Burlington Development Review Board
Department of Permitting & Inspections
645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/DPI/DRB
Telephone: (802) 865-7188
Fax (802) 863-0466

Development Review Board

Tuesday, July 16, 2024, 5:00 PM

645 Pine Street, Front Conference Room or Remote on Zoom:
Please click the link below to join the webinar:
Zoom: https://us02web.zoom.us/j/83225696227?pwd=SGQ0bTdnS000Wkc3c2J4WWw1dzMxUT09
Webinar ID: 832 2569 6227
Passcode: 969186
Telephone: US +1 929 205 6099 or +1 301 715 8592 or +1 312 626 6799 or +1 669 900 6833 or +1 253 215 8782 or +1 346 248 7799

1. Agenda

2. Communications

3. Minutes

4. Public Hearing

4.1.
ZP-24-243; 165 Shelburne Street (RC, Ward 5) Champlain Housing Trust, Inc. / Donal Dugan
Proposed change of use from hotel to 30 bed warming shelter with associated site improvements. (Project Manager, Scott Gustin)

4.2.
ZP-24-150; 953 North Avenue (RC, Ward 4) Harry Barton III / Mary Cannizzaro-Barton
Proposed home occupation for dog grooming and related driveway alteration. (Project Manager, Garret King)

5. Certificate of Appropriateness

5.1.
ZP-24-263; 1074 Pine Street (RL, Ward 5) South Meadow Apartments, LP / Liviya Kovacevic
Proposed construction of a gravel wetland to treat stormwater runoff. (Project Manager, Mary O'Neil)

6. Other Business

6.1. Annual Organizational Meeting

7. Adjournment

8. Informational and Non-Discrimination Statements

8.1.

Plans may be viewed upon request by contacting the Department of Permitting & Inspections between the hours of 8:00 a.m. and 4:30 p.m. Participation in the DRB proceeding is a prerequisite to the right to take any subsequent appeal. Please note that ANYTHING submitted to the Zoning office is considered public and cannot be kept confidential. This may not be the final order in which items will be heard. Please view final Agenda, at www.burlingtonvt.gov/dpi/drb/agendas or the office notice board, one week before the hearing for the order in which items will be heard.

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status, crime victim status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at (802) 540-2505.

Department of Permitting & Inspections
Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone:(802) 865-7188

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Steve Cormier, Code Compliance Officer
Ted Boylan, DPI Administrator

TO: Development Review Board
FROM: Scott Gustin
DATE: July 16, 2024
RE: ZP-24-243; 165 Shelburne Street

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Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: RC Ward: 5S

Owner/Applicant: Champlain Housing Trust, Inc / Donal Dugan

Request: Proposed change of use from motel to 30 bed emergency shelter and related exterior improvements.

Applicable Regulations:
Article 3 (Applications, Permits, & Project Reviews), Article 4 (Zoning Maps & Districts), Article 5 (Citywide General Regulations), Article 8 (Parking)

Background Information:
The applicant is seeking approval to establish a 30-bed emergency shelter within the existing building. Only the ground floor will change. The remainder of the building will remain lodging. Exterior alterations are limited to lighting, a new rear doorway and related walkway behind the building, and a modified front entryway. These limited alterations are depicted with "clouding" on a previously approved site plan.

Emergency shelters are a conditional use within the Residential Corridor zone, wherein the subject property is located. As of September, 2023, emergency shelters are subject to only limited zoning review per VSA 24, Sec. 4413.

Sec. 4413. Limitations on municipal bylaws

(a) (1) The following uses may be regulated only with respect to location, size, height, building bulk, yards, courts, setbacks, density of buildings, off-street parking, loading facilities, traffic, noise, lighting, landscaping, and screening requirements, and only to the extent that regulations do not have the effect of interfering with the intended functional use:
(G) emergency shelters.

(a) (3) For purposes of this subsection, regulating the daily or seasonal hours of operation of an emergency shelter shall constitute interfering with the intended functional use.

While conditional use approval is required, the applicable criteria are limited by these statutory provisions.

Previous zoning actions for this property are noted below.

- Zoning permit: ZPF-24-30 Install 8' rear yard privacy fence
- Zoning permit: ZP-23-235 Renovations to existing building and site.
- Zoning permit: ZP-22-102 Replacing the sliding patio door for 10 guest rooms. Also, install HVAC units and pads.
- Zoning permit: ZP-21-65 Replace asphalt roof with membrane.
- Zoning permit: ZP-20-711 Install replacement windows in basement and increase width of two doors.
- Zoning permit: ZP-03-129 Relettering of existing non-Conforming sign.
- Zoning permit: ZP-88-170 Place 10` diameter satellite dish, black in color- aluminum perforated, on rear of roof pitch to be 43ft. in height
- Zoning permit: 1976 erect a 3.5` x 64` cedar shingle wood fence on the front of the property

Recommendation: **Initial review and continuance of the public hearing** to allow additional time for the applicant to provide missing information:

I. Findings

Article 3: Applications and Reviews
Part 3, Impact Fees
Sec. 3.3.2, Applicability & Sec. 3.3.3, Exemptions & Waivers
The proposed emergency shelter does not contain any new dwelling units, but is it categorized as a special residential use. Occupants of the shelter will stay there rent free. As such, it qualifies for an exemption from impact fees per Sec. 3.3.3. **(Affirmative finding)**

Part 5, Conditional Use & Major Impact Review:
Section 3.5.6 (a) Conditional Use Review Standards
Approval shall be granted only if the DRB, after public notice and public hearing, determines that the proposed conditional use and associated development shall not result in an undue adverse effect on each of the following general standards:

1. *Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*

The proposed emergency shelter will be served by municipal utilities. The size of the proposed facility is small at just 30 beds. Sufficient water and sewer service are available. A State of Vermont wastewater permit may be required. A capacity letter issued by the Dept. of Public Works is required for issuance of a wastewater permit. **(Affirmative finding as conditioned)**

2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;*

Not applicable per VSA 24, Sec. 4413.

3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*

Given that the emergency shelter is within an enclosed building and is actively managed by the non-profit owner, anticipated noise impacts are no greater than those associated with the present use. **(Affirmative finding)**

4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies;*

No traffic information has been provided. While the 30-bed warming shelter almost certainly does not meet the threshold for needing a traffic study, at least basic information as to the number of staff onsite, days, and hours of operation should be provided, in addition to average existing traffic counts. **(No finding possible)**

and,

5. *The utilization of renewable energy resources;*

Not applicable per VSA 24, Sec. 4413.

and,

6. *Any standards or factors set forth in existing City bylaws and city and state ordinances**;***

VSA 24, Sec. 4413 limits only zoning review. Building and life safety codes continue to apply as usual.

(b) Major Impact Review Standards

Not applicable.

(c) Conditions of Approval:
In addition to imposing conditions of approval necessary to satisfy the General Standards specified in (a) or (b) above, the DRB may also impose additional conditions of approval relative to any of the following:

1. Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.
As noted above, noise impacts are anticipated to be similar to current conditions. No site or other changes requiring screening or landscaping are proposed. **(Affirmative finding)**

2. Time limits for construction.
No additional time is requested with the current application, nor is a phasing plan included. The standard 3-year timeframe for zoning permits will apply. **(Affirmative finding)**

3. Hours of operation and/or construction to reduce the impacts on surrounding properties.

Only limited construction is proposed. Limitations on construction hours beyond those in the city's noise ordinance are not warranted.

No information has been provided as to days and hours of operation of the proposed emergency shelter. VSA 24, Sec. 4413 precludes limiting days and hours of operation. **(Affirmative finding)**

4. That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions; and,
Any future enlargement or alteration will be reviewed under the zoning regulations in effect at that time. **(Affirmative finding)**

5. Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.
See the recommended conditions.

Article 4: Maps & Districts
Sec. 4.4.5, Residential Districts:
(a) Purpose
(1) Residential Corridor (RC)
This newly established district is primarily intended for mixed residential uses along major multi-modal transportation corridors. A variety of residential and special residential uses are allowed, either as permitted or conditional uses. The proposed emergency shelter is one such use.
(Affirmative finding)

(b) Dimensional Standards
Lot coverage will increase slightly from the new rear walkway. It will increase from 52% to 53.7% and will remain under the maximum permissible 80% lot coverage within the RC district.

Setbacks remain largely unchanged. Walkways are allowed to encroach into setbacks. As proposed, the walkway will comply with the minimum 5' accessory rear yard setback anyway.

Building height and footprint remain unchanged. **(Affirmative finding)**

(c) Permitted & Conditional Uses
As noted above, the proposed emergency shelter is a conditional use in the RC zone. **(Affirmative finding)**

(d) District Specific Regulations
1. Additional Residential Development Permitted
(Not applicable)

2. Exceptions to Dimensional Standards
(Not applicable)

3. Exception for Neighborhood Commercial Uses
(Not applicable)

4. Miscellaneous Standards

(Not applicable)

(e) Effective Date
(Not applicable)

Article 5: Citywide General Regulations
Part 4, Special Use Regulations
Sec. 5.4.13 Emergency Shelters

Not applicable per VSA 24, Sec. 4413.

Part 5, Performance Standards
Sec. 5.5.2, Outdoor Lighting
New outdoor lighting will illuminate building entries and the front parking area. Fixture cut sheets and a photometric plan have been provided. Proposed fixtures appear to be acceptable; however, some of the illumination levels are too high, and the photometric plan does not distinguish between the entryway and parking lighting environments. Entryway illumination needs to average 5.0 footcandles or less. Parking illumination is limited to 4.0 footcandles at any given point and needs to comply with a 20:1 uniformity ratio. Pole fixture mounting height is acceptable at 10.' A revised photometric plan is needed to comply with the outdoor lighting standards of Sec. 5.5.2. **(Adverse finding)**

Article 8: Parking
Sec. 8.1.9, Maximum On-Site Parking Spaces
The existing 16-space parking lot will remain unchanged. Within the subject building floor space, the maximum parking limitation for the proposed emergency shelter is 8 spaces, whereas the maximum for the lodging use is 3 spaces. **(Affirmative finding)**

Sec. 8.1.16, Transportation Demand Management
(b) Applicability
The proposed emergency shelter does not trigger the requirement for a transportation demand management plan. **(Not applicable)**

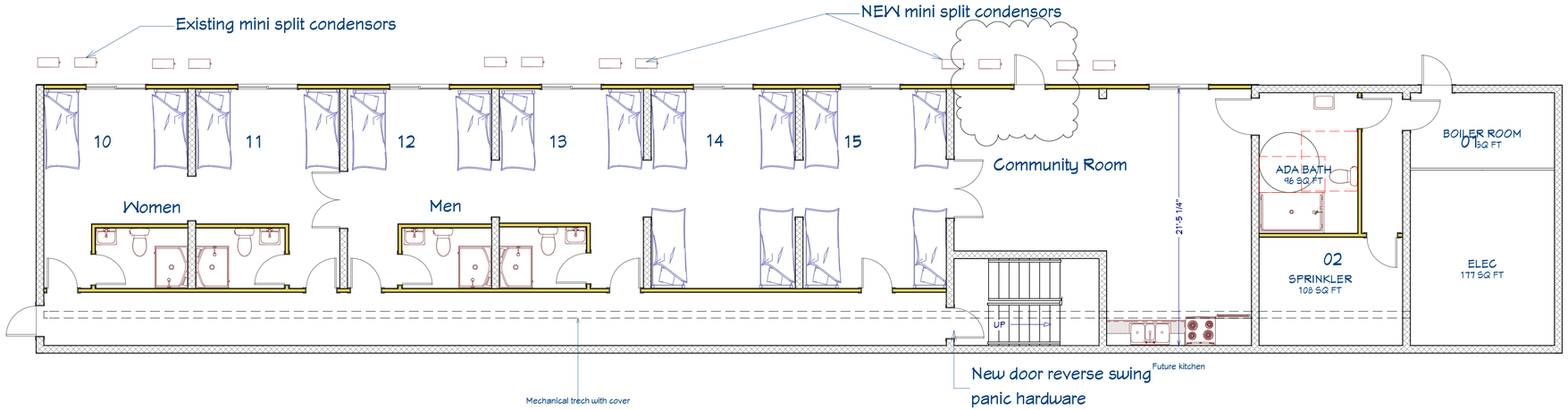
Sec. 8.2.5, Bicycle Parking Requirements
Table 8.2.4-1, *Bicycle Parking Requirements*, does not include emergency shelter as a use. The property contains 12 interior bicycle parking spaces that will remain in place. **(Affirmative finding)**

II. Conditions of Approval
If the DRB finds that approval is warranted, the following conditions are recommended.

1. **Prior to release of the zoning permit**, the following items shall be submitted, subject to staff review and approval:
    a. Revised lighting plans depicting compliant illumination levels for the entryways and parking lot lighting environments; and,
    b. Information as to the number of staff onsite, and days and hours of operation, in addition to average existing traffic counts.

2. A state wastewater permit may be required. It is the applicant's responsibility to contact VT DEC and obtain a wastewater permit or confirmation that one is not needed.
3. All new utility lines shall be buried.
4. It is the applicant's responsibility to comply with all applicable ADA requirements.
5. Installation of conduit for future solar energy devices is encouraged.
6. All new construction is required to meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances.
7. Standard Conditions 1-15.

30 beds min



1st Floor

NO.	DESCRIPTION	BY	DATE

SHEET TITLE: PLAN LEVEL 1

CHAMPLAIN PLACE REMODEL

155 165 SHELBURNE ST
CHAMPLAIN HOUSING TRUST

DATE: 7/8/2024

SCALE:

SHEET: A-1

Warming Shelter Zoning Permit 7/8/2024

210'-8 7/8"

38'-7 1/8"

61'-3"

Remove chainlink replace with 8' wood privacy fence

Filled in pool

replace

Remove shed and old pool apron. Create ramp to lower level of site

24 | 23 | 22 | 21 ADA renovated 2020 | 20 FHA Renovated 2020 | 19 | 18 | 17 | 16

TYPICAL EXISTING BATH 35 SQ FT

TYPICAL REMODEL BATH 24 SQ FT

New Mech chaseway

BATH 37 SQ FT

STORAGE 60 SQ FT

ADA BATH 66 SQ FT

BATH 24 SQ FT

BATH 35 SQ FT

UNHEATED STORAGE 51 SQ FT

OPEN BELOW 89 SQ FT

BATH 29 SQ FT

FHA UNIT 188 SQ FT

FHA BATH 60 SQ FT

ADA UNIT 174 SQ FT

BATH 72 SQ FT

RAMP

RAMP

RAMP

4'-7 1/4" | 8'-0 1/4" | 15'-0 5/16"

Planter on top of retaining wall as guardrail

LIVING AREA 35 SQ FT

LIVING AREA 22 SQ FT

16'-3 1/4"

accessible route to laundry

RAMP

covered BIKE PARKING
6 floor mounted
6 wall mounted

Raise floor level to bathroom level

ADA BATH 41 SQ FT

LULA 36 SQ FT

Raise floor level to basement level. Sloped transition at cabinetry

New conc slab

Recycling

Trash

GARDENER & RECYCLING 55 SQ FT

30'-1 3/4"

165

Remove asphalt convert to grass

ramp and raise sidewalk for ADA access

24'-4 5/16"

25'-0 13/16"

new concrete walk

Chain link for visibility this run only

Smoking Shelter 5x15

primary secure entry. Electric lock with remote release. Camera with audio.

FIRE LANE NO PARKING

6' PRIVACY fence

125'-3 3/4"

22'-8 3/4"

Utility / Emergency Services gate

GUEST LAUNDRY 148 SQ FT

12'-3"

NEW 6' privacy fence & gate

SHARED DRIVEWAY

Existing Parking 29
Revised Parking 16
Including 2 ADA

8' | 9'-0 7/8" | 8'

ADA VAN Parking

ADA VAN Parking

18'

155

BED BUG HEATER CLOSET 35 SQ FT

41'

12'-8 1/8"

56'-2 1/4"

13'-3"

replace existing 4' chainlink

Mature shrub to remain

36'

11'-9"

Demo planters and split rail fencing
Rremove sign (existing sign 98SF)
Replace with smaller sign

14'-6"

6'

GMT Timberframe bus stop structure 11'6"x4'6" min pad size 12'6x5'6" TO BE PERMITED UNDER SEPERATE PERMIT BY GMT

New Bsign location

Demo Lamp post & lights & splitrail fence

Demo Lamp post & lights & splitrail fennce

existing street trees

Warming Shelter Zoning Permit 7/8/2024

NO	DESCRIPTION	BY	DATE

SHEET TITLE: SITE PLAN/ LEVEL 2

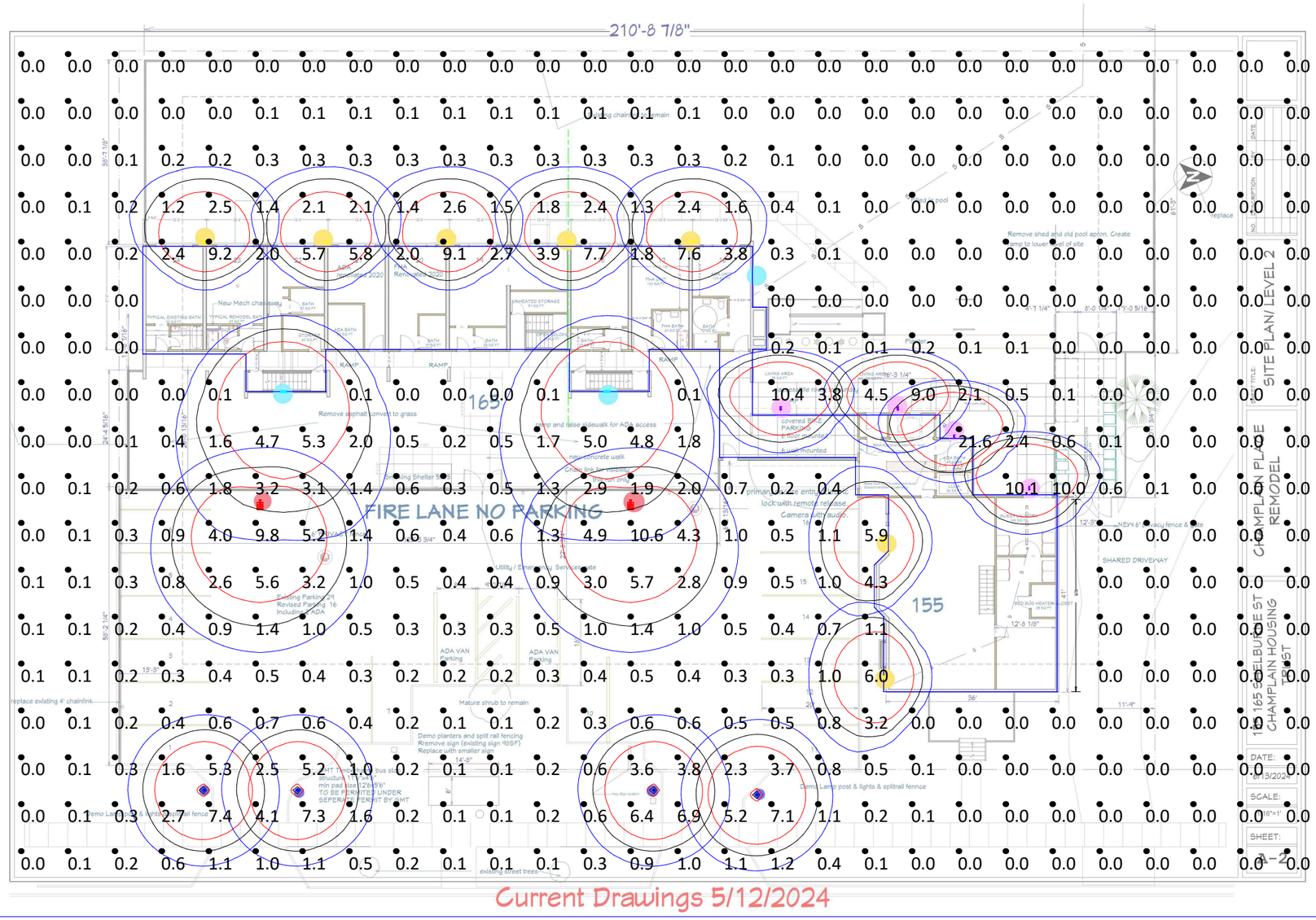
CHAMPLAIN PLACE REMODEL

155 165 SHELBURNE ST
CHAMPLAIN HOUSING TRUST

DATE: 7/8/2024

SCALE: 1/16"=1'

SHEET: A-2



Not to Scale

HOLBROOK-ASSOCIATED	Prepared By: Holbrook-Associated 35 Reservoir Park Drive Rockland, MA 02370	Job Name: Champlain Inn Burlington, VT	Scale: as noted	Project ID: 233732
			Date:6/25/2024	Rep: JD
			Filename: CI.AGI	
			Drawn By:JHainey	

Filename: C:\Users\jholbrook\Documents\AGI32 - Designs\2024 Designs\John Dignard\Champlain Inn\CI.AGI

The Lighting Analysis, ezLayout, Energy Analysis and/or Visual Simulation ("Lighting Design") provided by Holbrook-Associated represent an anticipated prediction of lighting system performance based upon design parameters and information supplied by others. These design parameters and information provided by others have not been field verified by Holbrook-Associated and therefore actual measured r esults may vary from the actual field conditions. Holbrook-Associated recommends that design parameters and other information be field verified to reduce variation.

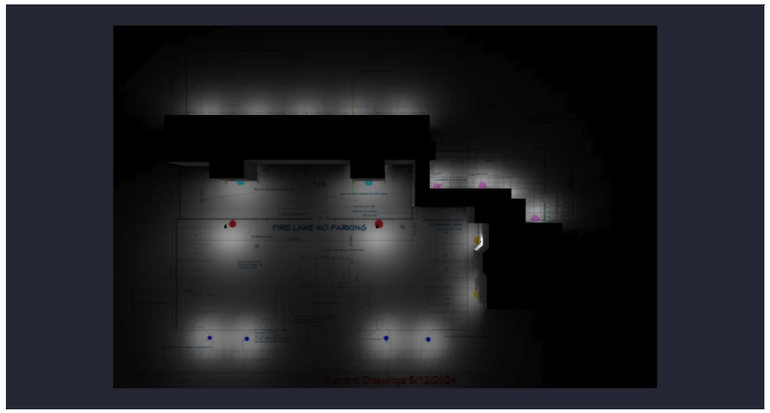
Holbrook-Associated neither warranties, either implied or stated with regard to actual measured light levels or energy consumption levels as compared to those illustrated by the Lighting Design. Holbrook-Associated neither warranties, either implied or stated, nor represents the appropriateness, completeness or suitability of the Lighting Design intent as compliant with any applicable regulatory code requirements with the exception of those specifically stated on drawings created and submitted by Holbrook-Associated. The Lighting design is issued, in whole or in part, as advisory documents for informational purposes and is not intended for construction nor as being part of a project's construction documentation package.

Calculation Summary											
Label	**CalcType**	**Units**	**Avg**	**Max**	**Min**	**Avg/Min**	**Max/Min**	**Description**	**PtSpcLr**	**PtSpcTb**	**Meter Type**
Site	Illuminance	Fc	0.97	21.6	0.0	N.A.	N.A.	Readings Taken @ 0'-0" AFG	10	10	Horizontal

Luminaire Schedule			All quotes/orders generated from this layout must be forwarded to the Local Rep Agency				
Symbol	**Qty**	**Tag**	**Label**	**Arrangement**	**LLF**	**Description**	**BUG Rating**
	4	A	B17DB	Single	1.000	B17D 19W 3000K	B1-U3-G1
	7	B	SLIM17FA15ADJ	Single	1.000	SLIM17FA15ADJ_3K	B1-U1-G0
	2	C	IVAFT-45LPA730ZU	Single	1.000		B1-U0-G2
	4	D	SLIM	Single	1.000	SLIM_12W_3000K	B1-U0-G1
	2	E	SLIM17FAFC40	Single	1.000	SLIM17FAFC40_3K at 0_ CCT Setting	B2-U0-G1

Expanded Luminaire Location Summary

LumNo	Tag	X	Y	MTG HT	Orient	Tilt
1	A	52	27	3.5	0	0
2	A	72	27	3.5	0	0
3	A	148	27	3.5	0	0
4	A	170	26	3.5	0	0
5	B	197	80	10	180	0
6	B	197	51	10	180	0
7	C	64	87.5	10	270	0
8	C	143	87.5	10	270	0
9	D	175	108	8	90	0
10	D	200	108	8	90	0
11	D	212	102	8	90	0
12	D	228	91	8	90	0
13	E	69	112	15	270	0
14	E	138	112	15	270	0
15	B	52	144	10	90	0
16	B	78	144	10	90	0
17	B	104	144	10	90	0
18	B	130	144	10	90	0
19	B	156	144	10	90	0
Total Quantity: 19						



Render Image - Top View

NOTES:
* The light loss factor (LLF) is a product of many variables, only lamp lumen depreciation (LLD) has been applied to the calculated results unless otherwise noted. The LLD is the result (quotient) of mean lumens / initial lumens per lamp manufacturers' specifications.

* Illumination values shown (in footcandles) are the predicted results for planes of calculation either horizontal, vertical or inclined as designated in the calculation summary. Meter orientation is normal to the plane of calculation.

* The calculated results of this lighting simulation represent an anticipated prediction of system performance. Actual measured results may vary from the anticipated performance and are subject to means and methods which are beyond the control of Holbrook-Associated.

* Mounting height determination is job site specific, our lighting simulations assume a mounting height (insertion point of the luminaire symbol) to be taken at the top of the symbol for ceiling mounted luminaires and at the bottom of the symbol for all other luminaire mounting configurations.

* It is the Owner's responsibility to confirm the suitability of the existing or proposed poles and bases to support the proposed fixtures, based on the weight and EPA of the proposed fixtures and the owner's site soil conditions and wind zone. It is recommended that a professional engineer licensed to practice in the state the site is located be engaged to assist in this determination.

* The landscape material shown hereon is conceptual, and is not intended to be an accurate representation of any particular plant, shrub, bush, or tree, as these materials are living objects, and subject to constant change. The conceptual objects shown are for illustrative purposes only. The actual illumination values measured in the field will vary.

* Photometric model elements such as buildings, rooms, plants, furnishings or any architectural details which impact the dispersion of light must be detailed by the customer documents for inclusion in the Holbrook-Associated lighting design model. Holbrook-Associated is not responsible for any inaccuracies caused by incomplete information on the part of the customer, and reserves the right to use best judgement when translating customer requests into photometric studies.

HOLBROOK-ASSOCIATED

Prepared By:
Holbrook-Associated
35 Reservoir Park Drive
Rockland, MA 02370

Job Name:
Champlain Inn
Burlington, VT

Scale: as noted	Project ID: 233732
Date:6/25/2024	Rep: JD
Filename: CI.AGI	
Drawn By:JHainey	

Filename: C:\Users\jholbrook\Documents\AGI32 - Designs\2024 Designs\John Dignard\Champlain Inn\CI.AGI

B17DB

Color: Black

Weight: 12.0 lbs

Project:	**Type:**
Prepared By:	**Date:**

Driver Info

Type	Constant Current
120V	0.20A/0.16A/0.12A
208V	0.12A/0.10A/0.07A
240V	0.10A/0.08A/0.06A
277V	0.09A/0.07A/0.05A
Input Watts	24/19/14W

LED Info

Watts	24/19/14W
Color Temp	3000K/4000K/5000K
Color Accuracy	72-75 CRI
L70 Lifespan	50,000 Hours
Lumens	1,959-3,409 lm
Efficacy	143.9-156.1 lm/W

Technical Specifications

Field Adjustability

Field Adjustable:
Field Adjustable Light Output:
24W/19W/14W (factory default 24W)
Color temperature selectable by 5000K, 4000K and 3000K (factory default 4000K)

Compliance

UL Listed:
Suitable for wet locations

IESNA LM-79 & LM-80 Testing:
RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

IP Rating:
Ingress protection rating of IP65 for dust and water

DLC Listed:
This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.
DLC Product Code: S-VXGT3F

Electrical

Driver:
Constant Current, Class 2, Class P, 120-277V, 50/60 Hz
24W: 120V: 0.20A, 208V: 0.12A, 240V: 0.10A, 277V: 0.09A
19W: 120V: 0.16A, 208V: 0.10A, 240V: 0.08A, 277V: 0.07A
14W: 120V: 0.12A, 208V: 0.07A, 240V: 0.06A, 277V: 0.05A

Dimming Driver:
Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

THD:
5.31% at 120V, 9.2% at 277V

Power Factor:
99.3% at 120V, 95.5% at 277V

Photocell:
Integrated photocell included with on/off switch

Surge Protection:
4kV

Performance

Lifespan:
50,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

LED Characteristics

LEDs:
Long-life, high-efficiency, surface-mount LEDs

Color Uniformity:
RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Construction

Cold Weather Starting:
The minimum starting temperature is -40°C (-40°F)

Maximum Ambient Temperature:
Suitable for use in up to 45°C (113°F)

Housing:
Die-cast aluminum

Mounting:
3 (Three) anchors for round version B17 and B17D. 4 (Four) anchors bolts for square version B17S. Internal base doesn't have leveling screws.

Technical Specifications (continued)

Lens:
Polycarbonate lens

Reflector:
Aluminum

Top (Head):
Dome

Shape:
Round

Finish:
Formulated for high durability and long-lasting color

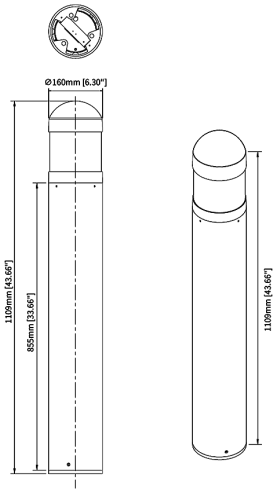
Green Technology:
Mercury and UV free. RoHS-compliant components.

Other

5 Yr Limited Warranty:
The RAB 5-year, limited warranty covers light output, driver performance and paint finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Dimensions



Features

- 50,000-Hour LED lifespan
- DLC Premium Listed
- 0-10V dimming, standard
- 5-Year, limited warranty

Ordering Matrix

Family	Shape	Wattage	Color Temp	Voltage	Top (Head)	Finish	Options
B17					D	B	
	Blank = Round **S =** Square	**Blank =** 24/19/13W Adjustable	**Blank =** 3000K/4000K/5000K CCT Adjustable	**Blank =** 120-277V, 0-10V Dimming	**Blank =** Flat Top (Round & Square) **D =** Dome (Round Only)	**Blank =** Bronze **W =** White **B =** Black	**Blank =** Integrated On/Off Photocell (Standard)

SLIM17FA15ADJ

Color: Bronze

Weight: 3.0 lbs

Project:	**Type:**
Prepared By:	**Date:**

Driver Info

Type	Constant Current
120V	0.13A
208V	0.07A
240V	0.06A
277V	0.05A
Input Watts	14.2/14/14.2W

LED Info

Watts	15W
Color Temp	3000K/4000K/5000K
Color Accuracy	70 CRI
L70 Lifespan	100,000 Hours
Lumens	1761/1904/1852 lm
Efficacy	124/136.2/130.3 lm/W

Technical Specifications

Field Adjustability

Field Adjustable:
Color temperature selectable by 3000K, 4000K and 5000K

Compliance

UL Listed:
Suitable for wet locations

IESNA LM-79 & LM-80 Testing:
RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

IP Rating:
Ingress protection rating of IP65 for dust and water

DLC Listed:
This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.
DLC Product Code: PL0MVJOV62Q3

Performance

Lifespan:
100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

Wattage Equivalency:
Equivalent to 70W Metal Halide

LED Characteristics

LEDs:
Long-life, high-efficiency, surface-mount LEDs

Electrical

Driver:
Constant Current, Class 2, 120-277V, 50/60 Hz, 120V: 0.13A, 208V: 0.07A, 240V: 0.06A, 277V: 0.05A

Dimming Driver:
Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

Photocell:
120-277V Integrated button photocell included.

Surge Protection:
L-N:2.5KV,L/N-GND:2.5KV

Construction

Cold Weather Starting:
The minimum starting temperature is -40°C (-40°F)

Ambient Temperature :
Max Power Temp Rating: 50°C (122°F)
Middle Power Temp Rating: 50°C (122°F))
Low Power Temp Rating: 50°C (122°F)

Housing:
Precision die-cast aluminum housing and door frame

Lens:
Polycarbonate lens

Mounting:
Hinged wiring access and conduit entries on the back, sides, top and bottom make installation a snap

Cut Off:
Adjustable from 0° (full cutoff) to 90°. 7 settings at 15° each.

Finish:
Formulated for high durability and long-lasting color

Green Technology:
Mercury and UV free. RoHS-compliant components.

Other

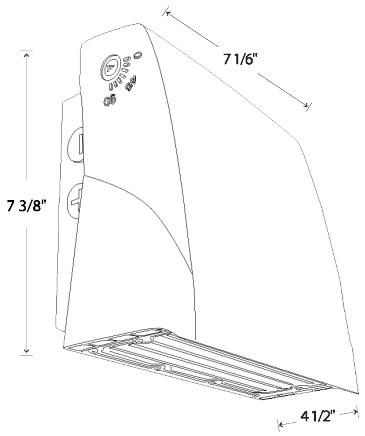
Note:
All values are typical (tolerance +/- 10%)

Technical Specifications (continued)

5 Yr Limited Warranty:
The RAB 5-year, limited warranty covers light output, driver performance and paint finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Dimensions



Features

- Selectable CCT
- Adjustable cutoff
- Integrated photocell
- 0-10V dimming, standard

Ordering Matrix

Family	Wattage	Style
SLIM17FA	15	ADJ
	15 = 15W **30 =** 30W	**ADJ =** Angle Adjustable

IVAFT-45LPA730ZU

Low profile, low glare. Edge-lit technology unlike any other.

Color: Bronze

Weight: 14.0 lbs

Project:	**Type:**
Prepared By:	**Date:**

Driver Info

Type	Constant Current
120V	0.33A
208V	0.19A
240V	0.17A
277V	0.14A
Input Watts	37.9W

LED Info

Watts	38W
Color Temp	3000K (Warm)
Color Accuracy	80 CRI
L70 Lifespan	100,000 Hours
Lumens	4,638 lm
Efficacy	122.4 lm/W

Technical Specifications

Compliance

UL Listed:
Suitable for wet locations

IESNA LM-79 & LM-80 Testing:
RAB LED luminaires have been tested by an independent laboratory in accordance with IESNAlm-79 andlm-80

Title 24 Compliant:
An IVELOT edge-lit area light can be used with a motion sensor or photocell control option to comply with 2016 Title 24 Part 6 Section 130.2 (a,b,v)

IP Rating:
Ingress protection rating of IP66 for dust and water

DLC Listed:
This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.
DLC Product Code: S-WXJ342

Electrical

Driver:
Class 2, 50/60Hz, 120-277V, 4kV standard, 10kV optional

Dimming Driver:
Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

THD:
8.58% at 120V, 17.28% at 277V

Power Factor:
98.9% at 120V, 91.3% at 277V

Performance

Lifespan:
100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations at 25°C

LED Characteristics

LEDs:
Long-life, high-efficacy, surface-mount LEDs

Color Stability:
LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

Color Uniformity:
RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

Construction

Cold Weather Starting:
The minimum starting temperature is -40°C (-40°F)

Maximum Ambient Temperature:
Suitable for use in up to 40°C (104°F)

Housing:
Precision die-cast aluminum

IES Classification:
The Forward Throw distribution is especially suited for mounting on the sides of buildings and walls, and for illuminating the perimeter of parking areas. It produces a semicircular distribution with essentially the same candlepower at lateral angles from 90° to 270°.

Mounting:
Universal pole adapter

Lens:
Diffused Polymethyl Methacrylate (PMMA)

Effective Projected Area:
EPA = 0.61

Finish:
Formulated for high durability and long-lasting color

Technical Specifications (continued)

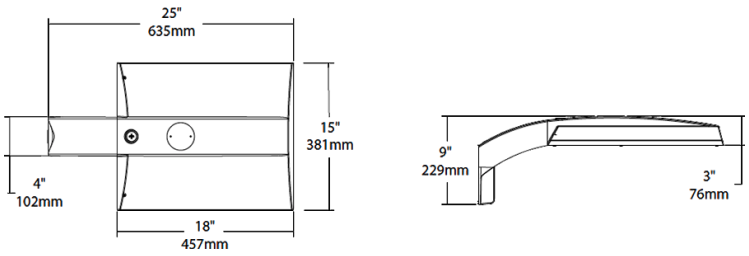
Green Technology:
Mercury and UV free. RoHS-compliant components.

Other

Warranty:
RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Dimensions



Features

- 0-10V Dimming, standard
- 100,000-Hour LED lifespan

Ordering Matrix

Family	Distribution		Lumen Output	Mounting	CRI/Color Temp	Finish	Voltage/Driver	Sensor Options	Lightcloud Option
IVA	FT	–	45L	PA	730	Z	U		
	T3 = Type III [*] **T4 =** Type IV [*] **T5S =** Type V Square [*] **FT =** Forward Throw [*] **T2 =** Type II [*]		**45L =** 4,500lm (38W) **75L =** 7,500lm (67W) **100L =** 10,000lm (94W) **130L =** 13,000lm (117W) [1]	**PA =** Universal Pole Mount **WM =** Wall mount **SF =** Slipfitter	**730 =** 70CRI 3000K **740 =** 70CRI 4000K **750 =** 70CRI 5000K	**Z =** Bronze **W =** White **G =** Roadway Gray **K =** Black	**U =** 120-277V 0-10V Dimming **H =** 347-480V, 0-10V Dimming	**Blank =** No Options **/WS =** 8ft lens Wattstopper **/WS2 =** 20ft lens Wattstopper **/WS4 =** 40ft lens Wattstopper **/7PR =** 7-Pin receptacle	**Blank =** No Lightcloud® **/LC =** Lightcloud Controller [2]

[1] *Applies to Type IV, V Square*

[2] *Applies 120-277V*

[*] *All values are nominal with +/- 10% tolerance. See spec sheet for more details.*

PR4-11-10D2

Color: Bronze

Weight: 65.3 lbs

Project:	Type:
Prepared By:	Date:

Technical Specifications

Compliance

CSA Listed:
Suitable for wet locations

Performance

Description:
Steel pole 4" round 11 gauge 10 foot drilled two sides square base

Construction

Shaft:
46,000 p.s.i. minimum yield.

Hand Holes:
Reinforced with grounding lug and removable cover

Base Plates:
Slotted base plates 36,000 p.s.i.

Color:
Bronze powder coating

Height:
10 ft

Gauge:
11

Wall Thickness:
1/8"

Shaft Size:
4"

Anchor Bolt Templates:
WARNING Template must be printed on 11" x 17" sheet for actual size. CHECK SCALE BEFORE USING. Templates shipped with anchor bolts and available online.

Max EPA's/Max Weights:
70MPH 19.1 ft/700 lb.
80MPH 14.4 ft/620 lb.
90MPH 11.1 ft/585 lb.
100MPH 8.7 ft/445 lb.
110MPH 7.0 ft/370 lb.
120MPH 5.7 ft/335lb.
130MPH 4.6 ft/300 lb.
140MPH 3.8 ft/265 lb.
150MPH 3.1 ft/180 lb

Accessories:
Base/Cap: BCK-R4
Anchor Bolts: BOLT4/11

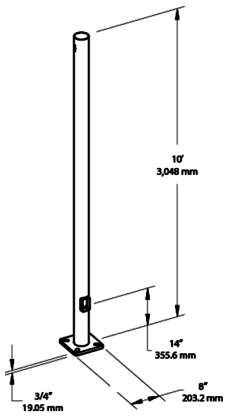
Other

Terms of Sale:
Pole Terms of Sale is available online.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

PR4-11-10D2

Dimensions



Features

- Designed for ground mounting
- Heavy duty TGIC polyester coating
- Reinforced hand holes with grounding lug and removable cover for easy wiring access
- Pole caps, base covers & bolts are sold separately
- Custom manufactured for each application

Ordering Matrix

Family	Shape	Size	Gauge	Height	Drilled/Welded Tenon
P	R	4	11	10	D2
	R = Round **TR =** Tapered Round	**4 =** 4" **5 =** 5" **6 =** 6" **7 =** 7" **8 =** 8"	**7 =** 7 **11 =** 11	**10 =** 10' **15 =** 15' **20 =** 20' **25 =** 25' **30 =** 30'	**D2 =** Drilled **WT =** Welded Tenon

SLIM

Color: Bronze

Weight: 2.9 lbs

Project:	Type:
Prepared By:	**Date:**

Driver Info

Type	Constant
120V	0.26A/0.20A/0.13A
208V	0.13A/0.10A/0.07A
240V	0.17A/0.09A/0.06A
277V	0.11A/0.08A/0.06A
Input Watts	15.2-30.5W

LED Info

Watts	26/18/12W
Color Temp	3000K/4000K/5000K
Color Accuracy	82-85 CRI
L70 Lifespan	100,000 Hours
Lumens	2,175-4,389 lm
Efficacy	135.1-150.6 lm/W

Technical Specifications

Field Adjustability

Field Adjustable:
Field Adjustable Light Output:
26W/18W/12W (factory default 26W)
Color temperature selectable 3000K, 4000K and 5000K (factory default 4000K)

Compliance

UL Listed:
Suitable for wet locations

IESNA LM-79 & LM-80 Testing:
RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

ADA Compliant:
Meets ADA Requirements for wall-mounted luminaires.

IP Rating:
Ingress protection rating of IP65 for dust and water

Trade Agreements Act Compliant:
This product is a product of Cambodia and a "designated country" end product that complies with the Trade Agreements Act

DLC Listed:
This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.
DLC Product Code: S-IHR6QX

Performance

Lifespan:
100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

Wattage Equivalency:
26W: Replaces up to 175W Metal Halide (MH) or 150W High Pressure Sodium (HPS)
18W: Replaces up to 125W Metal Halide (MH) or 100W High Pressure Sodium (HPS)
12W: Replaces up to 100W Metal Halide (MH) or 70W High Pressure Sodium (HPS)

LED Characteristics

LEDs:
Long-life, high-efficiency, surface-mount LEDs

Electrical

Driver:
Constant Current, Class 2, 120-277V, 50/60 Hz
26W: 120V: 0.26A, 208V: 0.13A, 240V: 0.12A, 277V: 0.11A
18W: 120V: 0.20A, 208V: 0.10A, 240V: 0.09A, 277V: 0.08A
12W: 120V: 0.13A, 208V: 0.07A, 240V: 0.06A, 277V: 0.06A

Dimming Driver:
Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

THD:
26W: 3.4% at 120V, 4.68% at 277V
18W: 2.95% at 120V, 5.3% at 277V
12W: 3% at 120V, 8.42% at 277V

Power Factor:
26W: 99.8% at 120V, 96.5% at 277V
18W: 99.7% at 120V, 94.6% at 277V
12W: 99.4% at 120V, 89.6% at 277V

Photocell:
120-277V selectable photocell that can be turned on and off.

Surge Protection:
4kV

Technical Specifications (continued)

Construction

Cold Weather Starting:
The minimum starting temperature is -40°C (-40°F)

Maximum Ambient Temperature:
Suitable for use in up to 40°C (104°F)

Housing:
Aluminum

Lens:
Acrylonitrile styrene acrylate (ASA) /Acrylonitrile butadiene styrene (ABS)

Reflector:
Mirror finish on polycarbonate

Mounting:
Heavy-duty mounting bracket with spring-hinged housing and "kick stand" allow for easy installations. Conduit entries on back and both sides.

Finish:
Formulated for high durability and long-lasting color

Green Technology:
Mercury and UV free. RoHS-compliant components.

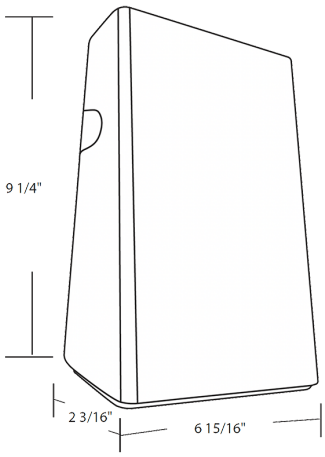
Other

Note:
All values are typical (tolerance +/- 10%)

Warranty:
RAB warrants that our LED products will be free from defects in materials and workmanship for a period of ten (10) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Dimensions



Features

- 100,000-hour LED Life
- 0-10V dimming, standard
- Selectable on/off photocell
- 10-Year, No-Compromise Warranty

Ordering Matrix

Family	Wattage	Color Temp	Finish	Voltage/Driver
SLIM				
	Blank = 26/18/12W	**Blank =** 3000/4000/5000K Adjustable	**Blank =** Bronze **W =** White **BR =** Brass	**Blank =** 120-277V, 0-10V Dimming

SLIM17FAFC40

Color: Bronze

Weight: 6.8 lbs

Project:	**Type:**
Prepared By:	**Date:**

Driver Info

Type	Constant Current
120V	0.40A
208V	0.30A
240V	0.20A
277V	0.15A
Input Watts	37.7/38.2/38.2W

LED Info

Watts	40W
Color Temp	3000K/4000K/5000K
Color Accuracy	80 CRI
L70 Lifespan	100,000 Hours
Lumens	4595/5421/4826 lm
Efficacy	121.9/141.8/126.5 lm/W

Technical Specifications

Field Adjustability

Field Adjustable:
Color temperature selectable by 3000K, 4000K and 5000K

Compliance

UL Listed:
Suitable for wet locations

IESNA LM-79 & LM-80 Testing:
RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

IP Rating:
Ingress protection rating of IP65 for dust and water

DLC Listed:
This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.
DLC Product Code: PL3FKMCN0SF0

Performance

Lifespan:
100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

Wattage Equivalency:
Equivalent to 200W Metal Halide

LED Characteristics

LEDs:
Long-life, high-efficiency, surface-mount LEDs

Electrical

Driver:
Constant Current, Class 2, 120-277V, 50/60 Hz, 120V: 0.40A, 208V: 0.30A, 240V: 0.20A, 277V: 0.15A

Dimming Driver:
Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

Photocell:
120-277V selectable photocell that can be turned on and off.

Surge Protection:
L-N:4KV,L/N-GND:4KV

Construction

Cold Weather Starting:
The minimum starting temperature is -40°C (-40°F)

Ambient Temperature :
Max Power Temp Rating: 50°C (122°F)
Middle Power Temp Rating: 50°C (122°F))
Low Power Temp Rating: 50°C (122°F)

Housing:
Precision die-cast aluminum housing and door frame

Lens:
Polycarbonate lens

Mounting:
Hinged wiring access and conduit entries on the back, sides, top and bottom make installation a snap

Cut Off:
Full cutoff (0°)

Finish:
Formulated for high durability and long-lasting color

Green Technology:
Mercury and UV free. RoHS-compliant components.

Other

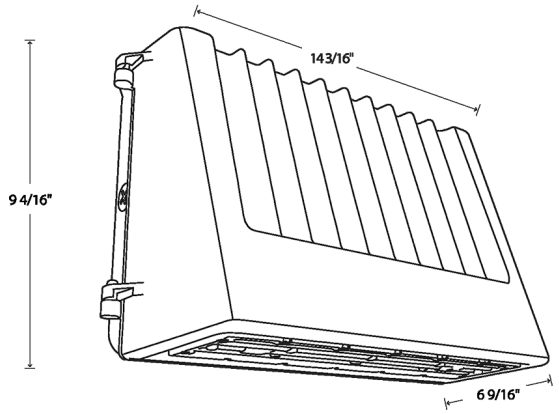
Note:
All values are typical (tolerance +/- 10%)

Technical Specifications (continued)

5 Yr Limited Warranty:
The RAB 5-year, limited warranty covers light output, driver performance and paint finish. RAB's warranty is subject to all terms and conditions found at rablighting.com/warranty.

Buy American Act Compliance:
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

Dimensions



Features

- Selectable CCT
- Full cutoff
- Selectable on/off photocell
- 0-10V dimming, standard

Ordering Matrix

Family	Style	Wattage	Color Temp	Finish	Voltage	Options
SLIM17FA	FC	40				
	FC = Full cutoff	**40 =** 40W **60 =** 60W **100 =** 100W **120 =** 120W **150 =** 150W	**Blank =** 3000K/4000K/5000K Adjustable	**Blank =** Bronze	**Blank =** 120-277V	**Blank =** Selectable On/Off Photocell **/MVS =** Selectable On/Off Photocell w/Microwave Occupancy Sensor **/LCB =** Lightcloud Blue Enabled **/LCBS =** Lightcloud Blue Enabled w/PIR Sensor **/LCBS/MVS =** Lightcloud Blue Enabled w/MVS Sensor

Department of Permitting & Inspections
Zoning Division
645 Pine Street
Burlington, VT 05401
Telephone:(802) 865-7188

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Joseph Cava, Permit Technician
Steve Cormier, Code Compliance Officer
Ted Boylan, DPI Administrator

TO: Development Review Board
FROM: Garret King
DATE: July 16, 2024
RE: ZP-24-150; 953 North Avenue

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Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: RC Ward: 4

Owner/Applicant: Mary Barton / Joann Barton

Request: Proposed home occupation for dog grooming and related driveway alteration.

Applicable Regulations:
Article 3 (Applications, Permits, and Project Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 8 (Parking)

Background Information:
Applicant is looking to make alterations to the layout of their existing driveway to create space to park a trailer that will be used for a home occupation. The home occupation will be a dog grooming business and will be run out of an 8ft x 20ft box-like trailer.

Prior zoning permit actions for this property:
12/16/2023 ZP-23-558 Construction of an ADU in attic
4/1/2022 ZP-22-205 Construct a new shed
9/22/2021 ZPF-21-54 Preplace 4` privacy fence with 6` PVC privacy fence. Add 16` x 3` split rail fence
12/5/2019 ZP-19-866 Demolish existing garage, breezeway and driveway. Construct new garage
9/8/2015 ZP-15-698 Place new driveway in new location and remove existing driveway. Also, expand and reorient the garage towards the new driveway.
4/22/2002 ZP-02-192 Construct 240sf deck between existing porch and house.

Recommendation: Certificate of Appropriateness and Conditional Use approval as per, and subject to, the following findings and conditions:

Article 3: Applications, Permits, and Project Reviews
PART 5. Conditional Use and Major Impact Review
Sec. 3.5.2 Conditional Use review
This home occupation is subject to conditional use review per Sec. 5.4.6 (b). **(Affirmative Finding)**

Sec. 3.5.6 Review Criteria

(a) Conditional Use Review Standards

Approval shall be granted only if the DRB, after public notice and public hearing, determines that the proposed conditional use and associated development shall not result in an undue adverse effect on each of the following general standards:

1. *Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;*
   The new home occupation will operate inside a mobile trailer. With the trailer staying mobile the new home occupation will only need an electric connection. **(Affirmative Finding)**

2. *The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;*
   Home occupations are allowed in residential districts, the Residential Corridor zoning district is intended to allow for a wider range of uses than other residential districts. **(Affirmative Finding)**

3. *The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;*
   All services provided by the home occupation will take place inside the trailer unit. The business will only take one to two pets at a time to maximize care and prevent the dogs from barking. The hours of operation are intended to match typical workday schedules to reduce impacts on the neighbors. With greater attention given to the animals and limited scheduling the business is focused on minimizing impacts on the neighborhood. **(Affirmative Finding)**

4. *The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies;*
   The home occupation will only have customers drop off and pick up their pets at the location. The business will run from 8am till 5pm Monday through Friday and expects between one to five customers a day. As the property is on the corner of North Ave and Killarney Drive the additional traffic is expected to be a minimal increase and is not expected to cause adverse effects on the roadway. **(Affirmative Finding)**

5. *The utilization of renewable energy resources; and,*
   No use of renewable energy is proposed, the new home occupation will not hinder prospects of future renewable energy resources. **(Affirmative Finding)**

6. *Any standards or factors set forth in existing City bylaws and city and state ordinances;*
   The home occupation will have to follow all regulations as established in the Comprehensive Development Ordinance. **(Affirmative Finding)**

Article 4: Maps & Districts

Sec. 4.4.5, Residential Districts:

(a) Purpose

(4) Residential Corridor (RC)

The district is intended for residential development that includes a mix of housing types such as duplex, triplex, quadplex, townhouse, and mid-sized, multi-unit and mixed-use buildings along major multi-modal transportation corridors that are adjacent to low intensity districts. Single-family detached dwellings are limited to buildings originally built for such purpose. New and infill development may be located closer to the street than historic development patterns, with building heights ranging from two to three and a half stories and high lot coverage. Neighborhood-serving commercial uses may be incorporated in existing or new buildings.

Currently 953 North Avenue is a single family home and will remain so. The new home occupation will not change the existing structure. **(Affirmative Finding)**

(b) Dimensional Standards

Residential density will not change, the existing single-family home will remain unchanged. The home occupation will be run out of a trailer, no dimensional changes will be made. Lot coverage is currently 32.4% and will increase to 32.5% remaining under the 80% maximum. **(Affirmative Finding)**

(c) Permitted & Conditional Uses

The proposal will not change the existing single family home, home occupations are allowed in the Neighborhood Corridor district. **(Affirmative Finding)**

(d) District Specific Regulations

Not Applicable

4. Miscellaneous Standards

(b) Accessory Residential Structures, Buildings, and Uses

Not Applicable

Article 5: Citywide General Regulations

Sec. 5.2.3, Lot Coverage Requirements

See Sec. 4.4.5 above.

Sec. 5.2.4, Buildable Area Calculation

Not applicable

Sec. 5.2.5, Setbacks

The trailer that will host the home occupation is intended to stay mobile and movable. As a trailer it is not constrained to the typical setbacks of a structure. The new driveway configuration will conform to the maximum driveway width of 18ft. **(Affirmative Finding)**

Sec. 5.2.6, Building Height Limits

The trailer that will host the home occupation is intended to stay mobile and movable. As a trailer it is not constrained to the typical height constraints of a structure. **(Affirmative Finding)**

Sec. 5.2.7, Density and Intensity of Development Calculations
See Sec 4.4.5 above.

