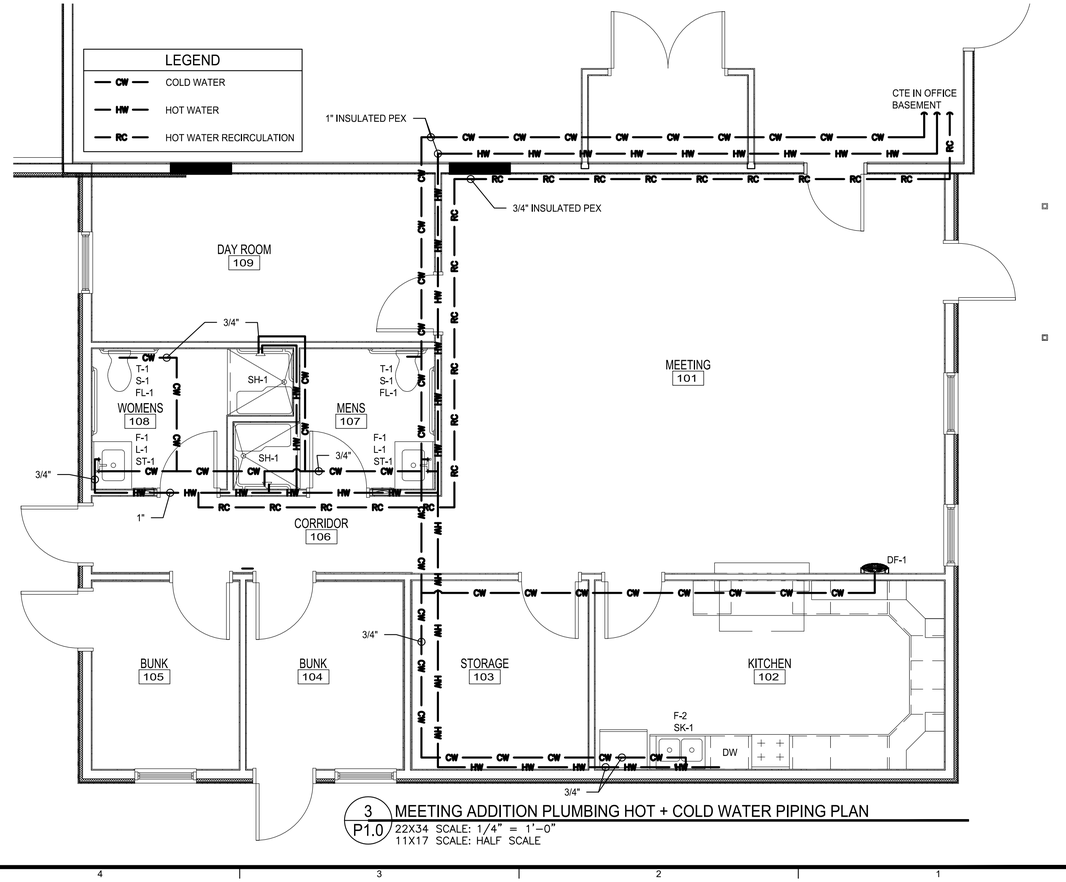
PLUMBING FIXTURE SCHEDULE									
UNIT	DESCRIPTION	MAKE	MODEL	MINIMUM LINE SIZES (IN)					NOTES
				WASTE	VENT	HOT	COLD	GAS	
T-1	TOILET	AMERICAN STANDARD	MADERA 3461.001	4	1.5	-	FL-1	-	ADA COMPLIANT
F-1	FAUCET	AMERICAN STANDARD	COLONY 2275.505	-	-	0.75	0.75	-	
L-1	LAVATORY	AMERICAN STANDARD	LUCERNE 0355.012	1.25	1.25	-	-	-	ADA COMPLIANT
S-1	TOILET SEAT	CHURCH	295CT	-	-	-	-	-	
ST-1	LAVATORY STRAINER	KEENEY	5680PC	1.5	-	-	-	-	
FL-1	TOILET FLUSH VALVE	ROYAL SLOAN	111	-	-	-	1.5	-	1.6 GPF
FD-1	FLOOR DRAIN	ZURN	Z533 HD	3	-	-	-	-	O.5 GPF
FCO	FLOOR CLEAN OUT	ZURN	CO2450-PV2	3	-	-	-	-	
DF-1	DRINKING FOUNTAIN/BOTTLE FILL	ELKAY	EZS8WSLK	1.25	-	-	3/8	-	ADA COMPLIANT
SH-1	ADA SHOWER	COMFORT DESIGNS	SSS 3682 BF .625 RRF-1	2	2	0.75	0.75	-	O.5 GPF
SK-1	ADA SINK	ELKAY	D23319	1.5	1.5				ADA COMPLIANT
F-2	FAUCET	ELKAY	LK1001CR			0.75	0.75		ADA COMPLIANT



1 P1.0 APPARATUS BAY PLUMBING WASTE + VENT PIPING PLAN
22X34 SCALE: 1/4" = 1'-0"
11X17 SCALE: HALF SCALE



2 P1.0 MEETING ADDITION PLUMBING WASTE + VENT PIPING PLAN
22X34 SCALE: 1/4" = 1'-0"
11X17 SCALE: HALF SCALE



3 P1.0 MEETING ADDITION PLUMBING HOT + COLD WATER PIPING PLAN
22X34 SCALE: 1/4" = 1'-0"
11X17 SCALE: HALF SCALE

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READFIELD FIRE STATION ADDITIONS
1154 MAIN STREET
READFIELD MAINE

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DRAFT

NOT FOR CONSTRUCTION

1/6/20

PLUMBING PLANS

REV.	DATE	DESCRIPTION
1	9/11/19	75% DESIGN DEVELOPMENT
2	11/4/19	ISSUED FOR BID
3	1/6/20	ISSUED FOR BID
DRAWN BY: CGC		CHECKED BY: TWP

PH: (207) 225 - 3040
7 Cobblestone Way,
Suite 2
Turner, ME 04282

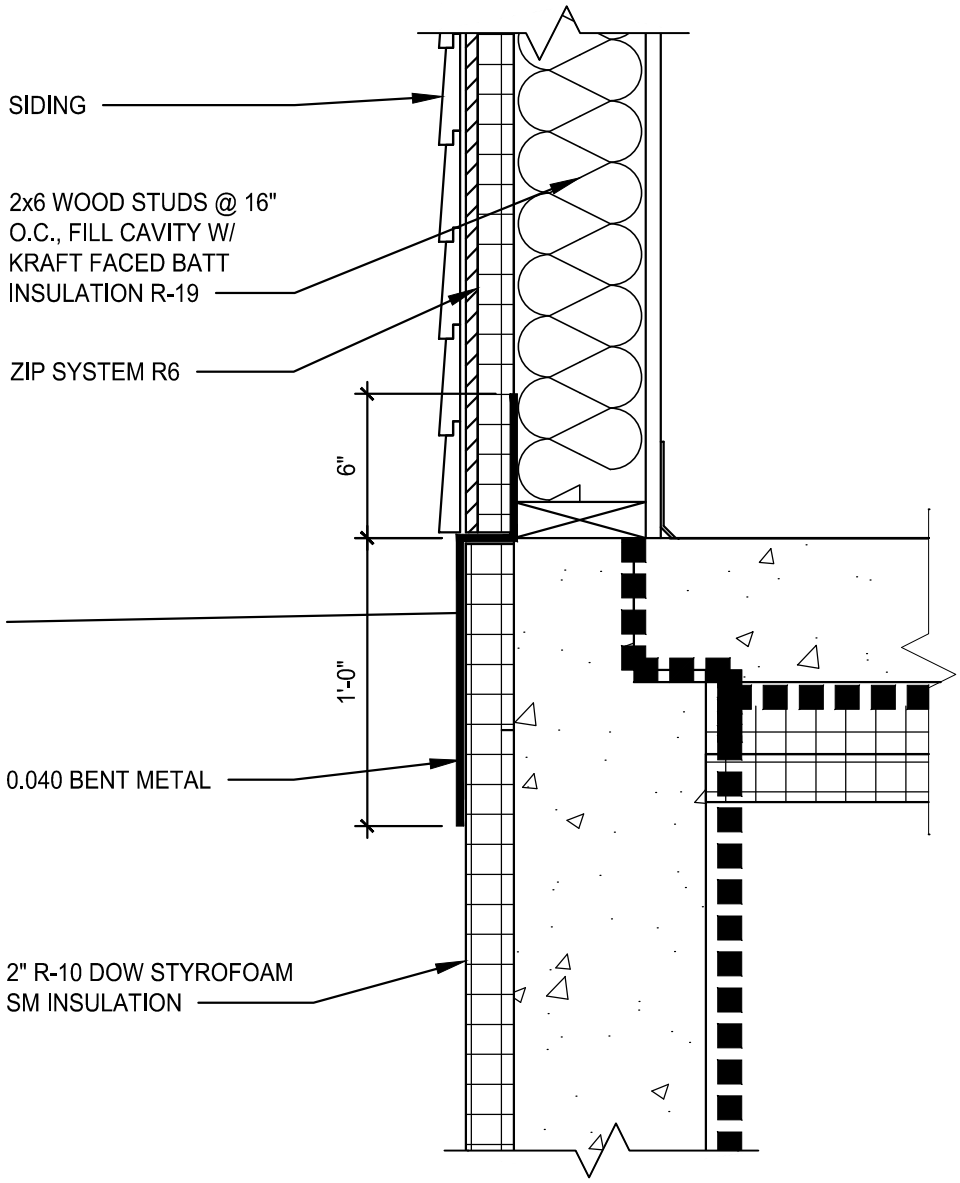
DIRIGO ARCHITECTURAL
ENGINEERING • CONSTRUCTION MANAGEMENT

DATE: 1/6/20

PROJECT: 19-006

SHEET NO.

P1.0



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SIGNED COPY OF DRAWING ON FILE AT DIRIGO A/E OFFICE

DRAWING NAME: WALL DETAIL

DRAWING STATUS: ISSUED FOR BID ADDENDUM #3

PROJECT: READFIELD FIRE STATION ADDITIONS

CLIENT: READFIELD FIRE STATION

SKETCH NO. SKA-1

DATE: 1/6/20 | SCALE: 1" = 1'-0"

PROJECT NO: 19-006

DRAWN BY: CGC | CHECKED BY: TWP

DIRIGO ARCHITECTURAL
ENGINEERING ▲ CONSTRUCTION MANAGEMENT
7 Cobblestone Way,
Suite 2, Turner, ME 04282 PH:(207)225-3040
EM:tperkins@dirigoae.com W:www.dirigoae.com

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.
   1. Aggregates
   2. Cement
   3. Water
   4. Admixtures
   5. Air Entraining Admixtures
   6. Fly-Ash
   7. Plasticizers
   8. Water Reducing Admixture
   9. Accelerating Admixtures
   10. Bonding Agent
   11. Mortar
   12. Finishing Grout/Plaster
   13. Curing Compound
   14. Plastic Film Moisture Barrier
   15. Mix Proportion
   16. Mixing and Delivery
   17. Placing Concrete
   18. Jointing
   19. Finishing
   20. Curing Concrete
   21. Cold Weather Concreting
   22. Hot Weather Concreting

1.01 PROTECTION

A. Provide protection stipulated in specification 311110 Site Preparation.

B. Shoring: Do shoring, bracing, etc., necessary to support soil adjoining the excavation and to protect foundation of existing building, in compliance with OSHA and all other Federal, State, and local codes.