Sec. 5.4.6 Home Occupations
(b) Conditional Use Review
All home occupations not otherwise eligible for administrative approval above shall require review and approval by the DRB pursuant to the requirements of Art. 3, Part 5. In addition to the conditional use criteria, the following criteria must be met for any home occupation:

1. *A home occupation shall be conducted solely by resident occupants plus no more than one additional full-time equivalent employee in RL districts, and no more than two (2) full-time equivalent employees in other districts. The home occupation shall be conducted entirely within an existing dwelling unit and/or one enclosed accessory structure;*
   Only one resident of the single-family home is planned to be the employee of the home occupation. The home occupation is proposed to be in a movable trailer that will sit in the driveway. This trailer may at times leave the premises of the property. **(Affirmative Finding)**

2. *No more than thirty-five per cent (35%) of the floor area of said residence, including accessory structures, up to a maximum of seven hundred fifty (750) square feet, whichever is less, shall be used for such purpose;*
   The home occupation will operate only out of the proposed 8ft x 20ft trailer. With a floor area of 160sf the home occupation will take up only 3.97% of the floor area of the residence. **(Affirmative Finding)**

3. *No home occupation shall require alterations, construction or equipment that would change the fire rating of the structure or the fire district in which the structure is located*
   With the proposed home occupation operating in the proposed trailer no changes to the existing structures is proposed. **(Affirmative Finding)**

4. *There shall be no outside storage of any kind related to the home occupation;*
   Some of the proposed trailer will be used for the storage of all necessary supplies and equipment for the home occupation. **(Affirmative Finding)**

5. *There shall be no exterior evidence of the conduct of a home occupation except for:*
   a. *A. Occasional garage/lawn/yard type sales (up to twice a year not to exceed two (2) days each); and*
      No garage or yard type sales are proposed with this home occupation. **(Affirmative Finding)**

   b. *B. One non-illuminated attached parallel sign that shall not exceed two (2) square feet. No other signs shall be permitted.*
      No signs are proposed with this home occupation. **(Affirmative Finding)**

6. *No home occupation may increase vehicular traffic flow or parking by more than one additional vehicle at a time for customers or deliveries. All parking shall be located off-street and shall maintain the required front yard setback;*
   Customers will only come to the property to pick up and drop off their pets. No parking for customers is indicated in the site plan. With the scale of the home occupation no adverse impact on the flow of traffic is expected. **(Affirmative Finding)**

7. *No home occupation shall create sounds, noise, dust, vibration, smell, smoke, heat, humidity, glare, radiation, electrical interference, fire hazard or any other hazard, nuisance or unsightliness which is discernible from any adjacent dwelling unit;*
   The home occupation is entirely contained inside the proposed trailer, operation of the grooming service should not create any negative impacts on the surrounding properties. Some increase in noise will not be able to be avoidable but the business`s goal is to reduce this as much as possible. The trailer will be parked in the front driveway of the property, with no signage proposed the trailer will appear nondescript. **(Affirmative Finding as Conditioned)**

8. *The home occupation shall be clearly incidental and secondary to the use of the dwelling for residential purposes and shall not change the character thereof or adversely affect the uses permitted in the residential district of which it is a part.*
   The home occupation will be entirely contained within the mobile trailer. The operation of the grooming service should not create any negative impacts on the surrounding properties. **(Affirmative Finding)**

9. *Delivery of products and materials related to the home occupation by vehicles other than automobiles shall occur no more than once per day;*
   No deliveries of materials by commercial vehicles will occur at the property. **(Affirmative Finding)**

10. *With the exception of one delivery per day, as specified in subparagraph (9), no more than one (1) commercial vehicle shall be allowed on the premises at any one time;*
    No commercial vehicles are proposed to park at the property. **(Affirmative Finding)**

11. *There shall be no sale of goods except for goods fabricated on the premises as part of an approved home occupation.*
    The grooming service will have services and products that are commonly seen at this type of business. The home occupation is not intended to be a retail location. No deliveries of materials by commercial vehicles will occur at the property. **(Affirmative Finding as Conditioned)**

Article 8: Parking
Sec. 8.1.12, Limitations, Location, Use of facilities
(b) Front Yard Parking Restricted and Residential Driveways:
Proposed changes to the driveway will move a parking space and will alter the layout of the driveway. Parking spaces are allowed within a front yard setback when within a driveway. The changes to the driveway will conform to the maximum width of 18ft wide. **(Affirmative Finding)**

II. Conditions of Approval

1. The proposed trailer that will be used for the home occupation shall not be painted or have signs applied that acts as advertising the business without an approved Zoning Permit.
2. The trailer shall be positioned and operated in conformance with Sec. 5.4.6 (b) 7. specifically "*nuisance or unsightliness which is discernible from any adjacent dwelling unit"* the business shall actively work to minimize negative impacts on neighboring properties.
3. The trailer shall remain movable as a trailer and not become a permeant structure.
4. The Applicant/Property Owner is responsible for obtaining all necessary Zoning Permits and Building Permits through the Department of Public Works as well as other permit(s) as may be required, and shall meet all energy efficiency codes of the city and state.
5. Standard permit conditions 1-15.

Two emails that were sent by Megan Moir (Water Resources Division Director).

Email #1

On the mobile grooming? Are they really only cutting dogs hair here? It would seem that they will need a water connection and sewer connection of some sort for dog bathing (not sure I have ever seen groomers that don't do bathing also).

I know it says it will only need an electrical connection, but I am not sure I buy that... did someone specifically ask how they were managing water/grey water?

Thanks,

Megan

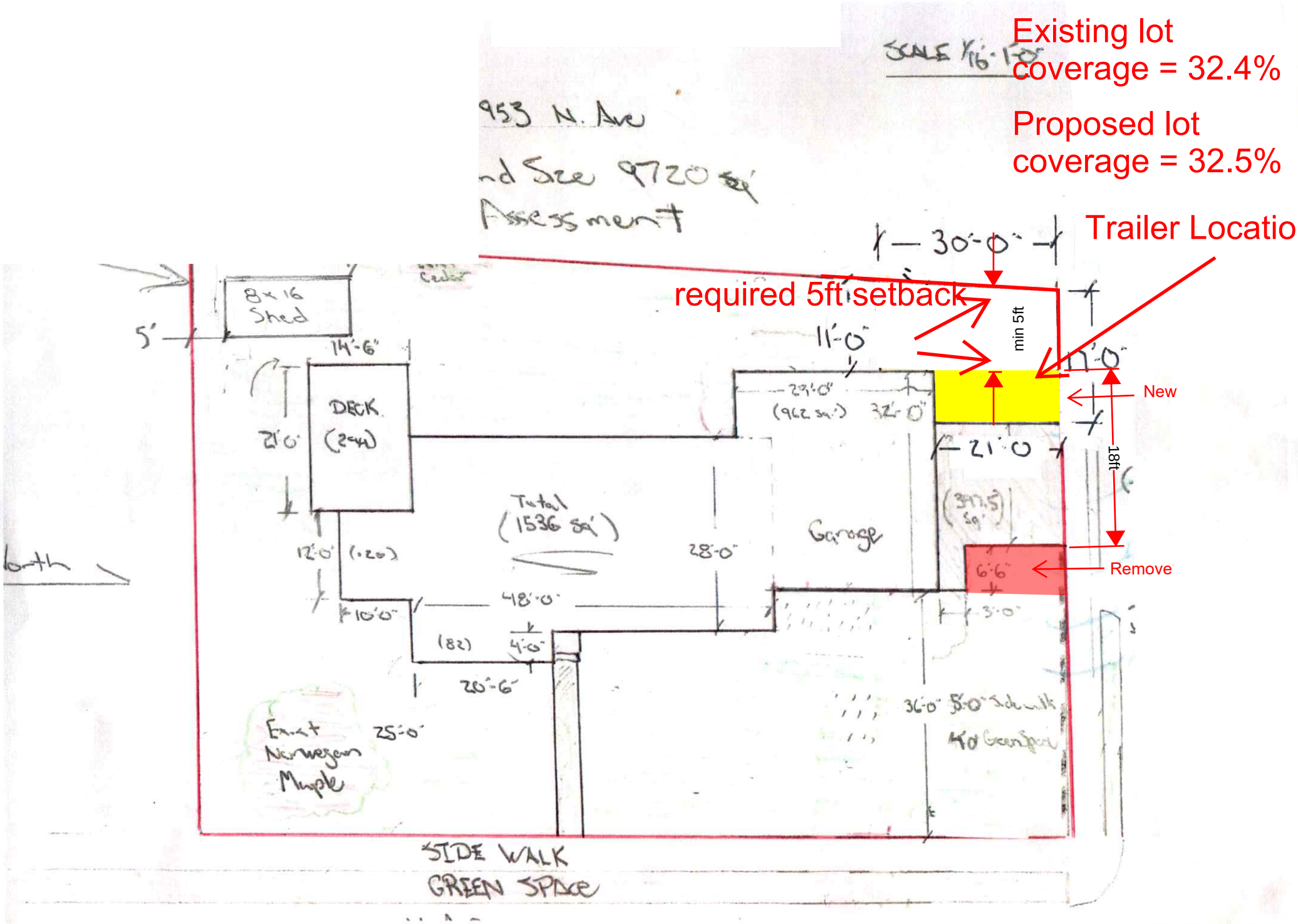
Email #2

I am not attending the meeting unfortunately, but have provided information in case anyone on the DRB

I don't think it is reason to not approve their zoning permit - but as part of their approval I would you to either directly ask/confirm about whether they are doing any bathing. If they are, they will need to contact Willie Glen.

Thanks for considering.

Megan


Existing lot coverage = 32.4%
Proposed lot coverage = 32.5%
Trailer Location
required 5ft setback
min 5ft
New
Remove
18ft
953 N. Ave
8x16 Shed
DECK
Total (1536 sq')
Garage
SIDE WALK
GREEN SPACE

Hello,

As a dog groomer and pet professional, I have in fact thought extensively about noise mitigation - it is an extremely large part of this industry. To combat this, my schedule has been set up to only accept one client household at a time, with a maximum of two dogs in the unit at any given time. That being said, as the majority of households are single dog households, it is unlikely that I will often be accepting more than one dog at a time regardless. I have also found that this is a great way to mitigate disease spread, give my full attention to one animal at a time, and have clients rest easy knowing that my focus is only on their precious pet.

In my experience, a dog who is getting my full attention 99% of the time does not bark or howl, it is when they are put aside and not getting love and attention that we often hear noise from them.

The hours of operation will be during regular business hours, from 8 am to 5 pm Monday through Friday. As we live in a working class neighborhood, I've found this to be the most respectful of our neighbors. The number of dogs that I will be grooming in a day fully depends on the size, breed, and temperament of the animal, but I never plan to go above 5 per day. For example, a 160 lb Newfoundland will often take me 4 hours to complete a groom, if they are well behaved and tolerant of the process. In this case, I will allow 6 hours for the groom to be completed, taking only one other small dog or basic bath after the big guy has left (a yorkshire terrier, french bulldog, shih tzu etc.) bringing the total number of dogs that day to 2, which translates to total number of cars turning down the street to 2. On the other hand, I can often complete a small dog full groom or basic bath in one hour. Leaving time in between for clients who need to drive to pick up and drop off their pets, I will schedule out 1.5 hours per dog. At 5 dogs for this day, this is 7.5 hours of work and is still easily within the normal business hours while still allowing plenty of time for clients to sit comfortably at home while their pet is getting cared for.

Please reach out with any other questions, as I am anxious to bring this much needed service to the town I love and grew up in, and be able to give back to my community in this way. I am a dog lover and a people lover, and I am more than happy to make sure that my clients, neighbors, and the city of Burlington as a whole are all on board and excited about what I am bringing to the community.

Thank you and best wishes,

Joann Barton
Green Mountain Grooming
802-393-2972

Department of Permitting and Inspections

645 Pine Street
Burlington, VT 05401-8415
Phone: (802) 865-7188
www.burlingtonvt.gov/dpi

Home Occupation Application Questionnaire

Use this checklist for all applications for a home occupation - See Sec. 5.4.6 of the Zoning Ordinance. This questionnaire is provided to summarize details and is required to accompany a zoning permit application form and required fee (for either administrative approval or conditional use review).

Please note:

1. The specific requirements for home occupations can be found in Section 5.4.6 of the Comprehensive Development Ordinance which is available in its entirety on our website at www.burlingtonvt.gov/PZ
2. A 'Business Personal Property Registration Form' may be required to be submitted to the Assessors Office. This form is available at www.burlingtonvt.gov/assessor/businesses

Name of Business Proposed: Green Mountain Groomers

Type of Business Proposed: Dog Grooming

Provide a detailed description of the proposed Home Occupation such as: activities involved; materials and equipment used; quantities of materials and equipment stored on-site; methods of operation; hours of operation.
This may be done on a separate piece of paper and attached.

Please respond to the following:

1. How many persons will be involved or employed in the conduct of the proposed Home Occupation:
   Residents of premises: 1 Others 0 Total Number 1

2. What type of product will be produced, serviced, or repaired in the conduct of your Home Occupation? (For example: repair of clocks or watches, making jewelry, etc.). Explain:
   Dog Grooming

3. Describe any alterations to the home or premises that might be required to facilitate your Home Occupation:
   Place maveable trailer in Driveway

4. Describe what rooms will be used in the conduct of the Home Occupation and how these rooms will be used. (For example: garage will be used to store supplies; or den will contain desk and file cabinets, etc.). Indicate the gross floor area(s) that will be used in the conduct of the Home Occupation. Indicate the total gross floor areas of your house and include any accessory structure(s) to be used for the Home Occupation, (Ex. Garage).
   All grooming activities will take place in a mobile 8*20 trailer in the Driveway

5. Describe the mechanical and/or electrical equipment that will be necessary to conduct your business activity:
   Electric

6. Describe how, where and in what amounts the material, supplies and/or equipment related to your Home Occupation will be displayed or stored:
   All will be stored in trailer

PLEASE TURN OVER

7. Will people come to your home to obtain any product or utilize any service connected with the proposed Home Occupation activity? Yes ___X_____ No _____
If yes, please explain in detail:
Dog drop off and pick up
_____
_____

8. Are any signs necessary or proposed relative to the Home Occupation?
Yes _____ No __X____
If yes, you are required to file for a Sign Permit. An application form can be obtained at the Planning and Zoning Department or on our website.

9. If trucks or other equipment will be used in your Home Occupation, where will they be parked or stored?
_____
_____

10. Will the Home Occupation involve the use of commercial vehicles for delivery of materials to or from the premises? Yes_____No_X__
If yes, please explain:
_____
_____

11. How may parking spaces will be provided for the home occupation? __Existing Driveway_____
Where will they be located? Indicate parking spaces on a site plan of this property as part of your application submission.

12. Is your proposed Home Occupation in conformance with the conditions, covenants and restrictions pertaining to your property? Yes__X___No___
We suggest checking your deed for conditions, covenants and restrictions.

I have read and understand 'Sec 5.4.6 Home Occupations' under the City of Burlington Comprehensive Development Ordinance and believe that to the best of my knowledge my proposed Home Occupation would not violate any portion of said Ordinance:

Applicant's Signature: __Joann Barton_____

Date: _____

Property Owner's Signature: Mary Cannizzaro-Barton Digitally signed by Mary Cannizzaro-Barton DN: CN=Mary Cannizzaro-Barton, E=maryandskip@comcast.net Reason: I am approving this document with my legally binding signature Location: Burlington, VT Date: 2024.04.19 11:04:41-04'00' Foxit PDF Editor Version: 2024.1.0

Date: _____

ILER 800-351-0767

Proposed trailer unit

8′ x 20′ Single Office Unit

SPECIFICATIONS AND FEATURES

Exterior

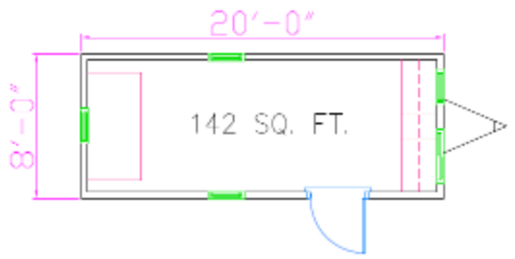
- 160 square feet
- .019 aluminum siding
- 30 gauge galvanized steel roof
- 1 metal exterior doors with 10" x 10" viewblock
- 46" x 27" horizontal sliding windows
- Vinyl composition tile (VCT) flooring
- Wood paneled interior

- Wall-mounted heating and air conditioning unit
- 4' flourescent lighting

Also, we can provide OSHA approved steps and skirting to help complete your office setup.

Request a Quote for 8' x 20' Single Office Unit

	Gross Area(sq. ft.)	Offices	Bathroom
8' x 20' Single Office Unit	160	1	none



CONTACT US

First Name Last Name
Email Phone
How can we help?
Submit

TO: Scott Gustin, Division Manager Zoning

RE: 953 North Avene ZP24-150 – July 16, 2024

In regard to 953 North Avenue and application for dog grooming business we are not in favor of this happening. First of all our street is gateway to bike path and on corner currently exists a button to push with flashing lights to serve crossing of bikers, joggers, walkers to reach the bike path. Given the very close proximity of 953 & 11 Killarney Drive already presents caution when we leave our driveways. Then drop a construction trailer to become a BUSINESS on 953 Driveway in a residential neighborhood close to top of street and added car traffic and obstacles with 953 vehicles.

Also add that 953 No Avenue has 6 vehicles 2 which are large work vehicles one who is mostly parked in front of our house and often leaks some type of fluid onto Killarney Drive and been asked to take care of with the response of FU or the finger. The other large work one is always parked close to our driveway and every day use of our drive way as their right to back way up into and sometimes close to bumper of our car just to show THEY CAN.. Mind you they have a wide drive way that can hold 3 vehicles and have 4 at times. The garage is able to park 3 vehicles in their since they also have a lift to use. Also, been asked not to use our driveway and met with FU or the finger. Seems our yard & driveway and front of our house is extension of what they feel is theirs and if we have a problem then FU or some other name calling tirades. Very entitled type having no regard to taking up so many spots on street parking and then open a business and trust that more issues won't happen given who we are dealing with.

Mind you we have lived on this street for 50 years and are in our 70's and never in all this time been talked to or treated with such disrespect and very volatile anger and outbursts towards us and subtle threats. This is what we have been dealing with for 2 yrs plus of this behavior and now faced with the possible approval of a business will further be a given to more issues probably beyond what I can even fathom given who we are dealing with who are so disrespectful so if business happens will be even more a nightmare.

Concerns for a Business? YES what an eyesore and embarrassment and calling a dog grooming place. It's a construction trailer and depreciates the value to our property. I can't fathom 2 dogs being safely inside an cramped space along with noise of barking nervous dogs and this is ok since daylight hours? Dogs will need at times bathroom break? Where will this take place? Giving dogs a bath? Where is this water going to be drained? What may start as a certain set of hours will possibly change if people want earlier drop off! Later pick up! Possible start of Saturday hours to assist along with the traffic and so close to the corner coming onto street and the handy use of our drive way for turn arounds why not 953 does this every day. No one can control a nervous dog or barking dog and in such extreme close quarters and really can't fathom being drawn to bring any loved dog there to such unattractive uninviting place. So many variables of what can go wrong and application has all boxes checked but could end up being long days and peak times for drop off and pick up and given how to control. Who really monitors or cares in regard to stretching of time, services, or perhaps if dog is right personality be kept in their fenced in back yard to have more room while waiting since tiny space to be trapped in. What about customers think parking for drop off and pick up find their yard full which often is or if promised won't be then lets add more in front of our house sure handy

for 953 so will be suggested hey use in front of house next door and you can even do quick turn around if need be we do it all the time its fine.

Just down the road at Ethan Allen Shopping Center is place called Pampered Pet zoned for and in commercial space inviting large roomy & attractive space and ample parking . Also another in a neighborhood in NNE called Urban Paws appointment only limited hours very respectful to neighbors and not close to a corner and gateway to the bike path. Also little further down and again commercial zoned called Passion 4 Pets on Heinberg Drive, Colchester VT. Those are 3 to mention and vets often provide this service along with Petco there is no shortage of services. These places are attractive roomy and housed in proper environment and contained for noise and proper room.

Also sure not any thought given to winter months and all the other issues to occur with snow banks and again parking issues that will take place and we know how handy our yard is good weather is and will happen in bad just ask 953.

We are surprised how this eyesore beat up trailer is given the ok guess because it meets the guidelines of size? And fits in the driveway? No matter the appearance of it? And open in residential area commercial business? We take pride in our property and now is center of attention and asked by so many people we know and strangers WHAT THE HECK IS THAT? Is it going to stay? When provide answer they say OH sorry you have to deal with this and we are too.

Sincerely

Steve & Pam Smith

Public comments that were submitted along with photos

“In regard to ZP-24-150 953 north Avenue meeting on July 16”

“The photos sent to you want you to have a visual of this and call it and want it to be a dog grooming business so unattractive diminishes the value of our property and never mind how unsafe feel it is.”

“This is how our street looks most often with their multiple vehicles and making it one way street so close to arriving and leaving Killarney Dr.”

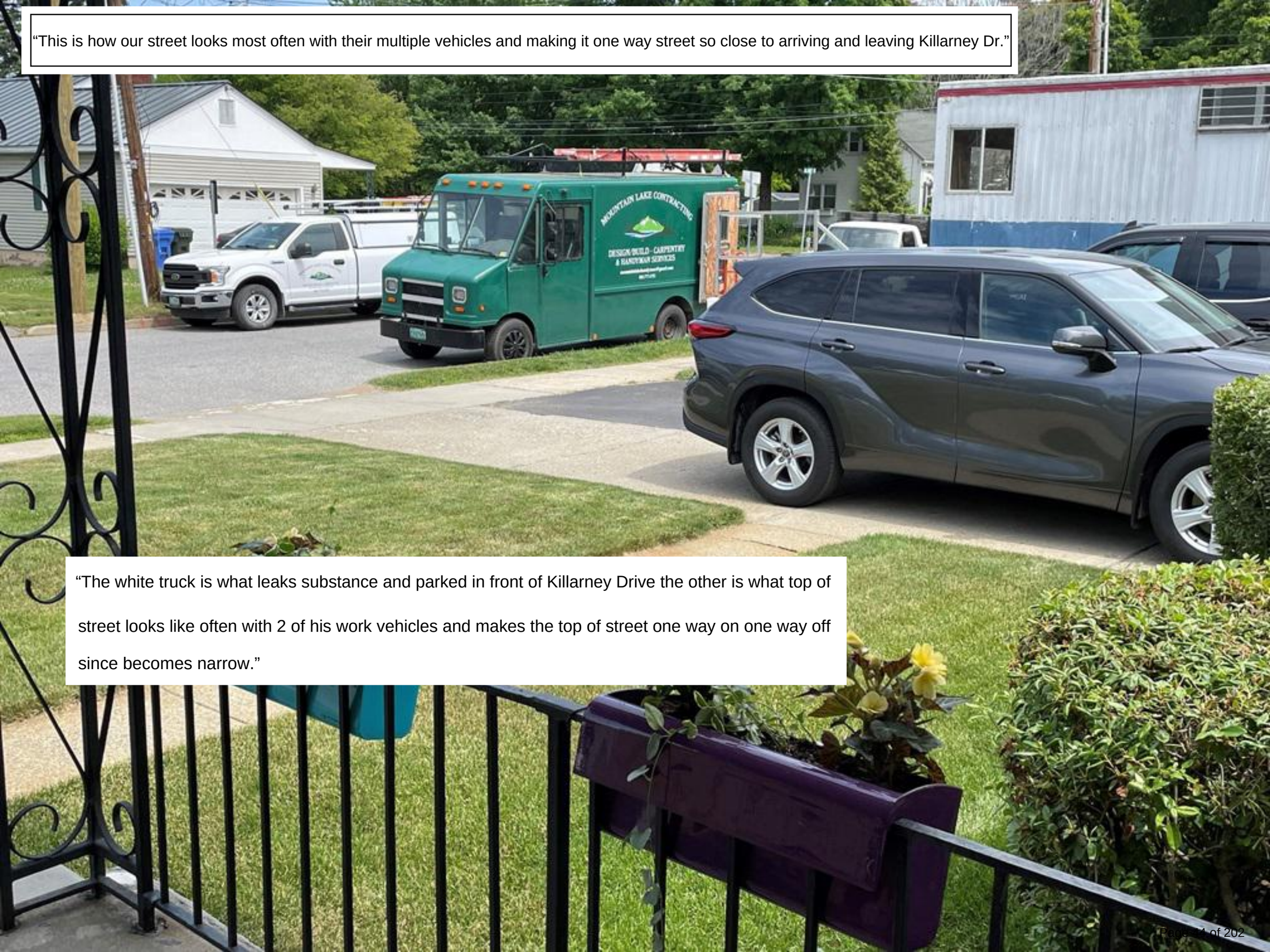
“In front of our house and many times leaks.”

“The white truck is what leaks substance and parked in front of Killarney Drive the other is what top of street looks like often with 2 of his work vehicles and makes the top of street one way on one way off since becomes narrow.”

“This will be my last correspondence until the meeting next week. Just wanted to add after 2 plus years of our drive way being used as his right to use every day when he has his own yard. We had him served with no trespassing yesterday and filed with Burlington Police Department today and he was served yesterday and I have a picture on my phone and was in such a hurry did not take second picture of how far up into our yard he was going and taken thru our curtain and wanted the second shot and dropped my phone then he was gone. BLANTED disregard and open a business. Even the sheriff department used our yard to turn around in its handy for many and 953 believes it’s theirs they are a NIGHTMARE. Ok I will send one pic I barely got and no more bothering you until the meeting.”

“Please add to the meeting July 16 on ZP 24 150 953 north Avenue. This may not be viewed or cared but inconsiderate entitled to close top of street into one way. This goes on so much feel like I live in constant construction zone with very little regard to anyone but their needs. And then open a business and be respectful won't happen.”

“This is how our street looks most often with their multiple vehicles and making it one way street so close to arriving and leaving Killarney Dr.”



“The white truck is what leaks substance and parked in front of Killarney Drive the other is what top of street looks like often with 2 of his work vehicles and makes the top of street one way on one way off since becomes narrow.”


STOP


2 plus years of our drive way being used as his right to use every day when he has his own yard.
We had him served with no trespassing yesterday and filed with Burlington Police Department today and he was served yesterday
was in such a hurry did not take second picture of how far up into our yard he was going

Please add to the meeting July 16 on ZP 24 150 953 north Avenue. This may not be viewed or cared but inconsiderate

entitled to close top of street into one way. This goes on so much feel like I live in constant construction zone

with very little regard to anyone but their needs. And then open a business and be respectful won't happen.”

“In front of our house and many times leaks.”

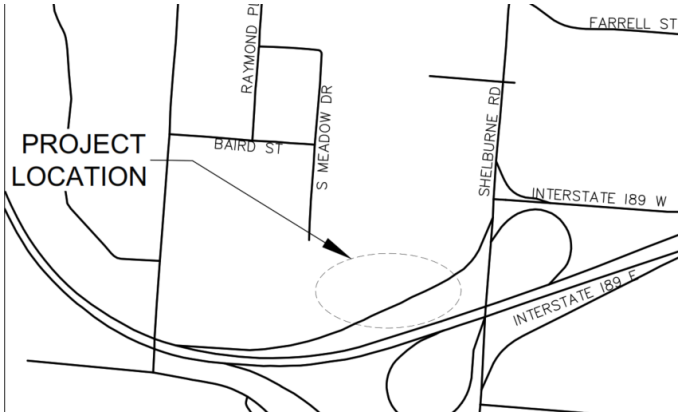
Department of Permitting and Inspections
Zoning Division
645 Pine Street
Burlington, VT 05401
https://www.burlingtonvt.gov/DPI/Zoning-Permits
Telephone: (802) 865-7188
(802) 865-7195 (FAX)

William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Garret King, Associate Planner
Steven Cormier, Zoning Compliance Officer
Joseph Cava, Planning Technician
Ted Boylan, Permit Administrator

MEMORANDUM

To: Development Review Board
From: Mary O'Neil, AICP, Principal Planner
Date: July 16, 2024
RE: ZP-24-263; 1074 Pine Street (South Meadow)

Note: These are staff comments only. Decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.



File: ZP-24-263
Location: 1074 Pine Street
Zone: RL **Ward**: 5
Date application accepted: June 21, 2024
Applicant/ Owner: Liviya Kovacevic, Watershed / Champlain Housing Trust / Ernie Pomerleau
Request: Construct gravel wetland to treat stormwater runoff from Shelburne Road Plaza onto Champlain Housing Trust parcel. (Champlain Parkway ROW is included in overall plan, but outside zoning review.)

Background:

- **Zoning Permit 19-0622CA**; Add backyard deck. March 2019.
- **Zoning Permit 17-1089CA**; replace existing double doors with single entry door with side lights at South Meadow Office. May 2017.
- **Zoning Permit 16-1070CA**; replace six existing decks with patios, replace six sliding doors with single door and window combination, replace nineteen existing windows all within complex of 116 units. April 2016.
- **Zoning Permit 17-0602CA**; replace existing stairs with metal stairs. November 2016.
- **Zoning Permit 16-0812CA**; handicapped loading and unloading spaces at 3 locations; new concrete sidewalk to playground; new section of concrete sidewalk between curb and existing sidewalk; new metal railings for safer access to 5 buildings; replace 4 original windows. February 2016.
- **Non-applicability of Zoning Permit Requirements 14-0403NA**; replace siding as necessary to match existing. September 2013.

- **Zoning Permit 13-0948FC;** new stockade fence in backyard of residential buildings between buildings and park. April 2013.
- **Zoning Permit 87-951**; installation of stockade fence, 712' in length between shopping center and South Meadow. May 1988.
- **Zoning Permit 85**-512 / COA S 84-110; construct 160 units (co-ops, 80; rentals, 80), townhouses and flats with carports, recreation amenities, community building, one acre neighborhood park on a 20 acre parcel of land. November 1985.
- **Zoning Permit 85-512 / COA 85-S 12**; construct 148 units with community building, two acre neighborhood park, and private streets on a 19+ acre parcel of land according to PRD and subdivision regulations. Revised plans submitted March 1986. Revised zoning permit issued May 14, 1986 per consent decree of Chittenden Suprior Court dated April 16, 1986 in accordance with terms and conditions contained therein.
- **Zoning Permit 85-247 / COA S85-066**; subdivide 26.1 acre parcel at 1110 Pine Street into two parcels – 19.8 acres to be conveyed for "South Meadow" development and 6.3 acres to be reserved for the Baird Center. June 1985.

Issued for 0 Raymond Place:

- **Zoning Permit 08-028SN**; one freestanding sign for South Meadow. July 2007.
- **Zoning Permit 06-836CA**; installation of new playground area. June 2006.

Overview: This project proposes construction of a gravel wetland south of the Shelburne Road Plaza on Champlain Housing Trust property, sized to treat runoff from the 1" storm with no overflow and provide 24-hour extended detention of the Channel Protection volume (CPv) from 17 impervious acres. The project is taking stormwater runoff from both CHT lands (1074 Pine Street) and the Shopping Center and treating it before it enters the impaired waterway of Potash brook. The project has the potential of treating over 800,000 gallons during a 2" storm event, so a substantive step towards environmental improvement.
Although this is intended to treat runoff from the shopping plaza, that particular land parcel is not involved. The two remaining parcels are 1074 Pine Street (South Meadow) and a portion of the Southern Connector ROW; the later which is outside zoning jurisdiction. The Department of Public Works, Water Resources and City engineering teams have been engaged with that review and likely agreements.

The **Conservation Board** reviewed the application at their July 1, 2024 meeting given the location within wetland and riparian buffers, and voted in support of the proposed plan.

Recommended motion: Certificate of Appropriateness Consent Approval, per the following Findings and Conditions:

I. Findings

Article 4: Zoning Maps and Districts

Section 4.4.5 Residential Districts

b) Dimensional Standards

Table 4.4.5-1, Lot size, Frontage, Setback and Lot Coverage Standards in Residential Districts

RL	Min Lot Frontage 30’	Setbacks, Front Av. Of front setback 2 adjacent lots on both sides +/- 5’	Setbacks Side 10% of lot width or av. Of side setbacks of 2 adjacent lots on both sides	Setbacks Rear 20’	Lot Coverage [9] 45%
1074 Pine Str.	No change	No change	Not applicable	Not applicable	ZP 19-0622 reported 41.70% lot coverage. Addition of 2,953.6 sf = **42.39%** lot coverage.

9. An additional ten per cent (10%) lot coverage may be permitted for accessory residential features per (d) 2C below.

Affirmative finding.

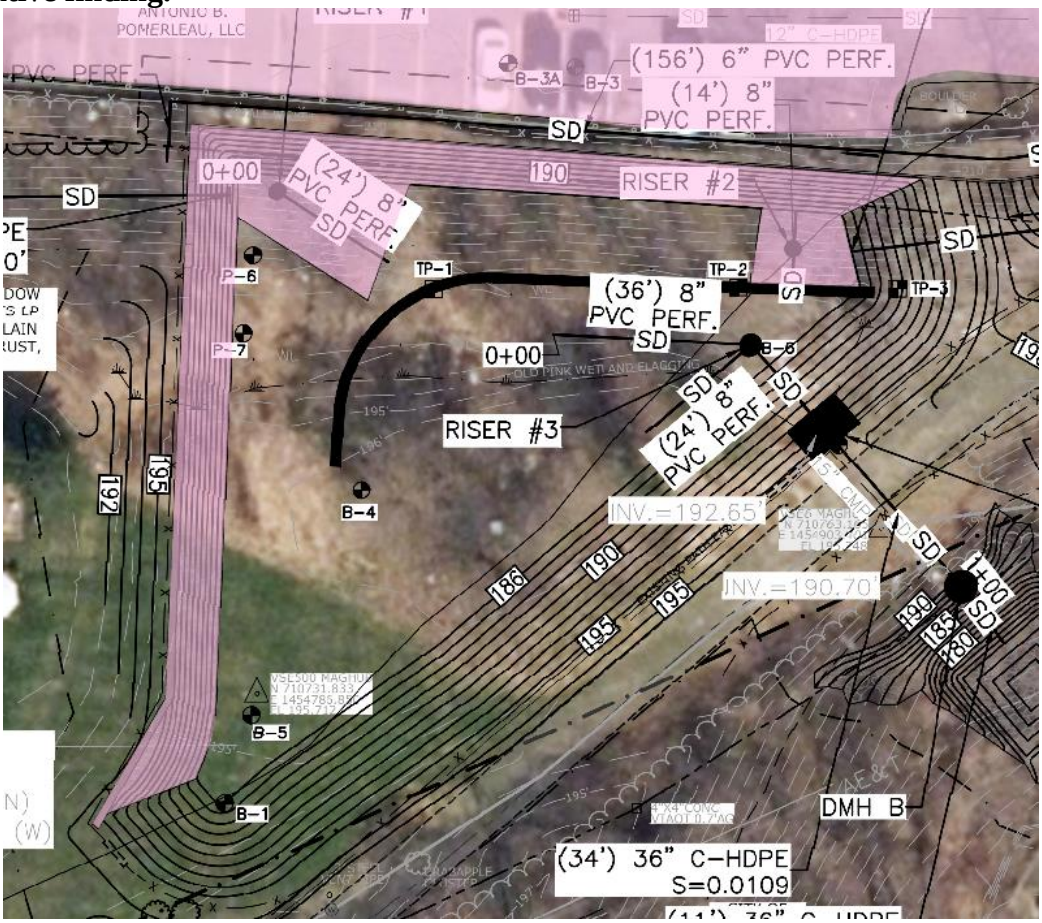


Table 4.4.5-2 Principal & Secondary Structures Massing and Placement Standards in Residential Districts
Not applicable.

c) Permitted and Conditional Uses
There is no proposed Change-of-use at this location. Not applicable.

d) District Specific Regulations:

1. Additional Residential Development Permitted

A. Reserved

B. Residential Development Bonuses

i. Senior Housing
Not applicable.

ii. Residential Conversion
Not applicable

iii Limitations on Residential Development Bonuses
No bonuses are sought. Not applicable.

2. Exceptions to Dimensional Standards

A. Encroachment into Side setback for residential driveways
Not applicable.

B. Encroachment into the Waterfront Setback
Not applicable.

C. Exceptions to Lot Coverage for Accessory Residential Features
In addition to lot coverage exemptions in Section 5.2.3 (b), within the RL and RM districts, an additional ten (10) percent of lot coverage above the otherwise applicable limit may be permitted for the following amenity features accessory to residential uses provided that such features shall at no time be enclosed:

i. Decks;
ii. Patios;
iii. Porches;
iv. Terraces;
v. Tennis or other ouytdoor game courts;
vi. Swimming Pool aprons;
vii. Walkways;
viii. Window Wells, and/or
ix. Pervious pavement design and maintained to infiltrate the 1 year / 24 hour storm event onsite, subject to review and approval by the Stormwater Administrator.

There are many amenities within the Planned community that would fall into the "bonus" category; however as proposed, lot coverage falls within allowable limits. **Affirmative finding.**

3. *Exception for Neighborhood Commercial Uses*
Not applicable.

4. *Miscellaneous Standards*

A. Additions to Existing Residential Structures

No request for an addition to an existing structure shall be considered or imply approval of an additional unit, unless requested specifically on the zoning permit application form.

Not applicable.

B. Accessory Residential Structures, Buildings and Uses

Not applicable to this application.

C. Residential Occupancy Limits

Not applicable.

Section 4.5.3 Natural Resource Protection Overlay District

The Special Flood Hazard Area falls outside this parcel boundary; but 1074 Pine includes a marginal portion of the project within the Riparian/Littoral zone, and within the wetland buffer.

(c) District Specific Regulations: Riparian and Littoral Conservation Zone

1. Permitted Uses:

Except where otherwise noted herein, only the following uses are permitted within the Riparian and Littoral Conservation Zone and its associated buffer subject to the requirements and limitations set forth below under subpart 4.

A. Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls;

B. "Accepted agricultural and silvicultural practices" as defined under 24 VSA Ch 117;

C. Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

D. Normal maintenance of existing docks, roads, rail lines, bridges, and culverts provided that disturbance to any shoreland is minimized in conjunction with such maintenance;

E. Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle; and,

F. Recreational and educational activities such as hiking, walking, fishing, nature study, and bird watching and associated boardwalks and unimproved trails.

The application is for the intentional construction of a stormwater system, consistent with Subsection C. **Affirmative finding.**

2. *Prohibited Uses:*

Except where noted herein, the following uses shall be prohibited within the Riparian and Littoral Conservation Zone and its associated buffer.

A. The deposition or introduction of organic and inorganic chemicals, including herbicides and pesticides, except when the application of pesticides is reviewed and approved by the BCB and DRB, and performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9); and,

B. The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized vehicles used to construct and maintain permitted or regulated activities are specifically exempted from this prohibition);

No prohibited uses, as listed above, are included in the application. **Affirmative finding.**

3. Regulated Uses:

Except where otherwise noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including any construction of buildings or other structures, and roads, parking areas or any other impervious surface, may be approved only within the Riparian and Littoral Conservation Zone and its associated buffer after review and approval pursuant to the requirements and limitations below under Subpart 4.

4. Requirements

1. Any land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) shall include a stormwater management, erosion prevention and sediment control plan pursuant to the requirements of Sec 5.5.3 to be reviewed by the conservation board and approved by the city engineer.

In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater, prevent erosion, and control sedimentation. The city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

2. Agricultural and silvicultural activities shall follow Best Management Practices for the Protection of Water Quality;

3. Installation of any seawalls, rip-rap or other shoreland retention structures shall be submitted for review by the conservation board who shall consult with

the city engineer prior to issuance of a recommendation to the DRB; and,

4. *No new stormwater outfall shall directly discharge into any surface water without approval and implementation of a stormwater management plan approved by the city engineer.*

The specific intent of the project is a Stormwater Management facility, supported by both Water Resources and the Conservation Board. **Affirmative finding.**

(d) District Specific Regulations: Wetland Conservation Zone:

1. *Additional Application Requirements*

The following information shall be submitted in addition to the applicable requirements of Article 3 for any development involving a wetland or wetland buffer zone:

A. Boundary Determination: The boundaries of a wetland shall be determined in the field by a qualified professional with expertise in wetland delineation and surveyed by a licensed land surveyor or other qualified individual. The boundary between wetland and upland shall be delineated by the methodology set forth in the Vermont Wetland Rules. The identification and delineation of wetlands for a proposed project must be performed within a five-year period prior to submission and acceptance of a complete zoning application;

B. A report addressing the project's impact on the wetland functions and values, and the measures that the applicant has incorporated into the project to avoid and minimize wetland impacts shall be prepared by a qualified professional with expertise in wetland delineation and evaluation;

C. A site plan for a project that will impact a wetland or buffer zone shall include delineated wetland boundaries, buffer zone boundaries, erosion control measures, and all components of the proposed project, including, but not limited to all structures, driveways, parking areas, lawns, utilities, and the overall footprint of the construction area/zone of disturbance; and,

D. As part of their application, applicants must submit a complete stormwater management, erosion prevention and sediment control plan pursuant to the requirements of Sec 5.5.3, and successfully demonstrate how the project will prevent adverse impacts to surface water and groundwater quality before, during, or after construction. At a minimum, an applicant should demonstrate how a project will meet the standards outlined in the latest edition of the Vermont Soil Erosion Handbook.

A Stormwater Management plan is the basis for this application, and has been prepared by consultant engineers to meet applicable standards. **Affirmative finding.**

2. *Permitted Uses:*

Except where otherwise noted herein, only the following uses are permitted within a wetland and its buffer zone subject to the requirements and limitations set forth below under Subpart 6.

A. Normal maintenance of existing lawns and maintained grounds including mowing, trimming of vegetation and the removal of dead or diseased vegetation around a residence, decorative landscaping and planting, vegetable and flower gardens, and the repair of existing private landscaping structures such as walkways and walls;

B. "Accepted agricultural and silvicultural practices" as defined under 24 VSA Ch 117.

C. Normal maintenance of constructed wetlands and stormwater systems, provided that naturally occurring wetlands are not disturbed in conjunction with the maintenance;

D. Normal maintenance of existing roads, rail lines, bridges, and culverts provided that disturbance to naturally occurring wetlands and shorelands is minimized in conjunction with such maintenance;

E. Selective cutting of less than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle; and,

F. Recreational and educational activities such as fishing, walking, hiking, nature study, and bird watching.

The plan intentionally and purposefully meets Substandard C, above. **Affirmative finding.**

3. *Prohibited Uses:*

Except where noted herein, the following uses shall be prohibited within a wetland and its buffer zone.

A. The deposition or introduction of organic and inorganic chemicals, including pesticides, except when the application of pesticides is reviewed and approved by the BCB and DRB, and performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9); and,

B. The off-road use of any motorized vehicles including ATVs or dirt bikes (the temporary use of motorized construction vehicles used to construct permitted or regulated activities in the wetland are specifically exempted from this prohibition);

No prohibited uses are proposed. **Affirmative finding.**

4. *Regulated Uses:*

Except where noted herein, all uses permitted or conditionally permitted in the respective underlying zoning district, including the list of activities below, may be approved within a wetland and its buffer zone after review and approval pursuant to the requirements and limitations set forth below under Subpart 6 below.

A. The construction of buildings or other structures, and roads, parking areas or other impervious surface;

B. Any form of drainage, dredging, excavation, or removal of material either directly or indirectly;

C. Alteration or modification of natural drainage patterns, natural features and contours;

D. Installation of docks, rip-rap or other shoreline stabilization features;

E. Installation of utility poles or utility service lines, underground pipes or cable conduits, and wells;

F. Cutting of greater than 25 percent of the trees six inches or more in diameter at breast height over any 10 year cycle;

G. Construction, expansion or placement of any structure;

H. Construction or expansion of roads, rail lines parking areas, trails, and sidewalks;

I. Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall, or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into a wetland;

J. The construction of a stormwater outfall as part of a stormwater management plan approved by the city engineer. In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and prevent erosion and control sediment and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules; and,

K. Application of pesticides performed by an applicator certified by the Vermont Department of Agriculture for the sole purpose of controlling invasive species and subject to the requirements of the City's pesticide application ordinance (Burlington Code of Ordinances, Chapter 17, Section 9). In no other cases shall pesticides be applied.

A Stormwater Management plan has been included per Subsection J above; accepted by the Conservation Board and Water Resources. **Affirmative finding.**

6. Criteria for Review

In granting, denying, or conditioning any permit involving a wetland, vernal pool or respective buffer zone, the DRB, in consultation with the conservation board, will consider the project's impact on the functions and values of the wetland, and the measures that the applicant has incorporated into the project to avoid and minimize impacts. The DRB shall only approve a project having an impact on a wetland or wetland buffer zone if an applicant can demonstrate that any adverse impact is de minimus on the significant functions and values of the wetland including:

A. Water storage for floodwater and stormwater;

B. Erosion and sedimentation control through binding and stabilizing the soil or shoreline;

C. Surface water and groundwater protection, including sediment and toxicant retention, nutrient retention and transformation, and groundwater discharge and recharge;

D. Fisheries habitat;

E. Wildlife habitat;

F. Examples of natural community types that are exemplary, rare, or make an important contribution to the natural heritage of Burlington and Vermont;

G. Habitat for rare, threatened and endangered species;

H. Education and research in natural sciences;

I. Recreational and economic benefits; and,

J. Open space and aesthetics.

In addition, the review of a project having involving a wetland or wetland buffer zone shall also be subject to the following requirements and limitations:

K. Any land disturbing activities (i.e., vegetation has been removed, or the landscape has been graded or filled resulting in bare soil surfaces) shall include a stormwater management, erosion prevention and sediment control plan pursuant to the requirements of Sec 5.5.3 to be reviewed by the conservation board and approved by the city engineer;

L. No new stormwater outfall shall directly discharge into surface water without approval and implementation of a stormwater management plan approved by the city engineer;

M. No installation of docks, rip-rap or other shoreline stabilization features shall be installed without review approval by the city engineer;

N. Agricultural and silvicultural activities shall follow Best Management Practices for the Protection of Water Quality; and,

O. Stormwater management, erosion, and sedimentation control plans shall be submitted for review by the conservation board who shall consult with the

development review board and city engineer prior to issuance of a recommendation to the city engineer who shall render a final decision on such plans.

In making determinations and decisions required herein, the city engineer shall consider the requirements of the most recent State of Vermont Stormwater Management Rules and Guidance document. The city engineer shall require the best practicable means be used to manage stormwater and control erosion and sedimentation and the city engineer is hereby authorized to develop performance standards to ensure conformance with these state stormwater management rules.

The Conservation Board reviewed this highly-engineered plan at their July 1, 2024, and offered full support for the application, including a recommendation to provide site information so the public can understand what a great "win" this project provides. (See attached Conservation Board minutes.)
Affirmative finding.

Article 5: Citywide General Regulations

Section 5.2.1 Reserved

Section 5.2 3 Lot Coverage Requirements
See Table 4.4.5-1, above.

Section 5.2.4 Buildable Area Calculation and Steep Slopes
The area of the proposed gravel wetland is within the Steep Slopes Overlay District.
The following Standards apply:

The boundaries shown on the Steep Slopes Overlay Map may be supplemented or modified by examination of one or more of the following sources by the Development Review Board whenever an application is submitted for review.

- *Contour maps prepared from the most current orthophotography.*
- *On-site survey prepared by a registered professional engineer or surveyor.*

The Zoning Administrative Officer or Development Review Board shall determine whether or not the Steep Slope Overlay District has been shown accurately on the application plans. The applicant may be required to revise the steep slope boundaries shown on the application plans.

The burden of proving the correct boundary shall be on the applicant, supported by engineering and/or surveying data or mapping.

1. *District Specific Regulations*
    A. *The Steep Slope Overlay District shall be an overlay on all zoning districts. The regulations in the overlay are in addition to those regulations of the underlying zoning district.*
    B. *These regulations apply to applications within the Overlay District that include 400 square feet or more of earth disturbance.*
    C. *Finished slopes of all cuts and fills shall not exceed 30%, unless the applicant can demonstrate that steeper slopes can be stabilized and maintained adequately to the satisfaction of the ZAO or DRB in consultation with the City Engineer.*
    D. *Any fills placed on a steep slope shall be property stabilized and, when necessary, supported by retaining walls or other appropriate measures as approved by the ZAO or DRB in consultation with the City Engineer.*
    E. *Finished grades shall be reasonably safe from slide, collapse, or similar failure as determined by the ZAO or DRB in consultation with the City Engineer.*
2. *Additional Application Requirements*
    A. *A site plan prepared by a registered professional engineer or surveyor that accurately depicts the proposed development and related land disturbance relative to the Steep Slope Overlay District boundaries, with all pertinent information describing the proposal, and a topographical survey depicting existing and proposed contour lines at no greater than 2-foot intervals. The plan shall depict all proposed cut, fill, and grading.*
    B. *A plan depicting the extent of proposed vegetation clearing.*
3. *Approval Condition*
    A. *Prior to construction, the applicant shall provide a geotechnical analysis prepared and stamped by a professional geotechnical engineer that determines the suitability of the steep slope for development.*

The application includes stamped engineering plans with contours; appropriate survey work has been completed. The engineering consultant assures that all steep slopes have appropriate stabilization as a basis for the plan.
Affirmative finding.

Section 5.2.5 Setbacks
See Table 4.4.5-1, above.

Section 5.2.6 Building Height Limits
Not applicable.

Section 5.2.7 Density and Intensity of Development Calculations
Not applicable.

Part 3: Non Conformities
Not applicable.

Sec. 5.4.8 Historic Buildings and Sites
Not applicable.

Part 5: Performance Standards
Section 5.5.1 Nuisance Regulations
Not applicable.

Section 5.5.2 Outdoor Lighting
Not applicable.

Section 5.5.3 Stormwater and Erosion Control
It is the specific intention of this application to ameliorate Stormwater from the Shopping Plaza; sized to treat runoff from the 1" storm with no overflow and provide 24 hour extended detention of the Channel Protection volume (CPv) from 17 impervious acres. All designs have been engineered. **Affirmative finding as conditioned.**

Article 6: Development Review Standards
Part 1: Land Division
Not applicable.

Part 2: Site Plan Design Standards
Section 6.2.2 Review Standards

a) Protection of Important Natural Features

The landscape, existing terrain and any significant trees and vegetation shall be preserved in their natural state insofar as practicable in keeping with the objectives of the underlying zoning district. Development and site disturbance shall preserve watercourses, wetlands, steep slopes, flood-prone areas, rock outcroppings, wildlife habitat and travel corridors, specimen trees and contiguous stands of forest, and other sensitive ecological and geological areas insofar as practicable in keeping with the objectives of the underlying zoning district. Site plans shall provide suitable buffers from any proposed site improvements, and maintain continuity and contiguousness of greenspace while allowing reasonable development in support of the overall intent of the zoning district. Where any natural features are proposed to be removed or the topography altered, special attention shall be given to replace or mitigate the loss of such features.

The Special Flood Hazard Area falls outside this parcel boundary, however this is a buffer area for wetland, and marginally within the Riparian Littoral zone. The Conservation Board has reviewed the application and found it complete and acceptable. **Affirmative finding.**

b) Topographical Alterations:

Alteration to the natural contour of the site shall minimize grading, cut, and fill, and shall take necessary measures to protect against erosion and future instability. Any grade changes shall be in keeping with the general appearance of neighboring developed areas. In areas where more intense levels of development are encouraged, development should seek to take advantage of topographical changes to hide and/or blend new construction into the landscape. Proposed design and construction details for any cut and fill, or retaining walls over 3-feet in height, or any height along the lakeshore, shall be subject to review and approval by the city engineer before receiving approval of the site plan.

The topographic changes are intentional; to create a well to capture stormwater and channel to an outfall. All designs are engineered to assure stability and function. **Affirmative finding.**

(c) *Protection of Important Public Views:*

Not applicable.

(d) *Protection of Important Cultural Resources:*

Not applicable.

(e) *Supporting the Use of Renewable Energy Resources:*

Not applicable.

(f) *Brownfield Sites:*

Not applicable.

(g) *Provide for nature's events:*

Special attention shall be accorded to stormwater runoff so that neighboring properties and/or the public stormwater drainage system are not adversely affected. All development and site disturbance shall follow applicable city and state erosion and stormwater management guidelines in accordance with the requirements of Art 5, Sec 5.5.3.

The specific intent of this application is to treat runoff from 17 impervious acres of the Shopping Plaza. All plans are engineered; and the application is supported by the Conservation Board. **Affirmative finding.**

(h) *Building Location and Orientation:*

Not applicable.

(i) *Vehicular Access:*

Not applicable.

(j) *Pedestrian Access:*

Not applicable.

(k) *Accessibility for the Handicapped:*

Not applicable.

(l) *Parking and Circulation:*

Not applicable.

(m) *Landscaping, Fences and Retaining Walls:*

Landscaping shall be used to beautify the development site and to provide specific functions and benefits to the uses and buildings on the site. These include but are not limited to stormwater retention and erosion control, winter windbreaks and summer shade, recreational and habitat corridors, buffers and screening of parking areas, and creating privacy for and from adjacent property.

Existing trees shall be retained and incorporated into a landscape plan to the extent possible, and existing trees to be retained shall be protected during construction in accordance with specifications provided by the city arborist. Contiguous green space, both within the site and with adjacent properties, should be provided on a site whenever possible and be designed to provide wildlife travel corridors and habitat preservation, as well as enabling recreational access. If open space is intended to be publicly accessible, it shall be designed to maximize accessibility for all individuals including the disabled, encourage social interaction, and facilitate ease of maintenance. Along the street edge, landscaping shall be used to provide a visual buffer into parking areas from the public street and reinforce the streetscape.

The selection of plant materials and planting sites should create a sustainable landscape, and consideration shall be given to factors such as hardiness, salt tolerance, disease resistance, invasiveness, root and canopy spread, underground and overhead utilities, soil conditions, and microclimates. The use of native plant materials is encouraged, and the use of plants considered invasive by VT Agency of Agriculture shall be prohibited. For more information on sustainable landscapes, applicants are encouraged to consult Planting Sustainable Landscapes: A Guide for Plan Reviewers prepared for the Vermont Department of Forests Parks and Recreation by the Vermont Chapter of the American Society of Landscape Architects.

New or replacement street trees shall be provided consistent with the city's Street Tree Master Plan. All proposed street trees shall be selected and planted in accordance with specifications provided by the city arborist.

Fences may be placed within the required setback along a property line, but shall be setback sufficiently to provide for the maintenance of both sides of the fence without entering onto the adjacent property and shall present a finished side to the adjoining property and public street. Fences placed within a clear sight triangle shall adhere to the standards of Sec. 5.2.6 (c). Styles, materials, and dimensions of the proposed fence shall be compatible with the context of the neighborhood and the use of the property.

Retaining walls greater than 5 feet tall shall incorporate textured surfaces, terracing, and/or vegetation to avoid long monotonous unarticulated expanses and to minimize adverse visual impacts to neighboring properties. As with fences, retaining wall styles, materials, and dimensions shall be compatible with the context of the neighborhood and use of the property.

Both retaining walls and a berm are proposed as part of the gravel wetland. Plan C1.2 includes proposed landscaping, but it is outside this parcel area.
Retaining wall details are provided on Plan S 1.1. The building official, acting on behalf of the City Engineer, has oversight for the wall plan.
Affirmative finding.

(n) *Public Plazas and Open Space:*
Not applicable.

(o) *Outdoor Lighting:*
Not applicable.

(p) *Integrate infrastructure into the design:*
Not applicable.

Part 3: Architectural Design Standards
Not applicable.

Article 8: Parking
Not applicable.

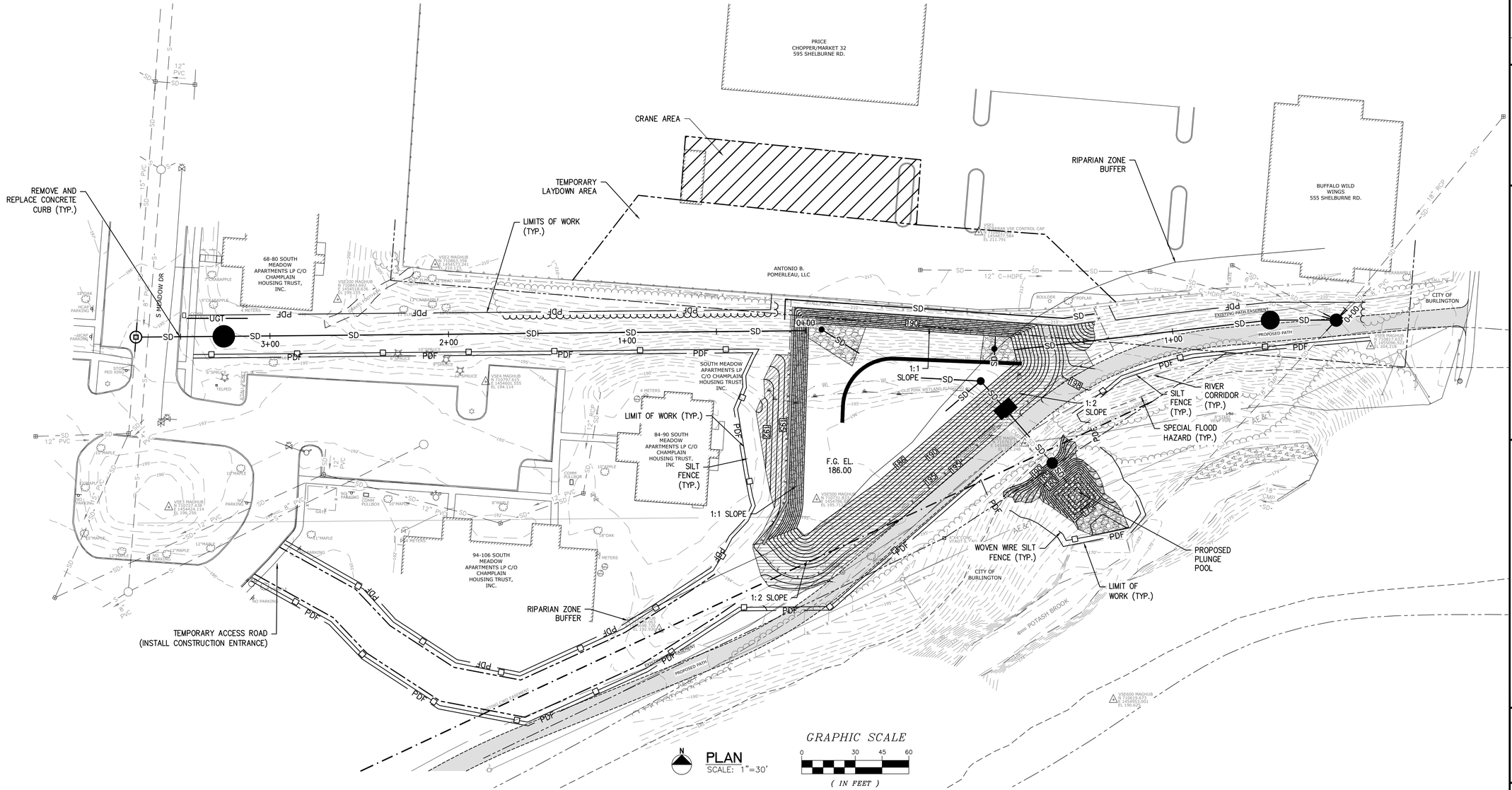
II. Conditions of Approval

1. Any part of this project that falls within the Champlain Parkway right-of-way is subject to review and agreements with appropriate representatives. Compliance with those encumbrance permit/agreements are a condition of the issuance of this permit.
2. Standard Permit Conditions 1-15.

NOTE: These are staff comments only. The Development Review Board, who may approve, table, modify, or deny projects, makes decisions.

EROSION CONTROL NOTES:

1. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
2. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
3. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
4. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIVERSION OF STORMWATER FLOWS AND BYPASSING EXISTING POND DURING CONSTRUCTION UNTIL NEW GRAVEL WETLAND IS COMPLETE AND READY TO ACCEPT FLOW. (SUBSIDIARY)
6. TOPSOIL AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE OUTFALL AREAS WITH REQUIRED EROSION CONTROL.
7. REMOVE ACCUMULATED SEDIMENT FROM BMP AT COMPLETION OF PROJECT (SUBSIDIARY).
8. SEEDING INSIDE GRAVEL WETLAND FACILITY SHALL BE AS PER THE REQUIREMENTS OF SPECIFICATION SPECIAL PROVISION 900.645 (GRAVEL WETLAND FACILITY).
9. ALL DISTURBED AREAS NOT OTHERWISE DESIGNATED, SHALL BE TILLED, TOPSOILED AND SEEDED WITH VERMONT CONSERVATION MIX (80 LBS PER ACRE APPLICATION RATE) IN ACCORDANCE WITH SECTION 651. SEE SOIL AND SEEDING NOTES ON DWG NO. G-0.2
10. STRAW MULCH AS PER NOTES ON G-0.2.



PLAN
SCALE: 1"=30'

GRAPHIC SCALE
0 30 45 60
(IN FEET)

100% SUBMISSION FOR REVIEW ONLY

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: TGB
DATE: DECEMBER, 2023
SCALE: 1" = 30'

HOYLE TANNER
125 College St. 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

EROSION AND SEDIMENT CONTROL PLAN

C2.6

PROJECT NO. 120006

SHEET 1 OF 2

21.120006.03-EROSION.DWG

EROSION CONTROL NOTES:

1. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
2. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
3. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
4. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
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6. TOPSOIL AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE OUTFALL AREAS WITH REQUIRED EROSION CONTROL.
7. REMOVE ACCUMULATED SEDIMENT FROM BMP AT COMPLETION OF PROJECT (SUBSIDIARY).
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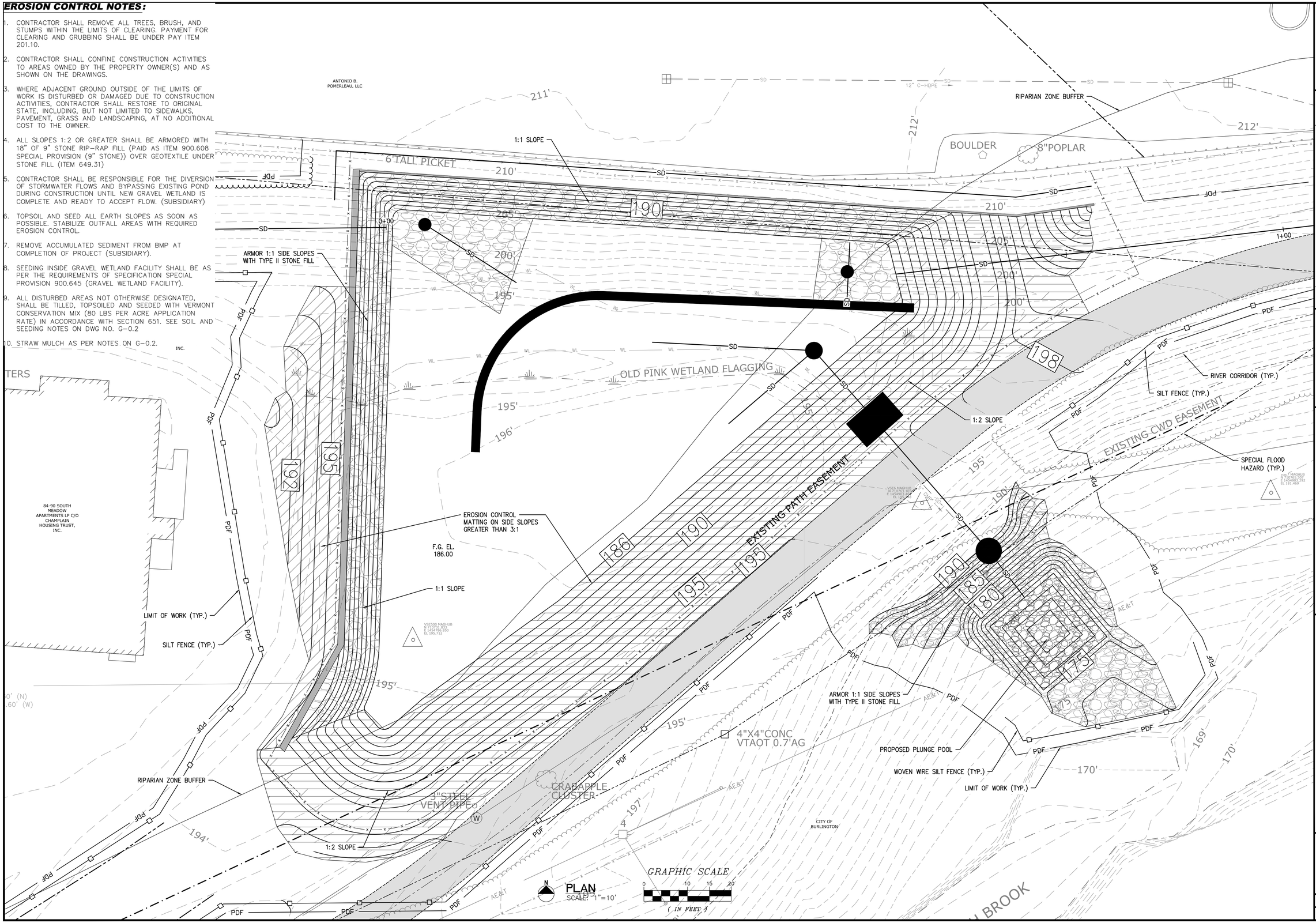
10. STRAW MULCH AS PER NOTES ON G-0.2.



100% SUBMISSION FOR REVIEW ONLY

REV.	DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: TGB

HOYLE TANNER
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DATE: DECEMBER, 2023
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APPLICANT
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84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

EROSION AND SEDIMENT CONTROL SITE PLAN

C2.7

PROJECT NO. 120006

SHEET 2 OF 2

21.120006.03-EROSION.DWG

SPECIFICATIONS

For the Construction of:

POMERLEAU AND CHITTENDEN HOUSING TRUST 3-ACRE STORMWATER MANAGEMENT PROJECT

for the
City of Burlington, Vermont
Pomerleau Real Estate, Burlington, Vermont

Final Design Submission

January 2024

Prepared by:

HOYLE TANNER

125 College Street
Burlington, Vermont

TABLE OF CONTENTS – TECHNICAL SPECIFICATIONS

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for

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1. SECTION INCLUDES

A. Related Sections

B. Contract Description

C. Contractor Use of Site

D. Limits of Work Area

E. Layout of Work

F. OSHA and VOSHA Requirements

G. Construction Permits and Easements

2. RELATED SECTIONS

A. Drawings and General Provisions of the Contract, including General Supplementary Conditions apply to this section.

3. CONTRACT DESCRIPTION

A. Contract Type: Unit Price as stated in the Agreement.

B. The work consists of the construction of the Pomerleau and Chittenden Housing Trust 3-Acre Stormwater Management Project. Including the following:

1. Installation of new gravel wetland including all necessary piping, drainage and outlet structures, vortex separator, retaining wall, berm, and landscaping, as described within and as identified on the plans.

C. The work generally includes the construction and/or installation of the project components, located in the vicinity of S Meadow Dr and Shelburne Rd in Burlington, all appurtenant structures, items, and incidental work as shown on the drawings and as specified herein.

1. The work required by these specifications shall include furnishing all labor, skill, supervision, tools, construction plant, equipment, and materials; and performing all operations necessary for the properly completed contract work as shown on the drawings, as mentioned in these specifications, and as evidently required with all incidental work necessary and customarily done to the complete satisfaction of the OWNER and its authorized representative.

2. All appurtenant demolition, clearing, cleaning, sheeting, finishing, landscaping, paving and restoration (roads, sidewalks, and curbs) is part of this work.

4. CONTRACTOR USE OF SITE

A. The CONTRACTOR expressly undertakes at their own expense:

1. to take every precaution against injuries to persons or damage to property;

2. to store their apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of their work or the work of any other contractors;

3. to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;

4. to clean up frequently and promptly when instructed by the OWNER or the ENGINEER all refuse, rubbish, scrap materials, and debris caused by this operation, to the end that at all times the site and the work shall present a neat, orderly, and workmanlike appearance;

5. to dispose of all waste or excess materials in a legally approved manner;

6. before final payment, to remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description, and debris of every nature resulting from their operations, and to put the site in a neat, orderly condition.

B. The CONTRACTOR shall not, except after written consent from the proper parties, enter or occupy with men, tools, materials, or equipment, any land outside the rights-of-way or property of the OWNER. A copy of the written consent shall be given to the ENGINEER.

C. The CONTRACTOR shall properly safeguard all existing utilities, structures, and appurtenances not scheduled for removal and shall restore and repair any such items or facilities damaged by his/her operations. Restoration and repair of damaged items shall be done solely at the CONTRACTOR'S own expense.

D. Time Restrictions for Performing Work: The Contractor will be limited to accessing the site and performing the required work between the hours of 7:00am to 7:00pm, Monday through Friday.

5. LIMITS OF WORK AREA

A. The CONTRACTOR shall confine their construction operations to those areas shown on the Contract Drawings, and as described in the Special Requirements. Storage of equipment and materials, or erection and use of sheds outside of the Contract Limits, if such areas are the property of the OWNER, shall be used only with the OWNER'S approval. Such storage or temporary structures, even within the Contract Limits, shall be confined to the OWNER's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

B. Due to the potential adverse impact of construction on the environment, the CONTRACTOR shall be required to minimize the extent of disturbance for construction as much as possible. Disturbance for construction including materials and equipment storage, personal vehicles, grading or stockpiling of soil, debris, and other materials, etc. shall be confined within and to the limits of the right-of-way and other sites or areas designated by the OWNER and the ENGINEER in conjunction with local environmental agencies.

6. LAYOUT OF WORK

A. The CONTRACTOR shall do all layouts from established points to properly complete the contract work.

B. The ENGINEER will furnish to the CONTRACTOR all basic surveys necessary for the layout of the work. These surveys shall establish certain reference points and benchmarks in the immediate vicinity of the work areas. The CONTRACTOR shall layout all additional lines and grades and otherwise do all layout and measurement necessary for the proper completion of the work.

1. The CONTRACTOR shall be responsible for preserving the control points provided by the ENGINEER throughout the life of the project. All control points lost or destroyed through the CONTRACTOR'S negligence or carelessness will be replaced by the ENGINEER who shall be reimbursed for such work by the CONTRACTOR.

2. The CONTRACTOR shall furnish assistance to the ENGINEER as requested to check the layout or otherwise control the work. Such assistance shall be understood to include the provision of suitable manpower to assist the ENGINEER in taping measurements, holding a survey rod for checking grades, and the like.

C. The ENGINEER reserves the right to inspect or check any of this work, and the CONTRACTOR shall not claim added compensation for any delay occasioned by the ENGINEER exercising this right, nor for any corrective work which is required as a result of the ENGINEER'S inspections.

D. The CONTRACTOR shall furnish a legally safe environment with all legally required safety equipment for the ENGINEER’S and/or the OWNER'S use during inspection and checking.

7. OSHA & VOSHA REQUIREMENTS

A. The CONTRACTOR is obligated to meet all OSHA and VOSHA requirements for safe trenching and excavation procedures. The CONTRACTOR is hereby referred to the latest revised OSHA standards as published in Title 29 of the Code of Federal Regulations (29 CFR), Part 1926 and as published in the Federal Register on Tuesday, October 31, 1989. In addition, the CONTRACTOR is hereby referred to the latest revised VOSHA standards as published in Vermont Statute Title 21 – Labor. The CONTRACTOR shall be solely responsible for compliance with the latest OSHA and VOSHA standards for work on this project.

8. CONSTRUCTION PERMITS AND EASEMENTS

A. The Owner shall be responsible for identifying and obtaining federal, state, and local permits as may be required due to the nature and location of construction as depicted in the drawings except those required to be obtained by the Contractor such as trench permits, building permits, waste disposal permits, etc. Should the Contractor’s preferred means and methods benefit from additional impact areas for which the Owner has not obtained permits, it shall be the Contractor’s responsibility to coordinate and pay for additional permitting at no cost to the Owner. Failure of the Contractor to obtain additional permits shall not relieve the Contractor from constructing the project per the Contract Documents. To the extent possible, Owner procured permits shall be obtained prior to the Advertisement for Bids for construction, and copies of all permits so obtained shall be included in the Appendix. The status of the application on each permit, including the conditions thereof, not obtained prior to the Advertisement for Bids shall also be indicated in the Supplementary Conditions.

B. When construction permits are accompanied by regulations or requirements issued by a particular authority or agency, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to their operations on this project.

C. The Owner has applied for or obtained the following permits:

1. Stormwater General Permit 3-9050
2. Act 250 Permit

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1. SECTION INCLUDES

A. Coordination and project conditions

B. Field engineering

C. Preconstruction meeting

D. Site mobilization meeting

E. Progress meetings

2. RELATED SECTIONS

A. Drawings and General Provisions of the Contract, including General Supplementary Conditions apply to this section.

3. COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of the various sections of the Specifications to ensure efficient and orderly sequence of construction elements.

B. Verify all existing utility locations.

C. Verify dimensions of existing structures to be maintained or rehabilitated.

4. FIELD ENGINEERING

A. Employ a Land Surveyor or Professional Engineer licensed in the State of Vermont and acceptable to Engineer to perform all layout work. Submit Land Surveyor or Professional Engineer credentials to Engineer for review.

B. Contractor shall locate and protect all survey control and reference points and shall accurately replace and have verified by the Engineer any such point, which is damaged or moved, at his own expense.

C. Control datum for survey is that shown on Drawings. The Licensed Land Surveyor shall establish certain reference points and benchmarks in the immediate vicinity of the work areas. The Contractor may lay out all additional lines and grades and otherwise do all layout and measurement necessary for the proper completion of the work.

D. The Contractor shall verify setbacks and easements; confirm drawing dimensions and elevations.

E. The Contractor shall provide field engineering services including establishing elevations, lines, and levels, utilizing recognized construction survey practices.

F. The Contractor shall furnish assistance to the Engineer as requested to check the layout or

otherwise control the work. Such assistance shall be understood to include the provision of suitable manpower to assist the Engineer in taping measurements, holding a survey rod for checking grades and the like.

G. The Engineer reserves the right to inspect or check any of this work, and the Contractor shall not claim added compensation for any delay occasioned by the Engineer exercising this right, nor for any corrective work which is required as a result of the Engineer's inspections.

5. PRECONSTRUCTION MEETING

A. Engineer will schedule a meeting after Notice of Award.

B. Attendance Required: Property Owner(s), Engineer, Contractor, and City of Burlington.

C. Sample Agenda:

1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of Subcontractors, schedule of values, and progress schedule.
5. Submission of list of surveyor or person responsible for layout, testing agency and other parties providing services on the project.
6. Designation of personnel representing the parties in Contract, and the Engineer.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
8. Procedures for layout of the project, establishing controls, limits of right-of-way and easements.
9. Scheduling.
10. DBE Reporting Requirements.

D. Engineer will record notes and distribute copies to participants and those affected by decisions made.

6. SITE MOBILIZATION MEETING

A. Engineer may schedule a meeting at the Project site prior to Construction start-up.

B. Attendance Required: Engineer, Contractor's Superintendent, and major Subcontractors.

C. Sample Agenda:

1. Use of site by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities provided by Contractor.
4. Temporary utilities provided by Contractor.
5. Survey layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.

D. Engineer will record notes and distribute copies to participants and those affected by decisions

made.

7. PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at bi-weekly intervals or intervals agreed to by Owner/City of Burlington/Engineer/Contractor.

B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Contractor's superintendent, major Subcontractors and suppliers, Engineer, as appropriate to agenda topics for each meeting.

D. Sample Agenda:

1. Review notes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Engineer will record notes and distribute copies to participants and those affected by decisions made.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1. DESCRIPTION

A. If alternative materials and or methods are proposed, full substantiation must accompany the bid.

1. Such alternatives must be listed in detail, with accompanying costs along with a concurrent listing of the items and their costs for which the alternatives are being proposed so that an accurate comparison and evaluation may be made by the Engineer.

B. A detailed schedule of values shall be submitted for each lump sum item in the bid. The schedule of values must be submitted and approved by the engineer prior to approval of any progress payments for lump sum items. The schedule shall be broken down by specification section and by subject.

2. CONSTRUCTION SCHEDULES AND PROGRESS REPORTS

A. Planning and progress schedules shall be prepared and shall be submitted to the Engineer by the Contractor at the end of each month during the progress of the work for the duration of the project. Revised schedules must be provided along with monthly payment requests. Failure to provide schedules may delay processing of pay requests.

1. The Contractor shall also submit to the Engineer, at the end of each month, itemized estimates of work completed for the purpose of making partial payments thereon. The costs employed in preparing any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

3. SURVEY DATA

A. The Owner will furnish to the Contractor all original surveys of the project Site.

B. The Contractor shall conduct an independent survey of the project Site field verifying existing conditions as necessary for the execution of the work. The Contractor shall submit the survey to the Engineer in AutoCAD format for review. The Contractor shall also submit for review a tabulated comparison of elevations of existing structures, grades, piping, etc. where new construction is taking place, identifying any discrepancies with the Contract Drawings.

4. SHOP DRAWINGS, PRODUCT DATA & SAMPLES

A. Contractor shall not install any materials until approved by the Engineer.

B. Attention shall be directed to the applicable articles of the General Conditions concerning shop drawings and samples. Special requirements for shop drawings and samples for various types of work are specified in the technical specifications in those sections for the various

types of work.

C. Before submittal to the Engineer, the Contractor shall check all shop drawings or samples for conformance with the Contract Documents including the plans and specifications, for suitability for satisfactory incorporation in the completed contract work and for correct dimensions, ratings and assembly and shall note legibly on the drawings or samples that he has verified its acceptability and that he approves it. If there are any deviations in the shop drawings or samples from the plans and specifications, the Contractor shall so note legibly on the shop drawings or samples and also inform the Engineer separately in writing of any such deviation. The Contractor shall submit shop drawings and samples in orderly sequence matched to the construction work, with sufficient completeness to enable review, with reasonable promptness and allowing sufficient time for the Engineer to review them. All shop drawings and samples shall be properly identified as to their location and application in the contract work and as to their association with various parts of the plans and specifications. The Contractor shall not commence work on any portion of contract work requiring shop drawings or samples until the submitted shop drawings or samples have been reviewed and approved by the Engineer.

D. Shop drawings may include general, assembly and detail drawings, diagrams, illustrations, material and equipment schedules with manufacturer's name and catalog numbers and description, performance charts, catalog cuts, brochures and such other information and data as is necessary and required by the Engineer.

E. The Contractor shall submit to the Engineer an electronic copy in Portable Document Format (pdf) of all shop drawings and information submittals required for the work. Refer also to Section 5 and Section 6 below regarding electronic submittal requirements. All drawings and information shall contain sufficient and accurate data to ascertain item-by item compliance with the Contract Documents. Incomplete, inadequate or unidentified submittals will be rejected. The Engineer will examine submittals only after they have been properly identified, as specified herein and signed by the Contractor to indicate that he has reviewed and endorsed them.

F. The Engineer will review the shop drawings and samples with reasonable promptness. The Contractor shall allow fifteen days for approval by the Engineer after receipt of shop drawings and samples. The Engineer's review and approval shall be only for conformance with the design concept of the contract work and with information given in the plans and specifications. The Engineer's approval of a separate item shall not indicate approval of an assembly in which the item functions. The Engineer's approval shall not relieve the Contractor of responsibility for conforming to the plans and specifications. The Contractor is responsible for confirming and correlating all quantities, dimensions, fabrication details and techniques, installation methods and performance of the work. The Contractor shall check and verify all field measurements.

G. If required in the technical sections of these specifications, as soon as practicable and not later than thirty (30) days after the date of notice of award of the contract, but sufficiently in advance of commencement of installation of materials and equipment to allow for approval of the regular submission, the Contractor shall submit preliminary shop drawings in the form of material and equipment schedules which shall contain a complete list of materials, fixtures and equipment to be incorporated in the work. No consideration will be given to partial lists submitted at different times. If any items in the list submitted differ from the item specified in the specifications and plans, the Contractor shall state that the substituted item is of the

proper size for the allotted space and will meet the performance requirements of the original item. After approval of the material and equipment schedules, by the Engineer, the Contractor shall submit the regular submission of shop drawings.

H. The Contractor shall furnish the regular submission of shop drawings after the approval by the Engineer of the preliminary submission if such preliminary submission is required; otherwise, the regular submission of shop drawings shall be submitted to the Engineer with sufficient lead time to allow his review and return of the shop drawings to the Contractor before work is commenced on that portion of the project covered by the shop drawings.

I. If the shop drawings are not approved by the Engineer, the Contractor shall correct or make changes as noted and shall resubmit revised shop drawings until approved by the Engineer.

J. Refer to individual specification sections for required submittals. Additions or deletions may be made by the Engineer or the Owner's representative as may be necessary during the life of the project.

5. SUBMITTAL RESPONSIBILITES OF THE CONTRACTOR

A. Submittal Transmittal Form:

1. Each Submittal shall include a Transmittal Form. The Contractor shall submit a proposed Submittal Transmittal Form that meets the following requirements for review and approval by the Engineer prior to the first submittal.

B. The Submittal Transmittal Form shall identify the Project Name, Location, Contractor, subcontractor, name of item submitted as specified in the Contract Technical Specifications or Drawings, supplier, manufacturer, pertinent Contract Drawing No.(s), Detail Number(s) and applicable Technical Specification Section numbers.

1. Identify each Transmittal Form by the corresponding Technical Specification. Sequentially number transmittal forms. Re-submittals shall have the original number with a suffix. Acceptable form of Submittal Transmittal Form ID is SSS.SS-NN.T, or SSS.SSS (name)-NN.T where:

a. SSS.SS indicates the 5-digit VTrans Contract Technical Specification, or SSS.SSS (name) indicates the 6-digit Special Provisions Technical Specification applicable to the equipment/item being Submitted.
b. NN indicates different equipment/item submittals for that Contract Technical Specification.
c. T indicates the number of times that submittal has been made.
d. Example for VTrans Specification Sections:

i. 301.15-01.0 Subbase of Gravel Submittal (In this example the submittal is the <u>first</u> Subbase of Gravel Submittal submitted on the project.)
ii. 301.15-01.1 Subbase of Gravel Submittal (In this example the submittal is the <u>second</u> Subbase of Gravel Submittal submitted on the project.)

e. For Special Provisions Specification Sections:

i. 900.620 (Gravel Wetland Facility) -01.0 (In this example the submittal is the first Special Provision 900.620 Gravel Wetland Facility Submittal submitted on the project.)

6. ELECTRONIC EMAIL SUBMITTALS BY CONTRACTOR

A. Email Subject shall include the Project Name and the Submittal ID using the following format: Pomerleau and Chittenden Housing Trust 3-Acre Stormwater Management Project - Submittal SSS.SS-NN.T – Name of Item Submitted.

B. The Name of Item Submitted shall be identified as specified in the Contract Technical Specifications or Drawings.

C. Email Submittals shall contain one Submittal only.

D. Email Submittals shall contain one attachment only.

E. Email Submittal attachment file name shall be the Submittal ID as defined herein.

F. There shall be no text in the Email body.

G. The Email attachment shall be a word searchable .pdf file format.

H. The first page of the Email attachment shall be the Submittal Transmittal Form.

I. The Submittal content shall be located after the Submittal Transmittal Form.

J. Submittal content within the pdf shall be oriented to be read without having to rotate pages.

K. Email Submittals shall contain attachments less than 25 MB in size.

L. Submittals that contain Drawings drawn to Scale on paper larger than 11”x17” size, shall be submitted by hardcopy.

7. REQUESTS FOR INFORMATION (RFI’s) BY THE CONTRACTOR

A. The Contractor shall be responsible for coordinating and submitting to the Engineer in writing Requests for Information (RFI’s) on an RFI Form provided or approved by the Engineer.

B. The RFI shall identify in writing the aspects of the Contract Documents for which clarification is requested by the Contractor.

C. The RFI shall reference the Contract Drawing Number, Detail Number or Technical Specification Section and Subsection that is the subject of the RFI.

D. The RFI shall include a description of the desired clarification and a proposed solution. The RFI shall indicate schedule or cost impact, if any. Each RFI shall be sequentially numbered in sequence.

E. RFI's shall be submitted to the Engineer by Email as specified below:

1. The RFI shall be submitted as a .pdf file attachment to an email.

2. The email Subject Line shall include the Project Name, RFI # and RFI Subject using the following format: Pomerleau and Chittenden Housing Trust 3-Acre Stormwater Management Project – RFI-NNN – RFI Subject. Example RFI Email Subject Line:

    a. Pomerleau and Chittenden Housing Trust 3-Acre Stormwater Management Project – RFI-001 – CPEP Pipe

3. The RFI subject description shall be identified as specified in the Contract Technical Specifications or Drawings.

4. Emailed RFI's shall contain one RFI only.

5. Emailed RFI's shall contain one attachment only.

6. Emailed RFI attachment file name shall be the RFI # and subject using the following format RFI-NNN – RFI Subject. Example:

    a. RFI-001 – CPEP Pipe
    b. In this example the RFI is the first RFI submitted on the project.

F. There shall be no text in the Email body.

G. Contractor shall include clarifying sketches or other information in the attached RFI pdf file, located after the RFI Form.

H. Submittal content within the .pdf file shall be oriented to be read without having to rotate pages.

I. Emailed RFI .pdf files shall be less than 25 MB in size.

8. PERSONNEL AND CONTACTS

A. Prior to commencing construction, the CONTRACTOR shall submit to the ENGINEER a detailed resume of the Superintendent to be employed by the CONTRACTOR for this project.

B. ENGINEER and the OWNER a list of the names, addresses, and telephone numbers of personnel to contact in emergencies. This list shall consist of at least three (3) designated responsible parties living within a fifty (50) mile radius of the project location who shall be on call and capable of responding to emergencies. If, for any reason, during the life of the project, any person so designated ceases to be available for emergency response as noted above, the CONTRACTOR shall immediately appoint a substitution and issue a new list to both the ENGINEER and the OWNER.

C. Prior to commencing construction, the CONTRACTOR shall submit to the ENGINEER, with a copy to the OWNER, the name of the CONTRACTOR's employee who will be the designated safety officer for the project.

9. SUPPLIERS AND SUBCONTRACTORS

A. The CONTRACTOR shall submit a complete list of all suppliers and subcontractors to be utilized by him/her on this project. This listing shall include the name(s) of all contact persons along with telephone and email addresses. This list shall be updated by the CONTRACTOR as necessary and submitted to the ENGINEER within five (5) working days of making any additions, deletions, or revisions to this list.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1. SECTION INCLUDES

A. Temporary Utilities: water and sanitary facilities.

B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, water control and erosion controls.

C. Construction Facilities: Access roads, parking, progress cleaning and project signage.

2. RELATED SECTIONS

A. Section 01700 - Contract Closeout: Final cleaning.

3. TEMPORARY ELECTRICITY

A. Contractor shall coordinate with the local electrical supplier to arrange for temporary electrical service as required for the project. Costs included in Item 635.11, Mobilization/ Demobilization.

4. TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

Not Used.

5. TEMPORARY HEATING

Not Used.

6. TEMPORARY COOLING

Not Used.

7. TEMPORARY VENTILATION

Not Used.

8. TELEPHONE SERVICE

Not Used.

9. FACSIMILE SERVICE

Not Used.

10. TEMPORARY WATER SERVICE

A. Provide, maintain, and pay for suitable quality water service required for construction operations at time of project mobilization.

B. Contractor will pay cost of water used. Exercise measures to conserve water. Provide separate metering if obtaining from local water utility and reimburse Owner for cost of water used.

C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

11. TEMPORARY SANITARY FACILITIES

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

B. At end of construction, return site conditions where facilities are located during construction to same or better condition as originally found.

12. BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

13. WATER CONTROL

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

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

14. PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

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

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

D. Prohibit traffic from landscaped areas.

15. SECURITY

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

16. ACCESS ROADS

A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.

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

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

D. Designated existing on-site roads may be used for construction traffic at the discretion of the Engineer.

17. PARKING

A. Construction personnel shall park within the project limits so as not to obstruct local traffic and construction activities.

18. TRAFFIC CONTROL

A. The Contractor shall establish and maintain necessary traffic control measures including signs, barricades, or flagmen to protect the traveling public (including bicyclist and pedestrians), construction operations, and access to property.

B. The Contractor shall conduct operations so as to maintain and protect access for vehicular and pedestrian traffic on all adjacent streets affected by his operations, and to subject the public to a minimum of delay and inconvenience.

C. The Contractor shall at the Owner's direction, hire uniformed policemen, in lieu of flagmen, to direct and maintain traffic on heavily traveled through-fares on which traffic is subject to delays or detours caused by the Contractor's operations. Locations and conditions requiring such uniformed policemen shall be as directed by the local governing authority.

D. Traffic control measures shall conform to VTrans Specification Section 641 and the latest edition of MUTCD.

19. PROGRESS CLEANING AND WASTE REMOVAL

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

B. Collect and remove waste materials, debris, and rubbish from site daily and dispose off-site.

20. FIELD OFFICES AND SHEDS

Not Used.

21. REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials, prior to Final Application for Payment.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing and permanent land and facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

22. DUST CONTROL

A. General

1. The Contractor shall furnish all labor, materials, tools and equipment necessary to apply water on roads or traveled surfaces within the construction site when directed by the Engineer and/or as necessary to control dust. Calcium chloride will not be allowed to be used on this project due to the potential for contaminating nearby surface water or groundwater.

2. When dust control is not included as a separate item in the Contract, the work shall be considered incidental to the appropriate items of the Contract.

B. Products

1. Water for sprinkling shall be clean, free of salt, oil, and other injurious materials.

C. Execution

1. Water shall be applied by equipment approved by the Engineer. As a minimum it shall consist of a tank, a spray bar and a gauge equipped pump. Water shall be dispersed through nozzles at a minimum pressure of 20 psi.

23. ADVERSE CONDITIONS

A. Night Work

1. Work after dark will not be permitted except under extreme emergency, or only under special directions, and only if permitted by the Engineer.

2. Whenever the Contractor finds it necessary or expedient to do work at night, such night work shall be performed by the Contractor without additional or extra cost to the Owner, and only with the Owner's approval. The Contractor shall provide all lights required for the proper and expeditious carrying on of any work.

3. The placing of concrete shall be started early enough in the daylight hours to insure completion of the section under construction before dark.

B. Weather Conditions

1. No work shall be done when the weather is unsuitable. The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials or equipment from damage or deterioration due to floods, driving rain, or wind and snowstorms. The Owner reserves the right, with the advice of the Engineer, to order that additional protective measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the Work from weather elements.

2. The mixing and placing of concrete or pavement courses, the laying of masonry, and installation of sewers and water mains shall be stopped during rain storms; all freshly placed work shall be protected by canvas or other suitable covering in such manner as

to prevent running water from coming in contact with it. Sufficient coverings shall be provided and kept ready at hand for this purpose. The limitations and requirements for mixing and placing concrete, or laying of masonry, in cold weather shall be as described elsewhere in these specifications.

24. POLICING

A. General

1. When, in the opinion of the Owner, or the Engineer, public safety or convenience requires the services of police, the Engineer may direct the Contractor to request the local police department to assign uniformed officers to direct traffic within the location of work under the Contract.

2. When so directed, the Contractor shall make all arrangements in obtaining police assistance and shall pay all police officers. The police shall, at all times, be subject to the direction and control of the Contractor.

3. The intent is to ensure public safety by police direction of traffic. Police are not to serve as watchmen to protect the Contractor's equipment and materials, or to warn pedestrians of such hazards as open trenches.

4. Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property under the terms of the Contract, or for providing necessary traffic control including signs, barricades, or flagmen as required in Section 01500 of these specifications.

25. FENCING

Not Used.

26. EXTERIOR ENCLOSURES

Not Used.

27. INTERIOR ENCLOSURES

Not Used.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1. SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

2. RELATED SECTIONS

A. Document 00200 - Instructions to Bidders: Substitute and "or equal" items procedures.

3. PRODUCTS

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacture for components being replaced.

4. TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

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

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

5. STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive Products in weather tight, climate controlled, enclosures in an environment favorable to Product.

D. For exterior storage of fabricated Products, place on sloped supports above ground.

E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

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

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

H. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

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

6. PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

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

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

7. SUBSTITUTIONS

A. Engineer will consider requests for Substitutions only within thirty (30) days after date of Owner-Contractor Agreement.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
2. Will provide the same warranty for the Substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:

1. Submit request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

3. The Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1. SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Operation and maintenance data.

F. Spare parts and maintenance Products.

G. Warranties and bonds.

H. Maintenance service.

2. RELATED SECTIONS

A. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.

3. CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.

B. Provide submittals to Engineer that are required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

4. FINAL CLEANING

A. Execute final clean up and restoration of all disturbed areas prior to final project assessment.

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

C. Remove waste and surplus materials, rubbish, and construction facilities from the site.

5. ADJUSTING

Not Used.

6. PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

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

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

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of footing in relation to finish ground or brook elevation.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Field changes of dimension and detail.
4. Details not on original Contract drawings.

G. The Contractor shall submit the Record ("As-Built") Set of documents to the Engineer in both electronic pdf format and hard copy at the completion of the work before claim for final Application for Payment.

7. OPERATION AND MAINTENANCE DATA

Not Used.

8. SPARE PARTS AND MAINTENANCE PRODUCTS

Not Used.

9. WARRANTIES

A. Contractor shall guarantee all work items indicated in the Contract Documents for one year from date of Substantial Completion.

10. MAINTENANCE SERVICE

A. Furnish service and maintenance of all work items indicated in the Contract Documents for one year from date of Substantial Completion.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

Index

For

SPECIAL PROVISIONS

The following Special Provisions are to be used in conjunction with the VTrans Standard Specifications and are herein made a part of the Contract Documents and apply to this project:

900.608 - SPECIAL PROVISION

PERFORMANCE-BASED STRUCTURAL CONCRETE

1. DESCRIPTION. This work shall consist of designing, furnishing and placing high performance Portland cement concrete for structures and incidental construction.

   The Portland cement concrete may consist of a homogeneous mixture of cement, fine aggregate, coarse aggregate, water, admixtures, and pozzolans, proportioned and mixed according to these specifications.

2. MATERIALS. Materials shall meet the requirements of the following subsections:

Portland Cement	701.02
Portland-Pozzolan Cement	701.05
Portland-Limestone Cement	701.06
Portland Blast-Furnace Slag Cement	701.07
Ternary Blended Cement	701.08
Fine Aggregate for Concrete	704.01
Coarse Aggregate for Concrete	704.02
Lightweight Coarse Aggregate for Structural Concrete	704.14
Lightweight Fine Aggregate for Structural Concrete	704.19
Preformed Joint Filler, Cork, and Asphalt-Treated Felt	707.08
Polyvinyl Chloride (PVC) Waterstop	707.10
Concrete Bonding Systems	707.16
Stay-in-Place Corrugated Metal Forms for Superstructure Slabs	715.05
Epoxy Bonding Systems	719.02
Concrete Curing Materials	725.01
Air-Entraining Admixtures	725.02(b)
Retarding Admixtures	725.02(c)
Water-Reducing Admixtures	725.02(e)
Water-Reducing and Retarding Admixtures	725.02(f)
Water-Reducing, High Range Admixtures	725.02(g)
Water-Reducing, High Range, and Retarding Admixtures	725.02(h)
Accelerating Admixtures	725.02(i)
Water-Reducing and Accelerating Admixtures	725.02(j)
Specific Performance Admixtures	725.02(k)
Mineral Admixtures	725.03
Silica Fume	725.03(b)
Slag Cement	725.03(c)
Polystyrene Insulation Board	735.01
Blanket Insulation Material	735.02
Pipe Insulation	740.08
Water	745.01

   The coarse aggregate for superstructure shall be conditioned so that the total moisture percentage shall be the absorption percentage plus, at a minimum, 0.25% free moisture for the aggregate.

3. CLASSIFICATION AND PROPORTIONING. The following classes of concrete, shown in Table 1, are included in these specifications and shall be used as shown on the Plans.

TABLE 1 – PERFORMANCE-BASED CONCRETE CLASSES AND PROPERTIES

Concrete Class [1]	Min. 56-Day Compressive Strength (psi) [2]	Max. W/CM Ratio [3]	VSI [4]	Slump /Spread Limit	Freeze/Thaw Durability [5]		Air Content Limits [6]	Max. Free Shrinkage	Max. 56-Day Surface Resistivity [7]
					Min. Durability Factor	Max. Air Void Spacing Factor (in.)			
PCD	4,000	TBD	--	N/A [8]	80	0.008	TBD	0.032%	Low
PCS	3,500	TBD	--	N/A [8]	80	0.008	TBD	0.042%	Low
SCC	4,000	TBD	≤ 1	TBD [9]	80	0.008	TBD	TBD [10]	Low

[1] PCD = Performance Concrete, Deck

PCS = Performance Concrete, Substructure

SCC = Self Consolidating Concrete

[2] The concrete may be accepted if the design compressive strength from standard cured cylinders has been obtained at 28 calendar days. Any 56 calendar day acceptance cylinders shall be tested regardless of the results of earlier tests.

[3] The maximum W/CM ratio shall be determined by the Contractor as established by mix qualification testing. During production, the W/CM ratio shall be less than or equal to the W/CM ratio from the approved qualification mix. See Subsection 3(b)(1).

[4] Visual Stability Index (VSI) as determined in accordance with *ASTM C 1611*.

[5] The freeze/thaw durability of the proposed mix design may be established by providing mix qualification testing demonstrating conformance with either of the two requirements. Testing shall meet the requirements of either *AASHTO T 161*, Procedure A, or *ASTM C 457*, as applicable. See Subsection 3(b)(2).

[6] The minimum air content shall be determined by the Contractor as established by mix qualification testing. During production, the air content shall be greater than or equal to the air content from the approved qualification mix, see note 10. See Subsection 3(b)(2).

[7] The Contractor shall determine the surface resistivity in accordance with Subsection 3(b)(4).

[8] The mix shall not exhibit segregation. If the mix does exhibit segregation, the load shall be rejected. If the spread is equal to or exceeds 18 inches, the mix shall be classified as SCC.

[9] The Contractor shall determine the spread target and limits in accordance with Subsection 3(b)(5). The spread shall be maintained within the determined spread limits for the placement. The mix shall not exhibit segregation. If the mix does exhibit segregation or exceeds the upper spread limit, the load shall be rejected. and subsequent loads shall be tested by the Contractor until the mix meets the allowable limits. The Engineer may perform a J-ring test at the time of placement if blocking is a concern.

[10] The Contractor shall determine the free shrinkage in accordance with Subsection 3(b)(1). SCC will be allowed for use in superstructure elements if the free shrinkage meets the requirements for Class PCD. SCC will be allowed for use in substructure elements if the free shrinkage meets the requirements for Class PCS.

If a nominal maximum aggregate size is not specified, the Contractor shall determine the nominal maximum aggregate size using guidance from *ACI 211.1*. In no case shall the maximum aggregate size exceed 1/5 of the narrowest dimension between sides of the forms, 1/3 the depth of slabs, or 3/4 of the minimum clear spacing between individual reinforcing bars, bundles of bars, or pre-tensioning strands unless approved by the Engineer.

The Contractor may use industry methods to develop gradations not specified in Section 704 that are better optimized to satisfy the required concrete performance characteristics. If the Contractor is using a combined gradation, they shall provide the method or methods of how they will monitor gradation, the limits of the gradation ranges, and the frequency of monitoring.

Lightweight fine aggregate may be used to replace up to 30% of the volume of normal weight sand. The gradation of the lightweight fine aggregate shall conform to the requirements of *AASHTO M 195*. The lightweight fine aggregate shall be conditioned for enough time to fully saturate the material.

The stockpile shall be constructed so that the moisture content is uniform throughout the pile. The stockpile will be allowed to drain 12 to 15 hours immediately prior to use, unless an alternate procedure is approved by the Structural Concrete Engineer. The Contractor shall state the method, duration and procedure used to confirm that the material is at or above its saturated surface dry (SSD) value, by weight, throughout the pile.

The use of chlorides or admixtures containing chlorides is prohibited. All admixtures will be considered incidental to the work and included in the Contract unit price of the concrete.

The concrete materials may be proportioned using the absolute volumes method in accordance with the specified requirements. The volumetric proportioning method such as that outlined in *ACI 211.1*. or other approved volumetric proportioning methods, shall be employed in the mix design.

Prior to placing concrete on the project (or prior to the trial pour or prior to the pre-placement meeting, whichever occurs first), the Contractor shall submit for approval the single mix design formulation that satisfies all mix design qualification requirements and testing for the class of concrete specified. The mix designs shall be submitted to the Structural Concrete Engineer at the Agency's Materials Section Central Laboratory. The Structural Concrete Engineer may require a minimum of 8 weeks for testing, review, and approval of new mix designs. No class of concrete shall be placed on a Project, including the trial pour, until the mix design is approved.

If the proposed Performance Concrete mix design fails to meet the qualification requirements, the Contractor shall submit a revised mix design formula in writing to address the mix qualification deficiencies of the original failed mix design.

Review of the revised mix design formula by the Structural Concrete Engineer will be completed within 14 calendar days. Upon approval of the revised mix design formula by the Structural Concrete Engineer, testing

of the revised mix design may commence. Testing of the revised mix design formula shall be completed within 6 months of the revised mix design formula approval.

Until the testing of the revised mix design is completed and approved, the Structural Concrete Engineer will specify the use of an alternative, prescriptive mix design formula for the application in question, including appropriate acceptance requirements for the prescriptive alternative mix.

(a) The mix design must contain the following information:

(1) Class of concrete.

(2) Type of mix, conventional or self-consolidating concrete (SCC).

(3) Saturated surface dry or dry weights (specify which).

(4) Aggregate types, sources, specific gravities, and absorption values.

(5) 56 calendar day design compressive strength, psi.

(6) Cementitious content and the amount of each, pounds per cubic yard.

(7) Air content lower limit, percent.

(8) 56 calendar day surface resistivity value.

(9) Determined spread lower limit and upper limit for SCC.

(10) Maximum water/cementitious materials (W/CM) ratio.

(11) Volumetric quantities of each material in the mix design.

(12) Design unit weight of the mix.

(13) Chemical admixture types, brand names, and dosages.

Concrete test mix or mixes shall be used to obtain the test results where applicable. All wet testing shall be done by personnel with current ACI Concrete Field Testing Technician Grade I certifications. All other tests shall be performed by a laboratory that is accredited by AASHTO re:source or the Concrete and Cement Reference Laboratory (CCRL) in the particular test method, or as allowed by the Engineer.

(b) The following mix qualification tests shall be performed. The minimum air content value and the maximum water/cementitious materials ratio of the material used to pass the mix qualification tests shall become the minimum air content value and the maximum water/cementitious materials ratio allowed during production.

(1) The Contractor shall provide test results that establish the shrinkage tendency of the concrete. The free shrinkage rate of the concrete shall be tested per the requirements of

AASHTO T 160. The test specimen shall be a prism of 4 inch square cross section. Procedure 11.1.2 of *AASHTO T 160* shall be followed for storage and measurements, and all specified test age results shall be submitted. Specimen testing may be terminated after 28 calendar days of drying. Testing shall be performed by a laboratory accredited in the specific test method.

(2) The Contractor shall provide test results that establish the freeze-thaw durability of the concrete. At the contractor's choice, either *AASHTO T 161* or *ASTM C 457* may be used to demonstrate freeze/thaw durability meeting the specification requirements.

Sampling shall be performed in accordance with *AASHTO R 60* on a qualification batch of concrete that is a minimum of 3 cubic yards. This freeze/thaw durability test batch shall also be tested for air content (*AASHTO T 152*), concrete temperature (*ASTM C 1064/C 1064 M*), and unit weight *(AASHTO T 121).* SCC concrete shall also be tested for spread (*ASTM C 1611/C 1611 M*, Procedure B).

For those electing to test for air void spacing factor in accordance with *ASTM C 457*, the Contractor shall make a minimum of two concrete cylinders per *AASHTO T 23* and report the average air-void spacing factor obtained from testing these two specimen. The cylinders shall be cured for a minimum of 5 calendar days prior to being tested according to the requirements of *ASTM C 457*.

The air content of the qualification batch that passes freeze-thaw durability testing shall become the minimum air content allowed in production. This shall also become the minimum air content allowed for all subsequent mix qualification testing.

(3) The compressive strength of the concrete shall be measured based on the requirements of *AASHTO T 22* for 7, 14, 28, and 56 calendar day standard cured cylinders.

(4) The surface resistivity of the test mix shall be measured at 56 calendar days based on the requirements of *AASHTO T 358*. Results shall be categorized as Low, Very Low, or Negligible in accordance with *AASHTO T 358*, Table 1. The surface resistivity may be accepted prior to 56 calendar days if the results meet these requirements. 56 calendar day test results shall be completed and submitted regardless of the results of earlier tests.

(5) The Contractor shall determine the lower and upper spread limit for SCC concrete. The J-Ring Test and the Spread Test will be conducted at both the lower and upper spread limits. The J-Ring Test will be conducted per the requirements of *ASTM C 1621/C 1621 M*, and the Spread Test will be conducted per the requirements of *ASTM C 1611/C 1611 M.*

The J-Ring test results shall be compared to the Spread Test results at both the upper and lower limits. The difference between the two tests at both the upper and lower limit shall not be greater than 2 inches. At both the upper and lower limits, the Visual Stability Index (VSI) shall not be greater than 1.

(c) The Alkali-Silica Reactivity (ASR) of each type of aggregate shall be measured separately based on the requirements of *AASHTO T 303*. If one or more of the aggregates exceeds 0.10% expansion, then the aggregate shall be tested again according to the requirements of *ASTM C 1567*.

The Contractor may elect to go directly to *ASTM C 1567* testing if they suspect that the aggregate may exceed the 0.10% expansion if tested by *AASHTO T 303*. Testing shall be performed by a laboratory accredited in the specific test method.

(d) After the mix design furnished by the Contractor has been reviewed and approved by the Structural Concrete Engineer, no changes to the mix design shall be allowed except as defined in Table 2. Following an approved change in accordance with Table 2, a contractor may still revert back to original approved mix design formulation. If a source change is requested due to a change in product or material name that does not include any significant change in product formulation or material characteristic, and this is substantiated by the product or material supplier in writing, re-testing is not required.

TABLE 2 – ALLOWABLE MIX DESIGN CHANGES FOR ALL MIX TYPES

Previously Approved Component or Property Being Changed	Mix Design Resubmittal Requirements [1]	No. of Changes Allowed
Cement source	If the alkali content (Na and K) of the new source is greater than that of the original source, and the original result from Subsection 3(c) was greater than 0.08% expansion, then updated ASR testing is required. Otherwise, no qualification testing is required.	Unlimited
Cement proportioning (+/- 5% by volume)	No qualification testing required	One
Aggregate proportioning (+/- 10% by volume)	No qualification testing required	One
Aggregate source	ASR testing and gradation check by original Contractor method	One
Slag source	If same grade is used, no qualification testing required	Unlimited
Silica fume source	No qualification testing required	Unlimited
Fly ash source	If either the calcium (CaO) or the alkali (Na and K) content of the new source is greater than that of the original source, and the original result from Subsection 3(c) was greater than 0.08% expansion, then updated ASR testing is required. Otherwise, no qualification testing is required.	Unlimited
Air-entraining admixture source – 725.02(b)	Resubmittal of freeze/thaw durability qualification testing	Unlimited
Shrinkage reducing admixture source – 725.02(k)	Resubmittal of shrinkage qualification testing	Unlimited
Corrosion inhibiting admixture source – 725.02(k)	Resubmittal of shrinkage qualification testing. If shrinkage qualification testing of the original mix design is greater than 70% of shrinkage limit, then updated shrinkage testing is required.	Unlimited

Latex admixture source – 725.02(d)	Resubmittal of surface resistivity testing	Unlimited
Accelerating admixture dosage increase – 725.02(i), 725.02(j)	Resubmittal of shrinkage qualification testing	Unlimited
Accelerating admixture source – 725.02(i), 725.02(j)	No qualification testing required	Unlimited
ASR mitigating admixture dosage decrease – 725.02(k)	Resubmittal of ASR qualification testing	Unlimited
ASR mitigating admixture source – 725.02(k)	Resubmittal of ASR qualification testing	Unlimited
All other admixture source and dosage changes – 725.02	No qualification testing required	Unlimited

[1] All changes will require administrative submittal to establish proposed changes. Where required, resubmittal testing shall be completed using the same material sources and proportions from the original approved mix design.