C. Protect structures, utilities, sidewalks, culverts, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Repair, or have repaired, all damage to existing utilities, structures, culverts, pavement, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Main-Land Development Consultants, Inc., the utility, the property owner, and the Owner.

1.02 REFERENCED DOCUMENTS

A. Applicable provisions of Division 1 shall govern all work under this section.

B. American Concrete Institute
   ACI 117 Specifications for Tolerances for Concrete Construction and Materials
   ACI 304 Guide to Measuring, Mixing, Transporting and Placing Concrete
   ACI 305 Hot Weather Concreting
   ACI 306 Cold Weather Concreting

ACI 308 Guide to Curing Concrete

C. American Society for Testing and Materials (ASTM)
C31M-08b Standard Practice for Making and Curing Concrete Test Specimens in the Field
C33M-08 Standard Specifications for Concrete Aggregates
C39M-05e2 Standard Test Methods for Compressive Strength of Cylindrical Concrete Specimens
C143M-08 Standard Test Methods for Slump of Hydraulic Cement Concrete
C150-07 Standard Specifications for Portland Cement
C171-07 Standard Specifications for Sheet Materials for Curing Concrete
C172-08 Standard Practice for Sampling Freshly Mixed Concrete
C231-08c Standard Test Methods for Air Content of Freshly Mixed Concrete by the Pressure Method
C260-06 Standard Specifications for Air-Entraining Admixtures for Concrete
C309-07 Standard Specifications for Liquid Membrane Forming Compound for Curing Concrete
C494M-08a Standard Specifications for Chemical Admixtures for Concrete
C618-08a Standard Specifications for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
C1017M-07 Standard Specifications for Chemical Admixtures for Use in Producing Flowing Concrete

D. Concrete Reinforcing Steel Institute (CRSI)
MSP-1-97 Manual of Standard Practice

2 PRODUCTS

2.01 AGGREGATES

A. Durable aggregate material meeting the requirements of ASTM C33M-08. Aggregates used in concrete shall be from the same source and of same gradation as those used to prepare mixture proportion samples for compressive strength testing.

2.02 CEMENT

A. Portland cement meeting the requirements of ASTM C150-07, Type I.

2.03 WATER

A. Potable water.

2.04 ADMIXTURES - GENERAL

A. Unless otherwise approved, admixtures shall be free of chloride ions.

B. Admixtures used in concrete shall be the same as those used in the approved mixture proportion sample.

2.05 AIR ENTRAINING ADMIXTURES

A. Air entraining admixtures shall meet the requirements of ASTM C260.

2.06 FLY ASH

A. Fly ash and raw or calcined natural pozzolan shall meet the requirements of ASTM C618-08a, Type C.

2.07 PLASTICIZERS

A. Plasticizers shall meet the requirements of ASTME C1017M-07.

2.08 WATER REDUCING, ACCELERATED, AND COMBINED ADMIXTURES

A. Water reducing, accelerated, and combined admixtures shall meet the requirements of

ASTM C494M-08a.
Type A – Water Reducing
Type B – Accelerating
Type C – Water reducing and retarding
Type E – Water reducing and accelerating
Type F – Water reducing high range
Type G – Water reducing high range and retarding

2.09 BONDING AGENT

A. Acrylic latex emulsion bonding agent suitable for bonding new concrete to existing concrete or new concrete.

2.10 MORTAR

A. Cement based mortar.

2.11 FINISHING GROUT/PLASTER

A. Cement based, aggregate type finishing grout. Finish color shall be grey.

2.12 CURING COMPOUND

A. Liquid membrane forming compound consisting of waxes, resins or other materials.

B. Curing compounds shall meet the requirements of ASTM C309-07.

C. Curing compounds shall be compatible with all other proposed concrete finishes.

2.13 PLASTIC FILM MOISTURE BARRIER

A. Polyethylene film having a minimum thickness of 4-mils, and meeting the requirements of ASTM C171-07.

B. Plastic film moisture barrier used in summer months shall be clear or opaque white.

3 EXECUTION

3.01 GENERAL

A. Prepare subgrade as required by the Drawings and other applicable specification sections.

B. Where new concrete meets existing pavement provide full depth sawcut, unless otherwise shown on the Drawings.

3.02 MIX PROPORTION

Prepare mix proportion for each type of concrete listed on Table 03300-2, as necessary to complete the work.

Type	Use	Min. Compressive Strength (psi)	Slump (in)	Min. Cement Content (Bags/CY)	Max. Water Content (Gal/CY)	Air Content (%Vol.)
AA	Slab, curbs, walks, walls, foundations	4000 psi (28-day)	1-3	6	30	5-8

Table 03300-2

3.03 MIXING AND DELIVERY

A. Use ready mixed concrete of type required for given application, and prepared in accordance with approved mix design.

B. Deliver and discharge concrete within 1 ½ hours of initial mixing, or before 300 drum or blade revolutions.

C. Do not add water on-site unless slump and water/cement ratio will be below the maximum after the addition of water. If water is added onsite, mix concrete an additional 30 revolutions.

D. Temperature of concrete shall be maintained between 50 F and 90 F.

E. If admixtures are added onsite, follow manufacturer's recommendations with regards to additional mixing.

3.04 PLACING CONCRETE

A. Place concrete in accordance with the most stringent of either ACI 304 or this section.

B. Before placing concrete, remove debris, ice, snow, and other foreign materials from the subgrade or formwork.

C. Remove standing water from subgrade. Dry and compact subgrade in accordance with the requirements of Division 2. Do not place concrete on soft or frozen subgrade.

D. Place and secure steel reinforcement prior to placing concrete.

E. Position and secure expansion joint material, sleeves, waterstops and other imbedded items prior to placing concrete. Place imbedded items in accordance with the most stringent of either drawings or manufacturer recommendations.

F. Apply bonding agent to existing concrete surfaces requiring a bond with new concrete.

G. Convey concrete from truck to final position by method that will prevent separation.

H. Unless otherwise approved, limit free fall of concrete to 4' maximum height to avoid separation.

I. Place concrete continuously so that concrete is deposited on or adjacent to concrete that is still plastic. When placing of concrete is temporarily halted or delayed, provide construction joints.

J. Place concrete in lifts not exceeding 18".

K. Consolidate concrete by mechanical vibration. Allow vibrator to penetrate the full depth of the slab or lift.

L. Overlap previously vibrated areas by 25%.

3.05 JOINTING

A. Provide joints as shown on the drawings.

B. Unless otherwise approved, minimize construction joints by terminating placement at expansion joint locations indicated on drawings.

C. Construction joints on walls shall be constructed in accordance with the drawings. Provide rustication strips for joints on exposed concrete surfaces.

D. When construction joints are necessary for flatwork, provide bonded joint using dowel or keyway. Roughen the surface of the joint prior to second placement of concrete. Remove laitance, loosened aggregate and damaged concrete. Dampen concrete surface prior to second placement of concrete.

E. Unless otherwise approved, joints on flatwork shall be hand tooled – not sawn. When allowed, sawcut joints shall be completed after initial cure to avoid displacing aggregate.

3.06 FINISHING

A. Flatwork/Slabs

1. Screed or strike off the surface of the slab using straightedge or vibratory screed.

2. After screeding, bullfloat or darby the concrete surface to provide uniform surface, free of ridges or voids. Complete prior to bleed water collection.

3. Once bleed water has evaporated and the concrete can sustain foot pressure, complete edging/jointing and floating.

4. Complete initial edging and hand tool jointing prior to floating. Re-edge or re-tool joints as necessary to receive uniform finish and specified Architectural features as finishing progresses.

5. Float surface with hand or power floats. Do not add water or dry cement on surface to modify conditions.

6. Unless otherwise indicated, flatwork/slabs for sitework shall be provided with a broomed finish. Broom slabs transverse to the main direction of traffic. Use approved broom finish texture.

7. Apply diamond pattern finish to all curb ramps and elsewhere as required by the drawings.

B. Walls

1. For walls that will be hidden from view by earth or subsequent construction, patch holes from form ties, honeycombing, and other irregularities in the finish. Use a compatible mortar.

2. For exposed exterior concrete walls, patch holes from form ties, honeycombing, and other irregularities in the finish. Grind joint marks and fins smooth with adjacent surfaces. Apply finishing grout/plaster in accordance with manufacturer's requirements. Provide rubbed-type finish.

3.07 CURING

A. Cure concrete in accordance with ACI 308.

B. Start curing operations immediately after finishing is completed. Cure concrete for a minimum of 7 days or until compressive tests completed on two separate field-cured cylinders indicate that 70% of the specified compressive strength has been obtained.

C. Flatwork/Slabs

1. Unless otherwise approved or necessary, cure using curing compound, plastic film moisture barrier. Do not use curing compounds that are incompatible with proposed concrete finishes, sealers, etc..

2. Apply curing compound in accordance with manufacturers recommendations.

3. Provide plastic film moisture barrier if precipitation is expected within 3 hours of finishing.

4. Modify curing methods for cold or hot weather concreting as necessary.

D. Walls

1. Cure concrete in forms – keep concrete moist by ponding and allowing water to run down inside of forms.

2. After forms are removed, apply curing compound or preserve moisture by continuous sprinkling, spraying or other approved method.

3.08 COLD WEATHER CONCRETING

A. Complete cold weather (temperatures below 40 deg. F for 3 successive days) concreting in accordance with ACI 306.

3.09 HOT WEATHER CONCRETING

A. Complete hot weather concreting in accordance with ACI 305.

END OF SECTION

SECTION 033001 PROTECTIVE COATING FOR CONCRETE SURFACES

1 GENERAL

1.01 SECTION INCLUDES

A. This work shall consist of furnishing and applying a protective coating on concrete surfaces as called for on the Plans or as designated by the Resident in accordance with these specifications and the manufacturer's published recommendations.

1.02 SUBMITTAL

A. Provide manufactures product information for review.

2 PRODUCTS

2.01 COATING

A. Materials shall meet the requirements of Type 1c penetrating silane concrete sealers, from the Maine DOT Qualified Products List (QPL). Materials shall be 100 percent silane solvent based. Foundation Armor SX5000 clear/matte or equal.

3 EXECUTION

3.01 SURFACE PREPARATION

A. On surfaces to be treated, all voids shall be filled with mortar and the entire surface shall be dressed by dry rubbing to remove form marks and blemishes to present a neat appearance. The concrete shall remain dry for at least 48 hours before treatment and shall be free of laitance, oil, grease, dirt, dust, curing compound or any other deleterious materials. All traces of dust shall be removed immediately before applying the silane sealer. The treatment shall not be done until at least 14 days after casting the concrete, or in accordance with the manufacturer's published recommendations, and completed at least 24 hours before the treated portion is opened to traffic.