No new materials shall be incorporated without prior written approval of the Engineer. In no case shall concrete from more than one mix design be permitted to be used during the same pour without prior written approval of the Engineer.

The approved mix design will be allowed consecutive re-approval if no material proportioning or material sources have changed from the previous year's approved mix design and the mix design is submitted with updated aggregate properties and volumes adjusted accordingly. The aggregate properties shall be tested within 60 calendar days of the mix design submission. The properties to be tested include, but are not limited to, specific gravity and absorption.

The mix design shall be accompanied by the previously completed and accepted mix qualification test data and any applicable updated test information. The submittal shall also include all applicable quality control test results and all requests for variance from the material requirements of these specifications.

4. BATCHING. Measuring and batching of materials shall be done at an approved batch plant. Batch plants shall have an inspection completed prior to the first concrete placement on an Agency project if it has been longer than 12 calendar months from the last inspection. Request for inspection and required documentation must be received by the Materials Testing and Certification Section a minimum of 21 calendar days prior to the date of the requested inspection.

All deficiencies shall be corrected and verified a minimum of 5 calendar days prior to the first concrete placement for any Agency project. The batch plant shall meet the requirements of *AASHTO M 157*, except as modified in these specifications, and shall always be maintained in good repair. The batch plant shall be subject to periodic inspections by authorized representatives of the Agency. The batch plant shall have approved methods of storing, measuring, and dispensing approved admixtures.

All concrete batch plants offered for Agency approval shall be equipped for semi-automatic batching and proportioning of all cementitious material, aggregates, water, and for the automatic insertion of admixtures. The plants shall be equipped to automatically and accurately record and report batch weights.

Proper facilities shall be provided for the Engineer to inspect ingredients and processes used in the batching and delivery of the concrete. The Contractor shall, without charge, afford the Engineer all reasonable facilities for securing samples to determine whether the concrete is being furnished in accordance with these specifications. In the batch room area, the producer shall provide the Inspector with a 24 inch × 18 inch horizontal working surface, at a sufficient working height, with a seat and an adequate view of the batching controls, display, and power supply.

The Contractor shall give the Engineer 24-hour's notice of intent to place concrete. Failure to give notice which causes postponement of placing operations shall not be reason for determining extension of Contract time per the requirements of Subsection 108.11.

(a) Batch Weight Tickets. Batch weight tickets shall include the following information;

(1) Approved State of Vermont mix identification number

(2) Weight of all aggregates

(3) Weight of cementitious material

(4) Quantity of admixtures by type

(5) Quantity of water batched

(6) Aggregate moistures

(7) Total water to cementitious ratio

Materials on the batch weight ticket shall be identified by type. All batch weight ticket information shall be provided in English units. All materials added to the concrete batch shall be added to the batch weight ticket prior to delivery.

(b) Semiautomatic Batch Plants. When actuated by a starting mechanism, the semiautomatic batch controller shall start the weighing operation of the materials and stop the flow automatically when the designated weight has been reached. It shall be interlocked to ensure that the discharge mechanism cannot be opened until the weight is within the tolerance specified in Subsection 4(e).

Water and admixtures may be batched in a weigh batcher or by volume in a volumetric device. When actuated, volumetric controls shall start the measuring operation and stop the flow automatically when the designated volume has been reached.

(c) Testing Laboratory. The Contractor shall provide a weatherproof building or room at the plant site for the use of Agency personnel as a testing laboratory. The Contractor shall attain and maintain a qualified laboratory status in accordance with the current edition of the Agency's Qualified Laboratory Program. Failure to comply with this program may result in suspension of material production for Agency projects.

The testing laboratory shall have a minimum gross internal area of 150 square feet with a layout providing a minimum internal width of 7 feet, in which to house and use the equipment specified. Should the Contractor elect to provide additional equipment relevant to testing of Portland cement concrete and materials, the gross inside floor area of the laboratory shall be increased in proportion to the area required to house and operate the additional equipment. If the additional equipment is to be operated on a bench, the length of bench sections shall also be proportionally increased.

Adequate ventilation, lighting, heating, and any necessary electrical or gas connections shall be provided. Proper sanitary toilet facilities with a lavatory shall be available for use by Agency personnel at the plant site. Dedicated private telephone and internet services shall be provided to the laboratory. The internet connection shall have a minimum download capacity of 3 Mbps (megabits per second) without utilizing compression algorithms and the bandwidth speed shall be verified using an online speed test.

The laboratory shall be equipped with the following items and equipment:

1 Standard office desk, with lockable drawers or a separate lockable two-drawer file cabinet and chair

1 VTrans Qualified Laboratory Binder with producer equipment calibration data

1 Set of bench sections at least 2 feet wide providing a minimum of 28 square feet of working area with under-counter shelving

1 Standard laboratory stool

1 Fully automatic electronic calculator with eight digit capacity

1 Standard laboratory sink and faucet provided with an adequate supply of water meeting the requirements of Subsection 745.01. The sink shall drain to the outside of the laboratory

1 Bench brush

1 Floor brush

1 Motorized 8-inch sieve shaker with an adjustable timer. The shaker’s operation shall be conducted by means of lateral and vertical motion of the sieve accompanied by jarring action with the following 8-inch diameter sieves: 3/8 inch (9.50 mm), No. 4 (4.75 mm), No. 8 (2.36 mm), No. 16 (1.18 mm), No. 30 (0.600 mm), No. 50 (0.300 mm), No. 100 (0.150 mm), plus pan and cover.

1 Mechanical aggregate shaker with an adjustable timer, a 1 cubic foot capacity, together with the following screens: 1-3/4 inch (43.0 mm), 1-1/2 inch (37.5 mm), 1 inch (25. 0 mm), 3/4 inch (19.0 mm), 1/2 inch (12.5 mm), 3/8 inch (9.50 mm), 1/4 inch (6.30 mm), No. 4 (4.75 mm), No. 8 (2.36 mm), No. 16 (1.18 mm), and pan. The aggregate shaker may be placed in a separate enclosed area, or be shielded for dust and sound control. When the aggregate shaker is placed in a separate enclosed area, there shall be a minimum of 5 feet of clear space measured from

the front frame of the aggregate shaker outward, as well as a bench section measuring approximately 36 inches high, 24 inches deep, and 50 inches long located adjacent to the aggregate shaker. The area shall be well lit and ventilated.

1 Square pointed shovel

5 Five gallon plastic buckets, with handles

1 Electronic balance with a minimum capacity of 50 pounds and accurate to 0.0002 pounds. If separate fine and coarse aggregate scales are to be used, the fine aggregate scale shall meet the requirements of *AASHTO M 231* Table 2, Class G2 with a minimum capacity of 1.75 pounds and readable to 0.0002 pounds. The coarse aggregate scale shall meet the requirements of *AASHTO M 231* Table 2, Class G5 with a minimum capacity of 50 pounds and readable to 0.002 pounds.

1 Set of standard masses (weights) to use for verifying the accuracy of the electronic balance

2 Double-burner hot plates with variable temperature controls

3 Metal pans with a nominal size of 9 inches × 9 inches × 2 inches

5 Metal pans with a nominal size of 9 inches × 13 inches × 2 inches

1 Sample splitter with a 2-1/2-inch chute

1 10-inch blunted trowel

1 4 foot × 4 foot minimum heavy canvas for quartering samples

1 Brass wire-bristle brush

1 Pair of heat-resistant gloves (500°F, short-contact)

2 1-1/2 inch soft bristle paint brushes

Acceptable substitutes for these items and equipment may be made with the approval of the Structural Concrete Engineer.

Batching operations shall not begin until the testing laboratory has been approved as being in compliance with these specifications and all equipment and equipment calibration requirements of the current VTrans Quality Assurance Program and Qualified Laboratory Program documents. Removal of any equipment, except with written request and written approval of the Structural Concrete Engineer, will revoke any prior approvals and/or qualifications and require the termination of batching operations.

The building or room designated as a testing laboratory shall be maintained in a clean condition by the producer and kept free of all articles not necessary for the testing of materials. Cleaning supplies shall be furnished by the Contractor.

(d) Bins and Scales. The batch plant shall include bins, weighing hoppers, and scales with adequate separate compartments for fine aggregate and for each required separate size of coarse aggregate. If cement is used in bulk, a bin, hopper, and scale for cement shall be included. Each compartment shall be designed to discharge efficiently and freely into the weighing hopper or hoppers. Means of control shall be provided so that when required, the material may be added slowly in minute quantities and shut off with precision.

Hoppers shall be constructed to eliminate accumulations of tare materials and to discharge fully without jarring the scales. Partitions between compartments shall be configured to prevent spilling under any working condition. All batch plant structures shall be properly leveled and maintained in that condition within the tolerance required by the design of the weighing mechanism.

The scales for determining the mass (weight) of aggregate, water and cementitious material shall be comprised of a suitable system of levers or load cells. The levers or load cells will determine the mass (weight) consistently within 0.5% under operating conditions, with loads indicated either by means of a beam with balance indicator, a full-reading dial, or a digital read-out or display.

Adequate means for checking the accuracy of the scales shall be provided by the Contractor either using 50 pound weights or by other methods approved by the Structural Concrete Engineer. Weights shall be certified annually by the Division of Weights and Measures of the Vermont Agency of Agriculture, Food, and Markets. All exposed fulcrums, clevises, and similar working parts of scales shall be kept clean.

When beam-type scales are used, provision shall be made for indicating to the operator that the required load in the weighing hopper is being approached. Poises shall be designed to be locked in any position to prevent unauthorized change of position. All measuring and weighing indicating devices shall be in full view of the operator while charging the hopper and the operator shall have convenient access to all controls.

The scales shall be serviced and their accuracy verified annually by a hopper-scale service person licensed by the Division of Weights and Measures. For Vermont plants, an Inspector representing the Division of Weights and Measures shall witness all testing conducted by the service person and will attach a seal to each hopper scale, provided it meets the current specifications, tolerances, and regulations adopted by the Division of Weights and Measures. Standard test weights used to determine the accuracy of hopper scales shall be certified yearly by the Division of Weights and Measures in accordance with their established standards.

The ready-mixed concrete producer shall hire a licensed hopper scale service person for annual checking and service of scales. In addition, Vermont producers shall schedule an inspection with the Division of Weights and Measures between February 15th and April 30th of each year. After April 30th, Vermont plants without current seals affixed to the hopper scales will not be permitted to supply concrete to Agency projects, unless otherwise directed by the Engineer or until the seals are affixed.

Out-of-state concrete producers shall observe all annual hopper scale weighing and seal requirements of their respective states.

(e) Production Tolerances for Batching. For weighed ingredients, the accuracy of batching is determined by a comparison between the desired weight and the actual scale reading. For volumetric measurement of water and admixtures, accuracy is determined by checking the quantity either by weight on a scale or by volume in a calibrated container.

Admixture-dispensing systems shall, at a minimum, be annually calibrated by an admixture distributor representative. The admixture distributor representative shall check at least two volumes, with a check done at approximately 15% of the minimum and at 15% of the maximum manufacturer's recommended dosage range, or other targets as approved by the Structural Concrete Engineer.

Batching shall be conducted to accurately measure the desired quantities of materials within the tolerances specified in Table 3.

TABLE 3 – CONCRETE PRODUCTION TOLERANCES FOR BATCHING

Material	Tolerance (%)
Cement	± 1
Water	± 1
Aggregates	± 2
Chemical admixtures	± 3
Mineral admixtures	+ 10, - 1

(f) Storage and Proportioning of Materials.

(1) Portland Cement. Either sacked or bulk cement may be used. No fraction of a sack of cement shall be used in a batch of concrete unless the cement is weighed.

All bulk cement shall be weighed on an approved weighing device. The bulk cement weighing hopper shall be properly sealed and vented to preclude dusting during operation. Facilities shall be provided for the sampling of cement at the batch plant, either from the storage silo or from the weighing hopper. The sampling device shall provide a sample that represents the true nature of the material being used. This device shall be a permanent installation located to allow for safe and easy access.

(2) Water. Water may be measured either by volume or by weight. When measurement is by meter, the water meter shall be so located that the measurements will not be affected by variable pressures and temperatures in the water supply line.

Measuring tanks shall be equipped with an outside tap and valve to provide for checking the setting, unless other means are provided for readily and accurately determining the amount of water in the tanks.

All water metering methods shall be verified and calibrated on an annual basis or at any time there is a question of accuracy. All water added to the concrete at any point shall be through an approved metering method.

(3) Aggregates. Aggregate stockpiles shall be formed on hard, well-drained areas that prevent contamination from underlying material and accumulation of excessive moisture.

Aggregates from different sources or of different gradations shall not be stockpiled together. Only rubber-tired equipment shall be permitted to operate on aggregate stockpiles.

Stockpiles shall be constructed as follows:

a. If the stockpile is to be made using mechanical equipment (front end loader, clam bucket, rock ladder, radial stacker, or other approved equipment), the stockpile shall be made in such a manner that segregation is kept to a minimum.

b. If the stockpile is to be made by dumping from trucks in multiple layers, each layer shall be approximately 4 feet in depth. Each layer shall be completely in place before commencing the next layer. Care shall be taken that successive layers do not "cone" down over the previous layer.

c. No equipment shall be used to haul aggregate over the stockpiled material except to deposit the material for the layer being placed. It shall be the responsibility of the Contractor to ensure that the aggregate is kept free from deleterious material or degradation.

Stockpiles shall be maintained in such a manner that twice the anticipated aggregate requirement for any Agency project placements will be on hand and available for sampling and testing at least 48 hours before mixing operations for the placements are scheduled to begin. The Engineer may modify this requirement when special aggregates are required.

Aggregates shall be handled from stockpiles or other sources to the batch plant in such a manner as to secure a uniform grading of the material. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates, except lightweight coarse aggregate, produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. In case the aggregates have a high or non-uniform moisture content, a storage or stockpile period longer than 12 hours may be required by the Engineer.

Stockpiles being watered per the specifications or allowed through producer QC procedures shall be watered for a sufficient time to ensure consistent moisture throughout the stockpile. Aggregate stockpiles being watered shall be loaded in the bin within 1 hour of being batched.

The Contractor shall conduct moisture content tests within 1.5 hours of the anticipated concrete batching time. If there is a visual difference in aggregate moisture appearance, aggregate moisture content will be tested again and new moisture test results shall be obtained and used as soon as possible. Material that has been stored in a storage bin for more than 10 hours shall be retested for moisture content. A minimum of one cubic yard of aggregate will be removed from the bottom of the storage bin. A minimum of one cubic yard of aggregate will then be removed and a moisture content sample taken.

Plants that employ moisture probes shall have them calibrated and verified a minimum of 24 hours prior to batching or as directed by the Structural Concrete Engineer. The procedure for checking the meter will be to run aggregate over the probe and then collecting a portion of the aggregate on which to perform a moisture content test. If the difference between the meter and the tested moisture content is greater than 0.5%, then the meter must be calibrated.

d. Lightweight coarse aggregate stockpiles shall be presoaked for a minimum period of time to ensure that the aggregate is completely saturated surface dry or greater immediately prior to use as indicated by moisture testing. Soaking shall be accomplished by continuous sprinkling or other suitable means that will provide a uniform moisture content throughout the stockpile. The stockpile shall be allowed to drain for 12 to 15 hours immediately prior to use.

(4) Admixtures. The Contractor shall follow an approved procedure for adding the necessary amounts of admixtures to each batch. Admixtures shall be dispensed in such a manner that will ensure uniform distribution of the material throughout the batch within the required mixing period. Except as specified herein, all admixtures shall be added to the batch at the plant, unless otherwise authorized by the Structural Concrete Engineer.

Chemical admixture containers, metering equipment, and scales shall be calibrated annually by a qualified admixture distributor representative. Admixture calibration and verification shall be done at 15% of the high, at approximately the middle, and at 15% of the low recommended ranges for the admixture being dispensed by the system. The calibration and verification shall be done in the presence of an Agency representative when requested by the Agency.

All dispensers shall include visual inspection aids such as graduated transparent cylinders. A separate dispenser shall be provided for each liquid admixture. If the dispensing system does not provide visual inspection aids, then periodic verification tests shall be done at a frequency satisfactory to the Structural Concrete Engineer. Calibration and verification records shall be kept at the production facility for a minimum of one year. The producer shall do the calibration and verification of the metering systems when requested.

Storage and dispensing systems for liquid admixtures shall be equipped to allow thorough circulation and/or agitation of all liquid in the system. This shall be required prior to the first batching of concrete for Agency projects in any calendar year and periodically

thereafter at intervals not to exceed 60 calendar days for the duration of the period the plant is supplying concrete for Agency projects.

If the plant has received a delivery of at least 25% of the volume of the storage container, this will be considered as a method of circulation or agitation. If the circulation method is used, the admixture shall be circulated until a complete exchange of admixture is achieved. If an agitation method is used, the method shall be subject to approval by the Structural Concrete Engineer. If an admixture does not need agitation, then the admixture manufacturer shall submit in writing stating this annually.

Storage and dispensing systems for liquid admixtures shall be maintained within the manufacturer's stated temperature and environmental conditions.

It shall be the responsibility of the Contractor to use the quantity of Agency-approved admixtures needed to obtain concrete meeting the requirements of the Contract. All admixtures will be approved by the Structural Concrete Engineer prior to incorporation into the mix.

a. Air-Entraining Admixture. Air-entraining admixture shall be used as required to obtain the specified air content.

b. Water-Reducing, Retarding, and Water-Reducing and Retarding Admixtures, Accelerators and Specialty Admixtures. Dosages shall be in the recommended range as stated by the Manufacturer, unless otherwise approved by the Manufacturer.

(5) Fly Ash or Slag. Fly Ash or Slag shall be stored at the batch plant in separate storage or holding bins or other approved holding containers and shall be protected from rain and moisture.

5. MIXING AND DELIVERY.

(a) General. Concrete may be mixed at the site of construction, at a central point, or wholly or in part in transit mixers. The production of concrete shall meet the requirements of *AASHTO M 157* with the following additional requirements:

(1) All concrete shall reach its final position in the forms no more than 1.5 hours after the cement has been added to the water.

Concrete shall not have water added once discharging has begun. Admixtures may be adjusted as required by QC.

If, in the opinion of the Engineer, the concrete visual characteristics appear to be noticeably different from the last acceptance test or previous concrete for that pour, the Engineer may direct the Contractor to perform QC tests to confirm the concrete conforms with the specifications.

(2) Addition of water or admixtures at the project site must be communicated to field inspection personnel. If additional mixing water, admixtures, or other additions are required, a minimum of 30 revolutions of the mixer drum at mixing speed shall be required before discharge of any concrete. If water is added in excess of the specified maximum W/CM ratio, the concrete shall not be used.

(3) The Engineer may require the Contractor to perform uniformity tests on a transit mixer or agitator, in accordance with *AASHTO M 157* and reported except as modified. Two samples shall be taken. The first sample shall be taken after 15% of the load volume has been discharged, and the second prior to 85% of the load volume being discharged.

Slump and air content tests shall be performed on each sample. The maximum difference in air content between the two samples shall be 1%. For concretes with a specified slump of 4 inches or less, the maximum difference between the two samples shall be 1 inch. For concretes with a specified slump greater than 4 inches, the maximum difference shall be 1-1/2 inches. If both conditions are not met, then the Contractor will be required to either modify the mixing procedure and/or batching sequence, or that transit mixer or agitator will not be allowed to deliver concrete to the project. The Contractor will be required to perform uniformity tests to confirm the changes have satisfactory results.

(4) Each load of concrete delivered at the job site shall be accompanied by a batch weight ticket meeting the requirements of Subsection 4.

(5) The Contractor shall provide direct communication service from the site of the work to the batch plant that shall always be available to the Engineer during concrete operations. The cost of this service will be considered incidental to the work.

(6) When use of a Water-Reducing, High Range Admixture or Water-Reducing, High Range, and Retarding Admixture is specified for deck concrete, the Contractor shall submit, for the Engineer's approval, information about the admixture manufacturer, the admixture addition rate, and when the admixture is to be added to the mixture (i.e., at the plant, on project, or a combination thereof).

To obtain the required concrete characteristics, a representative from the concrete producer is required on the project to determine the final admixture dosage and water addition for each load of concrete. The dosage shall be applied by means of a dispenser, or by other means of accurately measuring volume as approved by the Engineer. The Contractor shall provide QC concrete testing personnel, with current ACI Concrete Field Testing Technician Grade I Certification, to confirm the concrete is within specifications for the required work.

(7) All concrete shall be discharged into the forms before 300 revolutions of the drum or blades, not including initial mixing revolutions. The total allowed number of revolutions may be increased as directed by the Engineer.

Mortar shall be mixed in an approved mixer at the site of placement or in transit mixers when approved by the Engineer. The Engineer will withdraw approval for use of transit mixers, if necessary, to ensure a quality product or if the rate of delivery cannot be coordinated with finishing requirements.

(b) Stationary Mixers. When a stationary mixer is used for the complete mixing of the concrete, the mixing time for mixers that have a capacity of 10 cubic yards or less shall be not less than 90 seconds. For mixers that have a capacity of more than 10 cubic yards, the mixing time shall be determined by the concrete producer.

The time is valid provided that mixer efficiency tests prove the concrete is satisfactory for uniformity and strength. The plant shall be equipped with a timing device that will not permit the batch to be discharged before the predetermined mixing time has elapsed. Vehicles used in hauling shall comply with the requirements of Subsection 5(c).

(c) Transit Mixers. Transit mixers and agitators shall be subject to periodic inspections by an authorized representative of the Agency. Such equipment shall bear a currently dated inspection sticker supplied by the Agency indicating that the transit mixer or agitator conforms to the Agency's requirements.

For the purpose of this specification, the term agitator shall be interpreted to mean a vehicle with a drum that is not used to do the initial mixing of the concrete but is used to transport the concrete and mix the concrete prior to discharge.

Transit mixers shall be equipped with a water-measuring tank with a visible sight gauge for use when the water for the batch is supplied from the transit mixer tank. The gauge shall be clean and legibly graduated. Measuring tanks shall be provided with outside drain valves or other means to check their calibration. These should be easily opened for checking at any time.

Electrically-actuated revolution counters shall be required on all transit mixers except on mixers charged at central mix plants and utilized as agitator trucks only.

All mechanical details of the mixer or agitator such as water measuring and discharge apparatus, condition of the blades, speed of rotation of the drum, general mechanical condition of the unit and clearance of the drum shall be checked before a further attempt to use the unit will be permitted.

Mixers and agitators shall be kept free from accumulation of hardened concrete or mortar. The mixing blades shall be rebuilt or replaced when any part or section is worn 3/4 inch or more below the original height of the manufacturer's design. A copy of the manufacturer's design, showing the dimensions and arrangements of blades shall be available to the Engineer at the plant at all times.

The mixing of concrete containing silica fume is very important and shall be mixed in accordance with the appropriate situation:

(1) When silica fume is added to the batch by bags or in bulk from a silo, each batch of concrete shall be mixed for not less than 125 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of the equipment as the mixing speed. The mixing and agitating speeds shall be found on the metal plate on the mixer.

(2) When silica fume is blended with cement or a combination of cement and mineral admixture at the cement plant prior to being delivered to the concrete plant, each batch of concrete shall be mixed for not less than 70 nor more than 100 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of the equipment as the mixing speed. The mixing and agitating speeds shall be found on the metal plate on the mixer. If inconsistent test results are obtained, or the batch of concrete appears not to be completely mixed, the mixing revolutions shall be extended as necessary.

When a transit mixer or agitator is used for transporting concrete, mixing during transport shall be continuous and at two to six rotations per minute or as designated by the manufacturer of the equipment as agitating speed. Failure to do so is cause for rejection of the concrete.

Transit mixers and agitators assigned to a project shall not be used for other purposes until the desired work is completed at the site, and shall arrive at the project within the cycle that anticipated placement conditions dictate. The interval between loads shall be controlled in order that concrete in place shall not become partially hardened prior to placing succeeding batches. The plant capacity and transportation facilities shall be sufficient to ensure continuous delivery at the rate required.

Before discharging transit mix from a transit mixer that has been operating at agitating speed, the drum or blades shall be rotated approximately one minute at mixing speed. The same procedure shall apply to agitators.

Upon discharge of the concrete from the drum, a sufficient amount of water shall be charged into the drum to properly cleanse the drum. This water shall not be used as a part of the next succeeding batch but shall be discharged from the drum prior to the charging of the drum with the concrete ingredients. The drum shall be completely emptied before receiving materials for the succeeding batch. Re-tempering of concrete or mortar that has partially hardened, by remixing with or without additional materials, shall not be permitted.

6. QUALITY CONTROL. The Contractor shall provide assistance, equipment, materials, and curing for field sampling and testing as required by the Engineer. All costs shall be included in the Contract Unit Prices under Section 631. The Engineer shall perform all acceptance sampling and testing in accordance with the Agency's Quality Assurance Program. The Contractor shall perform all on-site Quality Control (QC) sampling and testing. The person performing the QC sampling and testing shall have, as a minimum, current ACI Concrete Field Testing Technician Grade I Certification.

(a) Trial Pour. When concrete will be used for a deck or overlay, or when deemed necessary by the Engineer, the Contractor shall construct a slab to be used for the trial pour. The purpose of the trial pour is to ensure that the mix can be placed and finished in accordance with these specifications. The slab shall be a minimum of 10 feet × 10 feet × 9 inches thick.

If the concrete is intended to be placed by pump, the trial pour concrete shall be placed by pump. The pump will be setup in the configuration that best represents the most difficult pumping condition. The wet concrete properties will be checked at the point of placement. The Contractor will demonstrate that they can provide an acceptable finish to the concrete for the element to be completed. The Contractor will need to bull float a minimum of 50% of the surface area of the slab and hand finish the curb areas in the same manner as anticipated during the production pour.

The Contractor may elect to construct the slab so that the same screed equipment and same finishing method can be used as anticipated for the production pour. In this case the Contractor will not be required to bull float a minimum percentage of surface area unless that will be included in their process for finishing the concrete deck surface during the deck pour. The test slab will become the property of the Contractor and removed from the project after completion of the trial pour.

Concrete production activities shall be closely monitored to ensure that no deviations are made from the approved mix design. If test results indicate a failure to obtain the characteristics as specified in Table 1, the Engineer may reject the material. The Contractor will be responsible for proposing solutions which could include changes to the mix design and will require testing be done with no extra payment. The modified mix design shall not be used until successful test results are obtained during a trial pour that is representative of the anticipated pour conditions.

(b) Sampling. Sampling for tests shall be taken in accordance with the requirements of *AASHTO R 60* or other procedures approved by the Agency. Sampling will be done at point of placement or as close to it as practical.

(1) Changes. Any time that there is a change in admixture dosage outside of the allowable tolerances, whether modified at the batch plant or at the site, additional QC sampling and testing shall be performed on the modified load prior to incorporating the concrete into the work.

(2) Beginning of Load Sampling. Beginning of Load Sampling is sampling for QC testing purposes that is taken before 15% of the load has been discharged. Beginning of Load Sampling shall be performed as required by the Engineer, or as needed to ensure that the Concrete meets the Contract requirements at the point of placement. The QC personnel shall monitor the placement operation and adjust the mix accordingly to ensure that the material being incorporated into the work meets Contract requirements.

(c) Slump Tests. Slump tests shall be made in accordance with *AASHTO T 119 M/T 119*.

(d) Spread Tests. Spread tests for SCC shall be made in accordance with the requirements of *ASTM C 1611/C 1611 M,* Procedure B. The concrete inside the cone shall not be tamped.

(e) Visual Stability Index (VSI) Tests. VSI tests for SCC shall be made in accordance with the requirements of *ASTM C 1611/C 1611 M,* Appendix X.1 and shall be performed on each completed spread test.

(f) Air Content Tests. Air content tests shall be made in accordance with the pressure method specified in *AASHTO T 152*.

For Class SCC, the specimens shall be fabricated in accordance with *ASTM C 1758/C 1758 M.*

(g) Compressive Strength Tests.

(1) General. The number of compressive strength tests performed for acceptance should be in accordance with the guidance given in the current edition of the VTrans *Materials Sampling Manual*. The Engineer may order additional tests as deemed necessary.

Compressive test cylinders shall be made in accordance with the requirements of *AASHTO T 23*, and tested for compressive strength in accordance with the requirements of *AASHTO T 22*.

For Class SCC, the specimens shall be fabricated per *ASTM C 1758/C 1758 M.*

(2) Categories of Testing.

a. Acceptance Testing. Acceptance testing utilizes specimens to determine the compliance with requirements for the project. All test cylinders used for quality acceptance testing shall be stored in an approved curing box until they are shipped to the Agency's Materials Section Central Laboratory.

b. Job Control Testing. Job control testing utilizes specimens to determine whether adequate curing procedures are being followed and for early form removal or early loading of structure.

1. All job control specimens shall be stored on the structure and shall receive the same curing and protection from the elements as the concrete that they represent up until 24 hours before anticipated testing of specimens.

2. The maturity method may be used as an alternative for estimating the concrete strength. The procedures of *ASTM C 1074* shall be followed except as noted below:

i. For Section 8.1 there shall be a minimum of 17 cylinders cast. Two of the 17 shall have temperature sensors embedded in them to be used for monitoring.

ii. For Section 8.4 there shall be 3 cylinders tested for each test age.

iii. For Section 8.4 for rapid set concrete mixes the test ages shall be 12 hours, 1 day, 2 days, 7 days, and 28 days.

The contractor may adjust or add test ages if approved by the Engineer.

All temperature measuring devices shall be verified/calibrated on a 12 month basis or sooner if there are questions about the accuracy. The device shall have an accuracy of +/- 2° F.

At least two temperature sensors shall be embedded each day in each pour. One sensor shall be placed where maturity is expected to develop the slowest at, or near, an exposed outer edge, and a second sensor shall be placed in the concrete poured from the last load of the day. Sensors shall be placed at least 2 inches to 4 inches from any existing concrete or an exposed outer edge. The temperature sensing end of the monitor shall not be placed in direct contact with reinforcing materials or other elements that will protrude through the surface of the concrete. The contractor shall submit the proposed locations to the Engineer for review and approval.

c. Specimen Curing Requirements. Specimen curing requirements shall be as stated in the specifications or as directed by the Engineer. If not specifically stated, the curing shall be as specified in Table 4.

TABLE 4 – CONCRETE SPECIMEN CURING REQUIREMENTS

Testing Category	Number of Specimens	Curing Location
Acceptance	See MSM	Curing box
Job control – applicable curing period	2	On structure

(h) Concrete Temperature. Concrete temperature tests shall be made in accordance with the requirements of *ASTM C 1064/C 1064 M*.

7. WEATHER AND TEMPERATURE LIMITATIONS – PROTECTION OF CONCRETE. The temperature of the concrete just prior to placement in the forms shall not be less than 50°F nor more than 85°F. Aggregates and water shall be heated or cooled as necessary to produce concrete within these temperature limits.

Placement and curing procedures shall be approved by the Engineer prior to actual placement.

(a) Hot Weather Concrete. Placement of concrete during hot weather may be limited by the Engineer based on an assessment of temperature, humidity, wind velocity, and sun radiation conditions. No concrete shall be placed when the ambient air temperature is, or is expected to be, above 90°F.

(b) Cold Weather Concrete.

(1) General. Cold weather concrete will be any concrete placed or cured when the ambient air temperature is expected to be below freezing at any point or below 40°F for a continuous 8-hour period. No concrete shall be placed when the ambient air temperature is lower than 10°F except by written permission of the Engineer. A cold weather concrete plan shall be submitted to the Engineer for their review and acceptance before any cold weather concrete is placed.

When placing cold weather concrete, the Contractor shall have adequate equipment for heating and protecting the materials and freshly-placed concrete meeting the approval of

the Engineer. This equipment shall be on the job and ready to deploy prior to the commencement of concrete placing operations.

No concrete shall be placed in any superstructure or thin section under cold weather conditions.

(2) Heating of Materials. The heating equipment deployed for cold weather concrete placement shall be capable of heating the materials uniformly. Aggregates shall not be heated to a temperature exceeding 150°F. If water is heated to a temperature exceeding 140°F, the water shall be mixed with the aggregate before the cementitious material is added.

The materials shall be heated in such a manner, for such a period of time, and in such quantity, as to produce concrete having a uniform temperature within the specified temperature range at the time of placement. Materials containing frost or frozen lumps shall not be used.

Stockpiled aggregates may be heated using dry heat or steam. Aggregates shall not be heated directly by gas or oil flame or on sheet metal over fire. When aggregates are heated in bins, steam-coil or water-coil heating, or other methods that will not be detrimental to the aggregates, may be used.

(3) Antifreeze Compounds. Salts, chemicals, or other foreign materials shall not be used in the mix to lower the freezing point of the concrete.

(4) Preparation of Forms. Before placing concrete; any ice, snow, or frost shall be completely removed from the forms.

Concrete shall not be placed on any surface or in any forms that are frozen, have surface temperatures below 32°F, or that contain frozen materials. The frozen surface or forms shall be completely thawed the day before the placement of the concrete and shall be kept continuously thawed until the concrete is poured. The temperature difference between forms or substrate and the plastic concrete shall not exceed 40°F.

(5) Housing. The Contractor shall furnish sufficient canvas with a supporting framework or other suitable type of housing to fully enclose and protect the structure when placing and curing cold weather concrete. The sidewalls and roofing of the protective housing shall be completely built before the placing of any concrete.

The protective housing shall be constructed independently of the forms and bracing and with adequate space to allow for form removal and the initial finishing of the concrete as required during the heating period. Joists shall be located to suitably support the housing roof with no sagging. The protective enclosure shall be heated to the proper temperature before placing any concrete.

When the temperature readings taken on or in the concrete indicate the temperature of the concrete may fall below 50°F, the Contractor shall, without exposing the concrete,

immediately build the necessary enclosures around the area involved and supply heat to ensure curing conditions as specified in Subsection 15. The enclosure shall be removed when directed by the Engineer.

(6) Heating the Enclosure. The enclosure shall be heated in such a manner that the temperature of the concrete and the enclosed air shall be kept above 50°F, and not more than 20°F above the concrete temperature, for the designated curing period. During this time, the concrete shall be kept continuously wet to provide proper curing. After the curing period, the temperature shall be gradually lowered to that of the surrounding atmosphere, taking at least 48 hours for the transition but at no time exceeding a 1°F change per hour.

When dry heat is used, a means of maintaining atmospheric moisture shall be supplied. The Contractor shall also maintain adequate fire protection and shall provide personnel to keep the heating units in continuous operation. When concrete placement operations are in locations where water levels may fluctuate, the supports for heating equipment shall be built so that the heating equipment can be raised and steam lines shall be placed above the probable high water level.

The enclosure shall be well-ventilated to avoid accumulation of carbon dioxide and carbon monoxide.

When using a hydronic heating system with heat-transfer fluid that circulates through a series of hoses, the heat-transfer hoses shall be laid on top of the vapor barrier, usually plastic sheeting, then covered with approved insulating materials or by other approved methods for retaining heat.

(7) Temperature Records. The Contractor shall provide an automatic temperature recorder to continuously record concrete curing temperatures and ambient air temperatures for the entire curing period. Recording thermometers shall be capable of measuring and recording temperatures within the range of 0°F to 200°F with maximum graduations of 5°F.

Temperature sensors shall be carefully placed within the curing enclosure or in the concrete to ensure that temperatures are measured at typical locations. The recorder's accuracy shall be certified once every 12 months, with the certificate displayed with each recorder. The Engineer may make random checks of each recorder.

On each recorder chart, the Engineer shall indicate the location of the representative concrete, the placement date, and start and finish times of the temperature record. At the completion of the curing period, the recorder charts shall be submitted to the Engineer.

A thermometer shall be provided that is capable of displaying the current ambient temperature with a maximum gradation of 1°F. The Inspector will use the thermometer to take periodic temperature measurements of the enclosure at varying locations.

The Contractor shall provide a hand-held infrared thermometer capable of taking no-contact measurements that is accurate within plus or minus 2% of the reading. The

thermometer's accuracy shall be certified once every 12 months, with the certificate provided with each thermometer.

When the Contractor places concrete at more than one location within the specified curing period or if the Engineer determines that monitoring of a single pour is necessary in multiple locations, additional monitoring and recording equipment shall be furnished to provide temperature records at each location.

8. FORMS. The Contractor shall be responsible for, and shall make good, any injury arising from inadequate forms. The Engineer shall be provided the opportunity to inspect all forms prior to concrete placement.

Unless the plans specifically allow for the use of stay-in-place forms, such forms shall not be used in the construction of any superstructure or bridge deck. Stay-in-place forms will only be allowed as approved by the Engineer.

(a) Falsework. In general, falsework that cannot be founded upon a solid footing shall be supported by falsework piling. The Engineer may require the Contractor to employ screw jacks or hardwood wedges to correct any deflections or settlement, however slight, occurring in the falsework.

(b) Construction. Forms shall be mortar-tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incidental to the construction operations, including vibration. Forms shall be constructed and maintained to prevent the opening of joints due to shrinkage of the lumber. Sealers and caulking as approved by the Engineer shall be used where forms abut structural steel members, such as top flanges of beams and girders, etc.

To ensure their easy removal, forms shall be filleted and chamfered at all sharp corners, unless otherwise shown on the Plans or directed by the Engineer, and shall be given a bevel or draft in the case of all projections, such as girders and copings.

Falsework and forms for slabs, beams, and girders shall be constructed to provide the camber shown on the Plans or ordered by the Engineer.

Falsework and forms for Class SCC construction shall be designed with consideration given to concrete placement rates, mix temperature, additives, and placement procedures that effect hydrostatic pressure of the concrete. Forms shall be water-tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other loads incident to the construction operations, including vibration, which should not be needed.

(c) Form Lumber. All face form lumber for exposed surfaces shall be concrete form exterior grade plywood, not less than five ply and with a minimum thickness of 3/4 inch. In computing stud spacing, plywood shall be considered 1 inch lumber, provided that the grain of three of the plies runs perpendicular to the studs.

Form lumber for unexposed surfaces may be dressed tongue-and-groove, dressed shiplap, or square-edge surfaced four sides of uniform width and thickness, with a minimum thickness, after finishing, of 3/4 inch.

All form lumber shall be sound and free from loose or rotten knots, knotholes, checks, splits, or wanes showing on the surface that will be in contact with the concrete. Used face form lumber, having defects or patches which may produce work inferior to that resulting from new material, shall not be used.

Other form materials may be used with the permission of the Engineer.

(d) Form Ties. Metal ties or anchorages within the forms shall be constructed to permit their removal to a depth of at least 1 inch from the face without injury to the concrete. Wire ties shall be used only in locations where they will not extend through surfaces exposed in the finished work and then only when authorized.

The cavities on vertical and overhead surfaces shall be filled with a product that meets the requirements of Subsection 780.02. The manufacturer's directions shall be followed for surface preparation, mix, and application. Cavities on horizontal surfaces shall be filled in with a mortar mix using the same proportion of cementitious material and sand. The surfaces shall be saturated with water for a minimum of an hour, dried to SSD just prior to being filled, and cured by a method in Subsection 15 approved by the Engineer for a duration of 3 calendar days

(e) Surface Treatment. All forms shall be treated with commercial form oil prior to placing reinforcement, and wood forms shall be saturated with water immediately before placing the concrete. Any material that will adhere to or discolor the concrete shall not be used.

(f) Metal Forms. The specifications for wood forms regarding design, mortar-tightness, filleted and chamfered corners, beveled projections, bracing, alignment, removal, reuse, and oiling also apply to metal forms. The metal used for forms shall be of such thickness that the forms will remain true to shape throughout the concrete placement operations.

All bolt and rivet heads shall be countersunk. Clamps, pins, or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms that do not present a smooth surface or do not line up properly shall not be used. Care shall be exercised to keep metal forms free from rust, grease, or other foreign matter.

(g) Removal of Forms.

(1) Deck Superstructure. The forms, or their supports, for any portion of a structure shall not be removed before the end of the 10-day cure period for the deck. Forms under beams or floor slabs may be removed upon approval of the Engineer after the concrete attains 85% of the minimum compressive strength as specified in Table 1, but not prior to the end of the 10-day cure period.

(2) Substructure. The forms, or their supports, for any portion of a substructure shall not be removed without the approval of the Engineer. Forms under arches, pier caps, or other special design conditions may be removed upon approval of the Engineer after the concrete attains 85% of the minimum compressive strength as specified in Table 1.

The removal of forms and supports may begin when the concrete is found to have the required strength. In no case shall the number of curing days be less than specified in Table 5.

Methods of form removal likely to cause overstressing of the concrete shall not be used. Forms and their supports shall not be removed without approval. Supports shall be removed in such a manner as to permit the concrete to uniformly and gradually take up the stresses due to its own dead load.

(h) Stay-in-Place Corrugated Metal Forms (SIPCMF) for Superstructure Deck Slabs.

(1) General. Use of SIPCMF for superstructure deck slab construction shall be subject to the following requirements:

a. Fascia overhangs shall be formed with removable forms that leave the resulting concrete with a flat-surfaced finish.

b. Bays that are constructed in stages such that a longitudinal joint is required shall be made with removable forms.

(2) Design Requirements. The following requirements shall govern the design of SIPCMF:

a. The design span shall be the clear span of the form plus 2 inches, measured parallel to the form flute (also referred to as the form valley).

b. The design load shall be the sum of the weight of forms, bar reinforcement, plastic concrete, and 55 pounds per square foot for construction loads.

c. The unit working stress shall not exceed 75% of the specified minimum yield strength of the material.

d. The dead load deflection shall not exceed 1/180 times the form span length or 1/2 inch, whichever is less.

e. Physical design properties shall be computed with the requirements of the latest edition of the *American Iron and Steel Institute Specifications for the Design of Cold-Formed Steel Structural Members*.

(3) Construction Requirements. The following construction requirements shall apply to the use of SIPCMF:

a. Construction Drawings. The Contractor shall submit construction drawings for SIPCMF in accordance with the requirements of Subsection 105.03. These drawings shall contain the following information as a minimum:

1. The name of the SIPCMF supplier.

2. A layout showing the compression and tension region of each beam/girder.

3. The method of SIPCMF attachment for the compression and tension regions.

4. The geometric properties of each type of panel being used.

5. The number, location, and type of panels being used within each girder bay.

6. Panel laps, considering the direction of concrete pours.

7. The specifications for the material used to fill the flutes.

8. Any other material data, erection information, or miscellaneous notes that may be required.

b. Handling and Installation. Care and protection shall be given the metal form sheets, supports, and accessory items during handling, shipping, and storage. During loading, hoisting, and unloading operations, extra precaution and care shall be taken to prevent damage to ends, corners, and edges of form sheets, supports, and accessory items.

If the form units and accessories are to be stored prior to installation, they shall not be placed in contact with the ground and shall be adequately covered or protected to keep them dry.

Form supports shall be placed in direct contact with the flange of beam/girder/stringer or floor beam. All attachments shall be made by permissible welds, bolts, clips, or other approved means. The welding of form supports to steel not considered weldable or to portions of flanges subject to tensile stresses shall not be permitted. Welds and welding shall be in accordance with the requirements of Subsection 506.10, with the exception that a 1/8-inch fillet weld will be permitted.

Form sheets shall not be permitted to rest directly on the flanges. They shall be securely fastened to form supports by self-tapping screws and shall have a minimum bearing length of 1 inch at each end. Transverse construction joints shall be located at the bottom of a valley. A 1/4 inch diameter weep hole shall be drilled at the lower end of each flute or valley.

Screed and pouring runway supports shall not be located directly on the form sheets, form supports, or reinforcing steel. No loose sheets or miscellaneous hardware shall be left on the structural slab at the end of the working day.

The corrugated metal sheets shall be fabricated for the placement sequence used, with the joints between sections of sheets overlapped or securely fastened to eliminate differential deflections. Any exposed form metal where galvanizing has been damaged shall be cleaned and repaired to the satisfaction of the Engineer.

(4) Inspection Procedures. The following three-step inspection procedure will be used to check the soundness of the concrete deck against the SIPCMF.

a. Step 1. Not less than two days after completion of a concrete structural slab pour, but prior to the next slab pour, one panel of the SIPCMF shall be removed from the most recently completed pour of each span, at a location selected by the Engineer, to provide visual evidence that the concrete mix or the construction procedures are obtaining the desired results.

If the concrete mix or the construction procedures are varied significantly within a pour, such as a change in the extent of vibration or change in the workability of the mix, another section of forming shall be removed to verify that the new procedures are yielding desirable results.

b. Step 2. After the concrete has attained 85% of the specified design strength, the Engineer will spot-check the underside areas of the steel forms by sounding with a suitable weight hammer. If honeycomb or voided areas are detected, the SIPCMF at that location shall be removed for a visual inspection.

c. Step 3. A minimum of 2% of the total SIPCMF area shall be removed for visual inspection of the concrete surface. The amount of sounding and form removal may be moderated, at the Engineer's discretion, after a substantial amount of the slab has been constructed and inspected, if the Contractor's methods of construction and results of the inspections as outlined above indicate that sound concrete is being obtained throughout the slab.

If, after removing a section of form, the concrete is found to be defective, additional panels shall be removed as directed by the Engineer. All defective concrete shall be repaired to match the adjacent concrete in section and color to the satisfaction of the Engineer.

The Contractor shall provide all facilities required for the safe, suitable, and convenient means of access to the forms for the Engineer's inspection procedures.

The form sections shall be removed by a metal saw or air-carbon-arc gouging with minimum damage to the concrete. Cuts shall only be sufficiently deep to sever the form. Any other method of removal shall be submitted to the Structures Engineer for approval. Cuts parallel to the corrugations in the forms shall be located on the sloping surface midway between a crest and valley. Cuts parallel to the supporting beams/girders shall be made through the supporting angles taking care not to damage the structural steel beams/girders.

The Contractor will not be required to replace the forms which have been removed.

9. PLACING CONCRETE.

(a) Workforce. The Contractor shall always have sufficient skilled personnel during the concreting operations to properly place, consolidate, and finish the concrete. If, in the opinion of the Engineer, the Contractor does not have sufficient skilled personnel to handle the concrete properly, the Engineer may postpone the start of the concreting operations until the Contractor has remedied this situation.

(b) Pre-Placement Meeting. For deck pours, or as required by the Engineer, a pre-placement meeting shall be scheduled by the Contractor to take place at least 7 calendar days before concrete placement, and prior to the Trial Pour, if required. Attendees at the pre-placement meeting shall include, but not be limited to, the Contractor's Project Superintendent, the Engineer, the Agency's Structural Concrete Engineer, and the concrete producer.

The Contractor shall provide a placement plan that addresses, but is not limited to, the following topics:

(1) Time of concrete placement and amount

(2) Batch plant testing

(3) Delivery of concrete

(4) Method of concrete placement on the deck

(5) Consolidation and finishing of concrete

(6) QC testing of the plastic concrete

(7) Protection of the concrete from evaporation

(8) Curing of the concrete

(9) How to avoid long delays for balance loads

(10) Screed, work bridge, and rail set-up

(11) Dry run schedule

(12) Contingency plans for long delays, break downs, weather events and other potential problems

(13) Crew size and responsibilities

(14) Available equipment

(15) Project layout including locations for all pumps, cranes, testing, cleanouts, staging, etc.

(c) Placement Limitations. All concrete shall be placed in daylight, unless otherwise authorized in writing by the Engineer. Authorization to place concrete at any other time shall not be given unless an adequate lighting system is provided prior to beginning the concrete placement operations.

Concrete shall not be placed under adverse environmental conditions that the Engineer determines will interfere with acceptable placement and/or finishing operations.

Concrete shall not be placed until the depth and character of the foundation, the apparent adequacy of the forms and falsework, and the placing of the reinforcing steel have been approved by the Engineer. The interior of the forms shall be clean of all debris before concrete is placed.

The Contractor shall submit to the Engineer a schedule of batching, delivery, and placement prior to the beginning of the concreting operations. The Contractor shall comply with the requirements of Subsection 5.

Equipment and tools necessary for handling materials and performing all parts of the work shall meet the approval of the Engineer as to design, capacity, and mechanical condition and must be on the site before the work is started. Any equipment, in the judgment of the Engineer, that proves inadequate to obtain results prescribed shall be improved or new equipment substituted or added.

The Engineer may suspend the pour or reject the pour if the Contractor deviates from the accepted pour plan which will also include unacceptable delivery rates. The Contractor will not be allowed compensation due to the pour being suspended or rejected due to the Contractor deviating from the accepted pour plan or uncontrolled delivery rates.

For simple spans, concrete should be deposited by beginning at the lower end of the span and working toward the upper end. For continuous spans, where required by design considerations, the concrete placing sequence shall be as shown on the Plans.

Concrete shall not be deposited in the forms more than 4 feet from its final position.

The dropping of unconfined concrete more than 5 feet will not be permitted.

Concrete shall not be deposited in running water.

The rate of placing the concrete shall be so regulated that no excessive stresses are placed on the forms. Concrete in all decks shall be placed in one continuous operation, unless otherwise specified.

Concrete shall be placed in continuous horizontal layers, the thickness of which shall not exceed 18 inches, unless otherwise directed by the Engineer. Each succeeding layer shall be placed before the underlying layer has taken initial set and shall be consolidated in a manner that will eliminate any line of separation between the layers. When it is necessary, due to any emergency, to place less than a complete horizontal layer at one operation, such layer shall terminate in a vertical bulkhead.

After the concrete has taken its initial set, care shall be exercised to avoid jarring the forms or straining the ends of projecting reinforcing bars.

(d) Placement of Overlays. For a period of at least 24 hours before the placement of overlay material, the prepared surface shall be flooded with water. After removal of all free water, the overlay material shall be deposited on the damp surface and manipulated to coat the horizontal and vertical surfaces to be covered. The rate of progress shall be controlled to prevent the drying of previously deposited materials.

(e) Use of Chutes. Chutes, troughs, and pipes used in placing concrete shall be arranged to avoid segregation of the materials and the displacement of the reinforcement and shall be approved by the Engineer. Aluminum chutes, troughs, or pipes will not be permitted.

All chutes, troughs, and pipes shall be kept clean and free of hardened concrete by thoroughly flushing with water after each run. Open troughs or chutes shall be either of metal or metal-lined and shall extend as nearly as possible to the point of deposit. When the discharge must be intermittent, a hopper or other device for regulating the discharge shall be provided.

Dropping of unconfined concrete more than 5 feet or depositing a large quantity at any point and running or working it along the forms will not be permitted.

(f) Use of Vibrators. Unless otherwise specified, the concrete shall be consolidated with mechanical vibrators, of an approved type and design, operating within the concrete. When required, vibrating may be supplemented by hand-spading with suitable tools to ensure proper and adequate consolidation.

Vibrators shall be manipulated to work the concrete thoroughly around the reinforcement and imbedded fixtures and into corners and angles of the forms to produce surfaces free of imperfections. Vibrators shall not be used to cause concrete to flow or run into position in lieu of placing. The vibration at any point shall be of sufficient duration to accomplish consolidation but shall not be prolonged to the point where segregation occurs.

Vibrators shall have non-metallic or rubber-coated heads. Vibrating machines shall at no time be left running unattended in the concrete.

When it is necessary due to an emergency to discontinue the placing of a monolithic section, the use of vibrators shall cease. Vibrators shall not again be used until a sufficient depth of fresh concrete is placed to prevent any possibility of the effect of vibration on the concrete already in place and in no case shall this depth be less than 2 feet.

The number of vibrators used shall be ample to consolidate the incoming concrete immediately after it is deposited in the form. The Contractor shall have at least one spare vibrator in serviceable condition at the site of the structure in which more than 25 cubic yards of concrete are to be placed.

The vibrators shall be capable of transmitting vibration to the concrete at frequencies of not less than 4,500 impulses per minute under load. The vibration shall be of sufficient intensity and duration to cause plasticity, settlement, and complete consolidation of the concrete without causing segregation. The vibrator shall visibly affect a mass of concrete of 2-inch slump over a radius of at least 18 inches.

(g) Blasting Operations. All blasting operations within 200 feet of any concrete work shall be completed prior to the placement of the concrete. Regardless of the above limitation on blasting operations, the Contractor shall be responsible for any damage resulting from blasting operations.

10. DEPOSITING CONCRETE UNDER WATER.

(a) General. Concrete shall not be deposited under water except as specified by the Contract or upon approval of the Engineer and shall be subject to the following specifications.

(b) Placement. When placing concrete underwater, the Contractor shall use a tremie or an alternate method of conveyance, approved by the Engineer, which minimizes the mixing of fresh concrete and water. A tremie shall have a hopper at the top that empties into a watertight tube at least 10 inches in diameter.

The discharge end of the tube on the tremie shall include a device to seal out water while the tube is first filled with concrete. An inflatable ball will not be permitted. The device shall keep its shape and float without danger of deflation.

The placement shall be continuous to the elevations shown on the Plans and the resulting concrete shall be monolithic and homogeneous.

Concrete shall not be deposited in water that has a temperature of 35°F or below. When the water temperature is between 35°F and 40°F, the mixing water, the aggregates, or both shall be heated as specified in Subsection 7(b).

A tremie shall be constructed of heavy-gauge steel pipe and consist of watertight joints between the tremie sections with a diameter of not less than 10 inches. The tremie hopper shall have a capacity of at least 1/2 cubic yard. When a batch is dumped into the hopper, the flow of the concrete shall be induced by slightly raising the discharge tube, always keeping it in the concrete.

Tubes shall be kept continuously submerged in concrete during discharge. The depth that the tube is submerged in concrete and the height of the concrete in the tube shall be sufficient to prevent water from entering the tube. The Contractor shall continuously monitor the difference in elevation between the top of the concrete and the end of the discharge tube.

Horizontal movement of discharge tubes through the concrete will not be allowed.

For minor quantities, at the sole discretion of the Engineer, a direct pumping method may be approved. If a direct pumping method is to be implemented, the pipe discharging the concrete shall consist of heavy-gauge steel sections. The Contractor shall demonstrate the ability to pump the concrete without the pump line surging or otherwise moving in the water as concrete is being pumped.

Cylinders cured as field cure shall be cured at the same temperature as the water covering the concrete.

11. PUMPING. Where concrete is conveyed and placed by mechanically-applied pressure, the equipment shall be suitable in kind and adequate in capacity for the work. The pump shall be capable of pumping concrete within the specified slump limits. The use of aluminum pipe as a conveyance for the concrete will not be permitted.

    The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. When pumping is completed, the concrete remaining in the pipeline, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients. The equipment shall be arranged so that no resulting vibrations may damage freshly placed concrete.

12. CONSTRUCTION JOINTS.

    (a) Construction Joint Locations. Joints shall be formed at the location shown on the Plans. Any variation or new location of joints shall require written permission of the Engineer. Feather edges at construction joints will not be permitted. Joints shall be formed with inset formwork so that each layer of concrete will have a thickness of not less than 6 inches.

    (b) Joining Fresh Concrete to Previously Set Concrete. When joining fresh concrete to concrete that has hardened, the surface of the set concrete shall be roughened in such a manner that will not leave loosened particles or damaged concrete at the surface and shall be thoroughly cleaned of all laitance, loose, and foreign material. Immediately prior to the placing of the new concrete, the surface shall be saturated with water.

        When shown on the Plans or ordered by the Engineer, the surface shall be thoroughly coated with a very thin coating of mortar, neat cement grout, or epoxy bonding system and all forms drawn tight against the face of the concrete. This coating shall not be allowed to dry out before being covered with fresh concrete.

    (c) Filled Construction Joints. Filled construction joints shall contain a pre-formed cork joint filler or other pre-formed joint filler that may be shown in the Contract. Joint filler shall be cut to fit exactly and shall completely fill the space that is shown on the Plans. Where a pour grade or caulking grade filler is indicated to be used in the joints, that portion of the joint to be filled shall be formed with a separate material (other than the pre-formed joint filler) that can easily be removed prior to placement of the above indicated filler.

    (d) Water Stops. Approved water stops shall be placed at locations shown on the Plans. They shall form continuous watertight joints.

    (e) Bond Breakers. Bond breakers shall be asphalt-treated felt or pipe insulation, as shown on the Plans.

13. EXPANSION JOINTS. All expansion joints shall be constructed according to details shown on the Plans.

(a) Filled Compression and Expansion Joints. Filled compression and expansion joints shall be made with a pre-formed self-expanding cork joint filler or other pre-formed joint filler that may be shown in the Contract. Joint filler shall be cut to fit exactly and shall completely fill the space that is shown on the Plans. Where a pour grade or caulking grade filler is indicated to be used in the joint, that portion of the joint to be filled shall be formed with a separate material (other than the expansion joint filler) that can easily be removed prior to placement of the above indicated filler.

(b) Special Types of Expansion Joints. Special types of expansion joints may be used when shown on the Plans or ordered by the Engineer.

14. CONCRETE FINISHING.

(a) Finishing Bridge Decks and Overlays.

(1) General. The Contractor shall follow the procedures and details for placing the deck in accordance with the pre-placement meeting. The procedure shall provide for adequate labor, equipment, and material supply to complete placement of concrete on the entire deck, or specified portion thereof.

If, during the placement, unforeseen circumstances delay the progression of the pour to a point where the concrete begins to lose plasticity, the Contractor shall be prepared to place a bulkhead, as directed by the Engineer.

If at any time the screed machine does not advance in a 15-minute period due to delayed concrete delivery, mechanical breakdown or other problem, the Contractor shall immediately cover concrete that is under the screed machine past the leading edge of the concrete with wet burlap. Just before concrete placement is to begin, the burlap shall be removed, the screed machine will be moved back, fresh concrete will be added to the area that was directly under the screed to the leading edge, and the area will be vibrated again. The screed machine may then be advanced forward to continue the placement.

Approval of their methods and equipment does not relieve the Contractor of full responsibility for obtaining the required surface finish.

Prior to texturing, the finished concrete surface shall be examined by the Contractor. Surface irregularities greater than 1/8 inch in 10 feet in either the longitudinal or the transverse direction shall be corrected in a manner acceptable to the Engineer. When a bituminous concrete surface is to be placed on a bridge deck, the deviation shall not be greater than 1/4 inch. When a sheet membrane is being applied, sharp ridges shall not be allowed. Thin mortar or laitance, which may have accumulated ahead of the finishing machine screed, shall be removed from the work site. These materials shall not be used to fill depressions.

If the bridge deck concrete does not meet the above smoothness requirements, the Contractor shall remove high spots up to 1/2-inch high by means of grinding. Any other corrections shall be made only with the written approval of the Engineer. The use of bush

hammers will not be allowed. No concrete shall be removed that will result in a concrete slab thickness less than that shown on the Plans.

Any deck that cannot be corrected by a method satisfactory to the Engineer shall be removed and replaced at the Contractor's expense.

Sidewalks shall receive their final finish with a fine bristled broom.

(2) Turf Drag. When specified on the plans, the surface shall be given a suitable texture with an artificial turf drag made of molded polyethylene or other material or method that will provide an acceptable finish. The selection of turf drag or other method should be capable of producing a surface texture with a horizontal peak-to-peak distance ranging from 0.02 inch to less than or equal to 0.25 inch and having a peak-to-peak amplitude of 0.005 inch to 0.8 inch. A turf drag material or other acceptable method that will minimize tearing and rolling of coarse aggregate from the surface shall be used.

The Contractor shall apply the finish texture in a transverse direction using hand methods. Other directions may be allowed with the approval of the Engineer. All texturing shall be performed from a work bridge immediately following the finishing operations and prior to curing operations. A second work bridge will be required for curing purposes unless a method using a single work bridge has been approved by the Engineer.

One pass of the turf drag over the finished area is desired. The drag shall leave a seamless strip between passes. The finish texture resulting from the drag shall stop within 15 inches of the curb face, rail anchor bolts, or edge of deck. Any buildup of concrete at the beginning or end of the pass shall be hand troweled to provide an even transition.

The drag should produce a transverse, skid-resistant micro-texture acceptable to the Engineer, but should not tear the surface. If the drag is not producing an acceptable micro-texture, the Contractor shall adjust the means and methods until an acceptable micro-texture is achieved.

The Contractor shall check the drag material before the deck pour and from time-to-time during finishing for tears, worn surface, or hardened concrete. The Contractor shall clean or replace the drag as often as necessary to maintain a well-defined micro-texture.

The turf drag or other acceptable methods should not be applied when the surface is so wet or plastic that the ridges formed flow back into the valleys when the drag has passed, nor should dragging be delayed until the concrete is so hard that sharp ridges cannot be formed by the drag. Fogging or similar methods shall be deployed to ensure that the surface does not dry prematurely.

If the 10-minute maximum, as specified in Subsection 15(c), for applying the wet cure cannot be met, then fogging of the area shall be performed in a manner that keeps the relative humidity above the evaporation rate of the concrete surface, but not so excessive that water begins to collect on the surface prior to texturing or other surface manipulating procedures.

(3) Finishing Machine Rail Supports. Finishing machine rail supports shall be of substantial construction and accurately set so that the finished deck surface will conform to the profile and transverse sections shown in the Plans. Finishing machine rail supports shall be placed and adjusted to properly provide for the deflection of forms, falsework, and structural supporting members which will occur during the placement of the concrete.

The finishing machine rail supports shall be spaced at a maximum of 2 feet on center and of sufficient design as to secure the rail to prevent it from falling off the support. The screed rails shall be configured to allow the screed machine and work bridges to be fully functional over the entire deck area.

Sufficient screed rails shall be provided so that all rails necessary for any one continuous pour may be preset and graded before the start of concreting operations. The removal of screed rails and exposed chairs shall be accomplished without walking in the fresh concrete and while the concrete is still plastic.

The Contractor shall furnish a work bridge or bridges of an approved type, capable of spanning the entire width of the deck without deflection to the concrete slab surface.

(4) Finishing. After the concrete has been placed, it shall be struck off by a finishing machine and the operation shall be repeated as necessary to produce a uniformly consolidated, dense, smooth surface. The final passage of the finishing machine shall result in a uniform surface at the required grade and slope over its entire area.

Finishing machines shall be kept in true adjustment. Machines shall not be used until the proper adjustments have been made and the adjustments have been checked and approved by the Engineer.

Sufficient time shall be provided prior to beginning concreting operations for the finishing machine to be operated over the full length of the bridge deck segment to be placed. This test run shall be made with the screed adjusted to its finishing position. While operating the finishing machine in this test, the screed rails shall be checked for deflection and proper adjustment, the cover on slab reinforcement shall be measured, and the controlling dimensions of slab reinforcement and forms shall be checked.

After the concrete is placed, it shall be struck off by one of the following methods:

a. A self-propelled concrete finishing machine may be deployed, supported on suitable rails, and equipped with adjustable strike-off and finishing roller screeds capable of producing the required finish surface for the full width of the bridge from face-to-face of curbs.

b. An approved mechanical vibrating screed may be deployed, capable of exerting a force of at least 12 pounds per linear foot, and generating at least 6,500 vibrations per minute when checked by a vibration reed-type tester. The vibrating screed shall provide a uniform finish throughout its entire length and shall be properly adjusted so as not to drive the aggregate more than 1/4 inch below the surface.

In areas that are inaccessible to finishing machines, an approved manual vibratory-equipped power screed with an approved grade-control method may be used with approval from the Engineer. Smoothness shall be checked as specified in Subsection 14(a)(1) to ensure a smooth ride and seamless transition to the finishing machine's finished area.

If manual vibratory-equipped power screeds are used, then initial vibration of the concrete for consolidation in those areas shall be of the minimal duration possible to avoid over-vibration and loss of air entraining of the surface concrete in these areas.

Hand finishing shall be allowed only in areas inaccessible to finishing machines or manually driven vibratory-equipped power screeds. Hand screeds or bull floats shall be magnesium and at least 10 inches in width. Care shall be taken not to overwork the concrete surface during any finishing operation. Smoothness shall be checked as specified in Subsection 14(a)(1) to ensure a smooth ride and seamless transition to the finishing machine's finished area.

15. CURING CONCRETE.

(a) General. Water for use in curing concrete shall conform to the requirements of Subsection 745.01. The effective cure time shall be only the time that the concrete has been maintained in a wet condition with the concrete surface temperature above 50°F. If the concrete is not maintained in a wet condition and/or the concrete surface temperature drops below 50°F, it shall not be counted as effective cure time. The cure period will be extended 4 hours for every 1 hour the concrete is below 50°F, beginning when the concrete temperature is raised to or exceeds the minimum curing temperature.

Regardless of the curing medium specified, the entire surface of the newly placed concrete shall be kept damp. This shall be achieved by applying water with a nozzle that atomizes the flow so that a mist and not a spray is formed. The moisture shall not be applied under pressure directly upon the concrete and shall not be allowed to accumulate in a quantity sufficient to cause a flow or washing of the surface.

The atomized flow shall be applied continuously until the surfaces can be covered by the specified curing mediums. For bridge barriers, curbs, and sidewalks the curing method shall be applied within 15 minutes of the completion of the finishing process.

Concrete components shall be cured for the times specified in Table 5.

TABLE 5 – CURING TIMES FOR CONCRETE COMPONENTS

Type of Construction	Curing Methods (Subsection)	Effective Cure Time (Days)
Substructure	17(b)(1), (2), (3), (5), (7), (8)	7
Superstructure	17(b)(2), (8)	10 [1]
Retaining walls	17(b)(1), (2), (5), (6), (8)	7
Headwalls	17(b)(1), (2), (5), (6), (8)	7
Sidewalks, curbs, and gutters	17(b)(2), (8)	7

[1] There shall be no activity on the superstructure during the cure period.

(b) Curing Methods. All exposed surfaces of newly placed concrete shall be cured by one of the following specified methods:

(1) Water Curing. Curing with water shall be by continuously sprinkling or flooding of all exposed surfaces for the entire required curing period.

(2) Burlap Curing. The entire exposed surface of the concrete shall be covered with two layers of approved burlap that has been pre-soaked with water. The burlap shall then be covered with a lapped layer of white polyethylene sheeting. Once the concrete superstructure has hardened sufficiently, a stream of water, applied with a soaker hose or similar device, shall be run continuously under the polyethylene sheeting until the cure period is complete.

(3) Sand Cover. The entire exposed surface of the concrete shall be covered with at least 3 inches of approved sand that shall be kept wet for the entire curing period.

(4) White Polyethylene Sheeting. The entire exposed surface of the concrete shall be covered with a blanket of white polyethylene sheeting, maintained and fastened to provide a nearly airtight condition in contact with the surface where possible. If, in the opinion of the Engineer, this cover is not adequately provided or maintained to ensure the proper conditions for the concrete cure, then the white polyethylene sheeting cure shall be terminated and another method substituted.

(5) White Burlap-Polyethylene Sheeting. The entire exposed surface of the concrete shall be covered with a blanket of white burlap-polyethylene sheeting. The burlap shall be thoroughly dampened prior to placing and shall be placed next to the concrete. All joints shall be lapped a minimum of 18 inches. The burlap shall be kept damp throughout the curing period.

(6) Membrane-Forming Curing Compounds. White-pigmented or fugitive-dye membrane-forming curing compounds may be used for curing concrete in minor drainage structures. All other uses of curing compounds shall be approved in writing by the Engineer. Only membrane-forming curing compounds approved by the Agency's Materials Section may be used.

When membrane curing is used, the exposed concrete shall be thoroughly sealed immediately after the free water has left the surface. The concrete inside the forms shall be sealed immediately after the forms are removed and necessary finishing has been done.

The solution shall be applied in one or two separate applications. If the solution is applied in two increments, the second application shall follow the first application within 30 minutes. Satisfactory equipment shall be provided, together with means to properly control and ensure the direct application of the curing solution to the concrete surface to result in a uniform coverage of the surface area at the rate of 1 gallon of solution for each 150 square feet.

If rain falls on the newly-coated concrete before the film has dried sufficiently to resist damage, or if the film is damaged in any other manner, a new coat of the solution shall be applied to the affected portions equal in curing value to that specified above.

Should the surface be subject to continuous injury or the use of curing compound results in a streaked or blotchy appearance, the method shall be stopped and water curing applied.

(7) White Polyethylene Sheeting with Sand Cover. This method may be used only when approved by the Engineer and shall conform to the requirements of Subsection 15(b)(4). The airtight condition shall be obtained by the addition of a uniform sand cover with a minimum depth of 2 inches.

(8) Pre-Dampened Cotton Mats. The entire exposed surface of the concrete shall be covered with a blanket of cotton mats that has been pre-dampened with water. The mats shall be maintained in a damp condition until the curing period is complete.

If, in the opinion of the Engineer, the Contractor's curing procedure is not producing an adequate cure, the Engineer may direct a change in the cure method at no additional cost to the Agency.

(c) Bridge Decks. For bridge decks, the curing method shall promptly follow the screed machine, within a maximum lag time of 10 minutes and without interruption. If this lag time cannot be met, then fogging of the area shall be performed in a manner that keeps the relative humidity above the evaporation rate of the concrete surface, but not so excessive that water begins to collect on the surface prior to texturing or other surface manipulating procedures.

16. LOADING OF CONCRETE. After the concrete has been placed and the finishing operations concluded, it shall not be walked on or disturbed in any manner, including removal of forms, for a minimum period of 18 hours. If retarder is used as an admixture, this minimum period may be extended as directed by the Engineer.

(a) Substructure. No backfill material shall be placed against a newly completed structure unless the concrete cure is maintained in accordance with Table 5, and until the field cured test cylinders have attained 85% of the compressive strength specified in Table 1. However, the Contractor may erect forms for subsequent concrete placement on footings after 18 hours have elapsed from the time that the footing placement was completed, provided the concrete has sufficient strength to allow it to be worked on without damage, and proper cure is maintained.

Static loads, such as forms, reinforcing steel, or other materials necessary for construction, may be placed on any concrete after it has been in place 72 hours, or a compressive strength of 1,800 pounds per square inch has been obtained, provided proper curing is maintained. Superimposed loads from subsequent concrete pours will not be allowed on any substructure unit or section in place until the field cured test cylinders have attained 85% of the compressive strength specified in Table 1, and provided curing of the supporting section is maintained in accordance with Table 5.

(b) Superstructure. Static loads, such as forms, granite curbing, cast-in-place concrete curb, and other materials necessary for deck construction, shall not be placed on deck concrete until the effective cure time specified in Table 5 is complete and the field-cured test cylinders for this concrete have attained 85% of the compressive strength specified in Table 1.

The Contractor shall keep bridge floors free of all motor vehicles, transit mixers, and heavy construction equipment until the curing period is satisfactorily completed, the field-cured test cylinders for the bridge floor concrete have attained the compressive strength specified in Table 1, and the field-cured test cylinders for the curb concrete or bridge rail concrete, as applicable, have attained 85% of the compressive strength specified in Table 1.

(c) Vertical Joints. Concrete shall not be placed against a vertical construction joint until the previously placed concrete has been in place a minimum of 72 hours.

17. METHOD OF MEASUREMENT. The quantity of Special Provision (Performance-Based Concrete, Class PCD), Special Provision (Performance-Based Concrete, Class PCS), and Special Provision (Performance-Based Concrete, Class SCC) to be measured for payment will be the number of cubic yards of the class of concrete specified in the complete and accepted work, as determined by the prismoidal method using dimensions shown on the Plans or as directed by the Engineer.

The quantity of concrete shall also include the volume of superstructure precast concrete stay-in-place forms, but exclude the volume of steel or other stay-in-place forms and form filling materials. No deductions will be made for the volume of concrete displaced by steel reinforcement, structural steel, expansion joint material, scuppers, weep holes, conduits, tops of piles, scoring, chamfers or corners, inset panels of 1-1/2 inches or less in depth, or any pipe less than 8 inches in diameter.

18. BASIS OF PAYMENT. The accepted quantity of Special Provision (Performance-Based Concrete, Class PCD), Special Provision (Performance-Based Concrete, Class PCS), and Special Provision (Performance-Based Concrete, Class SCC) will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for performing the work specified, including designing the mix, performance of trial pours, and satisfactory finishing and curing. Payment will also be full compensation for furnishing all forms, materials, including joint filler and bond breaker, labor, tools, admixtures, and equipment, including automatic temperature recording units, trial batches, and incidentals necessary to complete the work.

The cost of heating materials and protecting the concrete against cold weather, and any additional cost for cement, will not be paid for separately but will be considered incidental to the Contract unit prices for the applicable concrete pay items.

The cost of furnishing testing facilities and supplies at the batch plant and the setting of inserts, bench marks, and bridge plaques furnished by the Agency will not be paid for separately but will be considered incidental to the Contract unit prices for the applicable concrete item.

Costs for all materials, labor, and incidentals for steel or other stay-in-place forms and form filling materials will not be paid for separately but will be considered incidental to the Contract unit prices for the applicable concrete item.

Payment will be made under:

Pay Item	Pay Unit
900.608 Special Provision (Performance-Based Concrete, Class PCD)	Cubic Yard
900.608 Special Provision (Performance-Based Concrete, Class PCS)	Cubic Yard
900.608 Special Provision (Performance-Based Concrete, Class SCC)	Cubic Yard

900.620 – SPECIAL PROVISION

RISERS

1. DESCRIPTION

A. The work covered by this section includes all labor, materials, equipment, and incidentals required for a complete installation of Rises 1 and 2 as shown on the plans and related work.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 105 of the State of Vermont Agency of Transportation Standard Specifications for Construction dated 2018, and its latest revisions:

1. Product literature, specifications, and other informational material for the following items:

    a. Risers
    b. Covers

3. MATERIALS

A. RISERS

1. Risers shall consist of 36" diameter perforated Nyloplast Drain Basins, solid walled Nyloplast Riser Extensions, and perforated Nyloplast Riser Extensions as manufactured by ADS, and shall be fabricated with the stub sizes and dimensions indicated on the Contract Drawings.

2. Covers:

    a. Risers #1 and #2 shall be furnished with grated covers: 24" Polylok HDPE grate, model 3008-G24.

    b. Riser #3 shall be furnished with solid covers: 36" Polylok HDPE flat cover, model 3008-WEST.

3. Footers: Risers shall be placed on cast-in-place Class B concrete footers as shown on the Drawings. Concrete shall meet the requirements of Section 541.

4. CONSTRUCTION REQUIREMENTS

A. INSTALLATION

1. All Risers shall be installed as shown on the plans or as ordered by the Engineer.

5. METHOD OF MEASUREMENT

A. The quantity of Special Provision (Risers) to be measured for payment will be on a unit basis for the installed, complete, and accepted work.

6. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (Risers) will be paid for at the Contract lump sum price. Payment will be full compensation for furnishing; transporting; stockpiling, installing; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.620 Special Provision (Risers)	EA

END OF SECTION

900.620 – SPECIAL PROVISION

FLARED END SECTIONS

1. DESCRIPTION

A. Work under this Section includes furnishing and placing High Density Polyethylene (HDPE) flared end sections for the inlet piping into the gravel wetland and the outfall piping from the gravel wetland as shown in the Plans and as directed by the Engineer.

B. The work under this Section shall be performed in accordance with this provision and the Plans.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 01300 - SUBMITTALS.

1. Shop drawings and manufacturer's Certificates of Compliance shall be furnished for all end sections and any other items in this Section of work.

3. MATERIALS

A. High Density Polyethylene (HDPE) Flared End Sections

1. Flared End Sections shall be installed on the outlets of HDPE pipe as indicated on the drawings.

2. The invert of the pipe and the end section shall be at the same elevation as the Flared End Section and shall be high density polyethylene meeting ASTM D3350-00 with a minimum cell classification of 213320C. Each end section shall have a carbon black additive for UV protection.

3. End sections shall be High Density Polyethylene (HDPE) as manufactured by Advanced Drainage Systems (ADS) or approved equal.

4. Fitting size shall be 24", and 36" as shown on the drawings.

4. CONSTRUCTION REQUIREMENTS

A. HANDLING FLARED END SECTIONS

1. Storage of end sections shall be as approved so as not to create nuisance or expose the end section to damage. Damaged items shall be removed from the job site immediately.

2. End sections shall be handled in an approved manner no end sections shall be dropped from trucks.

B. INSTALLING FLARED END SECTIONS

1. Flared end sections, where indicated on drawings, shall be installed on outfall pipes.

5. INSPECTIONS AND TESTS

A. None.

6. METHOD OF MEASUREMENT

A. The quantity of Special Provision (14" Flared End Section) and Special Provision (36" Flared End Section) to be measured for payment will be on a unit basis for each installed in the complete and accepted work.

7. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (24" Flared End Section) and Special Provision (36" Flared End Section) will be paid at the Contract bid price per each. Payment will be full compensation for furnishing all materials, labor, tools, equipment, and incidentals necessary to install flared end sections on HDPE pipe as and where indicated on the drawings.

Payment will be made under:

Pay Item	Pay Unit
900.620 Special Provision (24" Flared End Section)	Each
900.620 Special Provision (36" Flared End Section)	Each

END OF SECTION

900.620 – SPECIAL PROVISION

ANTI-SEEP COLLARS

1. DESCRIPTION

A. Work under this Section includes furnishing and placing Anti-Seep Collars around pipe as shown in the Plans and as directed by the Engineer.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 105 of the State of Vermont Agency of Transportation Standard Specifications for Construction dated 2018, and its latest revisions:

1. Shop drawings and manufacturer's Certificates of Compliance shall be furnished for anti-seep collars in this Section of Work.

3. MATERIALS

A. Anti-Seepage Collars

1. Anti-Seepage Collars shall be either concrete collars as detailed on Drawings, or rubber anti-seep collars.

a. For 24" pipe: Model ASCO4 4'x4'
b. For 36" pipe: Model ASCO5 5'x5'

4. CONSTRUCTION REQUIREMENTS

1. Anti-Seepage collars, where indicated on drawings, shall be installed on pipe per drawings prior to placement of pipe and backfilling.

5. METHOD OF MEASUREMENT

A. The quantity of Special Provision (Anti-Seep Collars) to be measured for payment will be the number each installed in the complete and accepted work.

6. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (Anti-Seep Collars) will be paid for at the Contract unit price per each.

B. Payment will be full compensation for furnishing, handling, and placing the Anti-Seep Collars as specified; for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.640 Special Provision (Anti-Seep Collars)	Each

END OF SECTION

900.620 – SPECIAL PROVISION

STORMWATER SEPARATOR

1. DESCRIPTION

A. The work covered by this section includes all labor, materials, equipment, and incidentals required for a complete and operable installation of the stormwater separator treatment system (Advanced Hydrodynamic Vortex Separator, or AHVS), or approved equal, as shown on the drawings, as specified herein, and as directed by the ENGINEER including prefabricated stormwater treatment structure, pipe connections to the structure, and related work.

B. The work shall also include inspection and testing, inverts, rims and covers, boots, refill, and all incidental work, required for a complete job in strict accordance with the specifications, applicable drawings, and standard details.

C. The manufacturer shall design and supply the equipment listed herein and the Contractor shall install the equipment in accordance with the manufacturer's Handling, Storage, and Installation instructions.

2. GENERAL REQUIREMENTS

A. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff. The system shall be self-activating with no mechanical parts or external power requirements.

B. The treatment system shall be supplied by a manufacturer regularly engaged in such work who has furnished similar installations that have been in successful and continuous operation for a minimum period of fifteen years.

C. Upon request, independently certified performance data and references shall be made available to the Engineer of Record for use in determining that the treatment system meets the design criteria and performance requirements stated herein.

3. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 105 of the State of Vermont Agency of Transportation Standard Specifications for Construction dated 2018, and its latest revisions:

1. Manufacturing Experience
   The stormwater treatment supplier shall provide evidence of at least 15 years of successful product design and use. The supplier shall provide an

installation list of projects, model sizes installed and installation dates where the same type systems as specified herein have been designed and produced by the supplier.
2. General arrangement and dimensional drawings of the treatment system.
3. Plan and elevation drawings of the treatment system as it shall be incorporated into the stormwater drainage system. The elevation drawing shall indicate the top of water level both upstream and downstream of the treatment system at the flow conditions specified herein.
4. Handling, Storage and Installation Instructions.
5. Operation and Maintenance Instructions and a Maintenance video.

B. Performance Documentation

The following documentation must be submitted by the CONTRACTOR and approved by the ENGINEER prior to the manufacture and delivery of any materials.

1. Laboratory Data
The stormwater treatment system supplier shall provide documentation of Total Suspended Solids (TSS) removal efficiency from laboratory testing conducted on the supplier's full-scale system. The documentation shall include:

a. TSS removal efficiency versus operating rate for the full operating range of the stormwater treatment system for a 50-micron particle size.

b. TSS removal calculations for the system specified herein. The calculations must demonstrate that the system(s) is capable of achieving a net annual TSS removal efficiency as required by local regulations and as based upon a 50-micron particle size and the best available rainfall data for the project site location.

4. MANUFACTURER

A. The stormwater treatment system shall be the Downstream Defender® as designed by Hydro International located at 94 Hutchins Drive, Portland, Maine 04102, or approved equal.

B. Alternate stormwater treatment systems must demonstrate compliance with the specifications herein and be approved by the Engineer of Record. Request for alternative systems shall include:

i. Revised site plan showing location and orientation of proposed alternative, pipe sizes, connections, and excavation limits.

ii. Product installation drawings showing plan and elevation views with water elevations for the flow conditions specified herein.

iii. Performance data as required in Part 2.

iv. Maintenance manual including inspection and clean out costs, and three references for verifying successful completion of the procedures and associated costs.

5. MATERIALS

A. GENERAL

1. The stormwater treatment systems shall be an Advanced Hydrodynamic Vortex Separator (AHVS) with flow-modifying internal components that minimize turbulence and prevent any flow from internally bypassing the separation region within the vortex chamber. Vortex separators shall be sized as follows:

   a. Vortex Separator A: ten (10) foot diameter
   b. Vortex Separator B: eight (8) foot diameter

2. A tangential inlet pipe shall be used to establish rotational flow within a cylindrical vortex chamber. All polluted flow entering the vortex chamber through the inlet pipe shall follow a controlled three-dimensional flow path. Internal baffles will prevent flow entering the vortex chamber from discharging directly to the outlet pipe.

3. The tangential inlet pipe shall be positioned to convey flow into the vortex chamber beneath the internal water elevation. The AHVS shall not exceed the pressure drop (headloss) for the design flow rates specified herein as determined by ASTM C1745 / C1745M – 11.

4. The AHVS shall fit within the limits of excavation (area and depth) as shown in the project plans and will not exceed the dimensions for the design flow rates specified herein.

5. The AHVS shall provide separate and protected storage regions for captured pollutants that float and for those that settle and shall prevent re-suspension and washout of stored pollutants for the specified flow rates. The AHVS shall not release captured floating pollutants during surcharge conditions.

6. The storage capacities for pollutants that settle (sediment) and float (oil) shall not be less than the volumes listed in Table 1. The AHVS shall operate as intended and perform as specified herein as pollutants accumulate. The storage capacity for pollutants that settle shall not reduce the volume required in the vortex chamber for separation and for preventing re-suspension and washout or reduce the floatables storage volume capacity.

7. Minimum 24-inch openings shall provide access to the sediment storage volumes from the surface for inspection and maintenance. Two access openings shall be provided

for systems larger than 4 feet in diameter. Removal of pollutants from the treatment system shall be possible without requiring confined space entry.

B. PERFORMANCE

1. Performance of the AHVS shall be based on independent full-scale laboratory and/or field testing and shall adhere to the Performance Specifications listed in Table 1. The laboratory testing used as the basis of product performance shall be undertaken in accordance with testing protocols approved or endorsed by the Stormwater Equipment Manufacturers Association (SWEMA) or acceptable State agency, such as a State Department of Environmental Protection (DEP) or recognized verification agency (e.g: ETV, NJCAT, NETE).

2. Performance of the AHVS shall be based on treating the Water Quality Flow rate (WQF) without internally bypassing and without re-suspension and washout of captured pollutants (scour). The Treatment Flow Rate listed in Table 1 shall be greater than or equal to the WQF.

    a. NJCAT-certified treatment flow rates shall be based on 50% removal of a particle size gradation with a mean particle size of 75 microns, and a minimum particle size of 2 microns.
    b. 110 µm treatment flow rates shall be based on 80% removal of a particle size gradation with a mean particle size of 110 microns, and a minimum particle size of 53 microns.

3. The AHVS shall treat all flows without internally bypassing up to the Peak Treatment Flow Rate (PTFR). Full-scale independent laboratory scour testing shall demonstrate effluent control of less than or equal to 20 mg/L for all flows up to 150% of MTFR-100 without internal or external bypass.

4. The AHVS shall be capable of capturing and retaining fine silt and sand size particles. Analysis of captured sediment from full-scale field installations shall demonstrate particle sizes predominately in the 20-micron range.

5. The AHVS shall capture and retain 100% of all floating trash and debris and remove greater than 80% of hydrocarbons up to its rated storage capacities under conditions of a catastrophic spill such as might be experienced in an automobile or truck accident spill like conditions.

C. EQUIPMENT

1. The hydrodynamic separator shall consist of a hollow, cylindrical vessel with internal components.

a. The internal components to be supplied by the manufacturer shall include the center shaft and cone, dip plate, benching skirt, floatables lid and component support frame.

   Materials of construction for the above components excluding the support frame shall be cross-linked polyethylene (XLPE). The component support frame members and all metal parts shall be Type 304 stainless steel or carbon steel powder coated in accordance with ASTM 775/ ASTM A775M with a resulting thickness of 8-12 mils. All components shall be designed to withstand all normal loadings associated with fabrication, shipping, site installation, and normal operation of the equipment. The component support frame shall withstand a live load of 500 pounds.

b. The hollow cylindrical vessel shall be a precast concrete structure manufactured with concrete that has attained a compressive strength of 4,000 psi after 28 days. The structure shall be reinforced to withstand an HS20-44 loading. Shiplap joints shall be sealed with butyl rubber mastic sealant conforming to ASTM C990. Slab tops shall be suitably reinforced and provided with manhole openings and covers as required. The cast iron manhole frames and covers shall be sized as per the manufacturer's drawings and shall be in accordance with ASTM A48, CL.35B and AASHTO M105. The masonry fixing bolts shall be Type 304 stainless steel.

c. All piping connections and ancillary items not listed herein shall be provided by the Contractor.

6. CONSTRUCTION REQUIREMENTS

A. EQUIPMENT DELIVERY

1. The components shall be delivered within six weeks of date of approved technical submittal.

2. The components shall be delivered to the site fully fabricated.

3. Off-loading, storage, and installation shall be by the Contractor.

4. The Contractor shall inspect and provide signed acceptance of equipment prior to unloading, or notify the manufacturer of any damage to equipment to effect proper remedial action. Failure to notify manufacturer of damage to equipment prior to unloading will void all warranties pertaining to subject equipment.

B. EQUIPMENT INSTALLATION

1. The system shall be installed in strict accordance with the site plans, and the manufacturer's general arrangement drawings and Handling, Storage and Installation

Instructions. The Contractor shall be responsible for installing the equipment and all necessary site connections.

2. The Manufacturer shall be notified immediately of any equipment which is damaged during unloading, storage, or installation. The damaged equipment shall be repaired or replaced at the discretion of the manufacturer and entirely at the Contractor's expense.

3. The precast concrete structure shall be set on a granular or compacted sand sub-base in accordance with local requirements for standard manhole installation. In no instances shall the compacted sub-base material have a thickness of less than 12 inches.

4. The precast concrete structure shall be set level and plumb to within 0.5%.

5. Non-shrink grout or hydraulic cement conforming to ASTM C 595 shall be used to provide a water tight seal in the lift holes and in any drain holes. Flexible boot sleeve connections shall be used for the inlet and outlet pipes.

6. The Contractor shall, at the discretion of the owner or owner's representative, test the concrete structure for water tightness before backfilling.

7. METHOD OF MEASUREMENT

A. The quantity of Special Provision (Stormwater Separator) to be measured for payment will be per each.

8. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (Stormwater Separator) will be paid for at the Contract each price.

Payment will be full compensation for furnishing materials and equipment, installing, operating, maintaining, and removing applicable dewatering facilities, and for furnishing all labor, tools, equipment, fuel, and incidentals necessary to complete the work.

The costs of excavation for structure, sub-base material, and disposal of excavated material not suitable for backfill, will be paid for with the appropriate Contract payment items.

Payment will be made under:

Pay Item	Pay Unit
900.620 Special Provision (Stormwater Separator – 8' Diameter)	Each
900.620 Special Provision (Stormwater Separator – 10' Diameter)	Each

END OF SECTION

900.620 - SPECIAL PROVISION

PRECAST DRAINAGE, DIVERSION & OUTLET CONTROL STRUCTURES

1. DESCRIPTION

A. The work covered by this section includes the furnishing of all plant, labor, materials, equipment, and appliances; and performing all operations in connection with the satisfactory installation of precast catch basin structures as shown on the plans, as herein specified, and as directed by the ENGINEER.

B. The work shall also include inspection and testing, inverts, rims and covers, boots, excavation, refill, and all incidental work, required for a complete job in strict accordance with the specifications, applicable drawings, and standard details.

C. The term “catch basin” shall be used interchangeably with “drainage structure,” diversion structure, and “outlet control structure”.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 105 of the State of Vermont Agency of Transportation Standard Specifications for Construction dated 2018, and its latest revisions:

1. Shop drawings and manufacturer’s Certificates of Compliance shall be furnished for Outlet Control Structures in this Section of Work.

3. MATERIALS

A. It is the intention of these specifications that the catch basin, including all component parts, have adequate space, strength, and leak-proof qualities considered necessary for the intended service. Space requirements and configurations shall be as shown on the drawings. Catch basins may be an assembly of pre-cast sections with steel reinforcement, and approved jointing, or concrete cast monolithically in place with reinforcement. In any approved catch basin, the completed structure shall be of such material and quality as to withstand loads of 8 tons (H-20 loading) without failure and prevent leakage in excess of one gallon per day per vertical foot of catch basin, continuously for the life of the structure. A period generally in excess of 25 years is to be understood in both cases. It is further intended that any pointing of joints shall be accomplished after leakage tests have been satisfactorily completed.

B. Where catch basins of greater inside diameter than 4'-0" are required, the larger diameter (5'-0", 6'-0", etc.) barrel sections shall be provided from the invert of the catch basin up to the cone section of the catch basin. Intermediate transition sections which reduce the larger catch basin inside diameter down to 4'-0" shall not be used and will not be accepted, unless otherwise directed by the ENGINEER and the OWNER.

C. When the catch basin depth is less than 6 feet and where a shallow catch basin is indicated on the Contract Drawings, a reinforced concrete slab top shall be used in lieu of a cone section.

The reinforced concrete slab top shall have an eccentric entrance opening and shall be capable of supporting H-20 loads.

D. Precast catch basin structures shall be as shown on the standard details and as described herein.

1. Base sections shall be monolithic to a point 6" above the crown of the incoming pipe, and shall be pre-cast reinforced concrete, except for special catch basins which are cast-in-place.

2. Horizontal joints between sections of pre-cast concrete barrels shall be of a type approved by the ENGINEER, which type shall, in general, depend for water-tightness upon an elastomeric or mastic like sealant.

3. Pipe to catch basin joints shall be only as approved by the ENGINEER and, in general, will depend for water-tightness upon an approved flexible catch basin sleeve as shown on the Contract Drawings.

4. Cone sections shall be concentric - see standard detail.

5. All pre-cast sections and bases shall have the date of manufacture and the name or trademark of the manufacturer impressed or indelibly marked on the inside wall.

E. PRE-CAST DRAINAGE, DIVERSION AND OUTLET CONTROL STRUCTURES

1. Pre-cast concrete barrel sections, cones and bases shall conform to ASTM C 478, except as may be otherwise shown on the Typical Catch Basin and Drainage Basin Detail.

F. CASTINGS, FRAMES, GRATES AND COVERS

1. Frames, grates, and solid covers shall be provided as indicated on Contract Drawings.

2. Bar rack for outlet structure shall be cast into structure and shall consist of 1” bars spaced at 8” on center.

3. Catch basin frames, grates, and covers shall conform to the requirements of Sections 715.01 and 604.

4. Solid covers shall be provided with the words “STORM” cast into the top surface and shall be provided a 30" diameter clear opening.

5. The castings shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined at the foundry, before shipment to prevent rocking of covers in any orientation. Cover pick holes shall not be through holes when cover is seated.
6. All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

7. Castings shall be at least Class 30 conforming to the ASTM Standard Specification for Gray Iron Castings, Designation A48.

G. GRADE RINGS/INFRA-RISERS

1. Concrete grade rings or Infra-Risers shall be used to adjust the manhole frame to grade.

2. Precast concrete grade rings shall be a minimum of 8" wide, fabricated with 5000 psi concrete, and meet H20 loading requirements.

3. Infra-Risers shall be a rubber composite adjustment riser.

H. FLEXIBLE RUBBER BOOTS FOR PIPE CONNECTIONS

1. Approved flexible rubber boots shall be furnished and installed per manufacturer's instructions to connect new storm sewer pipe to catch basins.

2. Watertight boots shall be rubber-like Kor-N-Seal boots with stainless steel clamps.

I. WATERPROOFING

1. All precast concrete catch basin sections to be installed under this Contract shall be supplied with a factory-applied bituminous waterproofing compound on the exterior surfaces. Bituminous waterproofing compound may be trowel, brush or spray applied in accordance with the manufacturer's recommendations. The waterproof coating shall completely fill all crevices, grooves and voids creating a continuous coating that is free of breaks, pinholes, and other defects. Bituminous coating shall be carried over exposed exterior edges of catch basin joints and openings. Bituminous waterproofing coating shall be Hydrocide 600, 700 or 700B as manufactured by Sonneborn division of ChemRex, Inc. or acceptable approved equal.

J. BEDDING MATERIAL

1. Bedding material shall consist of crushed gravel conforming to the requirements of Section 704.05 for Crushed Gravel for Subbase, Fine Graded.

K. OVERFLOW WEIR IN DIVERSION STRUCTURE

1. A reinforced concrete overflow weir with aluminum rails for stop logs shall be cast in place inside the precast concrete drainage structure at the place of the precast fabricator. Concrete shall meet the same requirements as the precast catch basin structure.
2. Overflow weir shall be constructed to dimensions shown in detail on Contract Drawings.
3. PVC stop logs and aluminum rails shall be manufactured by Agri-Drain. Aluminum rails shall be embedded in concrete overflow weir.

4. CONSTRUCTION REQUIREMENTS

A. PREPARATION

1. Precast catch basin structures shall be constructed at the locations, to the elevations, and in accordance with notes and details shown on the drawings.

2. Precast bases shall be placed on a 6" layer of compacted bedding material. The excavation shall be properly dewatered while placing bedding material and setting the base or pouring concrete. Water-stops shall be used at the horizontal joint of poured-in-place catch basins.

3. Inlet and outlet stubs shall be connected and sealed in accordance with the manufacturers recommended procedure, and as shown on the Standard Details.

4. Barrel sections and cones of the appropriate combination of heights shall then be placed, using manufacturers recommended procedure for sealing the horizontal joints, and as shown on the Standard Details or the remaining barrel of the catch basin shall be cast above the base. A double ring of mastic sealant shall be used to seal the joints between catch basin riser sections. One ring of sealant shall be placed on the flat horizontal surface of the joint near the sloped portion of the joint. The second ring of sealant shall be placed on the inclined part of the joint. All joint surfaces shall be thoroughly cleaned prior to placement of the sealant so as to be completely free of stones, sand, soil, debris and other materials that could adversely affect sealing of the joints.

    a. Following setting of the cone section, the frame and cover or some other means of preventing accidental entry by unauthorized persons, children, animals, etc., shall be placed on the top of the structure until the CONTRACTOR is ready to make final adjustment to grade.

5. Frames. Catch basin frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the catch basin masonry and the bottom flange of the frame shall be completely filled and made water-tight. Concrete grade rings or Infra-Risers shall be set between the catch basin frame and top of concrete catch basin wall. A thick ring of mortar extending to the outer edge of the grade ring shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and be sloped to shed water away from the frame.

5. INSPECTIONS AND TESTS

A. Leakage Tests

1. General
    a. Leakage tests shall be made and paid for by the CONTRACTOR and observed by the ENGINEER on each catch basin. Prior to backfilling, all catch basins shall be vacuum tested. After backfilling, the catch basins shall be retested

using either the vacuum test or exfiltration test. The exfiltration test and vacuum tests shall be made as described below.

2. Preparation for Test.

    a. After the catch basin has been assembled in place, all lifting holes and those exterior joints within 6 feet of the ground surface shall be filled and pointed with an approved non-shrinking mortar. The test shall be made prior to placing the shelf and invert and before filling and pointing exterior horizontal joints below the 6-foot depth line or any interior horizontal joints. If the groundwater table has been allowed to rise above the bottom of the catch basin, it shall be lowered for the duration of the test. All pipes and other openings into the catch basin shall be suitably plugged and the plugs braced to prevent blow out.

B. Vacuum Test Procedure.

1. All catch basins shall be vacuum tested prior to backfilling. After backfilling catch basins shall be retested by vacuum test or exfiltration test. Vacuum test shall require the sealed catch basin to hold a vacuum drop of 1" Hg over a period of time as described below.

    a. Initial vacuum pressure = 10" Hg (i.e. ±20" Hg absolute)
    b. Test time for 1" Hg drop to 9" Hg"
        i. 2 minutes minimum allowable, for 0-10' deep catch basins;
        ii. 2½ minutes minimum allowable for 10'-15' deep catch basins;
        iii. 3 minutes minimum allowable for 15'-25' deep catch basins
    c. If the vacuum drop exceeds 1" Hg in 2 minutes the catch basin shall be repaired and retested.
    d. If a catch basin fails to meet 1" Hg drop in 1 minute after repair, the unit shall be removed and repaired or replaced as necessary.

C. Exfiltration Test Procedure (If Allowed)

1. The catch basin shall be filled with water to the top of the cone section. A period of time may be permitted, if the Contractor so wishes, to allow for absorption. At the end of this period, the catch basin shall be refilled to the top of the cone, if necessary, and the measuring time of at least 8 hours begun. At the end of the test period, the catch basin shall be refilled to the top of the cone; measuring the volume of water added. This amount shall be extrapolated to a 24-hour rate and the leakage determined on the basis of depth. The leakage for each catch basin shall not exceed 1 gallon per vertical foot for a 24-hour period. If the test fails this requirement, but the leakage does not exceed 3 gallons per vertical foot per day, repairs by approved methods may be made as directed by the Engineer to bring the leakage within the allowable rate of 1 gallon per foot per day. Leakage due to a defective section or joint or exceeding the 3 gallons per vertical foot per day, shall be cause for the rejection of the catch basin. It shall be the Contractor's responsibility to uncover the catch basin as necessary and to disassemble, reconstruct or replace it as directed by the Engineer. The catch basin shall then be retested and, if satisfactory, all joints shall be filled and pointed as necessary.

D. Infiltration Test.

1. If after vacuum testing and backfilling the groundwater table is above the highest joint in the catch basin, and if there is no leakage into the catch basin as determined by the Engineer, such a test can be used to evaluate the water-tightness of the catch basin. However, if the Engineer is not satisfied, the Contractor shall lower the water table and carry out the test as described hereinbefore.

6. METHOD OF MEASUREMENT

A. The quantities of Special Provision (Diversion Structure – 6' Diameter with Weir) and Special Provision (Outlet Structure – 6'x10') to be measured for payment will be the number of each unit installed in the complete and accepted work.

7. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (Diversion Structure – 6' Diameter with Weir), and Special Provision (Outlet Structure – 7'x11') will be paid for at the Contract unit price per each.

Payment will be full compensation for furnishing, transporting, handling, placing installing, and testing of the materials specified, including concrete barrel sections, risers, top sections, grade rings or Infra-Risers, joint gaskets, waterproof coatings, pipe stubs, flexible rubber boot pipe connections, mortar; for furnishing and installing the removal trash rack, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

B. Excavation for Special Provision (Diversion Structure – 6' Diameter with Weir) and Special Provision (Outlet Structure – 7'x11') including bedding and backfill operations, and disposal of excavated material not suitable for backfill, will be paid for as follows:

Payment will be made under:

Pay Item	Pay Unit
900.620 Special Provision (Diversion Structure – 6' Diameter with Weir)	Each
900.620 Special Provision (Outlet Structure – 7'x11')	Each

END OF SECTION

900.640 – SPECIAL PROVISION

MAGNETIC LOCATING TAPE

1. DESCRIPTION

A. Work under this Section includes furnishing and placing magnetic locating tape on all storm sewer piping as directed by the Engineer.

B. The work under this Section shall be perform in accordance with these provision and the Plans.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 01300 - SUBMITTALS.

1. Shop drawings and manufacturer's Certificates of Compliance shall be furnished for all items in this Section of work.

3. MATERIALS

A. Magnetic Locating Tape

1. Detectable tracer tape shall consist of a continuous aluminum foil core inseparably bonded on both sides with tough high density cross-laminated plastic films, pigmented in orange, blue or other warning colors. Bond strength of the tracer tape must be such as to prevent pitting or degradation after 300 hours of continuous testing as per ASTM B-117.

2. Detectable tracer tape shall be the type that can be located by the inductive method and does not require electrical connection to be made to the tape itself.

3. Magnetic Locating Tape shall be installed on all storm sewer pipe installed on this project, without exception.

4. The tape shall be six (6) inches in width and shall have the words "Buried Storm Sewer Line Below" permanently and indelibly printed on it.

4. CONSTRUCTION REQUIREMENTS

A. MAGNETIC TAPE INSTALLATION

1. Magnetic Locating Tape shall be installed 1'-0" above the top of pipe for storm sewer lines and the underground infiltration chamber inlet and

outfall pipes.

5. METHOD OF MEASUREMENT

A. The quantity of Special Provision (Magnetic Locating Tape) to be measured for payment will be the number of linear feet installed in the complete and accepted work as measured along the flow line of pipe.

6. BASIS OF PAYMENT

A. The quantities of Special Provision (Magnetic Locating Tape) will be paid for at the Contract unit price per linear foot. Payment will be full compensation for furnishing all materials, labor, tools, equipment, and incidentals necessary to install magnetic locating tape as indicated.

Payment will be made under:

Pay Item	Pay Unit
900.640 Special Provision (Magnetic Locating Tape)	Linear Foot

END OF SECTION

900.645 - SPECIAL PROVISION

GRAVEL WETLAND FACILITY

1. DESCRIPTION

A. Work under this section shall pertain to work on Stormwater Gravel Wetland Facilities, within indicated payment limits (including wetland planting soil, pea stone, gravel, landscaping (including wetland seed mixes) and related work.

2. SUBMITTALS

A. Submittals and certifications for the following items of work in this Section shall be furnished in accordance with Section 105 of the State of Vermont Agency of Transportation Standard Specifications for Construction dated 2018, and its latest revisions:

1. Product literature, specifications and other informational material for the following items:

    a. Excavated Wetland Soil Tests
    b. Wetland Seed
    c. Pea Stone
    d. Crushed Stone (Gravel) Sub-Layer
    e. Polyethylene Liner

2. Seed. At least 30 days prior to ordering, the Contractor shall submit to the Engineer seed packing certificates with source and date, as well as material specifications for all mulch materials. No material shall be ordered until submittals have been approved by the Engineer. Delivered materials shall match approved materials.

    a. Seed shall be brought to the site in unopened bags, whereupon Engineer shall collect certification from bag prior to opening bag and prior to any seeding activity. In addition, a manufacturer's Certificate of Compliance shall be submitted with each seed shipment. These Certificates shall include the guaranteed percentages of Pure Live Seed, based on purity and germination rates, as well as the net weight, harvest, and shipment dates.

3. MATERIALS

A. WETLAND SOIL REQUIREMENTS

1. The gravel wetland soil layer ensures that runoff does not infiltrate through the soil to the subsurface gravel wetland treatment media. Runoff should predominantly enter the gravel wetland treatment media through the perforated riser pipe(s) and secondary stone inlet. The soil layer shall have a minimum thickness of 8 inches and shall be level, constructed with a surface slope of zero.

    a. The soil media shall have low saturated hydraulic conductivity (Ksat) measured between 0.1-0.01 ft/day or with a soil texture conforming to Hydrologic Soil

Group D.

b. Soil pH should between 6.0 and 7.0.
c. Utilization of onsite material to manufacture the soil layer is encouraged provided the soil will meet specifications, either as a standalone product or by amendment with outside material.
d. In all cases, the gravel wetland soil shall be tested in accordance with the P-testing procedure described below.

P testing is required for upper media layer of bioretention systems and gravel wetland soil layers. Final mixes must have a Phosphorus Saturation Ratio (PSR) less than or equal to 0.10. PSR is to be determined using the following protocol:

a. Samples are to be air dried and sieved through 2 mm prior to testing
b. Air-dried, sieved soil samples are to then be extracted with the Mehlich-3 solution (0.2 M CH_3COOH + 0.25 M NH_4NO_3 + 0.015 M NH_4F + 0.013 M HNO_3 + 0.001 M EDTA) by shaking a soil-solution suspension for 5 minutes at a 1:10 ratio (soil mass in grams: solution volume in mL), followed by filtering to remove particles (pore size of 2 μm is recommended, max pore size = 8 μm).
c. Extracts from the Mehlich-3 procedure are to be analyzed for P, Fe, and Al by ICP-OES.
d. The Phosphorus Saturation Ratio (PSR) is then calculated as follows: where,

PM3 = Mehlich-3 P in mg P per kg dry soil
FeM3 = Mehlich-3 Fe in mg Fe per kg dry soil
AlM3 = Mehlich-3 Al in mg Al per kg dry soil

$$PSR = \frac{\left(\frac{P_{M3}}{31}\right)}{\left(\frac{Fe_{M3}}{56}\right)+\left(\frac{Al_{M3}}{27}\right)}$$

B. WETLAND SEED

1. Seed mix shall be Pure Live Seed and shall be a wetland mix comprised of native Vermont and New England species. Such seed mix shall be as follows:

a. At bottom of gravel wetland cells and along side slopes up to 2 feet above bottom of basin: Marsh, Swamp, & Bog Seed Mix, as manufactured by Vermont Wetland Plant Supply, application rate of 18 lbs per acre.

b. Side slopes above 2 feet above bottom of basin to gravel wetland facility extents shown on Drawings: Vermont Wet Meadow and Detention Basin Mix, as manufactured by Vermont Wetland Plant Supply, application rate of 35 lbs per acre.

c. Side slopes above the gravel wetland facility extents shown on Drawings shall be seeded with Vermont Conservation Mix.

C. CHOKER LAYER - PEA STONE

1. The pea stone choker layer shall be a 3/8" natural stone meeting the following gradation requirements:

Sieve Size	Percentage Passing by Weight
½"	100%
3/8"	85-100%
No. 4	10-30%
No. 8	0-10%

D. CRUSHED STONE (3/4" GRAVEL) SUB-LAYER

1. Crushed stone sub-layer shall be angular crushed stone (gravel) with a minimum size of ¾ in. Large particle, angular coarse to very coarse gravel is required to maintain system longevity. The crushed stone (gravel) layer shall meet the following gradation requirements:

Sieve Size	Percentage Passing by Weight
1½"	100%
1"	85-100%
¾"	5-20%
½"	0-5%
3/8"	0-5%
No. 4	0-5%

E. POLYETHYLENE LINER

1. Wetland liner shall be 20 mil HDPE liner, Herculine as manufactured by Anjon Manufacturing or approved equal.

4. CONSTRUCTION REQUIREMENTS

A. PREPARATION

1. All trees, stumps, brush and other removed vegetation shall become the property of the Contractor to be legally disposed of offsite or recycled for use.

2. The Contractor shall plan and execute operations in such a manner that the amount of excavated and exposed fill is minimized and foreign materials are prevented from being washed or otherwise carried into the replacement area or into nearby wetland resource areas.

B. DIVERSION OF STORMWATER FLOWS

1. Contractor shall provide flow diversions to existing outfalls during the construction of the gravel wetland facility, until such time that the gravel wetland is complete and ready to accept flow. There will be no separate payment for bypass pumping and diversion of flows.

C. EROSION AND SEDIMENT CONTROL

1. Stake out replacement area boundaries in the field prior to excavation. Install siltation barrier of hay bales and silt fence in accordance with the Contract Documents along the edge of the proposed replacement site. The siltation barrier shall begin and end in the surrounding upland and shall be placed so that no excavated material or disturbed soil can enter adjacent wetlands or waters. The siltation barrier shall act as a limit of work barrier for all heavy equipment. Siltation fencing needs to be entrenched in soil to prevent sediment transport.