3.02 APPLICATION

A. The application rate and method of application shall be in accordance with the manufacturer's published recommendations. When practical, treatment of the concrete surfaces shall be completed before exposure to deicing salts. The temperature of the concrete to be treated shall be above 40 degrees Fahrenheit at the time of application, or per the manufacturer's published recommendations.

4 PAYMENT

4.01 METHOD OF MEASUREMENT

A. Protective coating for concrete surfaces will be measured for payment by the square yard or lump sum unit as specified, satisfactorily applied and accepted.

4.02 BASIS OF PAYMENT

Protective coating for concrete surfaces will be paid for at the contract unit price per square yard or lump sum, as specified.

4.03 PAY ITEM PAY UNIT

Protective Coating for Concrete Surfaces Square Yard

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.
   1. Clearing and preparation of site.
   2. Stripping of topsoil
   3. Stockpiling
   4. Protection.

1.01 PROTECTION

A. Prior to excavation, verify the underground utilities, pipes, structures, and facilities; utilizing 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. Excavation, sidewalks, trenches, etc., shall be kept properly fenced and guarded. Lights shall be provided and maintained wherever and whenever necessary. Trees which are within the area of operations (and are to remain) shall be protected with suitable boarding or fencing.

C. Shoring: Do shoring, bracing, etc., necessary to support soil adjoining the excavation and to protect foundation of existing building, in compliance with OSHA and all other Federal, State, and local codes.

D. Protect newly filled areas from traffic and erosion. Repair and re-establish grades to the specified tolerances in settled, eroded and rutted areas. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, re-shape and compact to the required density prior to further construction.

E. Protect structures, utilities, sidewalks, culverts, pavements, and other facilities from damage caused by

settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Repair, or have repaired, all damage to existing utilities, structures, culverts, pavement, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Main-Land Development Consultants, Inc., the utility, the property owner, and the Owner.

1.02 QUALITY ASSURANCE

A. Materials used on-site are subject to the approval of the Main-Land Development Consultants, Inc. and Geotechnical Engineer and unsuitable materials shall be removed from the site.

2 PRODUCTS- Not Applicable

3 EXECUTION

3.01 CLEARING AND SITE PREPARATION

A. Trees, brush, boulders, etc., within the limits of grading shall be removed from the site (except trees indicated as remaining or undisturbed) including grubbing and removal of organic material, stumps, and roots larger than 2" diameter and 3' long. After separating from the topsoil, chip or grind stumps and roots and utilize the material on the site for erosion control mix, soil conditioning, or landscape mulch in areas approved by Main-Land Development Consultants, Inc.

B. Remove debris and deposit it in suitable disposal areas as specified below. Conform to Federal, State and local solid waste disposal regulations.

3.02 STRIPPING OF TOPSOIL

A. Topsoil within areas where excavation or filling will occur shall be stripped, cleaned of all stumps, rocks, debris, and roots larger than 2" diameter or 3' long, and stockpiled on site.

B. Following construction, stockpile the excess native topsoil on the site, cleaned as noted above, for the Owner’s future use.

C. Prior to re-use as finished loam, topsoil must conform to the requirements of Section 329113. Soil which does not meet these requirements, either naturally, or by additives supplied by the Contractor, shall not be used as finished loam. When approved by Main-Land Development Consultants, Inc., this material can be used in place of common borrow under non-paved or non-building areas.

3.03 STOCKPILES

A. On-site stockpiles are temporary. Unless allowed by 311110.3.02, 311110.3.03.B, or the Owner in writing, stockpiles shall be removed from the site.

B. Permanent topsoil stockpile areas are shown on the drawing. Notify Main-Land Development Consultants, Inc. immediately if the stockpile will exceed the area shown.

C. Keep debris stockpiles out of public sight when practicable.

D. Do not stockpile immediately adjacent to buildings, retaining walls, ponds, or other areas subject to potential landslides or damage.

3.04 DISPOSAL

A. Dispose of unsuitable material, organic material, wood waste and rock material off the site in a disposal

area obtained by the Contractor. Conform to Federal, State and local solid waste disposal regulations. Spread suitable surplus excavated soil on site in areas directed by Main-Land Development Consultants, Inc.

B. Do not remove soil material from the project site until approved by Main-Land Development Consultants, Inc.

C. 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 Owner immediately. The State Bureau of Oil and Hazardous Waste Control must be notified and consulted prior to disturbance of the waste or contaminated soil. Removal and disposal of contaminated materials is not included in the Contract Bid, since it must be handled as directed by the regulatory agencies on a case-by-case basis.

3.05 REMOVAL OF EXISTING BITUMINOUS PAVEMENT

A. Where it is necessary to excavate and make cuts in bituminous pavement, the Contractor shall saw cut paving along neat straight lines where new pavement meets existing pavement.

B. Dispose of excavated pavement in suitable off-site recycling disposal area obtained by the Contractor.

END OF SECTION

SECTION 312316 EARTHWORK

1 GENERAL

1.01 SECTION INCLUDES

1. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.

1. Protection.
2. Excavation:

a. General excavation to lines and grades indicated.
b. Trench excavation for footings, piers, etc.
c. Excavation for buried pipes, wires and conduits under ground floor.
d. Excavation for buried structures, tanks, pipes, wires and conduits outside the building.

3. General exterior rough grading, cutting and filling as required.
4. Filling and backfilling for excavations, including furnishing of extra material required.
5. Compacted granular borrow and/or crushed stone under buildings.
6. Shoring, bracing, sheathing, and cribbing as required and removal of the same.
    1. Pumping of excavation as may be required.
7. Crushed stone, including drains and soil gas vents inside building.

1.02 SUBMITTALS

1. Submit manufacturer's product literature and test results for approval on all materials. Make submissions in accordance with Division 1 Submittals section.

1.03 PROTECTION

1. Prior to excavation, verify the underground utilities, pipes, structures, and facilities; utilizing 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.
    2. If blasting, notify Dig Safe at least one business day in advance.
    3. 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.
    4. 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.
    5. 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.
    6. 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.
    7. Dig Safe requirements are in addition to town, city and/or state DOT street opening permit requirements.
    8. For complete Dig Safe requirements, call the PUC or visit their website.
    9. 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.
    10. 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.

2. Perform protection work as detailed in Specification 311110 Site Preparation.

1.04 QUALITY ASSURANCE

1. Compaction Control: Wherever a percentage of compaction for backfill is indicated or specified, it shall be the in-place dry density divided by the maximum dry density and multiplied by 100.

2. The maximum dry density shall be the dry density at optimum moisture as determined by ASTM D 1557-91 "Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort," latest revision. Method A, B or C shall be selected by the testing agency based on the gradation results of the sample taken. Adjustments to the laboratory density for oversize aggregate shall be made (if required) as specified in ASTM D 1557-91. These adjustments shall be made in accordance with ASTM D 4718-87, latest revision.

3. The in-place density shall be determined in accordance with ASTM Standard Method of Test for Density of Soil in Place by the Sand Cone Method, Designation D 1556; or density of soil and soil aggregate in-place by nuclear methods (shallow depth), Designation D2922.

4. Materials used on-site are subject to the approval of the Main-Land Development Consultants, Inc. and Geotechnical Engineer and unsuitable materials shall be removed from the site.

1.05 MEASUREMENTS AND CLASSIFICATION

1. Measurements: Measurements used for calculating amounts of excavation shall be within a vertical line placed 2'-0" outside the wall or 1'-0" outside footing, whichever is greater, and to the depth indicated. Trench excavation for underground utilities shall be based on a trench width 2'-6" greater than the diameter of the pipe with vertical walls, and the depth of 4" below the pipe. Excavation shall be taken to a minimum of 1'-0" below finish floor, and slabs on grade, unless a different backfill thickness is indicated.

Classification:
1. Earth excavation includes any and all material not having the qualities to classify as rock excavation.

2. Rock excavation includes the satisfactory removal and disposal of solid rock material which cannot be removed without systematic drilling and blasting. This includes rock material which is in ledges, bedded deposits, unstratified masses, and conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock. Fragmented "weathered" rock which can be removed by excavation equipment with "ripper" teeth will be considered earth. Boulders will be included only if each is two (2) cubic yard size or greater and cannot be excavated without drilling and blasting or pneumatic splitting. When, during the progress of excavation, ledge is encountered, Main-Land Development Consultants, Inc. shall be notified. Adjustments will be by unit price. Main-Land Development Consultants, Inc. shall determine the extent of rock excavation and classification.

3. The unit price for rock excavation is net and is not subject to credit for any other material which it may replace.

4. Excavation which measures 6'-0" or less in width, regardless of length, shall be classified as trench excavation. Measurements to be determined as outlined herein.

5. Excavation which does not meet the above requirements for trench excavation shall be classified as open excavation.

6. The Owner will take credit for excavation and/or fill omitted through changes from the Plans and/or Specifications at the unit price stated.

1.06 SOIL TESTING

1. Soil compaction control including laboratory testing and on site testing, will be done by a testing agency hired by the Owner. Geotechnical inspections and investigations will be performed by Main-Land Development Consultants, Inc., hired by the Owner.

2. Provide samples of each fill material from the proposed source of supply. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate sources if proposed material does not meet the specifications. Submit test results to Main-Land Development Consultants, Inc.

3. Tests of soil as delivered may be performed from time to time. Materials in question may not be used, pending test results. Remove rejected material and replace with new, approved soil.

4. Cooperate with the laboratory in obtaining field samples of in-place, bank-run, or stockpiled materials. Samples should be obtained by laboratory personnel from various suppliers, but other individuals may obtain and deliver samples if approved by Main-Land Development Consultants, Inc.

5. Coordinate schedule with testing agency and Main-Land Development Consultants, Inc. to allow testing agency representative to be on site prior to foundation formwork and at the start of filling operations.

6. The Contractor shall bear cost of retesting when initial test results indicate non-compliance with specifications, or when alternate sources are submitted.

7. In-place Compaction Test Frequency for Each Layer Placed:
   Building Interior Fill: 1 test per 1,000 sq. ft.
   Parking, Roads and Walks: 1 test per 1000 sq. ft.
   Trench - Utilities: 1 test per 150 lin. ft.

2 PRODUCTS

2.01 GENERAL

1. On-site gravel beneath pavement to be excavated will be suitable for use as gravel subbase, granular borrow, and granular bedding material subject to meeting gradation test requirements. Screen gravel to meet gradation. Do not mix with subgrade soils.

2.02 COMMON BORROW

1. Soil which is free from vegetable matter, roots, stumps, lumps of clay, perishable rubbish or peat, or frozen material, which can be placed and compacted to the required densities. 8-inch maximum stone size. Soil or loam "screenings" are not acceptable, since they are mostly stones and roots; these must be removed from the site.

2.03 STRUCTURAL FILL

1. Uniformly graded bank-run or processed gravel which can be compacted to the required density, free of debris, roots, topsoil, vegetable matter, frozen material, and any other deleterious material. Structural fill should meet the following gradation:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
3 inch	100
¼ inch	25 - 70
#40	0 - 30
#200	0 - 7

2.04 GEOTEXTILE EARTH STABILIZATION

1. Polypropylene Permeable, Woven, Reinforcement Fabric with the Following Minimum Properties:

Weight	6.- oz./sy
Grab Tensile Strength	300 lbs.
Thickness	17 mils
Coef of permeability	0.01 cm/sec.
Tear strength	100 lbs.

2. Mirafi 600X; Terra Tex-HD, or approved equal.

2.05 CRUSHED STONE

1. Screened or crushed natural stone, free from shale, organic matter and debris conforming to the following gradation: (Maine DOT Section 703.31 Crushed Stone)

SIEVE SIZE	PERCENT PASSING
2-1/2"	100%
2"	95 -100
1"	0 - 30
¾"	0 - 5

3 EXECUTION

3.01 CLEARING AND SITE PREPARATION

1. Prepare the site according to the drawings and specification 311110.

3.02 ROUGH GRADING

1. Rough grade the area within the limits of work to conform to grades indicated, making provision for finish materials, including necessary cutting and filling. Provide additional Common Borrow material from off-site sources, as necessary to complete the rough grading.

3.03 DISPOSAL

1. Dispose of unsuitable material, organic material, wood waste, rock material, and surplus excavated soil in excess of that required for rough grading off the site in a disposal area obtained by the Contractor. Conform to Federal, State and local solid waste disposal regulations.

2. Do not remove soil material from the project site until approved by Main-Land Development Consultants, Inc..

3. Grade the fill site to drain; use erosion control as necessary, and seed and mulch the fill conforming to Specification Section 02270.

4. 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 Owner immediately. The State Bureau of Oil and Hazardous Waste Control must be notified and consulted prior to disturbance of the waste or contaminated soil. Removal and disposal of contaminated materials is not included in the Contract Bid, since it must be handled as directed by the regulatory agencies on a case-by-case basis.

3.04 EXCAVATION

1. Excavation shall be made to the proper depths required by design, including the proper allowance for forms, utilities, etc. Excavation shall be approximately level, clean and clear of loose material. Debris, rock material, organic material or unsuitable material encountered in the excavation shall be removed and disposed of as specified above. Excavation beyond the design limits, made without authorization from the Owner or Geotechnical Engineer, will be refilled with structural fill material compacted to 95% maximum dry density at the Contractor's expense.

2. All spread footing foundations should be underlain by a minimum 12" thick pad of reinforced crushed stone. The crushed stone bearing pad should be underlain by suitable, undisturbed native glacial till, i.e., **all fill should be removed from directly beneath all slabs and spread footing foundations and in an envelope extending from the edge of footing outward at a 1H:1V.** This crushed stone bearing pad should be completely encapsulated in the geotextile fabric to reinforce subgrade beneath the stone and prevent migration of finer-grained surrounding soils into the stone. Excavate for pipes, utilities, pits, and incidentals. Proof-roll the sub-grade for footings and slabs and check for unsuitable subgrade. Notify Main-Land Geotechnical Engineer of any unsuitable subgrade.

3. If bearing is not suitable at levels shown on the Drawings, within the design limits, Main-Land Development Consultants, Inc. or Geotechnical Engineer shall be notified so that adjustments in level or changes may be made immediately. The Geotechnical Engineer will determine the extent of excavation of unsuitable material. Excavate unsuitable material such that the approved backfill material beneath the building will slope 1H to 1V down and away from the footings.

4. Exercise extreme caution during footing excavation to minimize disturbance of the subgrade soils. This will require excavation in dry weather, use of smooth bucket excavator (without teeth), limiting traffic on the exposed soil, and dewatering below subgrade. Place an unreinforced concrete work slab on the subgrade soil immediately following excavation, where shown on the Architectural Plans.

5. Prevent freezing of the subgrade soils inside the building lines. Freezing of these soils beneath footings and slabs may result in frost heaving or post-construction settlement. If frost penetration occurs, the native soil and overlying fill effected should be removed and replaced, as directed by the Geotechnical Engineer.

6. Draining of Excavation: The Contractor shall, by use of pumps, wells, well-points, or other approved means as may be necessary, prevent the accumulation of water in the excavated areas. Surface runoff and infiltration of groundwater must be controlled so that excavation, filling, foundation construction, and backfilling will be completed in-the-dry. Water from construction dewatering operations shall be cleaned of sediment before reaching wetlands, water bodies, streams, or site boundaries. Conform to the requirements of the Department of Environmental Protection, and specification Section 312514.

7. Prior to excavation, obtain confirmation from the Owner and Utility Company that all buried pipes and utilities are located accurately on the Drawings and in the field. Completeness or accuracy of subsurface information is not guaranteed. Obtain the services of 'Dig-Safe' or other qualified detection firm. Provide test pits as necessary to verify location and depth of buried pipes and utilities.

3.05 FILLING AND COMPACTION

General:

1. Prior to placing new fill in the expansion footprints, all fill, organics, and unsuitable subgrade materials should be removed down to suitable native glacial till subgrade. Existing underground utilities might have to be relocated. Found utilities and related information should be reported to the Civil Engineer. Unsuitable subgrade should be

removed and replaced with compacted structural fill (or crushed stone) up to design subgrade. If necessary, it is recommended that a woven geotextile stabilization fabric (Mirafi 600X or equivalent) be placed directly on subgrade in over-excavated areas to act as a separator and reinforcement for overlying new compacted granular fill.

2. Compaction should be performed by complete coverages on each lift such that the required density is achieved throughout each lift, with a maximum loose lift thickness of 12 to 14 inches. In confined areas such as foundation backfill zones adjacent to foundation walls and near existing buildings, smaller compaction equipment such as light vibratory drum roller or hand-operated plate compactor should be used with maximum loose lift thickness reduced to 6 inches. In filling against walls or pipelines, the fill shall be placed and compacted on both sides at the same time to avoid undue strain.

3. Fill material within 2 feet of outside building lines shall be gravel sub-base for the full depth to the footing. Where pavement is within 10 feet of the foundation wall, extend gravel subbase at least 10 feet wide from building foundations, sloping to 2 feet wide at footing elevation. Fill beyond this limit may be suitable on-site excavated material or granular borrow, unless noted otherwise. This limit does not pertain to sloped granular fill beneath footings. Common borrow may be used beneath grass areas, unless noted otherwise.

4. Compact fill under pavements and gravel areas to 95% of maximum dry density; and under grass or mulch areas to 90% of maximum dry density.

5. Provide additional material necessary to complete the filling.

6. Place gravel base material under concrete pads a minimum of 12" deep, compacted to 95% maximum dry density.

7. Fill above exterior foundation drain with compacted structural fill for full depth to the base of final surface layer.

8. Excavate, grade, and re-compact areas of settlement or improper backfill and compaction, at no additional cost to the Owner.

Buildings:

1. Prior to placing any concrete or soil, obtain approval of the exposed subgrade soil from the Geotechnical Engineer.

2. Do not use excavated native soil beneath the building.

3. **All existing fill will be removed from beneath new floor slabs and footing foundations, and replaced with compacted structural fill back up to floor slab subgrade.** All subgrade beneath new sub-slab fill should be proof-rolled and then reinforced with Mirafi woven 600X or equivalent prior to placing new overlying fill.

4. Reinforced crushed stone bearing pads shall be placed beneath all building spread footing foundations. The crushed stone bearing pad should be underlain by suitable, undisturbed native glacial till, i.e., all unsuitable existing fill and organics should be removed from directly beneath all spread footing foundations and in an envelope extending from both edges of the footing outward at a 1H:1V. This crushed stone bearing pad should be a minimum of 12-inches thick extend a minimum of 12 inches beyond the footing (both sides) and completely encapsulated in the geotextile fabric (Mirafi woven 600X or equivalent) to reinforce subgrade beneath the stone and prevent migration of finer-grained surrounding soils into the stone. The as-built dimensions of this pad will depend on the bottom of footing elevation and depth to native till beneath this elevation.

5. The building roof must be in place to shed water prior to placing the vapor retarder.

END OF SECTION

312514 EROSION AND SEDIMENTATION CONTROL

1 GENERAL

1.01 SECTION INCLUDES

A. Provide temporary erosion control for entire duration of project.

B. Provide permanent erosion control measures.

1.02 SCHEDULING

A. Provide to Main-Land Development Consultants, Inc., in writing, a time schedule outlining the sequence of construction for site work.

B. 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 and detention ponds are installed early in the construction sequence, to prevent sediments from uphill areas reaching streams, wetlands, or property lines.

C. This project is subject to State Department of Environmental Protection review. This section contains dates and time limits which are mandatory. Failure to meet these requirements may result in DEP enforcement action, such as work stoppage, fines, etc.

1.03 SITE CONDITIONS

A. Take necessary steps to prevent soil erosion. Refer to publications of the Maine DEP and the Maine Soil and Water Conservation Commission for additional prevention measures to stop soil erosion and follow DEP "Best Management Practices." The Contractor shall conduct his operations in conformity with all Federal and State permit requirements concerning water, air, or noise pollution, or the disposal of contaminated or hazardous materials. Erosion control measures shown on the Plans are minimum only and are not intended to be complete. Satisfy the current requirements of the regulatory agencies.

2 PRODUCTS

2.01 MATERIALS

A. Erosion Control Mesh: Intended as a temporary erosion control measure that will decompose after stabilization. Open weave, single jute yarn of loosely twisted construction, not varying in thickness by more than 1/2 its normal diameter. The woven material shall weigh 0.9 pounds per square yard. Synthetic mesh material may be used as approved by Main-Land Development Consultants, Inc..

B. Erosion Control Blanket: Intended as a permanent erosion control measure that will reinforce the topsoil and vegetation against erosion after construction. Synthetic fiber matrix sandwiched between heavy duty UV stabilized netting. Blanket shall weigh not less than 0.9 pounds per square yard. North American Green P300 or approved equal.

C. Staples: No. 11 (or heavier) plain iron wire, made 6 inches in length.

D. Mulch: Cured straw free from primary noxious weed seeds and rough or woody materials.

E. Erosion Control Seed:

TYPE	% BY WEIGHT	% PURITY	% GERMINATION
Domestic Rye Grass	70	69.75	90
Perennial Rye Grass	30	28.00	85

F. Silt 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.

Weight	2.5 oz/sy
Width	36 inch
Thickness	12 mils
Equiv. Opening Size	20-50 sieve
Tear Strength	50 lb.
Ultraviolet stability	80%

   a. Mirafi 100X; Terra Tex-SC, 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. Amoco Propex; AEF Silt Fence-III; or approved equal.

G. Erosion Control Soil/Bark Mix: Shall consist of a mix of recycled composted shredded bark, stump grindings, flume grit, and fragmented wood generated from water-flume log handling systems. The mix shall conform to the following:
1. pH - 5.0 to 6.0.
2. Screen size - 6 inch minus.
3. No less than 25 percent organic material.
4. No stones larger than 2 inches in diameter.

H. Filter Berm: A windrow of erosion control soil/bark mix 2 ft. high by 3 ft. wide. A filter berm may be an acceptable alternative to a silt fence if so noted on the Site Grading and Erosion Control Plan.

I. 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.

J. Water, calcium chloride, or crushed stone for prevention of airborne dust.

K. Under-Grate Sediment Trap: A filter fabric bag which hangs under the grate to catch sediments. Provide "Streamguard model 3003", "Basin Bag" by Emco Distribution, "SiltSack High Flow" by ACF Environmental, or approved equal. Install the bag device per manufacturer's recommendation.