2. Engineer shall inspect and approve erosion and sediment control measures prior to excavation work. Contractor shall remove sediment deposits as necessary to maintain the filters in working condition.

D. EXCAVATION

1. Final gravel wetland area shall be staked for approval prior to clearing and excavation. Environmental protection measures, including hay bales, silt fence, compost filter tubes or berms, shall be in place prior to any construction activities. Limits of the gravel wetland area shall be adjusted to protect root systems of existing trees: limits shall be a minimum of 6 feet (2 meters) from trunk of trees to the extent possible. However, the total area of wetland shall not be reduced.

2. Unless otherwise directed, the contractor shall excavate gravel wetland area to a depth of 12 inches (300mm) below finished grade.

3. In the event there is excess borrow, it shall be disposed of without additional compensation.

4. The Contractor shall remove any sediment that washes in the treatment gravel wetland during the construction phase.

E. COMPACTION

1. Compaction of both the base of the gravel wetland area and the required backfill shall be minimized. When possible, excavation hoes are to be used to remove original soil. If gravel wetland area is excavated using a loader, the contractor shall use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires is not acceptable.

2. Backfill gravel wetland facility with wetland gravel materials in lifts 12” or greater. Heavy equipment shall not be used within the gravel wetland basin. Grade gravel wetland materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

F. PREPARATION OF AREAS TO RECEIVE WETLAND SOIL

1. The sublayer materials within the areas to be covered by wetland soil shall be graded so

that the completed work after the wetland soil is placed shall conform to the specified lines and grades.

G. PLACING AND SPREADING OF WETLAND SOIL

1. The placement of wetland soil shall occur such that the wetland plantings can be installed immediately thereafter, as practicable, as approved by the Engineer.

2. Wetland soil in an unworkable condition due to excessive moisture, frost or other conditions shall not be placed until it is suitable for spreading. Wetland soil shall be placed on the designated area and spread to the specified thickness. After the wetland soil is spread all large stiff clods, rocks, roots and other foreign matter shall be raked clear and disposed of by the Contractor so that the finished surface will be acceptable for subsequent work such as seeding or planting.

H. SEEDING INSTALLATION

1. Once soils have been placed, no heavy equipment shall travel across replacement or restoration areas.

2. Seeding

a. Wetland seed mix shall be applied after soil has been raked or after mulch has been applied. Seed shall be sown by hand or by small mechanical lawn seeder unless otherwise approved by the Engineer. No fertilizers are shall be used.

b. Water seeded areas within same day. Spray of water shall not disturb seed on the soil surface. Any seeded area disturbed by watering or other construction activity shall be re-seeded at no additional cost. Watering shall continue as necessary for germination and establishment of seed.

3. Mulch

a. Upon completion of seeding, all disturbed areas up to the limit of the wetland area shall be lightly mulched with 1-2 inches (25-50 mm) of straw mulch.

4. Removal of Erosion Protection Measures

a. Upon completion of all construction and once soils are stabilized with a uniform cover of vegetation, silt fence shall be removed and disposed of off-site. Contractor shall rake out filter berms so that filter material is no greater than 3 inches (75 mm) in depth on soil substrate. If filter has been wrapped in fabric or fabric bags, all bag material shall be cut and removed and disposed of off-site by the Contractor, at no additional cost to the project. Filter material shall then be raked out.

I. MISCELLANEOUS

1. The gravel wetland facility may not be constructed until all contributing drainage area has been stabilized by either temporary or permanent streambank impacts.

J. MAINTENANCE OF WETLAND GRASSES

1. The Contractor shall be responsible for the provision of water and routine watering of the wetland grasses throughout the warranty period.

2. In the absence of "on-average" rainfall, or if rainfall is less than 1" in any 2-week period during the growing periods of last frost to first frost (May 10 – Oct 10) for the warranty period, the Contractor shall provide and administer water.

K. INSPECTIONS AND TESTS

1. Planting Soil Inspection and Sampling

   a. Planting soil stockpiled for reuse or proposed for use shall be inspected by the ENGINEER. At the time of inspection, the ENGINEER may require representative soil samples to be tested to insure compliance with the specified parameters. 20-pound samples shall be supplied and tests made at the CONTRACTOR's expense. A certified analysis of planting soil, from each source shall be submitted to the ENGINEER for approval before use in the work. If deficiencies in the planting soil are found as a result of this analysis, they shall be corrected at no additional expense to the OWNER.

   b. Sampling and Testing shall be in accordance with the current methods of the Association of Official Agricultural Chemists.

2. Wetland Plant Material Guarantee Inspection

   a. Monitoring will be performed in order to ensure satisfactory wetland plant material (wetland grass) establishment. At the end of each of **one (1) full growing season**, the Contractor shall complete and submit a progress report detailing the relative success or failure of the replacement efforts.
   b. Plant materials (wetland grasses) in the Gravel Wetland shall be inspected for disease and area shall be monitored for invasive species. All invasive species shall be removed.

   c. Inspection

      i. Contractor will conduct an inspection **at the end of the first full growing season**. The request shall be received at least ten (10) calendar days before the anticipated date of plant material guarantee inspection.

      ii. A written report must be submitted to the Resident Engineer documenting viability of the wetland area, condition of vegetation, evidence of invasive plant species, and any other information required by VTDEC-Stormwater regulations and requirements.

      iii. Seeding shall have ninety percent (90%) uniform cover and no "die-off" areas greater than 75 ft^2 by wetland species to be accepted as having satisfactory evidence of growth. Any areas that are unsatisfactory shall be reseeded. All reseeding, together with necessary re-grading, soil amendment and erosion

control, shall be done at the expense of the Contractor.

d. Upon completion and re-inspection of all repairs or removals necessary, in the judgment of the ENGINEER, the ENGINEER shall certify in writing to the OWNER as to the acceptance of the project.

5. METHOD OF MEASUREMENT

A. The quantity of Special Provision (Wetland Soil) to be measured for payment will be the number of cubic yards installed in the complete and accepted work. Measurement shall be of the square foot area of material placed to the specified depth in determining the measured quantity of payment.

B. The quantity of Special Provision (Wetland Seed - Marsh/Swamp/Bog Mix) to be measured for payment will be the number of pounds for the specified items used in the complete and accepted work, as determined from the load tickets furnished to the Engineer. The Engineer will verify and document such mass (weight) determination.

C. The quantities of Special Provision (Choker Layer – Pea Stone) and Special Provision (Crushed Stone (3/4" Gravel) Sub-Layer) to be measured for payment will be the number of cubic yards installed in the complete and accepted work. Measurement shall be of the square foot area of material placed to the specified depth in determining the measured quantity of payment.

D. The quantity of Special Provision (Polyethylene Liner) to be measured for payment will be the number of square feet installed in the complete and accepted work. Measurement shall be of the square foot area of liner placed in determining the measured quantity of payment.

6. BASIS OF PAYMENT

A. The accepted quantity of Special Provision (Wetland Soil) will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for identifying, stockpiling testing, amending, placing, compacting, and raking, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

B. The accepted quantity of Special Provision (Wetland Seed - Marsh/Swamp/Bog Mix) will be paid at the Contract bid price per pound. Payment will be full compensation for testing, furnishing, transporting, handling, and placing the material specified, and for furnishing all labor, tools, equipment, maintenance, water necessary to promote growth, and incidentals necessary to complete the work.

C. The accepted quantities of Special Provision (Choker Layer – Pea Stone), Special Provision (Crushed Stone (3/4" Gravel) Sub-Layer) will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing, transporting, and placing the materials specified; spreading, compacting, and raking, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

D. The accepted quantity of Special Provision (Polyethylene Liner) will be paid for at the Contract unit price per square foot. Payment will be full compensation for placing, and for

furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
900.608 Special Provision (Wetland Soil)	CY
900.608 Special Provision (Crush Stone (3/4" Gravel) Sub-Layer)	CY
900.608 Special Provision (Choker Layer – Pea Stone)	CY
900.635 Special Provision (Wetland Seed – Marsh/Swamp/Bog Mix)	LB
900.670 Special Provision (Polyethylene Liner)	SF

END OF SECTION

900.670 - SPECIAL PROVISION

MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL

1. DESCRIPTION. This work shall consist of designing, detailing, fabricating, furnishing, and erecting mechanically stabilized earth retaining walls constructed in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the Plans or as directed by the Engineer.

   The mechanically stabilized earth (MSE) retaining wall system shall consist of placement and compaction of select granular backfill, a non-structural leveling pad, precast concrete face panels, and membrane and soil reinforcement elements mechanically connected to each facing panel. The soil reinforcement shall have sufficient strength, length, and frictional resistance as required by the design as specified herein.

2. DESIGN REQUIREMENTS. The design shall be performed in accordance with the AASHTO LRFD Bridge Design Specifications, and the design criteria specified in the Plans. This work shall be performed in accordance with these provisions, the plans and with the Geotechnical Recommendations included in the Contract Documents.

   Acceptable prefabricated MSE Wall systems are those included in the "VAOT Approved Retaining Wall Systems", available on the Agency's website at the following address:

   https://outside.vermont.gov/agency/VTRANS/external/docs/construction/03GeotechEng/Engineering/Approved%20Wall%20System%20List.pdf

   Prefabricated earth retaining systems shall employ concrete facing. All wall components shall have a minimum design life of 100 years.

   The design by the wall system supplier shall consider the internal stability of the wall mass and shall be performed in accordance with the appropriate sections of the most recent edition of the AASHTO *LRFD Bridge Design Specifications*.

   The MSE retaining wall system shall be designed for a design life of 100 years, and any wall reinforcing located above the geomembrane shall have a design life of 125 years, both using the corrosion rates given in the AASHTO *LRFD Bridge Design Specifications* for non-aggressive soil.

   (a) Backfill. The friction angle of the select granular backfill used in the reinforced fill zone for the internal stability of the wall shall be assumed to be 34°, unless determined otherwise by tests. When a friction angle greater than 34° is proposed, the friction angle shall be determined by the standard direct shear test, AASHTO T 236, utilizing a sample of the material compacted to 95 percent of AASHTO T 99, Methods C or D (with oversize correction per AASHTO T 224), at the optimum moisture content. Before construction begins, the selected granular backfill material selected shall be subject to approval by the Engineer. Compliance with the test requirements shall be the responsibility of the Contractor. The wall supplier shall be furnished a copy of the test results for the backfill prior to construction.

(b) Connections. All connections shall be positive, structural connections subject to the same loss rates and tension requirements as the primary soil reinforcement for MSE retaining walls.

3. MATERIALS. The Contractor shall make arrangements to purchase from the wall system supplier the materials covered herein, including concrete panels, reinforcing strips, attachment devices, fasteners, joint materials, and all necessary incidentals. The Contractor, or the supplier as the Contractor's agent, shall furnish the Engineer a certificate of compliance certifying that the applicable materials comply with these provisions. Materials not conforming to these provisions shall not be used without the written consent of the Engineer.

(a) Concrete Facing Panels. Concrete facing panels shall meet the requirements of Section 540.

(1) Reinforcing Steel. Reinforcing steel used in the concrete facing panels and panel copings shall be epoxy coated in accordance with Sections 507 and 723.

(2) Casting. The panels shall be cast face down in level forms supported on a flat working surface. Guides shall be used to locate and support attachment devices set in the back face of the panel.

The concrete in each panel unit shall be placed without interruption.

(3) Concrete Finish. No Surface voids or "bug holes" greater than 5/8 inch in diameter and more than 1/4 inch deep allowed in the finished exposed surface. Surface voids or "Bug holes" that are less than described shall not exceed 1% of the finished exposed surface with no 6" by 6" area containing more than 3 surface voids or "bug holes". No repairs on finished exposed surface. The concrete surface for the front face shall meet requirements as noted in the plans.

(b) Soil Reinforcing and Attachment Devices. All reinforcing and attachment devices shall be carefully inspected to ensure they are true size and free from defects that may impair their strength and durability.

All structural streel material and fasteners shall conform to the requirements of Subsection 714.01.

(1) Reinforcing Mesh Elements. Reinforcing mesh elements shall be shop fabricated from cold drawn steel rod conforming to the minimum requirements of AASHTO M 32M/M 32 and shall be welded at the junctions between longitudinal and transverse wires in accordance with AASHTO M 55M/M 55. Galvanizing shall be applied after mesh fabrication and shall conform to the minimum requirements of AASHTO M 111M/M 111. The galvanizing thickness shall be determined and specified based on the design life requirements of the structure.

(2) Loop Embeds. Loop embeds shall be fabricated from cold drawn steel rod conforming to AASHTO M 32M/M 32. Loop embeds shall be welded in accordance with AASHTO M 55M/M 55. Loop embeds shall be galvanized in accordance with AASHTO M 232M/M 232.

(3) Reinforcing Strips. Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to ASTM A 572/A 572M Grade 450 or equal. Galvanizing shall conform to the minimum requirements of AASHTO M 111M/M 111. The galvanizing thickness shall be determined and specified based on the design life requirements of the structure.

(4) Tie Strips. Tie strips shall be shop fabricated from hot rolled steel conforming to the minimum requirements of ASTM A 570, Grade 50 or equivalent. Galvanizing shall conform to AASHTO M 111M/M 111 or AASHTO M 232M/M 232. The minimum coating thickness shall be 0.125 psf.

(5) Fasteners. Fasteners shall consist of galvanized hexagonal cap screw bolts and nuts conforming to the requirements of AASHTO M 164M/M 164 or equivalent. Fasteners shall be galvanized in accordance with AASHTO M 232M/M 232.

(c) Joint Materials. Joint materials shall be installed to the dimension and thickness indicated in the Plans.

(1) Bearing Pads. Bearing pads shall be pre-formed EDPM rubber pads conforming to ASTM D 2000 M2AA 807 and having a durometer hardness equal to 60±5.

(2) Joint Cover. Horizontal and vertical joints between panels shall be covered by a geotextile. The geotextile may be either a non-woven needle punched polyester geotextile or a woven monofilament polypropylene geotextile meeting the requirements of Section 720 for Geotextile Under Stone Fill. The wall supplier shall approve adhesive used to hold the geotextile filter fiber material to the rear of the facing panels prior to backfill placement.

(d) Select Granular Backfill. Select granular backfill material used in the mechanically stabilized earth structure shall conform to the requirements of Subsection 704.18.

(e) Geomembrane Liner. An impervious geomembrane and drain system shall be provided as detailed in the Plans. The impervious geomembrane shall have a minimum thickness of 0.03 in and shall consist of virgin polyvinyl chloride (PVC) resins, plasticizer, stabilizers, and such materials that, when compounded, will meet the physical requirements listed in the Table below.

Individual widths of PVC materials shall be fabricated into large sections by dielectric seaming into a single piece, or into a minimum number of panels, as required to fit the application. Lap joints with a minimum joint width of 0.75-in shall be used. The 6-in plastic pipe subsurface drains shall conform to the requirements of Section 605 and the filter material shall conform to the requirements of Section 649 for Geotextile for Roadbed Separator.

TABLE 1 – PHYSICAL REQUIREMENTS FOR GEOMEMBRANE

Property	Requirement	Test Method
Thickness, in. (Normal ± 5%)	0.03	ASTM D 1593
Specific Gravity, min.	1.23	ASTM D 792
Tensile Strength, psi, min. (Breaking Factor, lb/ft width, min.)	2,300 (835.3)	ASTM D 822
Elongation, at Break, % min.	350	ASTM D 882
Modulus at 100% Elongation, psi, min. (lb/ft width min.)	1,000 (363.2)	ASTM D 882
Tear Resistance, lb/ft, min, (lb, min.)	3630.28 (9.07)	ASTM D 1004
Low Temperature, °C	-28	ASTM D 1790
Dimensional Stability, % change, max.	3.5	ASTM D 1204 (100°C, 15 min.)
Water Extraction % loss change (max.)	0.35	ASTM D 3083
Volatility % loss, max.	0.70	ASTM D 1203
Resistance to Soil Burial, % loss (max.)	-5	ASTM D 3083
Tensile strength, Elongation at Break, Modulus at 100% Elongation %change, max	20	ASTM D 3083
Hydrostatic Resistance, psi, min.	85	ASTM D 751
Bonded Seam Strength (Factory Seam, breaking factor, lb/ft width)*	668	ASTM D 3082 Modified
*Factory bonded seam strength is the responsibility of the fabricator.		

A nominal 12 in (10 in minimum) of Drainage Aggregate conforming to Subsection 704.16 shall be placed over the PVC lining as shown on the Plans. The Drainage Aggregate shall be approved by the Engineer prior to placement. The Contractor may choose the equipment and manner with which to place the Drainage Aggregate over the liner, provided the Contractor satisfactorily demonstrates to the Engineer that both the equipment and manner used to place the chosen cover material over the lining will not have any detrimental effects on the liner.

Field seams will be made to seal factory fabricated panels of PVC together in the field. Seams shall be formed by lapping the edges of panels a minimum of 6 in. The contact surfaces of the panels shall be wiped clean to remove all dirt, dust, or other substance. Sufficient vinyl to vinyl

bodies solvent shall be applied to the contact surface in the seam area, and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out. Field seams shall have a strength of at least 85% of the specified sheet strength.

All curing compounds and coatings shall be completely removed from the joint area. Joining of the PVC to the back of panel shall be done with an adhesive. Unless otherwise shown on the Plans, the minimum width of concrete to PVC joint shall be 6 in. In addition, mechanical attachments may be necessary.

Any necessary repairs to the PVC shall be made with the lining material itself and cold applied vinyl to vinyl splicing adhesives. Patches should be cut so as to cover the area to be repaired by a minimum of 4 in in all directions. Patches should be cut with rounded corners. The splicing adhesive shall be applied to the contact surface between the patch and the lining, and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

4. GENERAL REQUIREMENTS. All appurtenances behind, in front of, under, mounted upon, or passing through the wall such as drainage structures, utilities, or other appurtenances shown on the Plans shall be accounted for in the stability design of the wall.

The mechanically stabilized earth retaining wall design shall follow the dimensions of the wall envelope shown on the Plans. The design shall locate the leveling pad at or below the 4 ft minimum wall embedment. Where a coping or barrier is utilized, the wall face panel shall extend up into the coping or barrier the minimum distance specified on the Plans. The top of the face panels may be level or sloped to meet the top of the wall. Cast-in-place concrete will not be an acceptable replacement for panel areas, except for minor grouting of pipe penetrations and leveling required for coping.

Where walls or wall sections intersect with an angle of 130° or less, a special vertical corner element panel shall cover the joint of the panels that abut the corner and allow for independent movement along the abutting panels.

The face panels shall be designed to accommodate differential settlement of 12 in in 100 ft between the spread footing and wall system. The design of the wall system must include a provision to accommodate settlement of this magnitude. The spacing between adjacent panels shall be designed to be 0.75 in. Where shown on the Plans, slip joints to accommodate excessive differential settlement shall be included.

5. SUBMITTALS. The Contractor shall submit a copy of the design computations and a set of fabrication Drawings and wall construction drawings for approval prior to beginning of construction.

(a) Working Drawings and design calculations shall be submitted to the Engineer for review and approval a minimum of 4 weeks before work is to begin and shall include the following:

(1) Complete design calculations substantiating that the proposed design satisfies the design parameters specified in the Contract Documents.

(2) Details of revisions or additions to drainage systems or other facilities required to accommodate the wall system.

(3) An elevation view of the wall, which shall include the elevation at the top of the wall at all horizontal and vertical break points and at least every 50 ft along the face of the wall, all steps in the leveling pads, the designation as to the type of panel, the length of soil reinforcing elements, the distance along the face of the wall to where changes in length of the soil reinforcing elements occur, and an indication of the final ground line and maximum calculated bearing pressures.

(4) A typical cross-section or cross-section showing the elevation relationship between ground conditions and proposed grades, including existing ground elevations that have been verified by the Contractor for each location involving construction wholly or partially in original ground.

(5) General notes pertaining to design criteria and wall construction.

(6) All other necessary details including reinforcement overlap detail.

(7) A listing of the summary of quantities on the elevation sheet for each wall.

(8) The details for diverting soil reinforcements around obstructions such as piles, catch basins, and other utilities.

(9) The details for connection between the concrete panel and the soil reinforcements.

(10) Other information required in the Contract Documents or requested by the Engineer.

(b) Fabrication Drawings shall show all dimensions necessary to construct the element, all reinforcing steel in the element, the location of soil reinforcing connection devices embedded in the panels, and an indication of the architectural treatment.

(c) The Contractor shall submit, for review by the Engineer prior to construction, wall design calculations, signed and sealed by a Professional Engineer directly employed by the wall system supplier. The Contractor shall not start work on any earth retaining system for which Working Drawings are required until the Engineer has approved such drawings.

Approval of the Contractor's Working Drawings shall not relieve the Contractor of any responsibility under the Contract for the successful completion of the work.

6. CONSTRUCTION REQUIREMENTS.

(a) Manufacturer's Representative. The Contractor shall make the necessary arrangements with the wall supplier to have a technical representative on the project to supervise the initial placement of the mechanically stabilized earth retaining wall system. The technical representative shall also be required to be on-site any time during wall installation as requested by the Engineer. The representative shall be available for a minimum of 20 working days.

(b) Wall Excavation. Common excavation shall be in accordance with the requirements of specifications for embankment excavation and in reasonably close conformity with the limits shown on the Plans.

(c) Foundation Preparation. The foundation for the structure shall be graded level for a width equal to or exceeding the length of the soil reinforcements, or as shown on the Plans. The Contractor shall proof roll the foundation using a minimum 5-ton, self-propelled vibratory roller to compact soils disturbed by excavation. Areas exhibiting excess weaving or soft, unsuitable soils should be excavated and replaced with compacted granular fill. Wet foundation soils should be proof rolled without vibration. Any foundation soils found to be unsuitable shall be removed and replaced as directed by the Engineer.

At each panel foundation level, an unreinforced concrete leveling pad shall be provided as shown on the Plans. The leveling pad shall have nominal dimensions of 6 in thickness and 12 in width and shall be cast using minimum 2000 psi 28 calendar day compressive strength concrete. The leveling pad shall be cast to the design elevations as shown on the Plans. Allowable elevation tolerances are + 0.12 in and - 0.24 in from the design elevation. Prior to placement of the leveling pad, the Agency's Geotechnical Engineer or designated representative shall inspect the foundation soils to evaluate the suitability of the bearing soils.

Leveling pads shall be allowed to cure a minimum of 24 hours before wall panels are erected on them.

(d) Wall Erection. Precast concrete panels shall be placed vertically with the aid of a light crane or other construction equipment capable of handling the anticipate loads. For erection, panels shall be handled by means of lifting devices set into the upper edge of the panels. Panels shall be placed in successive horizontal lifts in the sequence shown on the Plans as backfill placement proceeds.

As the backfill material is placed behind the panels, the panels shall be maintained in a vertical position by means of temporary wooden wedges placed in the joint at the junction of the two adjacent panels on the external side of the wall. External bracing is required for the initial lift. Vertical tolerance (plumbness) and horizontal alignment tolerances shall not exceed 0.79 in. The allowable offset in any panel joint shall be 0.79 in. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed 0.50 in per 10 ft of wall height.

(e) Placement of Reinforcements. Prior to the first layer of reinforcements, backfill shall be placed and compacted in accordance with part (f) of this Subsection.

Soil reinforcements shall be placed normal to the face of the wall, unless otherwise shown on the Plans or directed by the Engineer.

If skewing of the soil reinforcements is required due to obstructions in the reinforced fill, or in other cases justified by calculation, the maximum skew angle shall not exceed 15 degrees from the normal position, except in case of acute corners where redundant reinforcements are used, or in other cases justified by calculation.

(f) Backfill Placement. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing panels. Any wall materials which become damaged or disturbed during backfill placement shall be corrected or removed and replaced at the Contractor's expense, as directed by the Engineer.

No backfill shall be placed until test results from a qualified independent testing laboratory have been submitted for the proposed material. Test results shall demonstrate conformance with the backfill friction angle requirements included in these provisions (if friction angle greater than 34° is being proposed) and meet the requirements for Select Granular Backfill.

Backfill shall be compacted to 95 percent of the maximum density as determined in accordance with AASHTO T 99, Method C or D (with oversize correction).

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniform and acceptable throughout the entire lift.

The optimum moisture content shall be determined in accordance with AASHTO T 99, Method C or D (with oversize correction).

The frequency of sampling of Select Granular Backfill material, necessary to assure gradation control throughout construction, shall be as directed by the Engineer. If 30 percent or more of the Select Granular Backfill material is greater than 0.75-in in size, AASHTO T 99 is not applicable. For such material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material, as determined by ASTM D 4253 and D 4254 or a method specification (based on a test compaction section) which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed 10 in, regardless of the vertical spacing between the reinforced soil layers. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density. Prior to placement of the soil reinforcement elements, the backfill elevation, after compaction, shall be level with or slightly above the attachment device elevation. A maximum difference between the attachment device elevation and compacted backfill lift should be level or up to 0.6 in above when measured approximately 12 in behind the back face of the panels to the free end of the soil reinforcements, unless otherwise shown on the Plans.

Compaction within 3 feet of the back face of the panels shall be achieved by a minimum of three passes of a lightweight mechanical tamper, roller or vibratory system. The specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used, but no soil density tests need be taken within this area. Care shall be exercised in the compaction process to avoid misalignment of the panels or damage to the attachment devices. Heavy compaction equipment shall not be used to compact backfill within 3 feet of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

(g) Horizontal and Vertical Control. Immediately following the erection of the mechanically stabilized earth retaining wall system and prior to the construction of the bridge abutments, the Contractor shall establish horizontal and vertical survey points at three locations across the top and at mid-elevation on the wall to monitor future movements. These points shall be tied into a minimum of two control markers that are sufficiently removed from the wall so as not to be influenced by wall movement. The control shall be located to allow additional measurements to be made after all construction is complete. A plan with the locations of all survey points and ties, along with distances and elevations recorded to the nearest 0.001 ft, shall be provided to the Engineer within 48 hours of the completion of the mechanically stabilized earth retaining wall system.

7. ACCEPTANCE REQUIREMENTS.

(a) Backfill. Foundation and backfill material shall be compacted in accordance with the manufacturer's recommendations and at a minimum to not less than 95% of the material's maximum dry density as determined by AASHTO T 99, Method C. Field density determination will be made in accordance with AASHTO T 310, Nuclear Method. Moisture and density shall be sampled every 500 CY and a gradation every 3000 CY placed, or at the direction of the Resident Engineer.

(b) Concrete. Concrete will be sampled in accordance with AASHTO T 141; tested for slump in accordance with AASHTO T119, for air content in accordance with AASHTO T 152, and for compressive strength in accordance with AASHTO T 23. The concrete will be tested according to 540.05(b).

8. METHOD OF MEASUREMENT. The quantity of Special Provision (Mechanically Stabilized Earth Retaining Wall) to be measured for payment will be the number of square feet of wall surface area in the complete and accepted work, measured as the sum of the areas of panels actually erected in the wall.

9. BASIS OF PAYMENT. The accepted quantity of Special Provision (Mechanically Stabilized Earth Retaining Wall) will be paid for at the Contract unit price per square foot. Payment shall include full compensation for designing, detailing, fabricating, furnishing, transporting, erecting, and monitoring the mechanically stabilized earth retaining wall system; for preparing all required submittals; for materials required, including but not limited to, select granular backfill, PVC pipe, drainage aggregate, concrete facing panels, soil reinforcements, attachment devices, fasteners, bearing blocks, shims, joint materials, geomembrane, and geotextiles; for preparing the wall foundation, proof rolling foundation soils, and constructing the concrete leveling pad; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for excavation and backfill, which is in addition to work performed for Select Granular Backfill during mechanically stabilized earth retaining wall construction, and for cast-in-place or precast coping and other appurtenances, will be made under the appropriate Contract items.

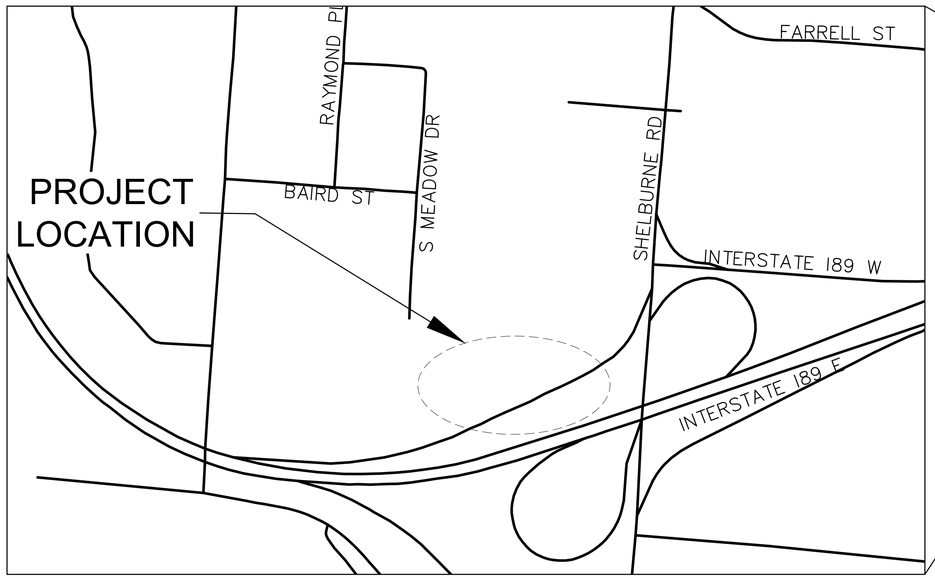
Payment will be made under:

Pay Item	Pay Unit
900.670 Special Provision (Mechanically Stabilized Earth Retaining Wall)	Square Foot

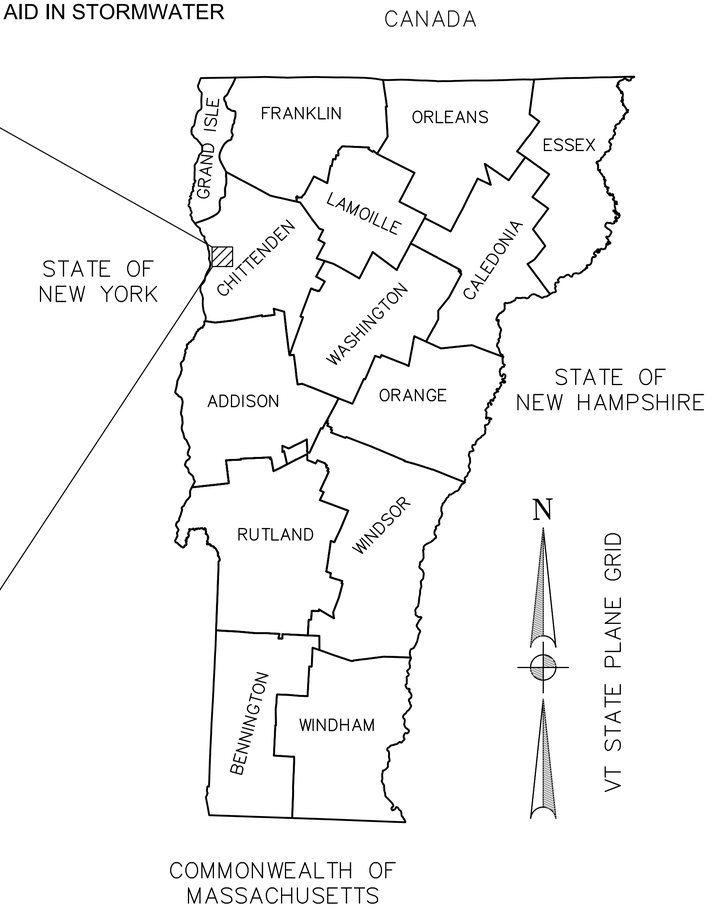
POMERLEAU AND CHITTENDEN HOUSING TRUST
3-ACRE STORMWATER MANAGEMENT PROJECT

PROJECT LOCATION: THE PROPOSED PROJECT IS LOCATED TO THE REAR OF 84-90 SOUTH MEADOW DRIVE, BETWEEN THE PRICE CHOPPER SUPERMARKET PLAZA AND POTASH BROOK IN BURLINGTON, VERMONT.

PROJECT DESCRIPTION: INSTALLATION OF NEW DRAINAGE INFRASTRUCTURE AND GRAVEL WETLAND PRACTICE TO AID IN STORMWATER TREATMENT.



LOCUS PLAN
SCALE: 1" = 75'



OWNERS:

POMERLEAU REAL ESTATE
29 COLLEGE STREET, BURLINGTON, VERMONT 05401

CHITTENDEN HOUSING TRUST
88 KING STREET, BURLINGTON VERMONT 05401

ENGINEER OF RECORD:

HOYLE, TANNER & ASSOCIATES, INC
125 COLLEGE STREET, BURLINGTON, VERMONT 05401

SURVEYOR:

VERMONT SURVEY AND ENGINEERING, INC
79 RIVER STREET, #201, MONTPELIER, VERMONT 05602

JANUARY 5, 2024

PREPARED BY:

HOYLE TANNER
125 COLLEGE STREET - 4TH FLOOR
BURLINGTON, VERMONT 05401

WATERSHED CONSULTING
208 FLYNN AVE - #2H
BURLINGTON, VERMONT 05401

100% DESIGN SUBMITTAL

GENERAL NOTES:

1. THESE GENERAL NOTES SHALL APPLY TO ALL DRAWINGS IN THIS CONTRACT AND TO THE WORK THEY CONVEY.

2. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION (VTRANS) STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AND ITS LATEST REVISIONS.

3. LOCATION OF EXISTING BURIED UTILITIES, STRUCTURES, PIPING AND OTHER ITEMS AS SHOWN ON THESE DRAWINGS HAVE BEEN TAKEN FROM AS–BUILT RECORD DRAWINGS OBTAINED FROM THE CITY OF BURLINGTON AND FROM THE SURVEY COMPLETED BY VERMONT SURVEY AND ENGINEERING ON 12/9/2021. LOCATION OF THESE ITEMS SHALL BE CONSIDERED APPROXIMATE AND THE CONTRACTOR SHALL DIG TEST PITS AS REQUIRED TO VERIFY LOCATIONS. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY EXCAVATION. THERE MAY BE OTHER BELOW–GRADE STRUCTURES NOT SHOWN WHICH WILL REQUIRE DEMOLITION AND/OR RELOCATING IN ORDER TO COMPLETE THE WORK OF THIS CONTRACT. THEREFORE, THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING STRUCTURES, AND OTHER FEATURES AFFECTING THE WORK PRIOR TO CONSTRUCTION "PAID AS ITEM 204.22 TRENCH EXCAVATION OF EARTH, EXPLORATORY (NABI)". CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SUPPORT OF ALL EXISTING UTILITIES LOCATED WITHIN THE LIMITS OF WORK.

4. CONTRACTOR SHALL REMOVE OR ABANDON ALL EXISTING STRUCTURES, PIPING, AND OTHER ITEMS NECESSARY FOR THE CONSTRUCTION OF THE PROJECT AS SHOWN ON THE CONTRACT DRAWINGS. PAYMENT FOR REMOVAL OR ABANDONMENT OF EXISTING STRUCTURES, PIPING, AND OTHER ITEMS IS CONSIDERED INCIDENTAL TO THE WORK AND THERE SHALL BE NO ADDITIONAL PAYMENT.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS FOR ANCHORING, SUPPORTING, AND/OR RELOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. ALL COSTS SHALL BE INCLUDED IN THE UNIT PRICES BID. IN THE CASE OF DAMAGE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ALL REPAIRS.

6. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF THE EXISTING FEATURES AND STRUCTURES WITHIN AND ADJACENT TO THE WORK. IN THE CASE OF DAMAGE, THE REPAIRS OR REPLACEMENT SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE AS APPROVED BY THE ENGINEER. THIS INCLUDES, BUT IS NOT LIMITED TO, THE REPLACEMENT/REPAIR OF EXISTING SIDEWALKS, PAVEMENT, CURBING, AND LANDSCAPING.

7. ALL WORK SHALL CONFORM TO ALL FEDERAL, STATE, AND LOCAL CODES, REGULATIONS AND STANDARDS. THE MORE STRINGENT SHALL APPLY.

8. ANY DISCREPANCY BETWEEN THESE DRAWINGS AND EXISTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING BEFORE PROCEEDING WITH THE WORK.

9. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SITE SAFETY SHALL SOLELY BE THE CONTRACTOR'S RESPONSIBILITY.

10. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL WASTE BUILDING MATERIAL, CONCRETE, MASONRY, TREES, SHRUBS, DEBRIS, EXCESS EXCAVATED MATERIAL AND OTHER MATERIALS NECESSARY FOR THE SATISFACTORY COMPLETION OF THE CONTRACT WORK AND AS REQUIRED BY THE OWNER. CONSTRUCTION DEBRIS SHALL BE DISPOSED OF IN STRICT ACCORDANCE WITH VERMONT LAW. ALL TREE STUMPS SHALL BE DISPOSED OF AT AN APPROVED OFFSITE LOCATION ACCOMPANIED BY A STATE–ISSUED INSIGNIFICANT WASTE MANAGEMENT EVENT APPROVAL. THE OWNER SHALL MAINTAIN OWNERSHIP OF ALL EXCESS TOPSOIL AND CLEAN EXCAVATED MATERIALS. ALL COSTS ASSOCIATED WITH THE REMOVAL AND DISPOSAL OF CONSTRUCTION DEBRIS INCLUDING HAULING SHALL BE INCIDENTAL TO THE WORK AND SHALL NOT BE PAID FOR SEPARATELY.

11. ALL AREAS DISTURBED BY THE CONTRACTOR DETERMINED NOT TO BE WITHIN THE LIMITS OF THE PROJECT, OR DETERMINED TO BE EXCESSIVE DISTURBANCE OF THE AREA FOR THE PROPOSED WORK, SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.

12. BASED ON THE ANTICIPATED AREA OF DISTURBANCE (LESS THAN 1 ACRE) THE PROJECT IS CONSIDERED NON–JURISDICTIONAL FOR THE CONSTRUCTION GENERAL PERMIT. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING MEASURES FOR EROSION PREVENTION AND SEDIMENTATION CONTROL (EPSC) IN ACCORDANCE WITH THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S "LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL".

13. ALL DISTURBED AREAS SHALL BE LANDSCAPED AS REQUIRED BY THE ENGINEER/OWNER AND THE VERMONT STORMWATER MANAGEMENT MANUAL, VERMONT AGENCY OF NATURAL RESOURCES, LATEST EDITION.

14. ALL DRAINAGE OUTLETS SHALL BE LOCATED AND CONTRACTOR SHALL BE RESPONSIBLE FOR ALL APPROPRIATE EROSION PREVENTION AND SEDIMENT CONTROL MEASURES INSTALLED AS REQUIRED PRIOR TO CONSTRUCTION. CONTRACTOR SHALL SUBMIT AN EROSION PREVENTION AND SEDIMENTATION CONTROL PLAN AS REQUIRED PRIOR TO BEGINNING OF WORK. ALL DEWATERING AND OPERATIONS SHALL CONFORM TO ALL APPROPRIATE AGENCY REGULATIONS.

15. ALL STORMWATER TREATMENT PRACTICES AND PROCEDURES ARE REFERENCED FROM THE VERMONT STORMWATER MANAGEMENT MANUAL, ENVIRONMENTAL PROTECTION RULE CHAPTER 36, STORMWATER TREATMENT STANDARDS, BY THE VERMONT AGENCY OF NATURAL RESOURCES, DATED JULY 1, 2017.

16. THE CONTRACTOR SHALL PROVIDE FLOW DIVERSIONS TO EXISTING OUTFALLS DURING CONSTRUCTION, UNTIL SUCH TIME AS THE COLLECTION SYSTEM OR INFILTRATION CHAMBER IS COMPLETE AND READY TO ACCEPT FLOW. THERE WILL BE NO SEPARATE PAYMENT FOR BYPASS PUMPING AND DIVERSION OF FLOWS.

17. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL, ALL BUOYANCY CALCULATIONS FOR UNDERGROUND STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE NEED AND SIZE OF ANY ANCHORS OR OTHER MEANS OF ANCHORING TO PREVENT FLOATATION AND SHALL PROVIDE APPROVED ANCHORS IF REQUIRED. THE CONTRACTOR SHALL DESIGN AND PROVIDE THE REINFORCING STEEL REQUIRED IN CONCRETE ANCHORS. THE CONTRACTOR SHALL DESIGN THE STRUCTURAL CONNECTION BETWEEN STRUCTURES AND ANCHORS TO PREVENT FLOATATION. SHOP DRAWINGS SHALL BE STAMPED BY A VERMONT REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.

18. ALL WORK BEING PERFORMED SHALL BE WITHIN LIMITS IDENTIFIED IN THE PLANS. WORK OUTSIDE OF THE LIMITS MUST BE APPROVED BY PROPERTY OWNERS AND PERMITS AMENDED AS NECESSARY. IF ADDITIONAL WORK IS REQUIRED OUTSIDE OF THE PAY LIMITS SHOWN ON THE PLANS TO COMPLETE THIS PROJECT, THIS WORK WILL NOT BE PAID SEPARATELY BUT WILL BE CONSIDERED INCIDENTAL TO ALL OTHER PAY ITEMS. THIS WORK INCLUDES BUT IS NOT LIMITED TO EXCAVATION, BACKFILL, UTILITIES, SUBBASE, PAVEMENT, CURB, SIDEWALK, TURF ESTABLISHMENT, AND LANDSCAPING.

19. CONTRACTOR SHALL TAKE MEASURES TO PREVENT THE SPREAD OF INVASIVE SPECIES, INCLUDING SELECTING WEED–FREE MATERIALS TO USE ONSITE.

UTILITY COORDINATION NOTES:

1. THE CONTRACTOR SHALL PROPERLY SAFEGUARD ALL EXISTING UTILITIES AND SHALL RESTORE AND REPAIR ANY SUCH ITEMS OR FACILITIES DAMAGED BY HIS/HER OPERATIONS. RESTORATION AND REPAIR OF DAMAGED ITEMS SHALL BE DONE SOLELY AT THE CONTRACTOR'S OWN EXPENSE.

2. SHOULD THE CONTRACTOR DAMAGE ANY UTILITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OF THE UTILITY AND THE ENGINEER. ANY REPAIRS OR MODIFICATIONS TO EXISTING UTILITIES SHALL BE MADE WITH THE APPROVAL OF THE UTILITY OWNER AND SHALL BE INSPECTED BY THE UTILITY OWNER PRIOR TO BACKFILL.

3. CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES TO RELOCATE UTILITIES CONFLICTING WITH THE PROPOSED WORK. THE UTILITIES ANTICIPATED IN THE AREA INCLUDE, BUT ARE NOT LIMITED TO GREEN MOUNTAIN POWER, CHAMPLAIN WATER DISTRICT, SOUTH BURLINGTON SEWER, AND VERMONT GAS SYSTEMS. CONTACT INFORMATION PROVIDED FOR CONTRACTOR'S CONVENIENCE AND ACCURACY CANNOT BE GUARANTEED.

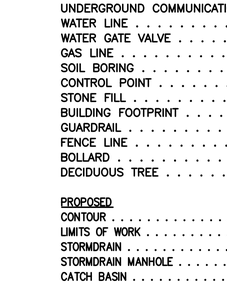
VERMONT GAS SYSTEMS:
NAME: MATT ANDERSON
PHONE: 802–951–0327

CHAMPLAIN WATER DISTRICT:
NAME: MAXWELL MURRAY
EMAIL: MAX.MURRAY@CHAMPLAINWATER.ORG
PHONE: 802–864–7454

LEGEND

EXISTING
CONTOUR
APPROXIMATE PROPERTY LINE
APPROXIMATE ROW LINE
EDGE OF PAVEMENT
CATCH BASIN
MANHOLE
STORM DRAIN LINE
SANITARY SEWER LINE
UNDERGROUND COMMUNICATIONS
WATER LINE
WATER GATE VALVE
GAS LINE
SOIL BORING
CONTROL POINT
STONE FILL
BUILDING FOOTPRINT
GUARDRAIL
FENCE LINE
BOLLARD
DECIDUOUS TREE

PROPOSED
CONTOUR
LIMITS OF WORK
STORMDRAIN
STORMDRAIN MANHOLE
CATCH BASIN



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CALL TOLL FREE
1-888-DIG-SAFE

SURVEY DATA

VERMONT SURVEY AND ENGINEERING, INC
79 RIVER STREET, #201
MONTPELIER, VERMONT, 05602

HORIZONTAL DATUM:

STATE OF VERMONT
NAD 83 (2011) SPC (4400 VT) sFT

VERTICAL DATUM:

STATE OF VERMONT
NAVD 88 FT

100% DESIGN SUBMITTAL

DRAWING INDEX

VTRANS REFERENCE ITEMS

VTrans Pay Item #	Item Description
Construction	
Civil	
201.10	Clearing and Grubbing, Including Individual Trees and Stumps
203.15	Common Excavation
203.16	Solid Rock Excavation
203.20	Muck Excavation
203.30	Earth Borrow
203.31	Sand Borrow
204.20	Trench Excavation of Earth
204.22	Trench Excavation of Earth, Exploratory (N.A.B.I.)
301.15	Subbase of gravel
301.26	Subbase of crushed gravel, fine graded
406.25	Marshall Bituminous Concrete Pavement
541.25	Concrete Footer, Class B
601.2620	24" CPEP Pipe
601.2630	36" CPEP Pipe
604.21	Precast Reinforced Concrete Manhole with Cast Iron Cover - 6' Diameter
605.10	Underdrain Pipe, 6 Inch PVC Perforated
605.11	Underdrain Pipe, 8 Inch PVC Perforated
605.11	Underdrain Pipe, 8 Inch PVC Solid
613.10	Stone Fill, Type I
613.11	Stone Fill, Type II
616.28	Cast-In-Place Concrete Curb, Type B
618.10	Portland Cement Concrete Sidewalk, 5 inch
620.11	Chain-Link Fence, 4 Feet
620.15	6' Wide Access Gate
620.20	Removal and Reset Fence
622.10	Insulation Board
629.54	Crushed Stone Bedding
641.11	Traffic Control All-Inclusive
649.31	Geotextile Under Stone Fill
649.41	Geotextile for Underdrain Trench Lining
653.476	Silt Fence, Type II
651.15	Seed
651.35	Topsoil
653.01	EPSC Plan
653.03	Maintenance of EPSC (N.A.B.I.)
653.12	Straw Mulch
653.20	Rolled Erosion Control Product, Type I
653.45	Filter Bag
653.50	Barrier Fence
900.620	Special Provision - 24" HDPE Risers
900.620	Special Provision - 24" Flared End Section
900.620	Special Provision - 36" Flared End Section
900.620	Special Provision - Anti-Seep Collars
900.620	Special Provision - Stormwater Separator - 8' Diameter
900.620	Special Provision - Stormwater Separator - 10' Diameter
900.620	Special Provision - Precast Concrete Catch Basin - 6' Diameter w/ weir
900.620	Special Provision - Precast Concrete Outlet Structure - 7'x11'
900.640	Special Provision - Magnetic Locating Tape
900.645	Special Provision - Gravel Wetland Facility
Structural	
Retaining Wall - West	
204.25	Structure Excavation
204.30	Granular Backfill for Structures
507.11	Reinforcing Steel, Level I
514.10	Water Repellant, Silane
541.30	Concrete, Class C
613.11	Stone Fill, Type II
900.608	Special Provision - Performance-Based Concrete, Class PCS
MSE Wall - North	
204.30	Granular Backfill for Structures
613.11	Stone Fill, Type II
620.11	Chain-Link Fence, 4 Feet
900.670	Special Provision - Mechanically Stabilized Earth Retaining Wall
Berm Wall	
507.11	Reinforcing Steel, Level I
514.10	Water Repellant, Silane
541.30	Concrete, Class C
635.11	Mobilization/Demobilization (5%)

REV.	REVISION DESCRIPTION	DATE

DESIGNED BY APS
DRAWN BY TGB
CHECKED BY KDW

HOYLE TANNER
125 College St. 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024
SCALE: AS SHOWN

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

GENERAL NOTES AND DRAWING INDEX
G0.1

PROJECT NO. 120006
SHEET 2 OF 16

STOCKPILED MATERIAL NOTES:

1. ALL STOCKPILES SHALL BE COVERED PRIOR TO INCLEMENT WEATHER, GRADED TO SHED WATER, AND COVERED AT THE END OF EACH WORKDAY WITH A MINIMUM OF 20-MIL BLACK POLYETHYLENE. THE COVER SHALL BE WEIGHTED AND WILL BE MAINTAINED THROUGHOUT THE STOCKPILE PERIOD.

2. STOCKPILE AREAS WILL BE GRADED SUCH THAT STORMWATER IS DIVERTED FROM STOCKPILED MATERIALS. SILT FENCE WILL SURROUND ALL STOCKPILES. SLOPES ON STOCKPILES SHALL NOT BE STEEPER THAN 1:1.

LAYOUT OF WORK NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT AND CONSTRUCTING THE WORK TO THE LINES AND GRADES INDICATED AND SPECIFIED. ALL LAYOUT AND SURVEY WORK SHALL BE DONE BY A COMPETENT AGENT OR EMPLOYEE OF THE CONTRACTOR AND SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL DO ALL LAYOUTS FROM ESTABLISHED POINTS TO PROPERLY COMPLETE THE CONTRACT WORK.

2. THE ENGINEER WILL FURNISH TO THE CONTRACTOR BASIC SURVEYS NECESSARY FOR THE LAYOUT OF THE WORK. THESE SURVEYS SHALL ESTABLISH CERTAIN REFERENCE POINTS AND BENCHMARKS IN THE IMMEDIATE VICINITY OF THE WORK AREAS. THE CONTRACTOR SHALL LAYOUT ALL ADDITIONAL LINES AND GRADES AND OTHERWISE DO ALL LAYOUT AND MEASUREMENT NECESSARY FOR THE PROPER COMPLETION OF THE WORK.

3. THE CONTRACTOR SHALL FURNISH ASSISTANCE TO THE ENGINEER AS REQUESTED TO CHECK THE LAYOUT OR OTHERWISE CONTROL THE WORK. SUCH ASSISTANCE SHALL BE UNDERSTOOD TO INCLUDE THE PROVISION OF SUITABLE MANPOWER TO ASSIST THE ENGINEER IN TAPING MEASUREMENTS, HOLDING A SURVEY ROD FOR CHECKING GRADES, AND THE LIKE.

4. THE ENGINEER RESERVES THE RIGHT TO INSPECT OR CHECK ANY OF THIS WORK, AND THE CONTRACTOR SHALL NOT CLAIM ADDED COMPENSATION FOR ANY DELAY OCCASIONED BY THE ENGINEER EXERCISING THIS RIGHT, NOR FOR ANY CORRECTIVE WORK WHICH IS REQUIRED AS A RESULT OF THE ENGINEER'S INSPECTIONS.

TOPSOIL AND SEEDING NOTES:

1. ALL AREAS OF EXPOSED SOIL SHALL GET TOPSOIL AND SEED. ROLLED EROSION CONTROL PRODUCT SHALL BE USED IN AREAS WITH GREATER THAN 3:1 SLOPES. NO ADDITIONAL PAYMENT WILL BE MADE FOR REPAIRING EXPOSED SOIL OUTSIDE THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS.

CONSTRUCTION GUIDANCE

SEED MIX: VERMONT CONSERVATION SHADE SEED MIX SHALL NOT BE USED WITHIN ANY WATERS OF THE STATE OF VERMONT.

SEED MIX: VERMONT CONSERVATION SHADE SEED MIX SHALL BE USED IN ALL AREAS DISTURBED DURING CONSTRUCTION.

SEED MIX: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.

STRAW MULCH: TO BE PLACED AT CREST OF SLOPE AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER. FOR SLOPES STEEPER THAN 3:1, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

TOPSOIL: MIN. 4" TOPSOIL WITH SEED WHERE TURF IS TO BE RE-ESTABLISHED, OR AS DIRECTED BY THE ENGINEER.

TURF ESTABLISHMENT: PLACING SEED AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

GRAVEL WETLAND NOTES:

1. WETLAND SOIL:

1.A. THE GRAVEL WETLAND SOIL LAYER ENSURES THAT RUNOFF DOES NOT INFILTRATE THROUGH THE SOIL TO THE SUBSURFACE GRAVEL WETLAND TREATMENT MEDIA. RUNOFF SHOULD PREDOMINANTLY ENTER THE GRAVEL WETLAND TREATMENT MEDIA THROUGH THE PERFORATED RISER PIPE(S) AND SECONDARY STONE INLET. THE SOIL LAYER SHALL HAVE A MINIMUM THICKNESS OF 8 INCHES AND SHALL BE LEVEL, CONSTRUCTED WITH A SURFACE SLOPE OF ZERO.

1.A.1. THE SOIL MEDIA SHALL HAVE LOW SATURATED HYDRAULIC CONDUCTIVITY (KSAT) MEASURED BETWEEN 0.1-0.01 FT/DAY OR WITH A SOIL TEXTURE CONFORMING TO HYDROLOGIC SOIL GROUP D.

1.A.2. SOIL PH SHOULD BE BETWEEN 6.0 AND 7.0.

1.A.3. UTILIZATION OF ONSITE MATERIAL TO MANUFACTURE THE SOIL LAYER IS ENCOURAGED PROVIDED THE SOIL WILL MEET SPECIFICATIONS, EITHER AS A STANDALONE PRODUCT OR BY AMENDMENT WITH OUTSIDE MATERIAL.

1.A.4. IN ALL CASES, THE GRAVEL WETLAND SOIL SHALL BE TESTED IN ACCORDANCE WITH THE P-TESTING PROCEDURE DESCRIBED BELOW.