3 EXECUTION

3.01 EROSION CONTROL BARRIER

A. Before earthwork is started, 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.

B. Erosion control barriers shall be removed after construction is complete, but not until finish grading, final seeding, and mulching has been completed and the established grass has stabilized the soil. Maintain

barrier in good condition until removed.

C. Remove silt deposits from the site, place in an area of low erosion potential, seed with erosion control mix, and mulch.

D. Silt Fence: Set fence post 8 feet O.C. to a depth of 2 feet. Attach support fence to post with fencing staples or appropriate wire ties. 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. No horizontal joints will be allowed. 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.

E. Filter Berm: Place uncompacted erosion control mix in a windrow at locations shown on the plan or as directed by Main-Land Development Consultants, Inc. 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. Berm material, where the berm is still required, which has decomposed, clogged with sediment, eroded, or becomes ineffective, shall be replaced. The berm shall be removed from the site or raked into nearby woods to a depth no greater than 1", when no longer required, as approved by Main-Land Development Consultants, Inc.

3.02 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 mulched with straw. 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 3 pounds of seed per 1000 sq. ft. and mulched with straw. Apply straw mulch at the rate of 75 pounds per 1000 sq.ft. Anchor mulch to prevent wind blown movement.

C. In sensitive areas (within 25 ft. of stream or wetland edge) temporary mulch must be applied at the end of each workday and prior to any storm event.

D. No fill shall be placed on hay mulch. Dispose of used hay mulch off site.

3.03 FALL AND WINTER STABILIZATION (September 15 or Later)

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 Main-Land Development Consultants, Inc. 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 mulch 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 1with 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. Anchor mulch with erosion control mesh.
   4. For slopes steeper than 10H:1V and flatter than 2H:1V, place a 6" layer of erosion control soil/bark mix on the disturbed soil by November 1. Remove snow accumulated on the slope prior to installation. If groundwater seeps are present, 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.

A. If the catch of permanent or temporary grass is less than 3" tall or covers less than 75% of the disturbed soil on slopes steeper than 10H:1V and flatter than 2H:1V by November 1, place a 6" layer of erosion control soil/bark mix or a rip rap layer, as described above.

3.04 DRAINAGE DITCHES AND EMBANKMENTS

1. Drainage ditches shall be provided with a temporary stone check dams spaced such that the bottom of the upstream check dam is at the same elevation as the top of the next downstream checkdam.
   a. Temporary ditch check dams shall be constructed where indicated, using stones in the configurations shown on the detail sheet. Additional temporary ditch dams shall be installed from time to time during the construction where necessary to prevent soil particle migration from the work area. Where necessary due to terrain configuration, earth berms shall be constructed at one or both ends of the ditch check so as to contain runoff. The tops of earth berms shall be higher than the tops of the dams so that runoff will occur only over the dams. Sandbags may be used instead of earth berms at the Contractor's option but shall be faced with earth placed against the upstream face.

B. Grassed drainage ditches and swales shall be lined with a continuous matt of erosion control mesh for full bottom width and side slopes to 12" above bottom, within 48 hours of final grading and prior to a storm event, in order to stabilize the loam, seed, and mulch.

C. Where erosive velocities in ditches or embankments are anticipated or experienced, and soil cannot be stabilized with mulch and mesh alone, substitute erosion control soil/bark mix in place of loam. For this use, screen the erosion control soil/bark mix to remove wood, bark, and stones one-inch in size and greater. If erosion control soil/bark mix is used in ditches, and erosive velocities are excessive, provide a 12" thick stone rip rap lining along ditch bottom and upside slopes to one foot above the bottom elevation. Place non-woven geotextile beneath stone.

D. Stabilize pond embankments (interior and exterior), slopes steeper than 3 horizontal to one vertical, and drainage ditches by September 15. Stabilization shall consist of permanent seeding and mulch. If this date cannot be met, provide alternative permanent or temporary stabilization described as Fall and Winter Stabilization.

E. Install erosion control mesh over mulch on slopes steeper than 6 horizontal to one vertical (16%) and in conformance to DOT Standard Specifications, latest Edition, Section 613, paragraphs 613.03 through 613.06. Anchor mesh as recommended by manufacturer.

F. Permanently rip-rap inlets and outlets of culverts and pipe outfalls within 48 hours of installation, as shown on the Drawings.

G. Install permanent erosion control blanket around culvert inlets and outlets as shown on the Drawings, and according to manufacturer’s recommendations.
   1. Prepare soil with loam, fertilizer, and seed as specified in Section 329113 prior to installing erosion control blanket.

2. Install permanent erosion control blanket 5 feet minimum in all directions around culvert inlets.
3. Install permanent erosion control blanket 5 feet minimum in all directions around culvert outlets, and a 6 feet width centered along the outlet channel for 10 feet.
4. Install staples as shown on the erosion control blanket detail on the Drawings, and throughout the blanket in an 18 by 18 inch grid.

3.05 PARKING AND DRIVES

A. Place temporary stabilized construction exits where vehicles leave the site and enter existing paved roads; consisting of a 6" layer of 1-1/2" to 3" crushed stone. Tracking and spilling of earth and/or debris on public streets shall be avoided to the maximum extent possible. Clean up and remove such spillage.

B. As the crushed stone stabilized construction exits continue to scrub the soil from the trucks, the stone layer will tend to fill with sediments. When this occurs remove the stone and sediment and replaced it with a clean layer of stone.

C. As soon as possible after roads and parking areas are cleared, grubbed and graded to the required subgrade, the gravel base shall be placed.

3.06 DUST CONTROL

A. Use traffic control to restrict traffic to predetermined routes. Maintain as much natural vegetation as is practicable. Use phasing of construction to reduce the area of land disturbed at any one time. The use of temporary mulching, permanent mulching, temporary vegetative cover, permanent vegetative cover, or sodding will reduce the need for dust control. Use mechanical sweepers on paved surfaces where necessary to prevent dust buildup. Stationary sources of dust, i.e., rock crushers, shall utilize fine water sprays to control dust.

B. The exposed soil surface shall be moistened periodically with adequate water to control dust.

C. Calcium chloride shall be either loose dry granules or flakes fine enough to feed through a spreader at a rate that will keep surface moist but not cause pollution or plant damage. Liquid calcium chloride can also be used. To reduce potential for environmental degradation, use only when other methods are not practical.

D. Cover surface with crushed stone or coarse gravel. In areas adjacent to waterways, use chemically stable aggregate.

E. When temporary dust control measures are used, repetitive treatment shall be applied as needed to accomplish control.

3.07 CONSTRUCTION DE-WATERING

B. 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 backed by staked hay bales, “Dirt Bag 55" sediment filter bag by ACF Environmental Inc, or other approved Best Management Practices (BMP’s).

C. 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 mix immediately backed by staked hay bales (see the site details). 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.

3.08 ADDITIONAL MEASURES

A. Areas outside the Contract work limits shall be protected from lubricants, fuel, sediment and other pollutants.

B. Trap sediments in the runoff flow at the rim of a Catchbasin.
   1. Catchbasin inlets in gravel or paved parking 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.
   2. Catchbasin inlets in grassed areas shall be protected by hay bales or block and gravel sediment filter until permanent soil stabilization has been achieved.
   3. Optionally, in lieu of other sediment stops, catchbasin inlets may be provided with a proprietary fabric sediment bag device under the catch basin rim.

C. Inspect erosion and sedimentation control weekly and after every storm and maintain in good working condition for project duration.

3.09 REMOVAL AND DISPOSAL

A. When 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 must be fully removed. Re-usable materials are and shall remain the property of the Contractor.

B. Remove silt and sediment from catchbasins, drainage ways, silt ponds and other silted areas and dispose offsite. Place the silt in an area of low erosion potential, and seed and mulch it for stability.

END OF SECTION

SECTION 313713 RIPRAP

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.
   1. Pumping of excavation as may be required.
   2. Geotextile
   3. Rip rap.

1.02 SUBMITTALS

A. Submit manufacturer's product literature and test results for approval on all materials. Make submissions in accordance with Division 1 Submittals section.

1.03 PROTECTION

A. Prior to excavation, verify the underground utilities, pipes, structures, and facilities. See Specification 312316.

B. Shoring: Do shoring, bracing, etc., necessary to support soil adjoining the excavation and to protect foundation of existing building, in compliance with OSHA and all other Federal, State, and local codes.

C. Protect newly filled areas from traffic and erosion. Repair and re-establish grades to the specified tolerances in settled, eroded and rutted areas. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, re-shape and compact to the required density prior to further construction.

D. Protect structures, utilities, sidewalks, culverts, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Repair, or have repaired, all damage to existing utilities, structures, culverts, pavement, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Main-Land Development Consultants, Inc., the utility, the property owner, and the Owner.

2 PRODUCTS

2.01 STONES FOR RIP-RAP

A. Size the stone mixture such that 50% of the stones, by weight, are larger than the specified d50 size. Stones shall not be schistosic.

B. Rip-Rap: 4" to 12" diameter, hard, sound angular stones, d50 = 6".

C. Heavy Duty Rip-Rap: 10" to 18" wide sound stones with flat top surface, d50 = 11".

2.02 NON WOVEN DRAINAGE FABRIC

Weight	5- oz./sy
Grab Tensile Strength	120 lbs.
Flow Rate	110 - 135 gal/sec/sf
Tear strength	50 - 60 lbs.

A. Mirafi 140N/160N or approved equal.

2.03

3 EXECUTION

3.01 RIP-RAP

A. Non-woven geotextile fabric shall be installed on top of shaped subgrade with fabric contacting the soil (no bridging), and overlapping 12 inches when a seam is necessary. Seams shall not be allowed in the flow path of channels where concentrated run-off is intended.

B. The stones shall be placed on the geotextile with their beds at right angles to the slope, the larger stones being used in bottom courses. They shall be laid in close contact so as to break joints, and in such manner that the weight of the stone is carried by the earth and not the adjacent stones.

C. The spaces between the larger stones shall be filled with spalls securely rammed into place. The finished work shall present an even, tight and reasonably smooth surface conforming to the required contour, and have a neat orderly appearance without scattered stones.

D. "Heavy Duty" rip-rap shall be placed in close contact to form an even, tight and reasonably smooth surface with relatively flat top surfaces. Use no small stones or spall.

END OF SECTION

SECTION 321123 GRAVEL BASE COURSES

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.
   1. Compacted gravel for roadways, drives and walks.

1.02 SUBMITTALS

A. Submit manufacturer's product literature and test results for approval on all materials. Make submissions in accordance with Division 1 Submittals section.

1.03 QUALITY ASSURANCE

A. Compaction Control: Wherever a percentage of compaction for backfill is indicated or specified, it shall be the in-place dry density divided by the maximum dry density and multiplied by 100.

B. The maximum dry density shall be the dry density at optimum moisture as determined by ASTM D 1557-91 "Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort," latest revision. Method A, B or C shall be selected by the testing agency based on the gradation results of the sample taken. Adjustments to the laboratory density for oversize aggregate shall be made (if required) as specified in ASTM D 1557-91. These adjustments shall be made in accordance with ASTM D 4718-87, latest revision.

C. The in-place density shall be determined in accordance with ASTM Standard Method of Test for Density of Soil in Place by the Sand Cone Method, Designation D 1556; or density of soil and soil aggregate in-place by nuclear methods (shallow depth), Designation D2922.

D. Materials used on-site are subject to the approval of the Main-Land Development Consultants, Inc. and Geotechnical Engineer and unsuitable materials shall be removed from the site.

1.04 MEASUREMENTS AND CLASSIFICATION

A. Measurements: course thicknesses are in place and compacted, not as spread.

1.05 SOIL TESTING

A. Soils here-to refer to gravel materials.

B. Soil compaction control including laboratory testing, on site testing, and geotechnical inspection will be done by a testing agency hired by the Owner.

C. Geotechnical Engineer and testing agency shall be selected by the Owner and shall report to Main-Land Development Consultants, Inc. Copies of test results and reports will be submitted to Main-Land Development Consultants, Inc. and the Contractor.

D. Provide samples of each fill material from the proposed source of supply. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate sources if proposed material does not meet the specifications. Submit test results to Main-Land Development Consultants, Inc.

E. Tests of soil as delivered may be performed from time to time. Materials in question may not be used, pending test results. Remove rejected material and replace with new, approved soil.

F. Cooperate with the laboratory in obtaining field samples of in-place, bank-run, or stockpiled materials. Samples should be obtained by laboratory personnel from various suppliers, but other individuals may obtain and deliver samples if approved by Main-Land Development Consultants, Inc.

G. Coordinate schedule with testing agency and Main-Land Development Consultants, Inc. to allow testing agency representative to be on site prior to foundation formwork and at the start of filling operations.

H. The Contractor shall bear cost of retesting when initial test results indicate non-compliance with specifications, or when alternate sources are submitted.

I. In-place Compaction Test Frequency for Each Layer Placed:
Parking, Roads and Walks: 1 test per 2000 sq. ft.

2 PRODUCTS

2.01 GENERAL

A. On-site gravel beneath pavement to be excavated will be suitable for use as gravel subbase, granular borrow, and granular bedding material subject to meeting gradation test requirements. Screen gravel to meet gradation. Do not mix with subgrade soils.

2.02 GRAVEL BASE AND SUB-BASE

A. Clean screened or crushed gravel free from organic material or clay. The portion that passes a 3" sieve shall conform to the following gradation requirements:

SIEVE SIZE	% PASSING	
	Base	Sub-Base
2"	100	-
1"	80 - 100	50 - 100
1/2"	35 - 75	-
1/4"	25 - 60	25 - 70
#40	0 - 25	0 - 30
#200	0 - 5	0 - 7

B. Maximum size stone for base passes 2" sieve. Maximum size stone for sub-base passes 3" sieve.

C. Gradations in the table represent the limits which shall determine suitability of gravel for use from the sources of supply. The gradations shall be uniformly graded from course to fine within the limits designated in the table and shall not vary from the low limit on one sieve to the high limit on the adjacent sieves, or vice versa.

D. Optional: provide MDOT Gravel Base Type A for Base Course and MDOT Gravel Subbase Type D for

Sub-Base Course.

3 EXECUTION

3.01 FILLING AND COMPACTION

A. General:
1. Compaction should be performed by complete coverages on each lift such that the required density is achieved throughout each lift, with a maximum loose lift thickness of 12 to 14 inches. In confined areas such as foundation backfill zones adjacent to foundation walls and near existing buildings, smaller compaction equipment such as light vibratory drum roller or hand-operated plate compactor should be used with maximum loose lift thickness reduced to 6 inches. In filling against walls or pipelines, the fill shall be placed and compacted on both sides at the same time to avoid undue strain.
2. Fill material within 2 feet of outside building lines shall be gravel sub-base for the full depth to the footing. Where pavement is within 10 feet of the foundation wall, extend gravel subbase at least 10 feet wide from building foundations, sloping to 2 feet wide at footing elevation.
3. Compact fill under pavements and gravel areas to 95% of maximum dry density.
4. Place gravel base material under concrete pads a minimum of 12" deep, compacted to 95% maximum dry density; and under grass or mulch areas to 90% of maximum dry density.
5. Fill above underdrain geotextile wrap with gravel sub-base for full depth to ground surface.
6. Excavate, grade, and re-compact areas of settlement or improper backfill and compaction, at no additional cost to the Owner.

A. Roads, Parking Lots and Walks:
1. Prepare subgrade to proper grade and proof-roll to 95% maximum dry density. Place fill in 6" to 12" layers compacted to 95% maximum dry density.
2. Place gravel sub-base and gravel base courses in 6" to 12" layers compacted to 95% maximum dry density.
3. Do no work when subgrade is muddy or frozen.
4. Finish surface tolerance shall be 3/8" above or below the required grade. Puddling in paved or unpaved areas will not be acceptable except in areas designated as ponds.

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

A. Provide materials and labor for drive, parking and walkway; paving, and pavement markings.

1.02 STANDARD REFERENCE

A. Reference is made to the latest revision of "Standard Specifications for Highways and Bridges" of the State of Maine Department of Transportation (MDOT), modified by these specifications.

1.03 SUBMITTALS

A. Submit pavement mix design of each grade.

B. Submit field density test results of one test for each 100 tons of bituminous paving by nuclear density gauge.

2 PRODUCTS

2.01 BITUMINOUS CONCRETE MATERIALS

A. Hot bituminous pavement, MDOT, Section 403. Composition, preparation and transportation of bituminous concrete, including plant and equipment shall meet applicable portions of MDOT, Section 401, HOT MIX ASPHALT PAVEMENT.

B. Aggregate conforming to MDOT, Section 703.09, HMA Type 19 mm(or Grade B). Aggregate conforming to MDOT, Section 703.09, HMA Type 12.5 mm-fine(or Grade C). Aggregate conforming to MDOT, Section 703.09, HMA Type 19.0 mm-fine (or Grade D).

C. Pavement grade may change with base, binder, and surface courses. See the detail on the drawings.

2.02 TACK COAT

A. A low viscosity liquid bituminous coating sprayed on an existing course prior to placing a new bituminous concrete course. Emulsified asphalt conforming to MDOT 702.04, Grade RS-1 or HFMS-1.

2.03 PAVEMENT MARKINGS

A. Latex paint designated for traffic use; meeting the requirements of AASHTO M248. Cosmicoat Traffic Paint, Sherwin-Williams Waterborne Traffic Paint, or approved equal. Color white and yellow.

3 EXECUTION

3.01 CONSTRUCTION OF PAVEMENT

A. Hot bituminous concrete pavement shall be constructed over gravel drive and walks in accordance with CONSTRUCTION REQUIREMENTS of MDOT, Section 401, except as modified herein. Exclude paragraphs 401.21 METHOD OF MEASUREMENT and 401.22 BASIS OF PAYMENT.

B. Do not place pavement over frozen gravel.

C. Replace existing pavement disturbed by the work of this Contract with new bituminous pavement of the thicknesses shown on the Drawings or match existing, whichever is greater.

D. Where new and existing pavement join, saw-cut square and form a smooth transition of grades.

E. Treat exposed existing pavement with sprayed bituminous tack coat prior to placing new adjacent or overlaying bituminous pavement. Pavement which has been in place longer than 30 days shall be considered existing. Conform to MDOT Section 409, excluding paragraphs 409.08 and 409.09.

F. Prior to placing surface course or tack coat, thoroughly clean the paved surface of soil, loose material, and other objectionable material, to the approval of Main-Land Development Consultants, Inc..

G. Construct walks no steeper than 5% (1 vert. to 20 hor.) longitudinal grade, and no steeper than 2% (1 vert. to 50 hor.) cross slope.

3.02 PAVEMENT MARKINGS

A. Apply lining paint in strict accordance with manufacturer's printed instructions after pavement has cured sufficiently to prevent bleeding or lifting (at least three weeks). Line width, 4" unless otherwise noted.

B. Apply handicap symbols in accordance with ANSI A117.1, Section 4.28.

C. Perform work in accordance with the U. S. Department of Transportation Manual of Uniform Traffic Control Devices.

D. Finished lines and markings shall be straight, uniform, and well-defined without excessive overspray. Wet thickness of paint at least 15 mils. Symbols shall be painted using appropriate templates.

E. Removing Lines and Markings: Remove painted lines from pavements by sand blasting, solvents, or other approved method. The method must be able to completely eradicate the existing markings without damage to the underlying pavement.

END OF SECTION

LAWNS AND GRASSES

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor, materials and equipment required to complete loaming, fine grading, liming, fertilizing, and seeding.

1.02 QUALITY ASSURANCE

A. Qualifications of Workmen: Provide at least one person who shall be present during execution of this portion of the Work, be thoroughly familiar with the type of materials being installed and the best methods for their installation, and direct work performed under this Section.

B. Standards:
1. Planting material shall meet or exceed the specifications of Federal and State laws requiring inspection for plant disease and insect control.
2. Quality shall conform with the current edition of "Horticultural Standards" for number one grade nursery stock, as adopted by the American Association of Nurserymen.

1.03 SUBMITTALS

A. Materials List: Before materials are delivered to the job site, submit to Main-Land Development Consultants, Inc. a complete list of seeding, mulching, soil amendments, and other items proposed to be installed.
1. Include complete data on source, size and quality.
2. Demonstrate complete conformance with the requirements of this Section.
3. This shall in no way be construed as permitting substitution for specific items described in the Drawings or these Specifications unless the substitution has been approved in advance by Main-Land Development Consultants, Inc.

B. Submit copies of all soil test reports; including initial and final testings.

C. Certificates:
1. Certificates required by law shall accompany shipments.
2. Prior to installation, deliver certificates to Main-Land Development Consultants, Inc.

1.04 PRODUCT HANDLING

A. Delivery and Storage:
1. Deliver items to the site in their original containers with labels intact and legible at time of Main-Land Development Consultants, Inc.'s inspection.
2. Immediately remove from the site seeding materials which are not true to name and materials which do not comply with the provisions of this Section of these Specifications.
3. Protect seeding materials before, during and after installation and to protect the installed work and materials of other trades.

B. Replacements: In the event of damage or rejection, immediately make repairs and replacements necessary to the approval of Main-Land Development Consultants, Inc., at no additional cost to the Owner.

1.05 PLANTING TIME

A. Seeding: Seeding shall be done between August 15th to September 15th and/or April 15th to June 15th.

B. Sodding: Sodding may be done between April 15th and November 15th.

C. Variance: If special conditions exist which may warrant a variance in the above planting dates, a written request shall be submitted to Main-Land Development Consultants, Inc. stating the special conditions for the proposed variance. Permission for the variance will be given if warranted in the opinion of Main-Land Development Consultants, Inc. Regardless of the time of seeding, the Contractor shall be responsible for a full growth of grass.