1.B. P TESTING IS REQUIRED FOR UPPER MEDIAL LAYER OF BIORETENTION SYSTEMS AND GRAVEL WETLAND SOIL LAYERS. FINAL MIXES MUST HAVE A PHOSPHORUS SATURATION RATIO (PSR) LESS THAN OR EQUAL TO 0.10. PSR IS TO BE DETERMINED USING THE FOLLOWING PROTOCOL:

1.B.1. SAMPLES ARE TO BE AIR DRIED AND SIEVED THROUGH 2MM PRIOR TO TESTING

1.B.2. AIR-DRIED, SIEVED SOIL SAMPLES ARE TO THEN BE EXTRACTED WITH THE MEHLICH-3 SOLUTION (0.2 M CH3COOH + 0.25 M NH4NO3 + 0.015 M NH4F + 0.013 M HNO3 + 0.001 M EDTA) BY SHAKING A SOIL-SOLUTION SUSPENSION FOR 5 MINUTES AT A 1:10 RATIO (SOIL MASS IN GRAMS: SOLUTION VOLUME IN ML), FOLLOWED BY FILTERING TO REMOVE PARTICLES (PORE SIZE OF 2 UM IS RECOMMENDED, MAX PORE SIZE = 8 UM).

1.B.3. EXTRACTS FROM THE MEHLICH-3 PROCEDURE ARE TO BE ANALYZED FOR P, FE, AND AL BY ICP-OES.

1.B.4. THE PHOSPHORUS SATURATION RATIO (PSR) IS THEN CALCULATED AS FOLLOWS: WHERE PM3 = MEHLICH-3 P IN MG P PER KG DRY SOIL; FEM3 = MEHLICH-3 FE IN MG FE PER KG DRY SOIL; ALM3 = MEHLICH-3 AL IN MG AL PER KG DRY SOIL

$$PSR = \frac{\left(\frac{P_{M3}}{31}\right)}{\left(\frac{Fe_{M3}}{56}\right)+\left(\frac{Al_{M3}}{27}\right)}$$

2. WETLAND SEED:

2.A. SEED MIX SHALL BE PURE LIVE SEED AND SHALL BE A WETLAND MIX COMPRISED OF NATIVE VERMONT AND NEW ENGLAND SPECIES. SUCH SEED MIX SHALL BE AS FOLLOWS:

2.A.1. AT BOTTOM OF GRAVEL WETLAND CELLS AND ALONG SIDE SLOPES UP TO 2 FEET ABOVE BOTTOM OF BASIN: MARSH, SWAMP & BOG SEED MIX, AS MANUFACTURED BY VERMONT WETLAND PLANT SUPPLY, APPLICATION RATE OF 18 LBS PER ACRE.

2.A.2. SIDE SLOPES ABOVE 2 FEET ABOVE BOTTOM OF BASIN TO GRAVEL WETLAND FACILITY EXTENTS SHOWN ON DRAWINGS: VERMONT WET MEADOW AND DETENTION BASIN MIX, AS MANUFACTURED BY VERMONT WETLAND PLANT SUPPLY, APPLICATION RATE OF 35 LBS. PER ACRE.

2.A.3. SIDE SLOPES ABOVE THE GRAVEL WETLAND FACILITY EXTENTS SHOWN ON DRAWINGS SHALL BE SEEDED WITH VERMONT CONSERVATION MIX.

100% DESIGN SUBMITTAL

OSHA & VOSHA REQUIREMENT NOTES:

1. THE CONTRACTOR IS OBLIGATED TO MEET ALL OSHA AND VOSHA REQUIREMENTS FOR SAFE TRENCHING AND EXCAVATION PROCEDURES. THE CONTRACTOR IS HEREBY REFERRED TO THE LATEST REVISED OSHA STANDARDS AS PUBLISHED IN TITLE 29 OF THE CODE OF FEDERAL REGULATIONS (29 CFR), PART 1926 AND AS PUBLISHED IN THE FEDERAL REGISTER ON TUESDAY, OCTOBER 31, 1989. IN ADDITION, THE CONTRACTOR IS HEREBY REFERRED TO THE LATEST REVISED VOSHA STANDARDS AS PUBLISHED IN VERMONT STATUTE TITLE 21 - LABOR. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLIANCE WITH THE LATEST OSHA AND VOSHA STANDARDS FOR WORK ON THIS PROJECT.

TRAFFIC CONTROL NOTES:

1. CONTRACTOR SHALL ESTABLISH AND MAINTAIN TRAFFIC CONTROL MEASURES TO PROTECT THE TRAVELING PUBLIC (INCLUDING BICYCLISTS AND PEDESTRIANS), CONSTRUCTION OPERATIONS, AND ACCESS TO PROJECT SITE.

2. TRAFFIC CONTROL MEASURES SHALL CONFORM TO VTRANS SPECIFICATION SECTION 641 AND LATEST EDITION OF MUTCD.

3. CONTRACTOR SHALL PREPARE AND SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL PRIOR TO COMMENCING WORK. TRAFFIC CONTROL PLAN SHALL BE PAID FOR UNDER PAY ITEM 641.11.

4. CARE SHOULD BE GIVEN TO MINIMIZE THE IMPACTS TO TRAFFIC FLOW DURING PEAK HOURS DUE TO CONSTRUCTION OF THE PROJECT.

5. CARE SHOULD BE GIVEN TO RESIDENTS AND BUSINESSES IMPACTED BY THE PROJECT AND ACCOMMODATIONS MUST BE MADE TO MAINTAIN ACCESS TO SUCH PLACES.

6. FLAGGERS AND UNIFORM TRAFFIC OFFICERS: ONLY CERTIFIED FLAGGERS WILL BE ALLOWED ON THIS PROJECT. FLAGGERS AND UNIFORM TRAFFIC OFFICERS WILL BE REQUIRED TO WEAR SAFETY APPAREL MEETING THE REQUIREMENTS OF THE AMERICAN NATIONAL STANDARD OF HIGH-VISIBILITY APPAREL.

CONCRETE NOTES:

1. LEVEL AND SLOPED WALL CONCRETE SHALL BE PERFORMANCE-BASED CONCRETE, CLASS PCS AND SHALL BE PAID FOR UNDER ITEM 900.608 "SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCS)".

2. BERM WALL CONCRETE SHALL BE ITEM 541.30, "CONCRETE CLASS C".

3. ITEM 514.10 "WATER REPELLENT, SILANE" SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES.

4. JOINTS AND SCORE MARKS IN THE CONCRETE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

5. ALL REINFORCING STEEL SHALL MEET THE REQUIREMENTS FOR AND BE PAID FOR AS ITEM 507.11 "REINFORCING STEEL, LEVEL I (BLACK)".

6. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED 1" UNLESS OTHERWISE NOTED.

SUBSTRUCTURES ON BEDROCK NOTES:

1. THE FOOTING FOR THE CAST-IN-PLACE RETAINING WALL WILL BE FOUNDED ON BEDROCK AND SHALL BE PLACED ON CLEAN COMPETENT ROCK. ALL LOOSE ROCK AND DEBRIS SHALL BE REMOVED.

2. ONCE THE CONTRACTOR HAS EXCAVATED FOR THE FOOTING, THE RESIDENT ENGINEER WILL CONTACT THE PROJECT MANAGER TO DETERMINE IF THE BEDROCK IS COMPETENT. FIVE (5) WORKING DAYS FROM NOTIFICATION WILL BE ALLOWED TO MAKE THE INSPECTION AND THE DETERMINATION FOR THE COMPETENCY OF THE BEDROCK.

3. ANY BEDROCK THAT NEEDS TO BE REMOVED WILL BE PAID FOR WITH THE APPROPRIATE EXCAVATION ITEM INCLUDED IN THE CONTRACT. OVERBREAKAGE BEYOND THE AVERAGE MAXIMUM ALLOWANCE SPECIFIED IN 204.09(B) (1) AND THE CONCRETE USED TO FILL THE AREA OF ADDITIONAL OVERBREAKAGE WILL BE AT THE CONTRACTOR'S EXPENSE.

4. THE FOOTING HAS BEEN DESIGNED FOR THE FOOTING ELEVATIONS SHOWN ON THE PLANS. SUBFOOTINGS OF CONCRETE CLASS "C" SHALL BE USED IN AREAS WHERE THE BEDROCK IS MORE THAN 6 INCHES BELOW THE DESIGN BOTTOM OF FOOTING ELEVATIONS AND SHALL BE PAID FOR UNDER ITEM 541.30, "CONCRETE, CLASS C". AFTER THE BEDROCK HAS BEEN EXPOSED, ADJUSTMENT TO THE BOTTOM OF FOOTING ELEVATIONS MAY BE NECESSARY TO MINIMIZE THE BEDROCK REMOVAL AND/OR REDUCE THE AMOUNT OF SUBFOOTING CONCRETE. CONTACT THE PROJECT MANAGER FOR POSSIBLE REDESIGN IF THE BEDROCK PROFILES DIFFER FROM THOSE SHOWN ON THE PLANS. NO FURTHER WORK SHALL BE DONE ON THE FOOTINGS UNTIL A REPLY IS RECEIVED FROM THE ENGINEER. A TURN-AROUND TIME OF UP TO FIVE BUSINESS DAYS MAY BE EXPECTED.

MECHANICALLY STABILIZED EARTH RETAINING WALL NOTES:

1. THE CONTRACTOR SHALL DESIGN, DETAIL, AND CONSTRUCT A MECHANICALLY STABILIZED EARTH (MSE) WALL IN ACCORDANCE WITH THESE PLANS, THE SPECIAL PROVISIONS, AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND MANUFACTURER RECOMMENDATIONS. WHERE GUARDRAIL OR GUARDRAIL APPROACH SECTION ARE LOCATED WITHIN THE LIMITS OF THE MSE WALLS, THE MSE WALL SHALL BE DESIGNED TO RESIST TRAFFIC BARRIER LOADS.

2. WHERE GUARDRAIL APPROACH SECTIONS ARE LOCATED WITHIN THE LIMITS OF THE MSE WALLS, THE MSE WALL SHALL BE DESIGNED TO RESIST HORIZONTAL LOADS FOR POST AND BEAM BARRIERS AS SPECIFIED IN AASHTO SECTION 11.10.10.2. ALL TEMPORARY CONSTRUCTION LOADS IMPOSED ON THE MSE WALL SHALL BE INCLUDED IN THE DESIGN OF THE MSE WALL.

3. ALL LAYOUT DIMENSIONS ARE TO THE OUTSIDE FACE OF THE WALL.

4. FOR FOUNDATION SOILS AND NOMINAL BEARING RESISTANCE INFORMATION SEE GEOTECHNICAL ENGINEERING SERVICES REPORT FROM OWNER.

5. IN THE EVENT THAT BEDROCK IS ENCOUNTERED SHALLOWER THAT THE RECOMMENDED MINIMUM MSE WALL EMBEDMENT DEPTH, THE SELECT GRANULAR BACKFILL SHALL BEAR ON A 6 INCH THICK LEVELING LAYER OF CRUSHED STONE OVERLYING THE BEDROCK SURFACE.

6. GIVEN THE VARIABILITY IN THE BEDROCK DEPTH, THERE IS THE POSSIBILITY THAT BEDROCK COULD RISE ABOVE THE TOP OF THE LEVELING PAD WITHIN THE REINFORCED ZONE. WHERE BEDROCK REMOVAL IS REQUIRED FOR WALL INSTALLATION, BEDROCK REMOVAL LIMITS WILL BE APPROVED BY THE ENGINEER AND WILL BE CONSIDERED INCIDENTAL TO ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

7. THE PANELS SHALL HAVE A NOMINAL SIZE OF 4.5 FT WIDE AND 4.5 TALL, OR GREATER. NO ARCHITECTURAL FINISH IS REQUIRED. THE CONTRACTOR SHALL DETERMINE THE LEVELING PAD ELEVATIONS AND LENGTHS.

8. CONCRETE FOR THE CAST-IN-PLACE COPING AND LEVELING SHALL BE PERFORMANCE-BASED CONCRETE, CLASS PCS IN ACCORDANCE WITH ITEM 900.608, "SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE CLASS PCS)". REINFORCING STEEL SHALL BE LEVEL I, (BLACK) IN ACCORDANCE WITH SECTION 507. COSTS ASSOCIATED WITH FURNISHING AND INSTALLING REINFORCING STEEL AND CONCRETE FOR COPING AND LEVELING PADS WILL BE INCLUDED IN THE BID PRICE FOR ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

9. REINFORCING STEEL DOWELS EXTENDING FROM MSE WALL PANELS IN TO THE CAST-IN-PLACE COPING SHALL BE CAST INTEGRALLY WITH THE PANELS - DRILLING AND GROUTING OF REINFORCING DOWELS WILL NOT BE ALLOWED.

10. CONTRACTION JOINTS SHALL BE PROVIDED IN THE CAST-IN-PLACE CONCRETE COPING AT 20'-0" MAXIMUM SPACINGS AND SHALL ALIGN WITH JOINTS BETWEEN ADJACENT PANELS. REINFORCING STEEL WITHIN THE CAST-IN-PLACE COPING SHALL BE CONTINUOUS THROUGH CONTRACTION JOINTS.

11. A 30 MIL GEOMEMBRANE SHALL BE INSTALLED ON TOP OF THE SELECT FILL. THE GEOMEMBRANE SHALL SLOPE AWAY FROM THE MSE WALLS TO CONVEY WATER TO AN UNDERDRAIN PIPE. A 6 INCH FOLD OF GEOMEMBRANE SHALL BE ATTACHED TO THE BACK FACE OF THE MSE WALL WITH AN ADHESIVE. THE GEOMEMBRANE AND ADHESIVE SHALL MEET THE REQUIREMENTS OF THE MANUFACTURER. GEOMEMBRANE, ADHESIVE, AND ANY EQUIPMENT NECESSARY FOR INSTALLATION WILL BE INCLUDED IN ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

12. ANY WALL REINFORCING STRIPS LOCATED ABOVE THE GEOMEMBRANE SHALL HAVE A DESIGN LIFE OF 125 YEARS USING CORROSION RATES GIVEN IN AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR NON-AGGRESSIVE SOIL.

13. UNDERDRAIN PIPES SHALL BE PERFORATED AND MEET THE REQUIREMENTS OF SUBSECTION 710.06. THE DRAINAGE AGGREGATE, FILTER FABRIC, AND PIPE AND ANY FITTINGS OR ADHESIVES NECESSARY FOR INSTALLATION WILL BE PAID UNDER ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)".

14. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 720 FOR GEOTEXTILE UNDER STONE FILL. FILTER FABRIC SHALL BE ADHERED TO THE BACK FACE OF THE MSE WALL PANELS AT ALL HORIZONTAL AND VERTICAL JOINTS BETWEEN PANELS. FILTER FABRIC SHALL NOMINALLY BE 18 INCHES WIDE AND CENTERED ON THE JOINTS.

15. THE CONTRACTOR SHALL PREPARE A MOCKUP OF THE CONCRETE FINISH TO THE ENGINEER AND OWNER FOR APPROVAL PRIOR TO CASTING.

15.A. SMOOTH-FORMED FINISH: AS-CAST CONCRETE TEXTURE IMPARTED BY FORM-FACING MATERIAL, ARRANGED IN AN ORDERLY AND SYMMETRICAL MANNER WITH A MINIMUM F SEAMS. REPAIR AND PATCH TIE HOLES AND DEFECTS. REMOVE FINS AND OTHER PROJECTIONS THAT EXCEED SPECIFIED LIMITS ON FORMED-SURFACE IRREGULARITIES.

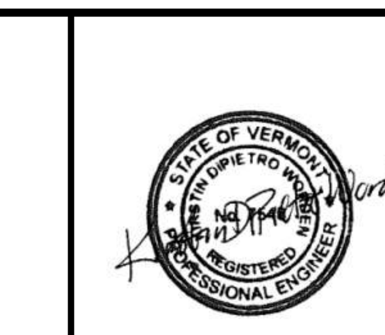
15.B. RUBBED FINISH: APPLY THE FOLLOWING TO SMOOTH-FORMED FINISHED AS-CAST CONCRETE WHERE INDICATED:

15.B.1. SMOOTH RUBBED FINISH: NOT LATER THAN ONE DAY AFTER FORM REMOVAL, MOISTEN CONCRETE SURFACES AND RUB WITH CARBORUNDUM BRICK OR ANOTHER ABRASIVE UNTIL PRODUCING A UNIFORM COLOR AND TEXTURE. DON NOT APPLY CEMENT GROUT OTHER THAN THAT CREATED BY THE RUBBING PROCESS.

15.B.2. GROUT-CLEANED FINSIH: WET CONCRETE SURFACES AND APPLY GROUT OF A CONSISTENCY OF THICK PAINT TO COAT SURFACES AND FILL SMALL HOLES. MIX ONE PART PORTLAND CEMENT TO ONE AND ONE-HALF PARTS FINE SAND WITH A 1:1 MIXTURE OF BONDING ADMIXTURE AND WATER. ADD WHITE PORTLAND CEMENT IN AMOUNTS DETERMINED BY TRIAL PATCHES SO COLOR OF DRY GROUT WILL MATCH ADJACENT SURFACES. SCRUB GROUT INTO VOIDS AND REMOVE EXCESS GROUT. WHEN GROUT WHITENS, RUB SURFACE WITH CLEAN BURLAP AND KEEP SURFACE DAMP BY FOG SPRAY FOR AT LEAST 36 HOURS.

15.B.3. CORKED-FLOATED FINISH: WET CONCRETE SURFACES AND APPLY A STIFF GROUT. MIX ONE PART PORTLAND CEMENT AND ONE PART FINE SAND WITH A 1:1 MIXTURE OF BONDING AGENT AND WATER. ADD WHITE PORTLAND CEMENT IN AMOUNTS DETERMINED BY TRIAL PATCHES SO COLOR OF DRY GROUT WILL MATCH ADJACENT SURFACES. COMPRESS GROUT INTO VOIDS BY GRINDING SURFACE. IN A SWIRLING MOTION, FINISH SURFACE WITH A CORK FLOAT.

15.C. RELATED UNIFORM SURFACES: AT TOPS OF WALLS, HORIZONTAL OFFSETS, AND SIMILAR UNIFORMED SURFACES ADJACENT TO FORMED SURFACES, STRIKE OFF SMOOTH AND FINISH WITH A TEXTURE MATCHING ADJACENT FORMED SURFACES. CONTINUE FINAL SURFACE TREATMENT OF FORMED SURFACES UNIFORMLY ACROSS ADJACENT UNIFORMED SURFACES UNLESS OTHERWISE INDICATED.



REV.	REVISION DESCRIPTION	DATE

CHECKED BY KDW | DRAWN BY TGB | DESIGNED BY APS

HOYLE TANNER
125 College St, 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024

SCALE: AS SHOWN

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

CONSTRUCTION NOTES

G0.2

PROJECT NO. 120006

SHEET 3 OF 16

NOTES:

1. EXISTING SURFACE FEATURES AND INFORMATION SHOWN ON THESE PLANS WERE OBTAINED FROM FIELD SURVEY AND RECORD DRAWINGS. REFER TO DRAWING G-01 FOR SURVEY DATA REFERENCE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS.
2. REFERENCE GRAVEL WETLAND DATA SUMMARY REPORT PREPARED BY SANBORN, HEAD & ASSOCIATES, FOR SUBSURFACE EXPLORATION PROGRAM.

EXISTING SMH
RIM=200.05'
8" PVC INV. IN=193.30' (N)
8" PVC INV. IN=193.20' (W)
8" PVC INV. OUT=193.20' (S)

EXISTING CB
RIM=198.39'
15" PVC INV. IN=192.20' (N)
4" PVC INV. IN=194.30' (S)
4" PVC INV. IN=194.30' (N)
6" PVC INV. IN=193.00' (NW)
12" PVC INV. IN=192.20' (E)
15" PVC INV. OUT=192.20' (S)

EXISTING CB
RIM=198.51'
4" PVC INV. IN=194.30' (N)
4" PVC INV. IN=194.30' (S)
12" PVC INV. OUT=193.50' (W)

EXISTING SMH
RIM=197.50'
8" PVC INV. IN=191.00' (N)
8" PVC INV. IN=191.00' (NE)
4" PVC INV. IN=192.20' (NW)
8" PVC INV. OUT=190.90' (S)

RELOCATE EXISTING UNDERGROUND TELEPHONE

REMOVE EXISTING TREES

CLEAR AND GRUB EXISTING VEGETATION TO APPROXIMATE INDICATED EXTENTS

EXISTING CB
RIM=210.55'
12" C-HDPE INV. OUT=200.90' (E)

EXISTING CB
RIM=211.32'
12" C-HDPE INV. IN=200.40' (W)
15" C-HDPE INV. OUT=198.00' (E)

EXISTING CB
RIM=206.56'
18" RCP INV. OUT=200.40' (SW)

EXISTING CB
RIM=212.38'
6" PVC INV. OUT=208.80' (SE)

CLEAR AND GRUB EXISTING VEGETATION TO APPROXIMATE INDICATED EXTENTS

EXISTING CB
RIM=190.88'
12" PVC INV. OUT=187.30' (E)

EXISTING SMH
RIM=192.26'
8" PVC INV. OUT=186.60' (SW)

INV.=189.10'

INV.=192.65'

INV.=190.70'

EXISTING DMH
(TO BE REMOVED AND REPLACED)
RIM=203.12'
15" C-HDPE INV. IN=190.50' (W)
6" PVC INV. IN=199.50' (NW)
18" RCP INV. IN=186.60' (NE)
8" PVC INV. IN=198.90' (NE)
18" CMP INV. OUT=186.10' (SW)

EXISTING CB
RIM=193.66'
15" PVC INV. IN=186.90' (N)
4" PVC INV. IN=189.20' (NE)
12" PVC INV. IN=186.90' (W)
15" PVC INV. OUT=186.90' (SW)

EXISTING CB
RIM=191.45'
12" RCP INV. IN=188.60' (N)
12" PVC INV. OUT=188.60' (W)

EXISTING CB
RIM=191.41'
12" PVC INV. IN=187.80' (E)
12" PVC INV. IN=186.50' (N)
12" PVC INV. OUT=186.30' (SW)

EXISTING CB
RIM=191.46'
12" PVC INV. IN=188.30' (E)
12" PVC INV. OUT=188.30' (W)

EXISTING SMH
RIM=189.24'
8" PVC INV. IN=182.30' (NE)
8" PVC INV. IN=182.30' (N)
8" PVC INV. OUT=182.20' (SW)

EXISTING CB
RIM=187.96'
15" PVC INV. IN=183.90' (NE)
12" PVC INV. IN=184.20' (NE)

RIVER CORRIDOR (TYP.)

SPECIAL FLOOD HAZARD (TYP.)

PRICE CHOPPER/MARKET 32
595 SHELBURNE RD.

BUFFALO WILD WINGS
555 SHELBURNE RD.

68-80 SOUTH MEADOW APARTMENTS LP C/O CHAMPLAIN HOUSING TRUST, INC.

84-90 SOUTH MEADOW APARTMENTS LP C/O CHAMPLAIN HOUSING TRUST, INC.

94-106 SOUTH MEADOW APARTMENTS LP C/O CHAMPLAIN HOUSING TRUST, INC.

ANTONIO B. POMERLEAU, LLC

CITY OF BURLINGTON

S MEADOW DR

POTASH BROOK

P-1 P-2 P-3 P-3A P-4 P-5 P-6 P-7

TP-1 TP-2 TP-3

B-1 B-2 B-3 B-3A B-4 B-5 B-6

100% DESIGN SUBMITTAL

PLAN
SCALE: 1"=30'

GRAPHIC SCALE
0 30 45 60
(IN FEET)

HOYLE TANNER
125 College St. 4th Floor
Burlington, VT 05408
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www.hoyletanner.com

REV.	REVISION DESCRIPTION	DATE

DESIGNED BY: APS
DRAWN BY: TGB
CHECKED BY: KDW

DATE: JANUARY 5, 2024
SCALE: 1" = 30'

APPLICANT: POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT: POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

EXISTING CONDITIONS PLAN
C1.1

PROJECT NO. 120006
SHEET 4 OF 16

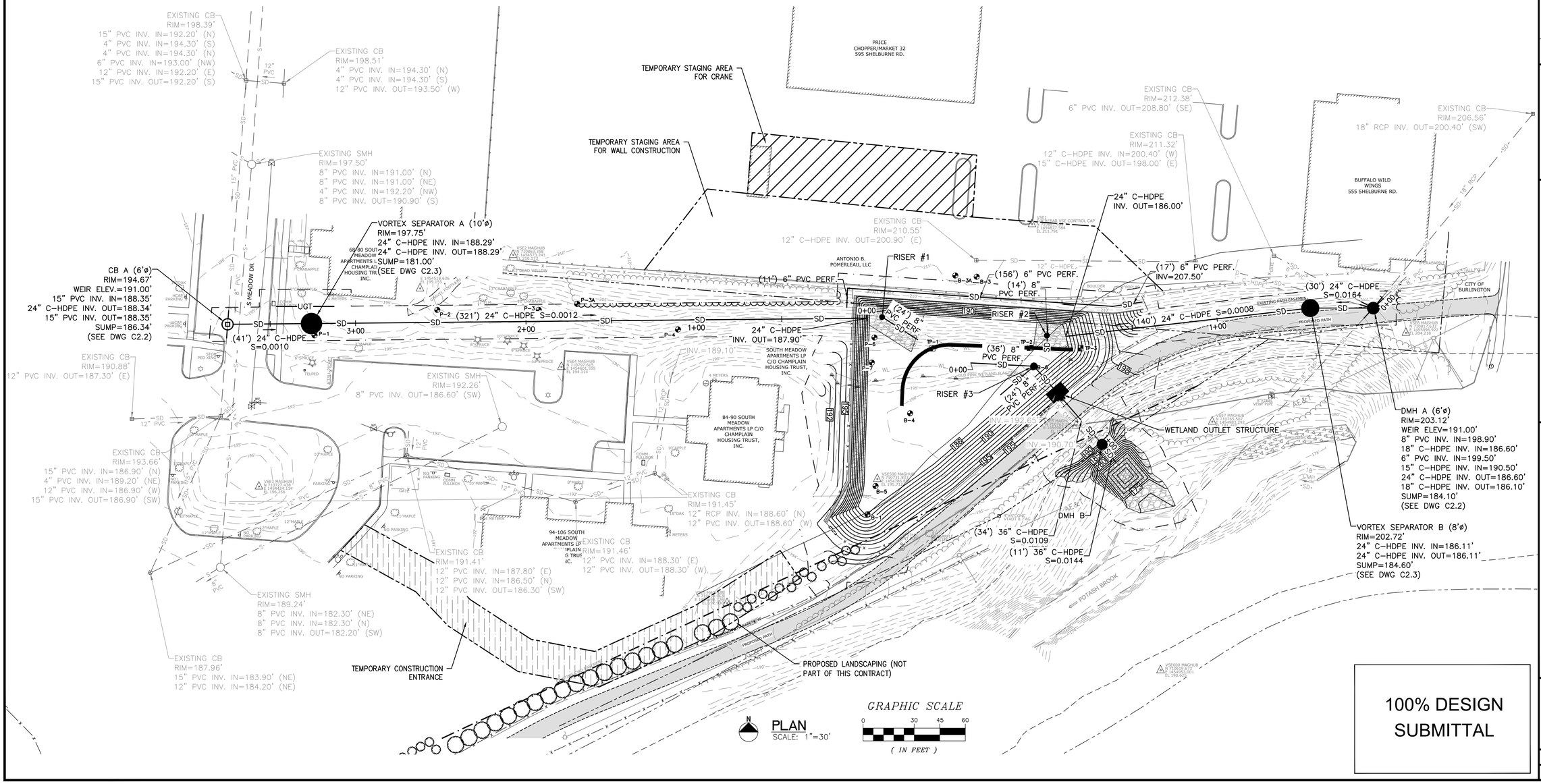
21.120006.03-EXISTING.DWG

NOTES:

1. EXISTING SURFACE FEATURES AND INFORMATION SHOWN ON THESE PLANS WERE OBTAINED FROM FIELD SURVEY. REFER TO DRAWING G-0.1 FOR SURVEY DATA REFERENCE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SUPPORT OF ALL EXISTING UTILITIES LOCATED WITHIN THE LIMITS OF WORK, INCLUDING UTILITY POLES.
3. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANIES INVOLVED AND VERIFY IN THE FIELD THE EXACT LOCATION OF MAINS AND SERVICES TO PREVENT DAMAGE; LOSS OF SERVICE DURING CONSTRUCTION; AND FOR REPLACEMENT OF SERVICES. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IDENTIFICATION AND LOCATION OF ALL UTILITIES PRIOR TO THE START OF WORK. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT BETWEEN THE PROPOSED WORK AND AN EXISTING UTILITY SUCH AS WATER, SEWER, GAS, ELECTRICAL OR TELECOMMUNICATIONS. CONTRACTOR SHALL RELOCATE CONFLICTING UTILITIES AS NEEDED. THERE SHALL BE NO SEPARATE PAYMENT
4. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
5. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
6. CONTRACTOR SHALL SECURE WORK AREA WITH FENCING. PAID AS ITEM 653.50 BARRIER FENCE.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF TRAFFIC AND TRAFFIC CONTROL.
8. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
9. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
10. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIVERSION OF STORMWATER FLOWS AND BYPASSING EXISTING POND DURING CONSTRUCTION UNTIL NEW GRAVEL WETLAND IS COMPLETE AND READY TO ACCEPT FLOW. (SUBSIDIARY)
11. SEE SPECIAL PROVISION SPECIFICATION 900.645 (GRAVEL WETLAND FACILITY) FOR GRAVEL WETLAND PLANTS, SOIL AND MATERIAL REQUIREMENTS.
12. SEE DRAWING NO. C-2.1 FOR POND GRAVEL WETLAND DETAILS.
13. CONTRACTOR SHALL REMOVE AND RESET EXISTING PLAYGROUND EQUIPMENT AND FENCE AS NECESSARY FOR CONSTRUCTION OF WORK. REMOVAL AND RESETTING OF FENCE SHALL BE PAID FOR AS ITEM 620.50.
14. CONTRACTOR SHALL USE SHEETING AND/OR SHORING AS REQUIRED FOR EARTH SUPPORT DURING INSTALLATION OF NEW PIPING, AND SHALL SUPPORT AND PREVENT UNDERMINING OF EXISTING 24" CWD MAIN.

CWD NOTES:

1. CONTRACTOR TO COORDINATE ALL WORK AS REQUIRED TO MAINTAIN THE EXISTING CHAMPLAIN WATER DISTRICT (CWD) WATER MAIN, WITH CWD.
2. CONTRACTOR SHALL SUBMIT A SEQUENCE OF OPERATIONS AND DETAILS ON MEANS AND METHOD FOR REVIEW AND APPROVAL BY CWD, OUTLINING HOW THE EXISTING CWD WATER MAIN WILL BE PROTECTED FROM DAMAGE. DAMAGE MAY INCLUDE BUT IS NOT LIMITED TO UNDERMINING AND SETTLEMENT. SUBMISSION SHALL BE REVIEWED AND APPROVED BY CWD.
3. CONTRACTOR SHALL SUBMIT THE PROPOSED METHOD OF EARTH SUPPORT TO CWD FOR APPROVAL.
4. SHOULD ROCK REMOVAL BE REQUIRED WITHIN 10 FEET OF THE CWD MAIN, METHODS FOR ROCK REMOVAL INCLUDING VIBRATION MONITORING AND VIBRATION LIMITS, SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY CWD.
5. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10' UNDISTURBED SOIL BEHIND THE EXISTING THRUST BLOCK AT THE 45-DEGREE BEND. THE THRUST BLOCK IS INTENDED TO USE UNDISTURBED, NATIVE SOIL IN THE THRUST RESTRAINT.



100% DESIGN SUBMITTAL

HOYLE TANNER
125 College St. 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: APS
DATE: JANUARY 5, 2024
SCALE: 1" = 30'

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

OVERALL PROPOSED PLAN

C1.2

PROJECT NO. 120006

SHEET 5 OF 16

21.120006.03-PROPOSED.DWG

GENERAL NOTES:

1. EXISTING SURFACE FEATURES AND INFORMATION SHOWN ON THESE PLANS WERE OBTAINED FROM FIELD SURVEY. REFER TO DRAWING G-0.1 FOR SURVEY DATA REFERENCE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SUPPORT OF ALL EXISTING UTILITIES LOCATED WITHIN THE LIMITS OF WORK, INCLUDING UTILITY POLES.
3. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANIES INVOLVED AND VERIFY IN THE FIELD THE EXACT LOCATION OF MAINS AND SERVICES TO PREVENT DAMAGE; LOSS OF SERVICE DURING CONSTRUCTION; AND FOR REPLACEMENT OF SERVICES. THE CONTRACTOR SHALL NOTIFY "DIG SAFE" PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IDENTIFICATION AND LOCATION OF ALL UTILITIES PRIOR TO THE START OF WORK. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT BETWEEN THE PROPOSED WORK AND AN EXISTING UTILITY SUCH AS WATER, SEWER, GAS, ELECTRICAL OR TELECOMMUNICATIONS. CONTRACTOR SHALL RELOCATE CONFLICTING UTILITIES AS NEEDED. THERE SHALL BE NO SEPARATE PAYMENT
4. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
5. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
6. CONTRACTOR SHALL SECURE WORK AREA WITH FENCING. PAID AS ITEM 653.50 BARRIER FENCE.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF TRAFFIC AND TRAFFIC CONTROL.
8. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
9. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
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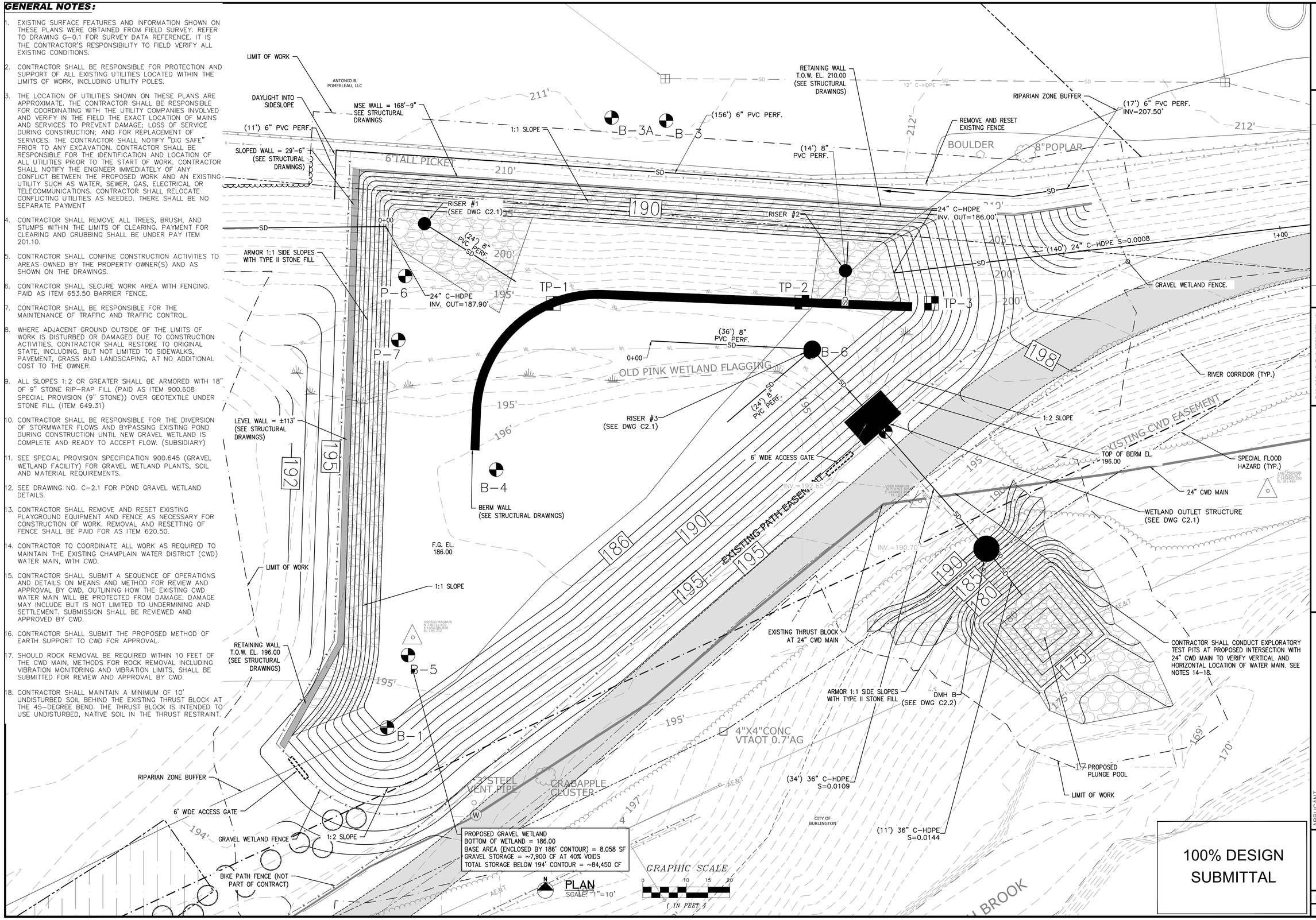
16. CONTRACTOR SHALL SUBMIT THE PROPOSED METHOD OF EARTH SUPPORT TO CWD FOR APPROVAL.
17. SHOULD ROCK REMOVAL BE REQUIRED WITHIN 10 FEET OF THE CWD MAIN, METHODS FOR ROCK REMOVAL INCLUDING VIBRATION MONITORING AND VIBRATION LIMITS, SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY CWD.
18. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10' UNDISTURBED SOIL BEHIND THE EXISTING THRUST BLOCK AT THE 45-DEGREE BEND. THE THRUST BLOCK IS INTENDED TO USE UNDISTURBED, NATIVE SOIL IN THE THRUST RESTRAINT.



REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: APS
DATE: JANUARY 5, 2024
SCALE: 1" = 10'

HOYLE TANNER
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APPLICANT: POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT: POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

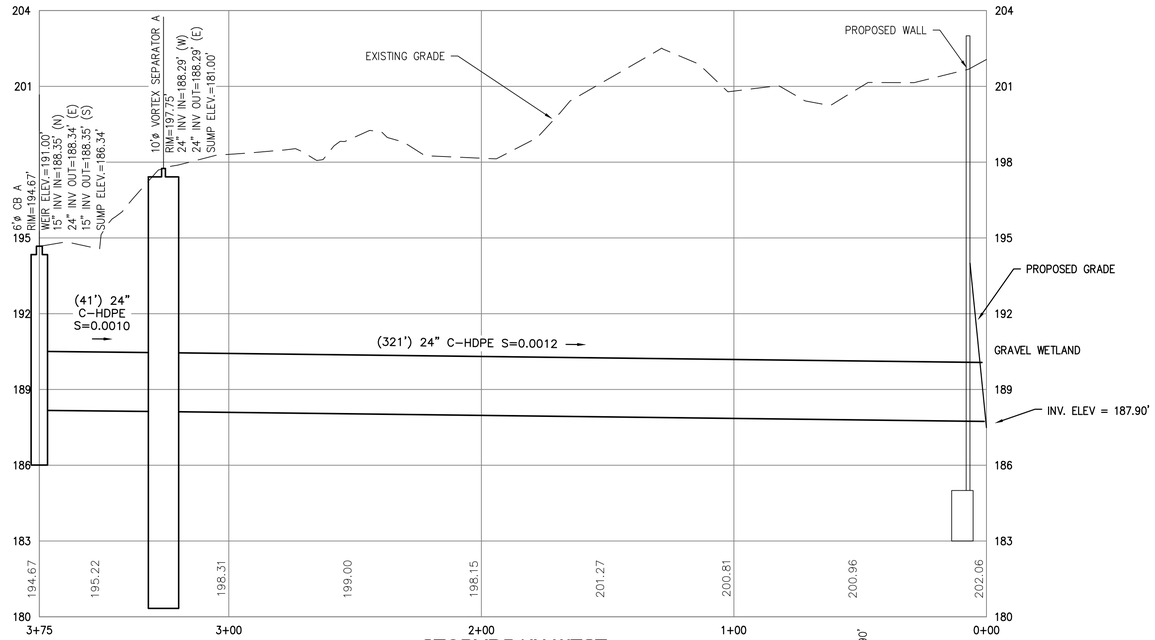
GRAVEL WETLAND SITE PLAN

C1.3

PROJECT NO. 120006

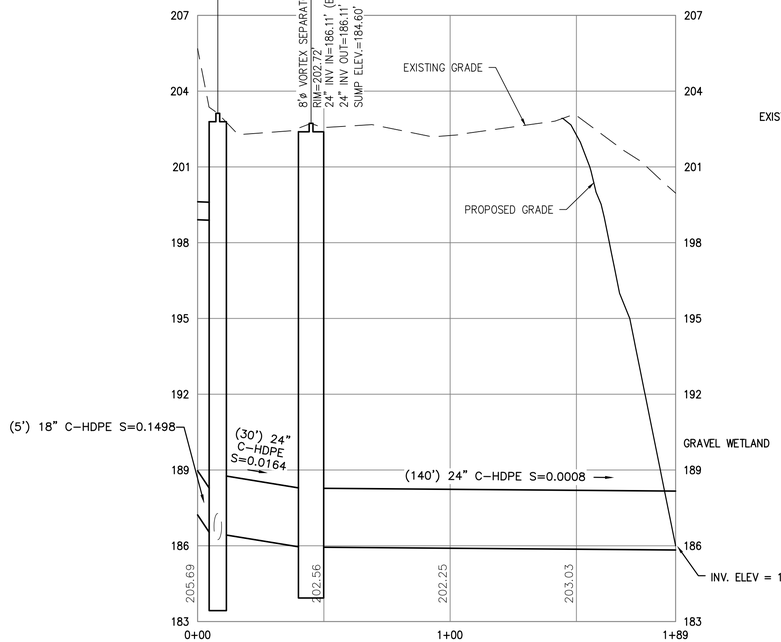
SHEET 6 OF 16

21.120006.03-PROPOSED.DWG



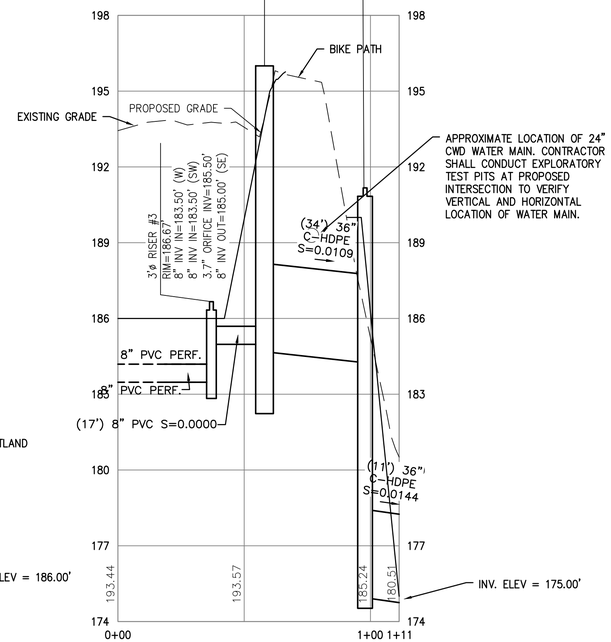
STORMDRAIN WEST

SCALE: HORIZ. 1"=30'
VERT. 1"=3'



STORMDRAIN EAST

SCALE: HORIZ. 1"=30'
VERT. 1"=3'



STORMDRAIN OUTFALL

SCALE: HORIZ. 1"=30'
VERT. 1"=3'

100% DESIGN SUBMITTAL

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REV.	REVISION DESCRIPTION	DATE

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

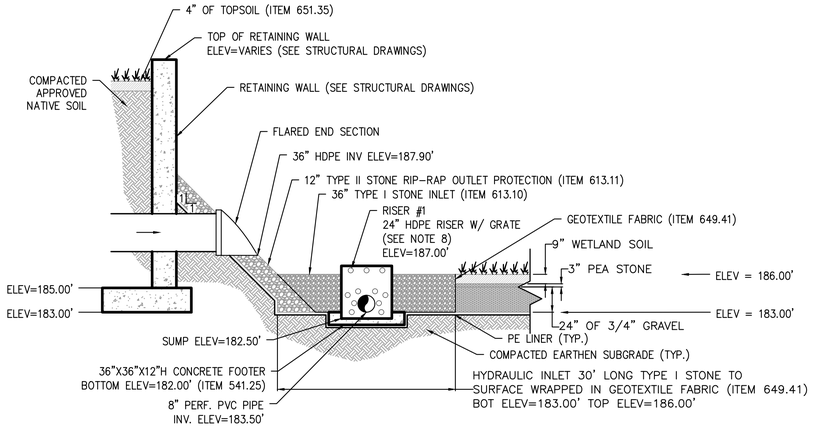
PROPOSED PROFILES

C1.4

PROJECT NO. 120006

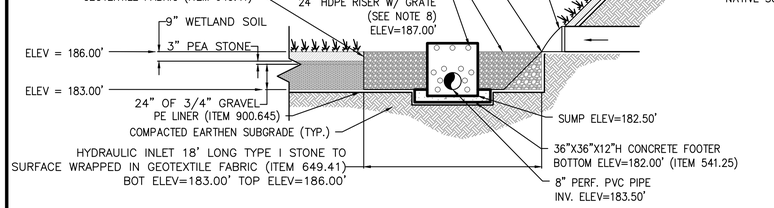
SHEET 7 OF 16

21.120006.03-PROPOSED.DWG



RISER #1 DETAIL

SCALE: NOT TO SCALE



RISER #2 DETAIL

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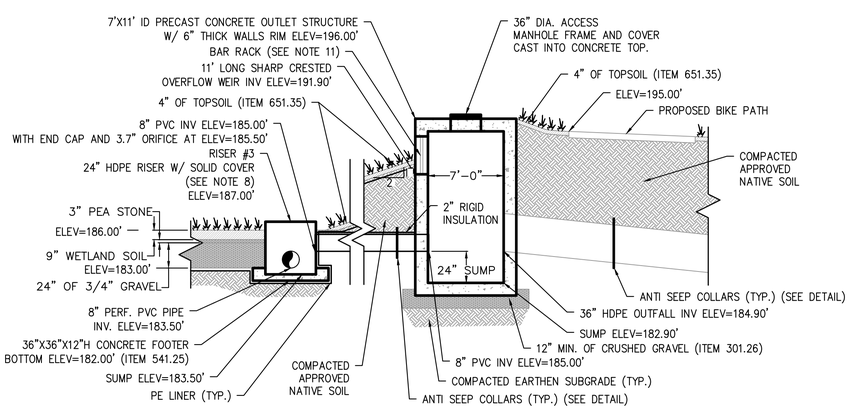
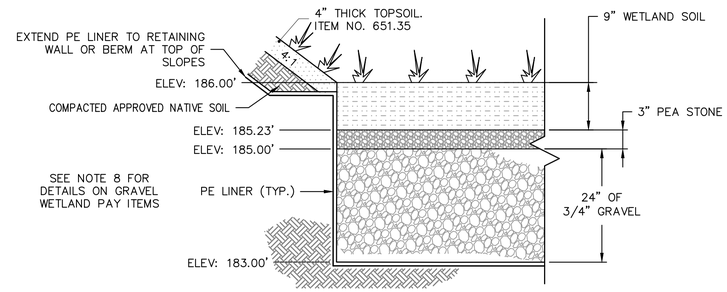


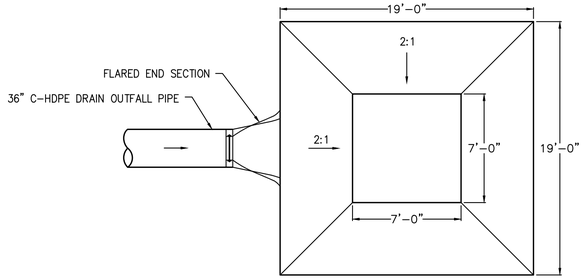
RISER #3 AND OUTLET STRUCTURE DETAIL

SCALE: NOT TO SCALE



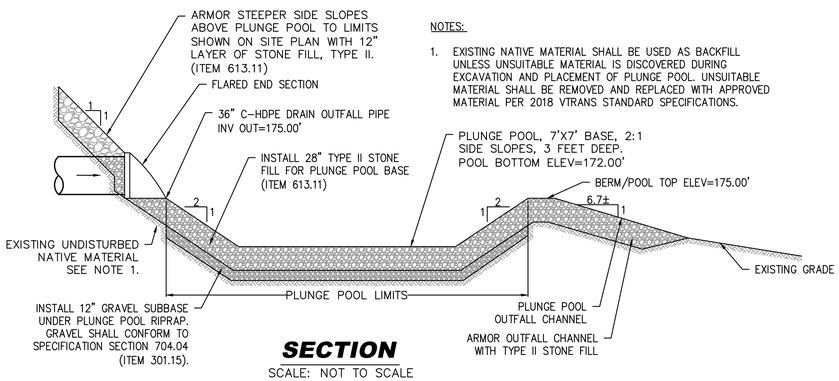
GRAVEL WETLAND DETAIL

SCALE: NOT TO SCALE



PLAN VIEW

SCALE: NOT TO SCALE



NOTES:

1. EXISTING NATIVE MATERIAL SHALL BE USED AS BACKFILL UNLESS UNSUITABLE MATERIAL IS DISCOVERED DURING EXCAVATION AND PLACEMENT OF PLUNGE POOL. UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROVED MATERIAL PER 2018 VTRANS STANDARD SPECIFICATIONS.

SECTION

SCALE: NOT TO SCALE

PLUNGE POOL DETAIL

SCALE: NOT TO SCALE

NOTES:

1. THE WETLAND BASIN AREA SHALL BE CLEARED OF ALL TREES, ROOTS, STUMPS, BOULDERS AND SOD TO A DEPTH OF 2' BELOW FINAL GRADE.
2. CONSTRUCT BERM USING EMBANKMENT MATERIAL FREE OF SOD, ROOTS, FROZEN MATERIAL. NO STONES LARGER THAN 6 INCHES OR OTHER OBJECTIONABLE MATERIAL. COMPACT AS PER SPECIFICATIONS.
3. OUTLET CONTROL STRUCTURE TO BE PRECAST WITH DIMENSIONS AS SHOWN. SEE ITEM 900.620 SPECIAL PROVISION (PRECAST DRAINAGE, DIVERSION & OUTLET AND DIVERSION STRUCTURES PAY ITEMS).
4. TOPSOIL AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE OUTFALL AREAS WITH REQUIRED EROSION CONTROL.
5. REMOVE ACCUMULATED SEDIMENT FROM BMP AT COMPLETION OF PROJECT (SUBSIDIARY).
6. ANTI-SEEP COLLARS SHALL BE INSTALLED AS SHOWN TO RESIST FLOW ALONG THE OUTSIDE OF THE PIPE. COLLARS SHOULD BE PLACED A MINIMUM OF 5 FT. FROM THE PIPE. MAXIMUM SPACING OF COLLARS IS 28 FT. PAID AS ITEM 900.620 SPECIAL PROVISION (ANTI-SEEP COLLARS).
7. ALL PIPE CONNECTIONS SHALL HAVE FLEXIBLE WATERTIGHT GASKETS CONFORMING TO THE SPECIFICATIONS. PIPE TO OUTLET STRUCTURE CONNECTION SHALL BE WATERTIGHT WITH AN EMBEDDED FLEXIBLE RUBBER BOOT. SEE ITEM 900.620 SPECIAL PROVISION (PRECAST DRAINAGE, DIVERSION & OUTLET AND DIVERSION STRUCTURES).
8. FOR RISERS, SEE SPECIAL PROVISION SPECIFICATION 900.620 (RISERS).
9. FOR WETLAND PLANTS, SOIL AND MATERIALS INSIDE WETLAND, SEE SPECIAL PROVISION SPECIFICATION 900.645 (GRAVEL WETLAND FACILITY).
10. PROVIDE 8" SOLID-WALLED PVC (ITEM 605.11) CLEAN OUTS WITH CAP TO 1 FOOT ABOVE GRADE FOR ALL 8" PERF. PVC UNDERDRAIN PIPING.
11. CAST IN PLACE BAR RACK FOR OUTLET STRUCTURE SHALL HAVE 1" DIAMETER BARS AT 8" ON CENTER.

100% DESIGN SUBMITTAL

REV. | REVISION DESCRIPTION | DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: APS

HOYLE TANNER
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Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024

SCALE: AS SHOWN

APPLICANT: POMERLEAU AND CHITTENDEN HOUSING TRUST

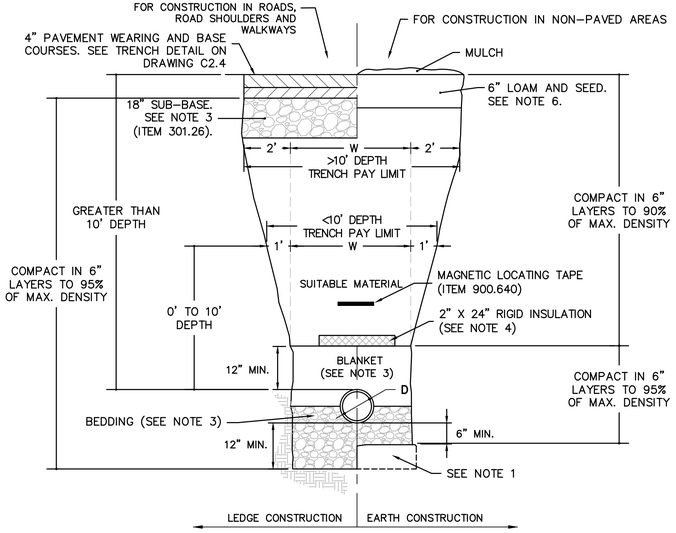
PROJECT: POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

GRAVEL WETLANDS DETAILS

C2.1

PROJECT NO. 120006

SHEET 8 OF 16

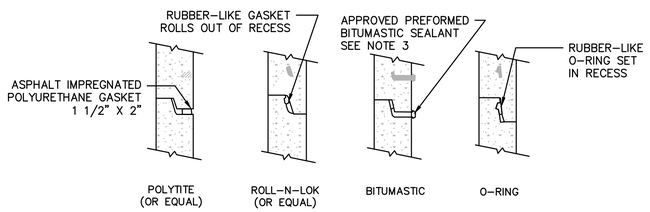


NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. SEE ALSO NOTE 2.
2. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. W=D+2', OR 3', WHICHEVER IS GREATER. D = NOMINAL PIPE DIAMETER.
3. BEDDING AND BLANKET MATERIAL FOR DUCTILE IRON PIPE SHALL BE COMPACTED (95%) SAND (ITEM 203.31) BEDDING AND BLANKET MATERIAL FOR PVC AND HDPE PIPE SHALL BE 3/4" CRUSHED STONE (ITEM 629.54).
4. PROVIDE INSULATION WHEN DEPTH IS LESS THAN 4 FEET, CROSSING OTHER UTILITIES, OR DIRECTED BY THE ENGINEER (ITEM 622.10).
5. FOR TRENCH CONSTRUCTION THAT IS NOT IN THE ROADS, ROAD SHOULDERS AND WALKWAYS, CONTRACTOR SHALL RESTORE TO GRADE WITH LOAM, SEED, FERTILIZER AND MULCH.