D. Place permanent soil stabilization within 15 days of final grading.

2 PRODUCTS

2.01 TOPSOIL

A. General: Topsoil, except that existing on the site, will not be made available by the Owner. The Contractor shall be responsible for supplying any additional topsoil needed and hauling it to the site. It shall be obtained from naturally well-drained areas. Whether from on-site or off-site source, the topsoil shall be a fertile, friable natural loam containing no less than 7% nor more than 15% organic matter, by weight. The pH of the soil shall be between 6 and 7 and shall not contain soluble salts greater than 500 parts per million. It shall not contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be cleaned and free from clay lumps, stones, stumps, roots, or similar substances 3/4-inch or more in diameter, debris, or other objects which might be a hindrance to planting operations. Soil shall not be used for planting while in frozen or muddy condition. Furnish all topsoil required to complete the work. Materials removed shall be disposed of by the Contractor.

B. Maximum particle size of 3/4-inch, with maximum of 3% retained on the 1/4-inch mesh sieve. Composition in the following range:

Silt	15 to 40%
Sand	30 to 70%
Clay	3 to 15%

C. Initial Testing: Take representative samples of topsoil from the site and from borrow sources and submit samples to a Soil Testing Laboratory for chemical and physical analysis. Each sample shall be made by combining 10 small grab samples from throughout the source. Indicate to the testing agencies that turf is to be planted and the name of the Owner. Forward to Main-Land Development Consultants, Inc. two copies of analysis and recommendations of the testing agencies.

D. Final Testing: After the final topsoil has been amended and mixed as recommended, take representative samples and submit them to a Soil Testing Laboratory for chemical and physical analysis. Each sample shall be made by combining 10 small grab samples from throughout the source. Make final amendments to the topsoil to meet the specification, based on the test results. Forward to Main-Land Development Consultants, Inc. two copies of analysis and recommendations of the testing agencies.

2.02 FERTILIZER

A. Starter Fertilizer: shall be a commercial balanced fertilizer (18-24-12), delivered to the site in bags labeled with manufacturer's guaranteed analysis. Approximately 30% to 50% of the fertilizer shall be a slow release form (UF IDBU SCU).

B. Fertilizer shall be mixed, as specified, and delivered to the site in standard, unopened containers showing weight, guaranteed analysis, and name of manufacturer.

C. Special Protection: If stored at the site, protect fertilizer from the elements.

2.03 SOIL AMENDMENTS

A. Peat: Peat shall be moist. It shall be finely shredded, consist of 90 percent organic moss peat, be brown in color, and suitable for horticultural purposes. Shredded particles shall not exceed one (1) inch in diameter. Peat shall be measured in air dry condition, containing not more than 35 percent moisture by weight. Ash content shall not exceed 10 percent.

B. Compost: Compost shall meet Maine Department of Environmental Protection rules and guidelines and must be approved for commercial landscaping. Vendor shall provide approximate nitrogen availability calculations for soil blending and complete set of available plant nutrients, pH, trace metals, total volatile solids, soluble salts, measured water holding capacity and maturity measurements. Compost shall be weed seed free and consist of approximately equal portions of municipal bio-solids, short paper fiber, wood ash and sawdust and be the product of 15 days of thermophillic aerobic decomposition followed by 90 days of curing. Compost will be adequately stabilized, pathogen free with acceptable odor. The material shall pass through a 3/8" mesh screen, be friable and free of stones, sticks and all objectionable debris. Compost source is subject to the review of the Engineer.

Compost Parameters:

C:N Ratio	20:1 - 35:1
Total Nitrogen	<1.5%
Maturity Index	Stable - Very Stable
Texture	100% passing 3/8" screen
Soluble Salts	<4 mmhos/cm
Moisture Content	40-60%
Total Volatile Solids	<60%
Density	800 - 1200 lbs./cy

Earth Life Products Compost from New England Organics, Falmouth, Maine, or approved equal.

C. Limestone: Ground dolomitic limestone shall be an approved agricultural limestone and shall contain not less than 85 percent of total carbonates with a minimum of 30% magnesium carbonates. Limestone shall be ground to such fineness that 50 percent will pass a 100 mesh sieve, and 90 percent will pass a 20 mesh sieve.

2.04 GRASS SEED

A. General: Grass seed shall be:
1. Free from noxious weed seeds and recleaned.
2. Grade A recent crop seed.
3. Treated with appropriate fungicide at time of mixing.
4. Delivered to the site in sealed containers with dealer's guaranteed analysis.
5. Each variety of seed shall have percentages of germination of not less than 80%, and a percentage

of purity of not less than 85%.

B. Seed Mix Proportions by Weight:

Description	Kind of Grass	Proportion by Weight
General Lawn Areas	Chewing Fescue "Dignity"	35%
	Pennlawn Creeping Red Fescue	35%
	Perennial Rye "Tourstar" (Nutrite)	30%

C. Weed seed content shall not exceed 0.25 percent. Wet, moldy, or otherwise damaged seed will be rejected.

2.05 MULCH

A. Mulch shall consist of long fibered hay or straw, reasonably free from noxious weeds or other undesirable material. No material shall be used which is so wet, decayed, or compacted as to inhibit even and uniform spreading. No chopped hay, grass clippings or other short fibered material shall be used unless directed.

3 EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:
1. Prior to work of this Section, carefully inspect the installed work of other trades, and verify that such work is complete to the point where this installation may properly commence.
2. Verify that seeding may be completed in accordance with the original design and the referenced standards.

3.02 SUBGRADE PREPARATION

A. The Contractor shall do whatever grading is necessary to bring the subgrade to a true, smooth slope, parallel and at the depth shown on the Drawings below finished grade, for seed bed areas.

B. There must be sufficient grade staked to insure correct line and grade of subgrade and of finished grade.

C. Immediately prior to being covered with topsoil, the top 3" to 6" of the subgrade shall be raked or otherwise loosened and shall be free of stones, rock and other foreign material 1-1/2" or greater in dimensions.

3.03 FINISH GRADE PREPARATION

A. Topsoil shall not be delivered or worked in a frozen or muddy condition.

B. Place and spread topsoil over approved areas to a depth sufficiently greater than shown on the Drawings in "loam and seed" lawn areas and in plant bed areas so that after natural settlement and light rolling, the completed work will conform to the lines, grades, and elevations indicated.

C. After topsoil has been spread in approved areas, it shall be carefully prepared by scarifying or harrowing, and stones over one inch in diameter shall be removed from the topsoil. It shall be free of smaller stones in excessive quantities, as determined by Main-Land Development Consultants, Inc.

D. The whole surface shall then be rolled with a roller which weighs not more than 100 pounds

per foot of width. During the rolling, all depressions caused by settlement of rolling shall be filled with additional topsoil, and the surface shall be regraded and rolled until presenting a smooth and even finish to the required grade.

3.04 SEED BED PREPARATION

A. After the areas to be seeded have been brought to the grades specified, spread limestone at a rate of 100 pounds minimum per 1,000 square feet, or as recommended by soil testing agencies.

B. Apply starter fertilizer at a rate of 15# per 1000 sq. ft. just prior to final grading of the site. Thoroughly and evenly incorporate fertilizer and lime with the soil to a depth of 3" by discing or other approved method. In areas inaccessible to power equipment, use hand tools. Adjacent to trees and shrubs use hand tools to avoid disturbance of the roots. Provide a second application of starter fertilizer at a rate of 6# per 1000 sq.ft. approximately 2 weeks after seedling emergence.

C. Reconstitute the soil, as may be recommended by a soil testing agency, prior to use as planting soil. Any deficiencies in the topsoil shall be corrected by the Contractor, as recommended, at no expense to the Owner.

D. After incorporation of fertilizer and lime into the soil, the seed bed shall be fine graded to remove all ridges and depressions and the surface cleared of all debris and of all stones one inch or more in diameter.

3.05 SEEDING

A. Immediately before seeding, the ground shall be restored, as necessary, to a loose friable condition by discing or other approved method to a depth of not less than 2". The surface shall be cleared of all debris and of all stones 1" or more in diameter.

B. Seed with specified grass seed, sowing evenly with a Brillion seeder or other approved mechanical seeder at the rate of 5 pounds per 1,000 square feet. Sow 50% in one direction and 50% at right angles to the first seeding. Spread seed when soil is moist. Cultipacker, or approved similar equipment, may be used to cover the seed and to firm the seed bed in one operation. In areas inaccessible to cultipacker, the seeded ground shall be lightly raked and rolled in two directions with a water ballast roller. Extreme care shall be taken during seeding and raking to insure that no change shall occur in the finished grades and that the seed is not raked from one spot to another.

C. Hydro-seeding may be used for general lawn areas and low maintenance areas. Certify in writing that the hydro-seed fertilizer mix is as herein specified and applied at the equivalent rate.

D. Promptly after seeding, wet the seed bed thoroughly, keeping all areas moist throughout the germination period.

E. Mulch shall be placed immediately after seeding. Hay that has been thoroughly fluffed shall be spread evenly and uniformly at the rate of two to three tons per acre. Lumps and thick mulch materials shall be thinned. Anchor hay mulch with erosion control mesh on slopes steeper than 6 horizontal to one vertical (16%) and as necessary to prevent movement. Anchor mesh as recommended by manufacturer. Hydromulching is an acceptable method of mulching. The mulch shall consist of natural cellulose wood fibre containing no materials which will inhibit seed germination or plant growth. Sufficient non-toxic water soluble green dye shall be added to provide a definite color contrast to the ground surface to aid in even distribution. Wood fibre mulch shall be supplied in uniform packages not exceeding 100 pounds each. Each package shall be marked to show the air dry weight.

F. Take whatever measures are necessary to protect the seeded area while it is germinating. These measures shall include furnishing warnings signs, barriers, and other needed measures of protection.

3.06 MAINTENANCE

A. Maintenance shall begin immediately after seeding operations and shall continue until Project Substantial Completion or for a minimum of 60 days, whichever is longer.

B. Maintenance of seed areas shall consist of watering, weeding, curing, repair of all erosion, and reseeding as necessary to establish a uniform stand of grass. Lawns shall be watered in a satisfactory manner during and immediately after planting, and not less than twice per week until Project Substantial Completion. Areas which fail to show a uniform stand of grass for any reason shall be reseeded repeatedly until a uniform stand is attained. Scattered bare spots approximately 8" in size, evenly distributed in any lawn area, will be allowed at the discretion of Main-Land Development Consultants, Inc.

C. At the time of the first cutting, there shall be a uniform stand between 3 and 3-1/2" high, and mower blades shall be set between 2-1/2" and 3" high. Provide at least 3 cuttings of grass in lawn areas not closer than 10 days apart. Catch shall be representative of seed specified.

D. Correct graded areas which settle during the first 12 months after Project Substantial Completion

3.07 ACCEPTANCE IN PART

A. The work may be accepted in parts when it is deemed to be in the Owner's best interest to do so and when approval is given to the Contractor in writing to complete the work in parts. Acceptance and use of such areas by the Owner shall not waive any other provisions of this Contract.

3.08 CLEAN-UP

A. When this work is done while buildings are occupied, pavements shall be kept broom cleaned to prevent tracking dirt into buildings.

B. After completion of planting operations, dispose of debris and excess material to the satisfaction of Main-Land Development Consultants, Inc. Pavements shall be broomed and hosed clean.

3.09 FINAL INSPECTION AND ACCEPTANCE

A. At the end of the guarantee period, Main-Land Development Consultants, Inc. will inspect guaranteed work for the Final Acceptance upon written request of the Contractor. The request shall be received at least 10 calendar days before the anticipated date for final inspection.

B. Upon completion and reinspection of repairs or renewals necessary in the judgement of Main-Land Development Consultants, Inc. at that time, he shall certify in writing to the Contractor as to the Final Acceptance of the project.

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the sanitary and storm drainage as shown on the Drawings and/or herein specified.
   1. Sewer lines.
   2. Trench insulation.
   3. Repair of existing utilities damaged by the work.
   4. Septic tank and subsurface disposal system.

B. Terminate site utility pipes and conduits at the building foundation wall for connection to building utilities.

1.02 SUBMITTALS

A. Submit manufacturer's product literature and Shop Drawings for approval on materials in accordance with Division 1 Submittals section.

B. Certified copies of test results.

C. As-built records of pipe location, depth, services, and repairs.

2 PRODUCTS

2.01 SEWER PIPE

A. Polyvinylchloride (PVC), conforming to ASTM D3034, maximum ratio of outside diameter to wall thickness of 35 (SDR-35). Watertight push-on couplings with flexible O-ring gasket, conforming to ASTM D3212. Use same for septic system.

2.02 SEWER SERVICE CONNECTIONS

A. Use 4" diameter, forty-five degree wyes, tee-wyes, or gasketed saddles, appropriate adaptors, fittings, and end plug. Tap main with core drill in the upper half of the pipe.

B. Use polyvinylchloride (PVC) sewer pipe (SDR-35) with watertight push-on joints.

2.03 GEOTEXTILE DRAINAGE FABRIC

A. Polypropylene or Polyester Non-woven, Needle-punched Drainage Fabric with the Following Minimum Properties:

Weight	4.5 oz/sy	Water Flow Rate	280 gpm/sf
Thickness	60 mils	Coef of Permeability	0.2 cm/sec
Tear Strength	50 lbs	Equiv. Opening Size	70-100 sieve

B. Mirafi 140N, Terra Tex - SD, Trevira 1115, AEF 480, or approved equal.

2.04 TRENCH INSULATION

A. Extruded polystyrene with a "K" factor of 0.18, with 2.2 lb./cu. ft. density, and 30 psi compressive strength, manufactured by Dow Chemical, or approved equal.

2.05 PRECAST REINFORCED CONCRETE DISTRIBUTION BOX

A. Constructed of 4000 psi concrete designed to support an HS-20 wheel loading. Provide a box of approximate dimensions of 11 ½" wide, 11 ½" high, and 2'-3/4" long, with 8 pipe outlets for each disposal pipeline.

2.06 PRECAST REINFORCED CONCRETE SEPTIC TANK

A. Constructed of 4000 psi concrete designed to support HS-20 wheel loading. The 1,500-gallon capacity tank shall be of approximate dimensions of 12'-12" long, 6'-10" wide and 5'-1 ½" high. The 1,000-gallon capacity tank shall be approximate dimensions of 8' long, 5'-4" wide and 5'-7" high. The tanks shall have a 24 diameter cleanout cover with a precast concrete manhole section riser rings raised to finished grade, and inspection covers at each end.

2.07 PRECAST REINFORCED CONCRETE LEACHING CHAMBERS

A. Constructed of 4000 psi concrete designed to support HS-20 wheel loading. Chambers must be listed as approved by the State of Maine Division of Health Engineering. Approximate dimensions of 8'-0-" long, 4'-0" wide, and 13" high, and constructed to be connected to others in series.

2.08 BURIED WARNING AND IDENTIFICATION TAPE

A. For non-metallic pipe use metallic core or metallic-faced, acid and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. For metallic pipe use non-metallic polyethylene plastic warning tape. Provide tape on rolls, 3-inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

B. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Metallic tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep.

WARNING TAPE COLOR CODES	
Red	Electric
Yellow	Gas, Oil, Dangerous Materials
Orange	Telephone and other Communications
Blue	Water Systems
Green	Sewer Systems
White	Steam Systems
Gray	Compressed Air

3 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. Conforming to the appropriate portions of Section 312316, Earthwork.

3.02 SEWER PIPING

A. Lay pipe on stable bedding beginning at the downstream end and proceeding upstream with the bell end of the pipe upstream. Provide adequate trench drainage to prevent pipe floatation and insure proper bedding compaction.

B. Where continuous bedding material is used and pipe slope exceeds 3%, construct trench dams along the trench to hinder the flow of ground water through the bedding material. Construct trench dams of relatively impervious clayey or silty material excavated from the trench, extending 1 foot above the pipe embedment zone, and spaced within 25 feet upstream of each manhole, and whenever the trench grade rises 10 feet.

C. Provide 4 foot wide layer of 2-inch thick rigid foam insulation on bedding material 2-inches above top of pipe, where depth of cover over the top of pipe is less than 5 feet. Where cover is less than 3 feet, provide two 2" layers, where approved by Main-Land Development Consultants, Inc..

D. Coordinate work on municipal utility lines and within street right-of-way with municipal sewer department, MDOT, and public works department.

3.03 SEWER SERVICE LINE

A. Install wye or tee-wye fitting and additional service line from the main to an existing service line within right-of-way limits; or for new service lines to the right-of-way limits or as directed by Main-Land Development Consultants, Inc.. Sewer service lines for existing services shall be laid at a uniform grade from the sewer to the point of connection with the existing service lines. All sewer service lines for future use shall be laid at a uniform grade of one eighth inch per foot unless otherwise authorized by Main-Land Development Consultants, Inc.. Pipe used for reconnections shall be of the same diameter as the existing line. Where water lines are to be crossed, service pipe joints shall be spaced such that no joint falls within ten feet of the centerline of the existing, or proposed water line. All connections shall be made with appropriate adaptors.

3.04 SUBSURFACE WASTE WATER DISPOSAL SYSTEM

A. Install disposal system true to line and grade as shown on the Drawings and in accordance with the State of Maine Subsurface Waste Water Disposal Rules of the Division of Health Engineering, latest revision. The designed subsurface wastewater disposal system is a combination of a serially distributed and sequentially distributed, commercial system. Drawings detail and diagrammatically layout the system design including parts, materials, and installation notes.

1. Prepare the subsurface wastewater system area by laying out the extents of the system and the locations of the H20 rated chambers, drop boxes, distribution boxes, pipes, and other parts.
2. Stump and grub the system area leaving no organics or loamy topsoil. Utilize an excavator with a toothed bucket to avoid “smearing” of the subgrade soils. Alternatively, bulldoze to remove topsoil and scarify subgrade to a depth of 6 inches prior to installation of specified sand layer.

3. Do not continue system installation on saturated, frozen, or smeared ground.
4. Limit to the greatest extent practical, any activities that compact the prepared subgrade or sand soil interface. This includes but is not limited to the use of tracked and pneumatic equipment and foot traffic.
5. Seed and mulch according to section 032913 for lawn areas to stabilize finish surface.

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor and materials to complete the sanitary and storm drainage as shown on the Drawings and/or herein specified.
   1. Storm drain lines.
   2. Underdrains, including foundation drains inside and outside building.
   3. Trench insulation.
   4. Geotextile filter fabric.
   5. Repair of existing utilities damaged by the work.

B. Terminate site utility pipes and conduits at the building foundation wall for connection to building utilities.

1.02 SUBMITTALS

A. Submit manufacturer's product literature and Shop Drawings for approval on materials in accordance with Division 1 Submittals section.

B. Certified copies of test results.

C. As-built records of pipe location, depth, services, and repairs.

2 PRODUCTS

2.01 STORM SERVICE CONNECTIONS

A. Use 6" diameter, forty-five degree wyes, tee-wyes, or gasketed saddles, appropriate adaptors, fittings, and end plug. Tap main with core drill in the upper half of the pipe.

B. Use polyvinylchloride (PVC) sewer pipe (SDR-35) with watertight push-on joints.

2.02 STORM DRAINS

A. Unless Otherwise Noted Use Any of the Following Pipe Materials:
   1. Polyvinylchloride (PVC), conforming to ASTM D3034, maximum ratio of outside diameter to wall thickness of 35 (SDR-35). Watertight push-on couplings with flexible O-ring gasket, conforming to ASTM D3212.

2.03 UNDERDRAINS

A. Underdrains Outside the Building Foundation Wall:
   1. Polyvinylchloride (PVC), Type PS-46 conforming to ASTM F-789 or PSM (SDR 35)conforming to ASTM D-3034 perforated with two rows of 1/2-inch diameter holes. Gasketed push-on joints.

B. For underdrains beneath floor slabs inside the building foundation, use either of the previously specified materials or substitute PVC "S & D" pipe conforming to ASTM D-2729, perforated with two rows of 1/2" holes, or high-density polyethylene “S & D” pipe conforming to ASTM F-810.

C. Provide cleanout risers to finish grade outside the building with threaded covers. Grease threads on cover. Provide cleanout plug inside a cast iron or aluminum handhole and cover, set flush to walkway or drive pavement, where cleanout is in a hard surface area.

2.04 GEOTEXTILE DRAINAGE FABRIC

A. Polypropylene or Polyester Non-woven, Needle-punched Drainage Fabric with the Following Minimum Properties:

Weight	4.5 oz/sy	Water Flow Rate	280 gpm/sf
Thickness	60 mils	Coef of Permeability	0.2 cm/sec
Tear Strength	50 lbs	Equiv. Opening Size	70-100 sieve

B. Mirafi 140N, Terra Tex - SD, Trevira 1115, AEF 480, or approved equal.

2.05 TRENCH INSULATION

A. Extruded polystyrene with a "K" factor of 0.18, with 2.2 lb./cu. ft. density, and 30 psi compressive strength, manufactured by Dow Chemical, or approved equal.

3 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. Conforming to the appropriate portions of Section 02200, Earthwork.

3.02 STORM PIPING

A. Lay pipe on stable bedding beginning at the downstream end and proceeding upstream with the bell end of the pipe upstream. Provide adequate trench drainage to prevent pipe floatation and insure proper bedding compaction.

B. Where continuous bedding material is used and pipe slope exceeds 3%, construct trench dams along the trench to hinder the flow of ground water through the bedding material. Construct trench dams of relatively impervious clayey or silty material excavated from the trench, extending 1 foot above the pipe embedment zone, and spaced within 25 feet upstream of each manhole, and whenever the trench grade rises 10 feet.

C. Provide 4 foot wide layer of 2-inch thick rigid foam insulation on bedding material 2-inches above top of pipe, where depth of cover over the top of pipe is less than 5 feet. Where cover is less than 3 feet, provide two 2" layers, where approved by Main-Land Development Consultants, Inc..

D. Provide 4 foot wide layer of 2-inch thick rigid foam insulation on bedding material 6-inches above or below sewer pipe, where it crosses a storm drain pipe with less than 5 feet of separation.

E. Coordinate work on municipal utility lines and within street right-of-way with municipal sewer department, MDOT, and public works department.

3.03 UNDERDRAINS

A. Set pipe in crushed stone bedding surrounding pipe, with perforations on the bottom half of the pipe. Slope pipe uniformly to drain. Fully wrap stone bedding with Geotextile fabric. Compact to 95% maximum density around pipe.

END OF SECTION