STANDARD WATER, SEWER, AND STORM DRAIN TRENCH SECTION CONSTRUCTION AND PAY LIMITS DETAIL

SCALE: NOT TO SCALE



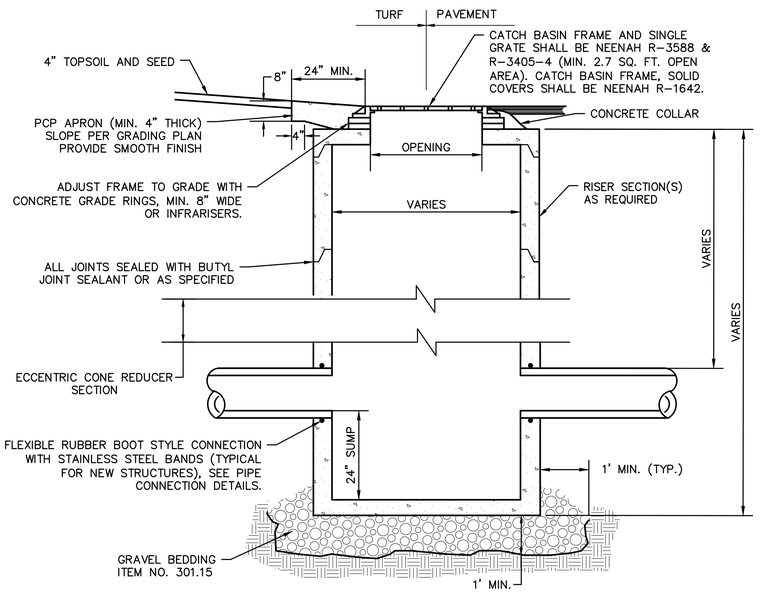
DETAIL-A

NOTES:

1. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATERTIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO BASIN JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON ELASTOMERIC SEALANT.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. NON-SHRINKING MORTAR SHALL ONLY BE USED WHERE SPECIFICALLY APPROVED BY THE ENGINEER.
5. ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS

PRECAST CONCRETE STRUCTURE JOINT DETAILS

SCALE: NOT TO SCALE

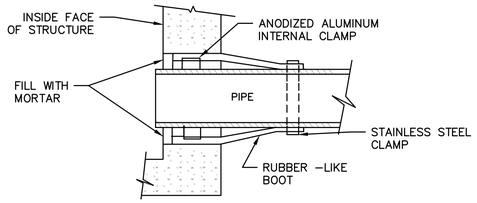


NOTES:

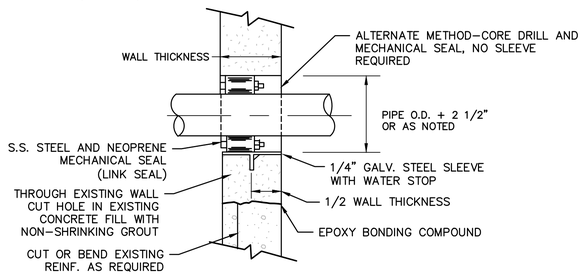
1. ALL PREFABRICATED REINFORCED CONCRETE CATCH BASINS AND FRAMES AND GRATES OR COVERS SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO THE CITY OF SOUTH BURLINGTON STANDARDS. THE CONTRACTOR IS REQUIRED TO SUPPLY SHOP DRAWINGS AND MANUFACTURERS' CERTIFICATIONS TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.
2. STORM DRAINS ARE TO BE LABELED WITH A MARKER STATING "NO DUMPING. DRAINS TO STREAM".
3. SEE PAY ITEM 604.20 (PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST IRON GRATE) FOR REQUIREMENTS.

TYPICAL CATCH BASIN AND DRAINAGE BASIN DETAIL

SCALE: NOT TO SCALE



BOOT STYLE PIPE CONNECTION TO CATCH BASINS
(OR EQUAL)



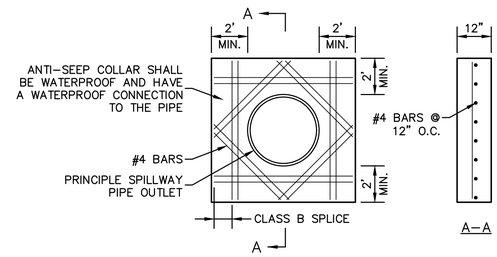
WALL SLEEVE DETAIL FOR PIPE CONNECTION TO EXISTING CATCH BASINS

NOTES:

1. INSTALL SEALS FROM DRY SIDE OF PENETRATION. WET SIDE FILLED WITH WATERPROOF GROUT.

PIPE CONNECTION TO CATCH BASIN DETAILS (SUBSIDIARY TO CATCH BASIN)

SCALE: NOT TO SCALE

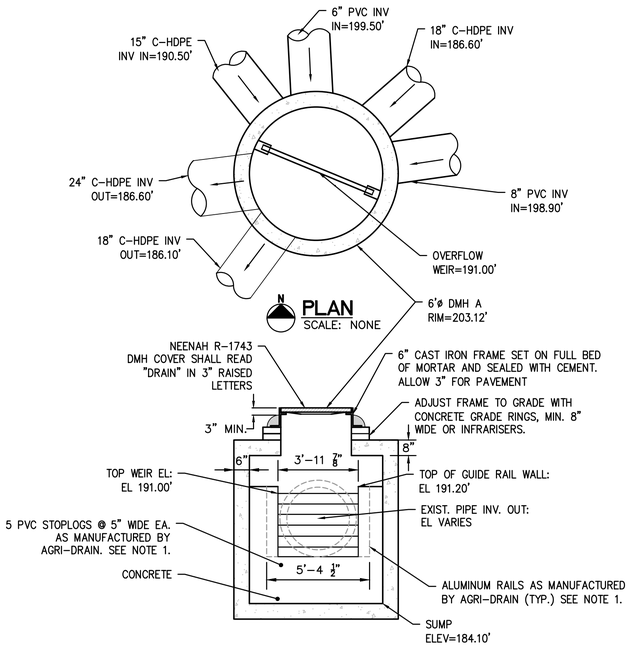


ANTI-SEEP COLLAR NOTES:

1. SPACING BETWEEN ADJACENT COLLARS SHALL BE A MINIMUM OF 5 FEET, AND A MAXIMUM OF 28 FEET WITH THE FIRST COLLAR BEING A MINIMUM OF 5 FEET FROM THE INLET.
2. FURNISH A MINIMUM OF 2 COLLARS PER CONDUIT.
3. PROVIDE A 4,000 PSI (MIN.) CONCRETE MIX.
4. RUBBER ANTI-SEEP COLLARS MAY BE USED IN LIEU OF CONCRETE ANTI-SEEP COLLARS. FOR 8" PIPES, ANTI-SEEP COLLAR SHALL BE ASCO3 3' X 3' AND FOR 24" PIPE, ANTI-SEEP COLLAR SHALL BE ASCO4 4' X 4'.
5. ANTI-SEEP COLLARS SHALL BE PAID UNDER PAY ITEM 900.620 SPECIAL PROVISIONS (ANTI-SEEP COLLARS)

ANTI-SEEP COLLAR

SCALE: NOT TO SCALE



DRAIN MANHOLE A W/OVERFLOW WEIR DETAIL

SCALE: NOT TO SCALE

NOTES:

1. REFER TO SPECIAL PROVISION 900.620 FOR PRECAST DRAINAGE DIVERSION AND OUTLET CONTROL STRUCTURES FOR REQUIREMENTS.
2. CONFIGURATION OF OVERFLOW WEIR SIMILAR FOR CB-A.

100% DESIGN SUBMITTAL

REV.	REVISION DESCRIPTION	DATE

DESIGNED BY: APS
DRAWN BY: TGB
CHECKED BY: KDW

HOYLE TANNER
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PROJECT: POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

DRAINAGE DETAILS I

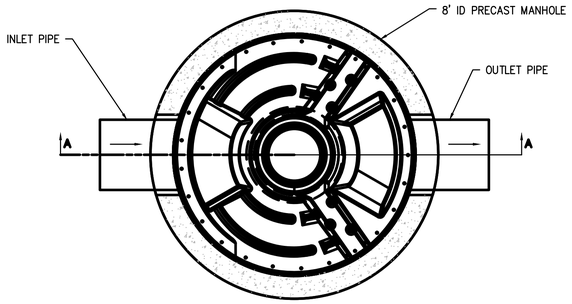
C2.2

PROJECT NO. 120006

SHEET 9 OF 16

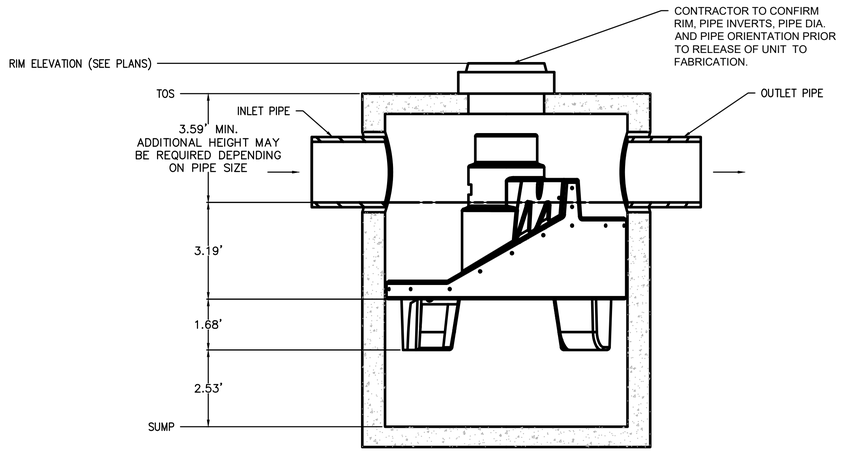
FRAME AND COVER DETAIL

SCALE: NOT TO SCALE



8'Ø VORTEX SEPARATOR PLAN

SCALE: NOT TO SCALE



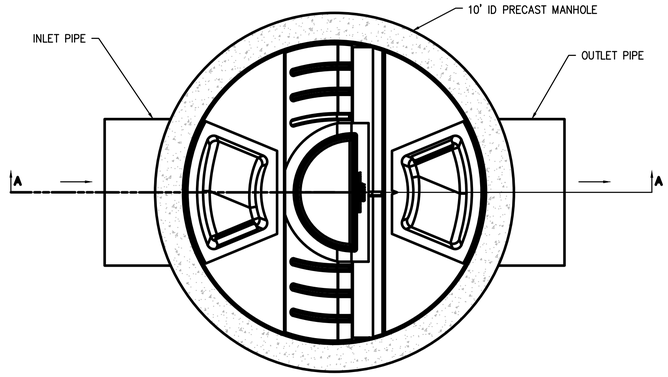
8'Ø VORTEX SEPARATOR DETAIL

SCALE: NOT TO SCALE

TO BE PAID UNDER ITEM 900.620 SPECIAL PROVISION
(STORMWATER SEPARATOR - 8' DIAMETER)

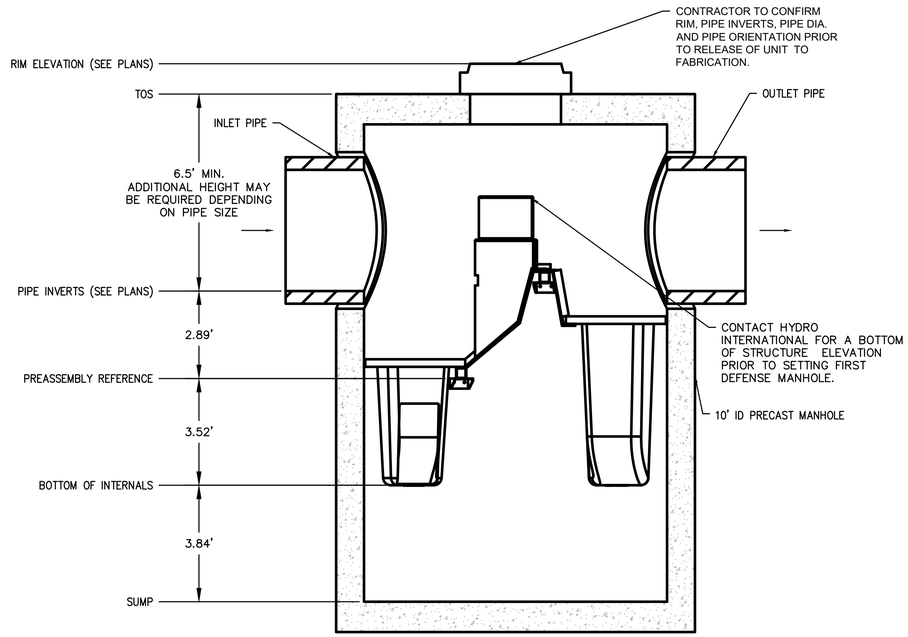
FRAME AND COVER DETAIL

SCALE: NOT TO SCALE



10'Ø VORTEX SEPARATOR PLAN

SCALE: NOT TO SCALE



10'Ø VORTEX SEPARATOR DETAIL

SCALE: NOT TO SCALE

TO BE PAID UNDER ITEM 900.620 SPECIAL PROVISION
(STORMWATER SEPARATOR - 10' DIAMETER)

100% DESIGN SUBMITTAL

REV.	REVISION DESCRIPTION	DATE

CHECKED BY KDW
DRAWN BY TGB
DESIGNED BY APS

HOYLE TANNER
125 College St, 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024
SCALE: AS SHOWN

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

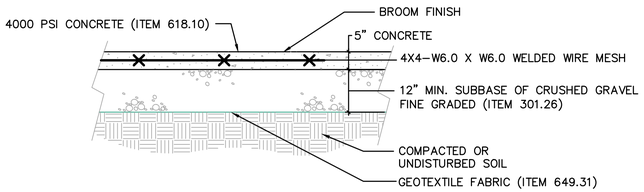
PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

DRAINAGE DETAILS II

C2.3

PROJECT NO. 120006

SHEET 10 OF 16

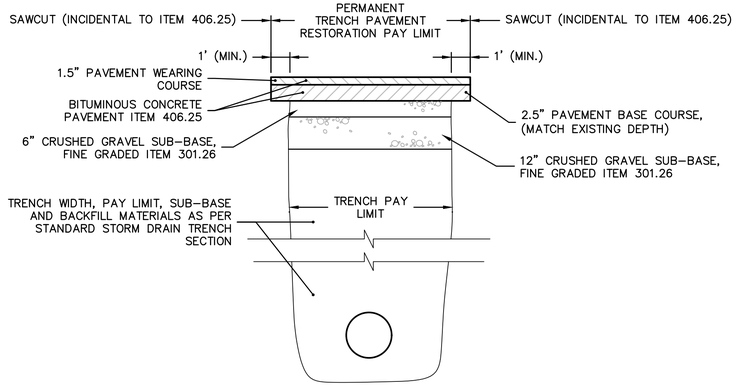


NOTES:

1. PROVIDE EXPANSION JOINT EVERY 25'
2. PROVIDE CONTROL JOINTS EVERY 5', 1/4 – 1/3 THICKNESS OF SLAB
3. DO NOT USE CALCIUM CHLORIDE OR OTHER MATERIALS CONTAINING ANTIFREEZE OR CHEMICAL ACCELERATORS
4. AIR CONTENT: 5–7% AIR ENTRAINMENT
5. MAXIMUM WATER–CEMENTITIOUS MATERIALS RATIO: 0.50
6. SLUMP LIMIT: 3–4" PRIOR TO ANY WATER REDUCING ADDITIVE
7. DOWEL AND EPOXY TO EXISTING SIDEWALK.

CONCRETE SIDEWALK DETAIL

SCALE: NOT TO SCALE

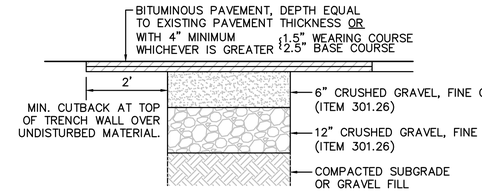


TRENCH PAVEMENT RESTORATION SECTION AND PAY LIMIT NOTES:

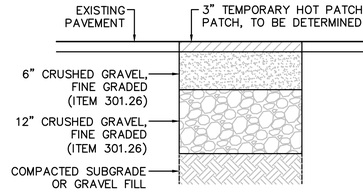
1. PAVEMENT STANDARDS ARE FOR 1.5 INCH WEARING COURSE AND 2.5 INCH BASE COURSE, HOWEVER, CONTRACTOR SHALL MATCH EXISTING DEPTH OF BASE COURSE TO REPLACE ASPHALT TO EXISTING SURFACE.
2. ALL EXPOSED BITUMINOUS SURFACES SHALL BE COATED WITH EMULSIFIED ASPHALT PRIOR TO PLACEMENT OF NEW BITUMINOUS PAVEMENT.

TRENCH PAVEMENT RESTORATION SECTION AND PAY LIMITS DETAIL

SCALE: NOT TO SCALE



PERMANENT PAVEMENT REPAIR



TEMPORARY PAVEMENT REPAIR

PAVEMENT REPAIR NOTES:

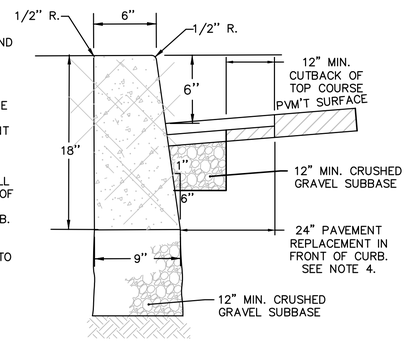
1. MATERIALS SHOULD BE REPLACED IN–KIND, WITH MINIMUM THICKNESS AS SHOWN.
2. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REQUIREMENTS.
3. ROADWAY CONSTRUCTION SHALL CONFORM TO VTRANS STANDARD SPECIFICATIONS.
4. NOT FOR WINTER CONSTRUCTION.

TYPICAL PAVEMENT REPAIR DETAILS

SCALE: NOT TO SCALE

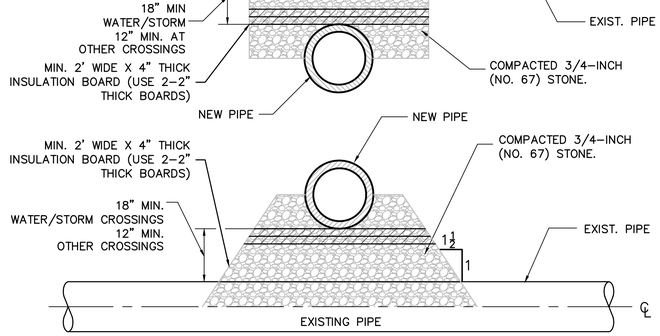
NOTES:

1. WHEN CONCRETE SIDEWALK IS CONSTRUCTED ADJACENT TO CONCRETE CURB, ASPHALT TREATED FELT SHALL BE PLACED BETWEEN THE SIDEWALK AND CURB FOR THE TOTAL DEPTH OF THE SIDEWALK. A MONOLITHIC CURB AND SIDEWALK WILL NOT BE ACCEPTED.
2. CAST–IN–PLACE CEMENT CONCRETE CURB SHALL BE CONSTRUCTED IN CONFORMANCE TO THE REQUIREMENTS OF SECTION 616.06 OF THE VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS.
3. ALL CAST–IN–PLACE CONCRETE FOR CURBING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 541 OF THE VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONCRETE, CLASS B. THERE SHALL BE A MINERAL ADMIXTURE SUBSTITUTION FOR PORTLAND CEMENT OF 20% FLY ASH OR 25% GGBFS. CONCRETE WILL BE SUBJECT TO INSPECTION AND TESTS FOR COMPLIANCE WITH QUALITY REQUIREMENTS.
4. CONTRACTOR SHALL REPLACE PAVEMENT AND SUB–BASE IN FRONT OF CURB AS PER PAVEMENT REPLACEMENT DETAIL.



CAST-IN-PLACE CONCRETE CURB TYPE B DETAIL

SCALE: NOT TO SCALE

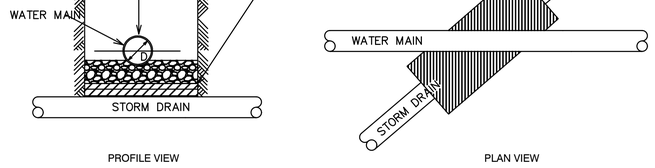


TYPICAL PIPE CROSSINGS

TYPICAL PIPE CROSSING DETAILS

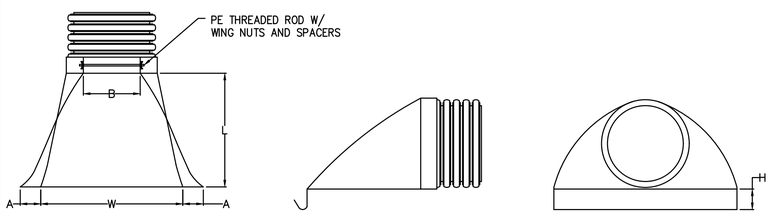
SCALE: NOT TO SCALE

PROVIDE INSULATION WHEN WATER MAIN CROSSES ABOVE OR BELOW STORM DRAIN



WATER MAIN INSULATION DETAIL

SCALE: NOT TO SCALE



PIPE SIZE	A	B(MAX)	H	L	W
30"	7.5"	22"	8.6"	58"	63"

FLARED END SECTION DETAIL

SCALE: NOT TO SCALE

NOTES:

1. TO BE PAID UNDER ITEM 900.620 SPECIAL PROVISION (30" FLARED END SECTION)

100% DESIGN SUBMITTAL

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125 College St, 4th Floor
Burlington, VT 05408
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REV.	REVISION DESCRIPTION	DATE

DESIGNED BY APS | DRAWN BY TGB | CHECKED BY KDW

DATE: JANUARY 5, 2024

SCALE: AS SHOWN

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

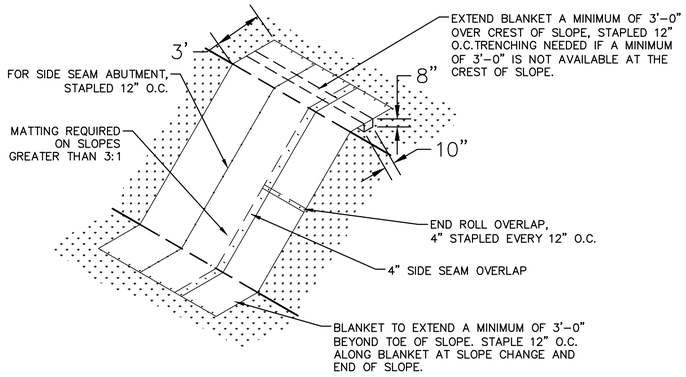
PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

GENERAL DETAILS

C2.4

PROJECT NO. 120006

SHEET 11 OF 16

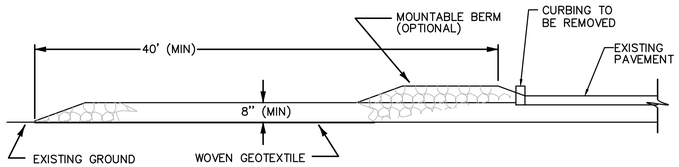


NOTES:

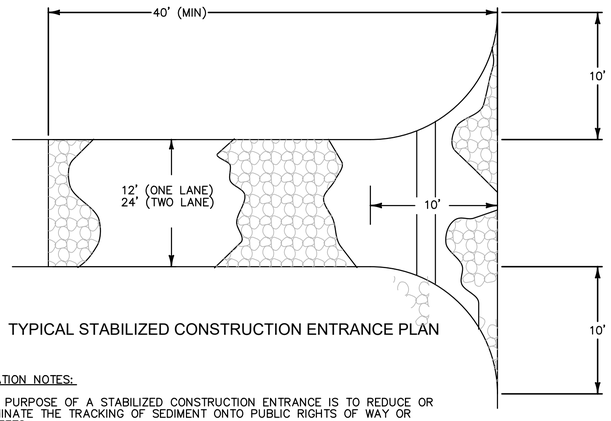
1. MATTING TO BE USED SHALL BE CURLEX® 01 MANUFACTURED BY AMERICAN EXCELSIOR COMPANY, OR APPROVED EQUAL
2. STAPLE PATTERNS ARE DEPENDENT ON SITE CONDITIONS.SEE CURLEX® STAPLE PATTERN GUIDE FOR DETAILS.

EROSION CONTROL MATTING SLOPE DETAIL

SCALE: NOT TO SCALE



TYPICAL CONSTRUCTION ENTRANCE PROFILE



TYPICAL STABILIZED CONSTRUCTION ENTRANCE PLAN

APPLICATION NOTES:

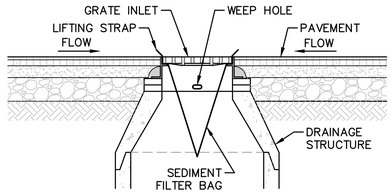
1. THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY OR STREETS.

GENERAL NOTES:

1. STONE SIZE – USE CLEAN STONE WITH GRADATION BETWEEN 1 INCHES AND 4 INCHES.
2. LENGTH – 40 FEET (MIN)
3. THICKNESS – 18 INCHES (MIN)
4. WIDTH – 12 FEET (MIN)
5. GEOTEXTILE UNDER STONE WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. WHEN WASHING OF VEHICLE IS NECESSARY, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
7. THE ENTRANCE SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT.
8. MAINTENANCE– THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
9. AT THE TIME OF REMOVAL OF THE STABILIZED CONSTRUCTION ENTRANCE THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.

CONSTRUCTION ENTRANCE DETAIL

SCALE: NOT TO SCALE

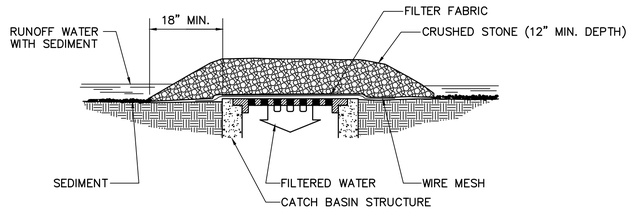


INLET PROTECTION NOTES:

1. REMOVE DRAINAGE INLET GRATE AND PLACE SEDIMENT FILTER BAG AROUND THE FRAME, REPLACE GRATE AND SEDIMENT FILTER BAG IN POSITION OR FOLLOW MANUFACTURER'S RECOMMENDATIONS. LIFTING STRAPS SHALL BE EXPOSED AND READY FOR MAINTENANCE PROCEDURES.
2. INSPECT SEDIMENT FILTER BAG WEEKLY AND AFTER EVERY RAINFALL EVENT.
3. REPLACE, CLEAN OR REMOVE SEDIMENT FILTER BAG AS DIRECTED.
4. INLET PROTECTION SHALL BE PROVIDED FOR ALL CATCHBASINS THAT WILL RECEIVE RUNOFF FROM DISTURBED AREAS.

SEDIMENTATION CONTROL AT CATCH BASIN

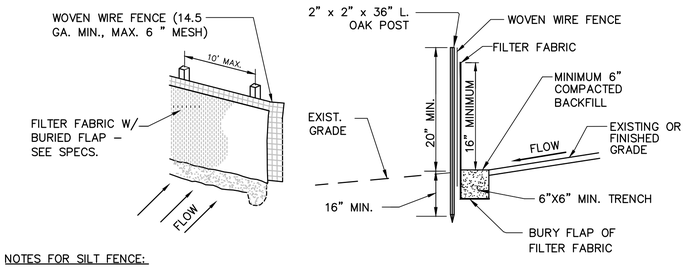
SCALE: NOT TO SCALE



1. A WIRE MESH SHALL BE PLACED OVER THE DROP INLET OR CURB OPENING SO THAT THE ENTIRE OPENING AND A MINIMUM OF 12 INCHES AROUND THE OPENING ARE COVERED BY THE MESH. THE MESH MAY BE ORDINARY HARDWARE CLOTH OR WIRE MESH WITH OPENINGS UP TO 1/4 INCH.
2. THE WIRE MESH SHALL BE COVERED WITH CLEAN COARSE AGGREGATE SUCH AS CRUSHED STONE FOR A MINIMUM DEPTH OF 12 INCHES. CRUSHED STONE SHALL BE BEDDING STONE FOR SEWERS (ASTM STONE SIZE NO. 67). SEE SPECIFICATIONS.
3. THE COARSE AGGREGATE SHALL EXTEND AT LEAST 18 INCHES BEYOND ALL SIDES OF THE CATCH BASIN/DRAIN OPENING.
4. THIS SEDIMENTATION CONTROL SHALL BE UTILIZED AT ALL CATCH BASINS ENCOUNTERED.

SEDIMENTATION CONTROL AT CATCH BASIN

SCALE: NOT TO SCALE



NOTES FOR SILT FENCE:

1. SPACING OF WOOD FENCE POSTS NOT TO EXCEED 10'–0".
2. SILT FENCE SHALL BE INSTALLED BEFORE ANY EARTH REMOVAL OR EXCAVATION TAKES PLACE
3. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO POSTS WITH WIRE TIES OR STAPLES AT TOP, MIDPOINT AND BOTTOM.
4. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE.
5. OVERLAP BY 6", FOLD AND STAPLE ADJOINING SECTIONS OF FILTER FABRIC.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED, AND THE MATERIAL REMOVED WHEN "BULGES" DEVELOP. DO NOT DEPOSIT MATERIAL NEAR WETLANDS OR WATERCOURSES.
7. FILTER FABRIC SHALL BE ENTRENCHED 6" MIN. BELOW EXISTING OR FINISHED GRADE.

SILT FENCE DETAIL

SCALE: NOT TO SCALE

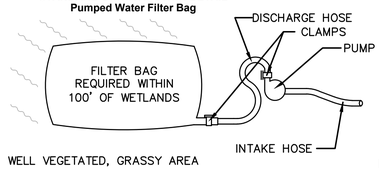
CONSTRUCTION DEWATERING NOTES:

1. THE CONTRACTOR WILL PROVIDE DEWATERING EQUIPMENT (I.E. PUMPS, HOSES, ETC.,) CAPABLE OF CONTROLLING GROUNDWATER ENCOUNTERED IN THE EXCAVATIONS SUCH THAT ALL CAN BE PERFORMED "IN THE DRY." SEE SPECIAL PROVISION SPECIFICATION SECTION 900.645–02140 (DEWATERING).
2. AS NEEDED, CONSTRUCTION DEWATERING DISCHARGED TO THE SUBSURFACE OR TO SURFACE WATER BODY/DRAINAGE SYSTEM SHALL BE PRETREATED FOR SEDIMENT REMOVAL BY RESIDING IN A FILTER BAG OR FRACTIONATION/SEDIMENTATION TANK PRIOR TO DISCHARGE. UNDER NO CIRCUMSTANCES IS WATER FROM THE SEDIMENTATION TANK TO BE DISCHARGED DIRECTLY TO A WETLAND RESOURCE AREA. WATER FROM THE SEDIMENTATION TANK MUST BE DISCHARGED THROUGH A CATCH BASIN WITH AN ADEQUATE AND FUNCTIONING SUMP OR THROUGH A SEDIMENTATION TRAP PRIOR TO ENTERING A WETLAND RESOURCE AREA OR RECEIVING WATER. THE OUTLET MUST BE INSPECTED DURING OPERATION TO CONFIRM THAT SEDIMENT IS NOT BEING DISCHARGED TO A WETLAND RESOURCE AREA.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PROPER PERMITTING FOR CONSTRUCTION DEWATERING ACTIVITIES.

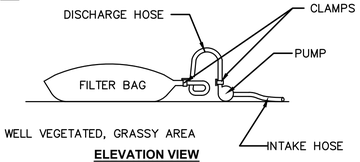
EROSION CONTROL NOTES:

1. ALL DRAINAGE OUTLETS SHALL BE LOCATED AND CONTRACTOR SHALL BE RESPONSIBLE FOR ALL APPROPRIATE EROSION PREVENTION AND SEDIMENT CONTROL MEASURES INSTALLED AS REQUIRED PRIOR TO CONSTRUCTION. CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (NOI) AND AN EROSION PREVENTION AND SEDIMENTATION CONTROL PLAN PRIOR TO BEGINNING OF WORK. ALL DEWATERING AND OPERATIONS SHALL CONFORM TO ALL APPROPRIATE AGENCY REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED DISCHARGE SAMPLING AND TESTING AND SHALL BE INCIDENTAL TO THE DEWATERING OPERATIONS.
2. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROVIDE EROSION PREVENTION AND SEDIMENT CONTROL.
3. THE CONTRACTOR SHALL FULLY COMPLY WITH ALL LOCAL AND STATE REGULATIONS.
4. THE CONTRACTOR SHALL FURNISH, INSTALL AND PERFORM ALL NECESSARY REQUIREMENTS TO COMPLY WITH THE VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL AND THESE PLANS AND SPECIFICATIONS. THE MORE STRINGENT SHALL APPLY.
5. THE CONTRACTOR SHALL PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE THE TIME THAT SOIL IS LEFT DISTURBED.
6. PROPERLY ENTRENCHED SILTATION FENCE SHALL BE INSTALLED IMMEDIATELY OUTSIDE OF THE PAVEMENT OR AS SHOWN ON THE PLANS.
7. SILT FENCE INSTALLATIONS SHALL BE INSPECTED FOR THE FOLLOWING:
   - VISIBLE DAMAGE TO SILT FENCE INSTALLATIONS.
   - SEDIMENT ACCUMULATION: SEDIMENT REMOVAL SHALL OCCUR WHEN SEDIMENT HAS ACCUMULATED TO NO MORE THAN ONE THIRD THE HEIGHT OF THE FENCE.
   - SIGNS OF CHANNEL OR GULLY EROSION FORMATION PARALLEL TO THE FENCE.
   - SIGNS OF DETERIORATED OR CLOGGED GEOTEXTILE; REPLACE AS NEEDED.
   - SIGNS OF UNDER CUTTING OR PIPING.
   - STAKES SHALL BE SECURED TO THE GROUND.
8. INSPECTIONS OF THE PROJECT SITE AND ALL EROSION CONTROL BARRIERS BY THE CONTRACTOR SHALL OCCUR DAILY AND AFTER EVERY SIGNIFICANT PRECIPITATION EVENT (EXCEEDING 1/2–INCH PRECIPITATION).
9. IN ADDITION LIME SHALL BE ADDED TO THE TOPSOIL IN AMOUNTS AS NECESSARY TO ACHIEVE THE REQUIRED PH AS SPECIFIED.
10. SHOULD SEASONAL LIMITATIONS MAKE ESTABLISHMENT OF GRASS ON AREAS TOPSOILED, SEEDED, AND MULCHED UNREALISTIC, SUCH AREAS SHALL BE TREATED WITH BONDED FIBER MULCH.
11. ALL AREAS DISTURBED SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
12. ALL CUT & FILL SLOPES SHALL BE LOAMED AND SEEDED WITHIN 72 HOURS OF ESTABLISHING FINISHED GRADE.
13. IF THE PROJECT CONTINUES INTO THE WINTER THE FOLLOWING CRITERIA SHALL BE MET:
    - ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES STEEPER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
    - ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

STANDARD CONSTRUCTION DETAIL
Pumped Water Filter Bag



PLAN VIEW



ELEVATION VIEW

100% DESIGN SUBMITTAL

FILTER BAG DISCHARGE DETAIL

SCALE: NOT TO SCALE

HOYLE TANNER
125 College St, 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: APS
DATE: JANUARY 5, 2024
SCALE: AS SHOWN

APPLICANT: POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT: POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

EROSION AND SEDIMENT CONTROL DETAILS

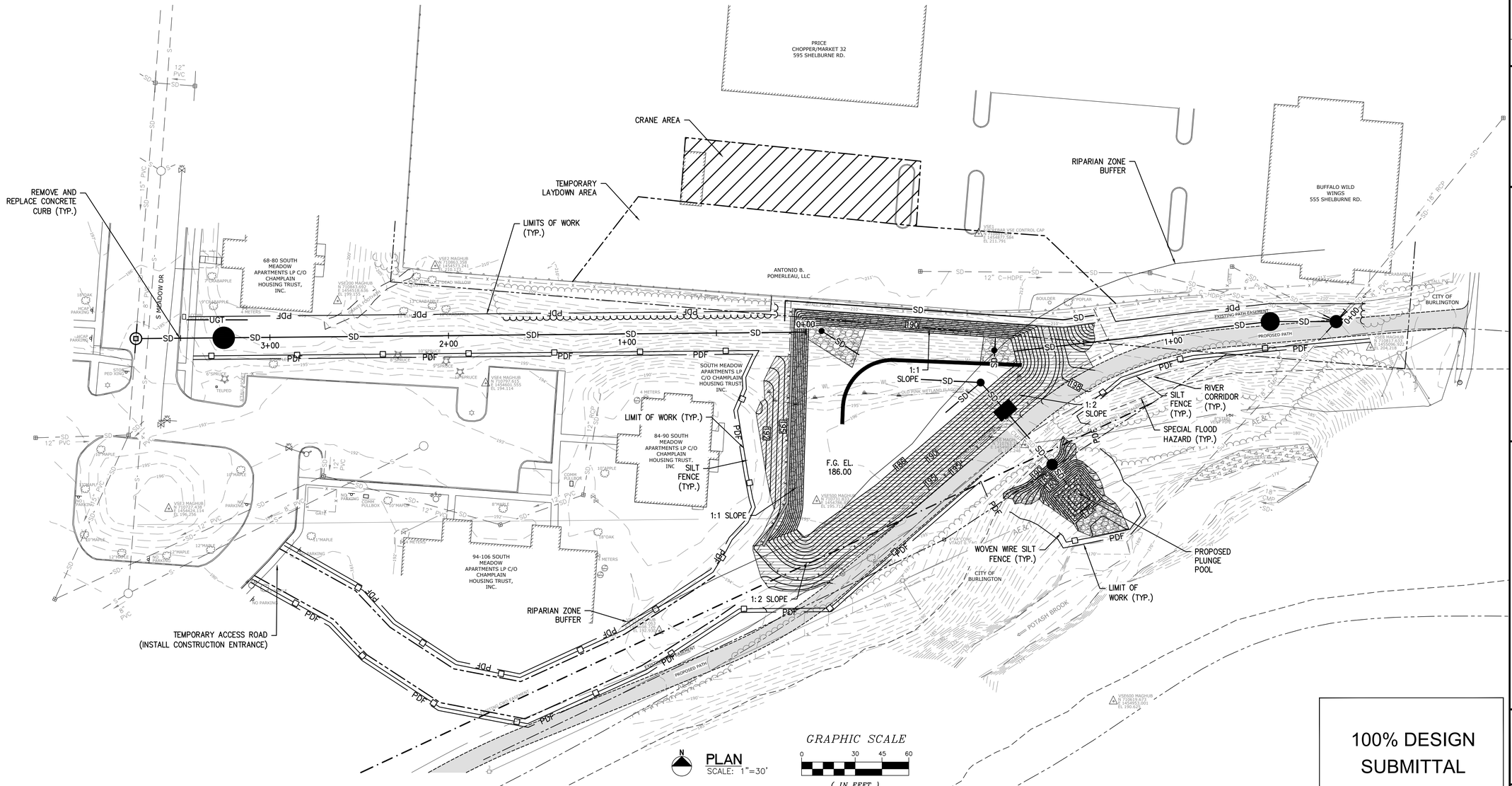
C2.5

PROJECT NO. 120006

SHEET 12 OF 16

EROSION CONTROL NOTES:

1. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
2. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
3. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
4. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIVERSION OF STORMWATER FLOWS AND BYPASSING EXISTING POND DURING CONSTRUCTION UNTIL NEW GRAVEL WETLAND IS COMPLETE AND READY TO ACCEPT FLOW. (SUBSIDIARY)
6. TOPSOIL AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE OUTFALL AREAS WITH REQUIRED EROSION CONTROL.
7. REMOVE ACCUMULATED SEDIMENT FROM BMP AT COMPLETION OF PROJECT (SUBSIDIARY).
8. SEEDING INSIDE GRAVEL WETLAND FACILITY SHALL BE AS PER THE REQUIREMENTS OF SPECIFICATION SPECIAL PROVISION 900.645 (GRAVEL WETLAND FACILITY).
9. ALL DISTURBED AREAS NOT OTHERWISE DESIGNATED, SHALL BE TILLED, TOPSOILED AND SEEDED WITH VERMONT CONSERVATION MIX (80 LBS PER ACRE APPLICATION RATE) IN ACCORDANCE WITH SECTION 651. SEE SOIL AND SEEDING NOTES ON DWG NO. G-0.2
10. STRAW MULCH AS PER NOTES ON G-0.2.



PLAN
SCALE: 1"=30'

GRAPHIC SCALE
0 30 45 60
(IN FEET)

100% DESIGN SUBMITTAL

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: TGB

HOYLE TANNER
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(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024
SCALE: 1" = 30'

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

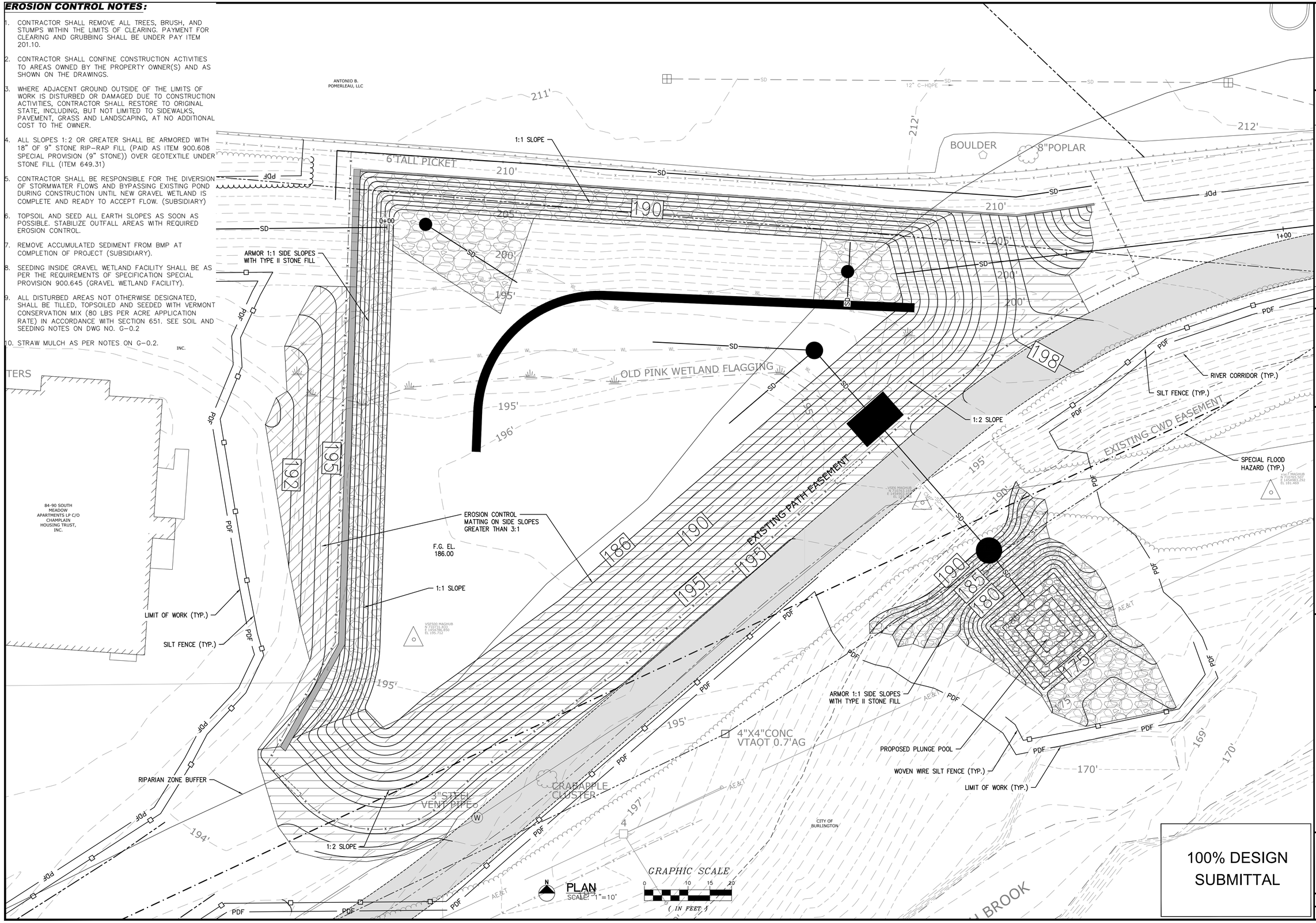
EROSION AND SEDIMENT CONTROL PLAN I
C2.6

PROJECT NO. 120006
SHEET 13 OF 18

21:120006.03-EROSION - C2.6 - EROSION & SEDIMENT CONTROL PLAN I.DWG

EROSION CONTROL NOTES:

1. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, AND STUMPS WITHIN THE LIMITS OF CLEARING. PAYMENT FOR CLEARING AND GRUBBING SHALL BE UNDER PAY ITEM 201.10.
2. CONTRACTOR SHALL CONFINE CONSTRUCTION ACTIVITIES TO AREAS OWNED BY THE PROPERTY OWNER(S) AND AS SHOWN ON THE DRAWINGS.
3. WHERE ADJACENT GROUND OUTSIDE OF THE LIMITS OF WORK IS DISTURBED OR DAMAGED DUE TO CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE TO ORIGINAL STATE, INCLUDING, BUT NOT LIMITED TO SIDEWALKS, PAVEMENT, GRASS AND LANDSCAPING, AT NO ADDITIONAL COST TO THE OWNER.
4. ALL SLOPES 1:2 OR GREATER SHALL BE ARMORED WITH 18" OF 9" STONE RIP-RAP FILL (PAID AS ITEM 900.608 SPECIAL PROVISION (9" STONE)) OVER GEOTEXTILE UNDER STONE FILL (ITEM 649.31)
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIVERSION OF STORMWATER FLOWS AND BYPASSING EXISTING POND DURING CONSTRUCTION UNTIL NEW GRAVEL WETLAND IS COMPLETE AND READY TO ACCEPT FLOW. (SUBSIDIARY)
6. TOPSOIL AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE OUTFALL AREAS WITH REQUIRED EROSION CONTROL.
7. REMOVE ACCUMULATED SEDIMENT FROM BMP AT COMPLETION OF PROJECT (SUBSIDIARY).
8. SEEDING INSIDE GRAVEL WETLAND FACILITY SHALL BE AS PER THE REQUIREMENTS OF SPECIFICATION SPECIAL PROVISION 900.645 (GRAVEL WETLAND FACILITY).
9. ALL DISTURBED AREAS NOT OTHERWISE DESIGNATED, SHALL BE TILLED, TOPSOILED AND SEEDED WITH VERMONT CONSERVATION MIX (80 LBS PER ACRE APPLICATION RATE) IN ACCORDANCE WITH SECTION 651. SEE SOIL AND SEEDING NOTES ON DWG NO. G-0.2
10. STRAW MULCH AS PER NOTES ON G-0.2.



100% DESIGN SUBMITTAL

HOYLE TANNER
125 College St. 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KDW
DRAWN BY: TGB
DESIGNED BY: TGB
DATE: JANUARY 5, 2024
SCALE: 1" = 10'

APPLICANT
POMERLEAU AND CHITTENDEN HOUSING TRUST

PROJECT
POMERLEAU / CHT 3-ACRE STORMWATER MANAGEMENT PROJECT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

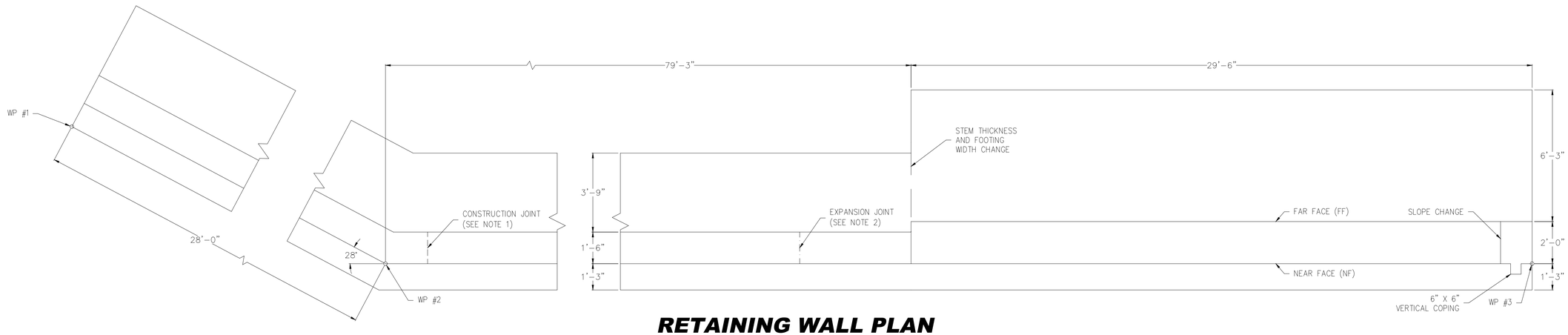
EROSION AND SEDIMENT CONTROL SITE PLAN II

C2.7

PROJECT NO. 120006

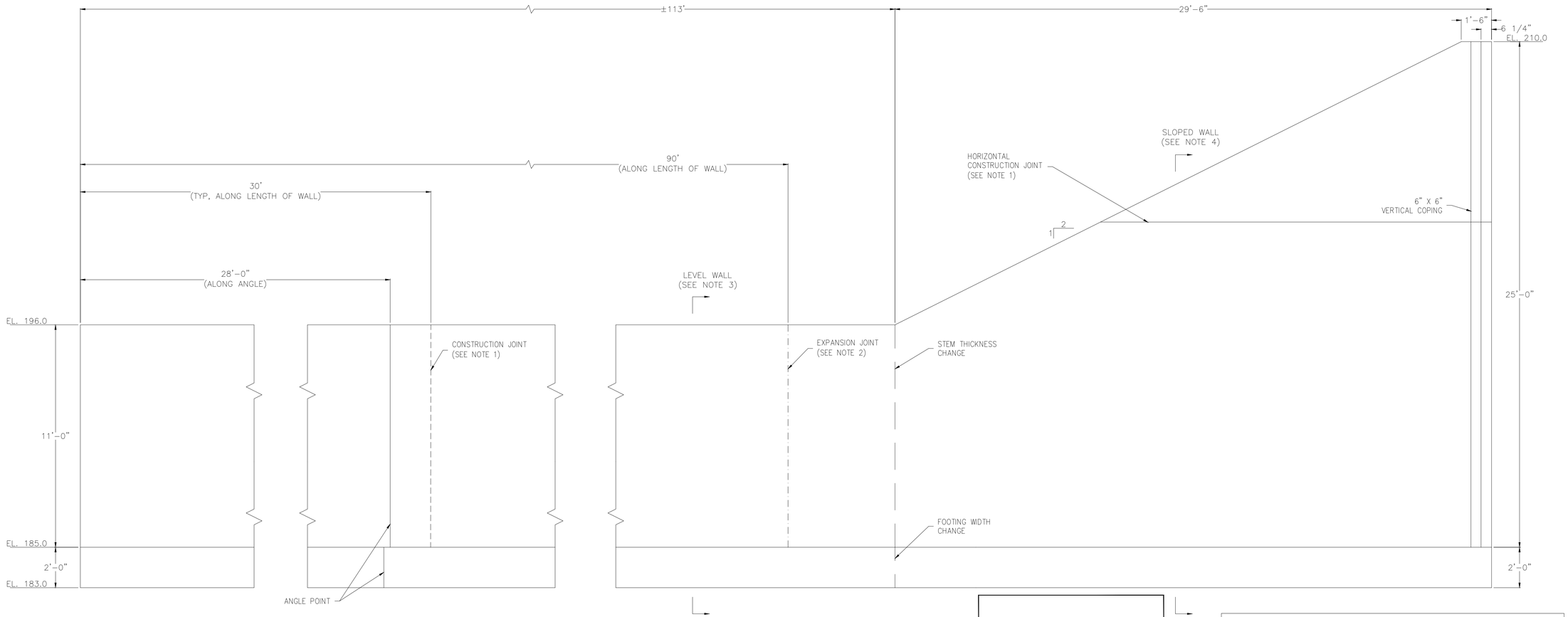
SHEET 14 OF 18

21:120006.03-EROSION - C2.6 - EROSION & SEDIMENT CONTROL PLAN I.DWG



RETAINING WALL PLAN

SCALE: 3/8" = 1'-0"



RETAINING WALL ELEVATION

NOTES:

1. SEE CONSTRUCTION JOINT DETAILS. CONTRACTOR TO DETERMINE LOCATION OF HORIZONTAL CONSTRUCTION JOINT. VTRANS STANDARD S-500.
2. SEE VERTICAL EXPANSION JOINT DETAIL. VTRANS STANDARD S-500..
3. SEE LEVEL WALL SECTION DETAILS ON SHEET S-1.2.
4. SEE SLOPED WALL SECTION DETAILS ON SHEET S-1.3.

100% DESIGN SUBMITTAL

WORKING POINTS

WORKING POINT	NORTHING	EASTING
WP #1	710706.2796	1454757.3920
WP #2	710730.7200	1454771.0636
WP #3	710839.4690	1454774.5810

REVISION DESCRIPTION | DATE | REV.

DESIGNED BY ANS | DRAWN BY ANS | CHECKED BY KCB

HOYLE TANNER
125 College St, 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024

SCALE: AS SHOWN

APPLICANT
CITY OF BURLINGTON
149 CHURCH STREET
BURLINGTON, VT 05401

PROJECT
CCRPC POMERLEAU/CHT 3-ACRE SW MANAGEMENT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

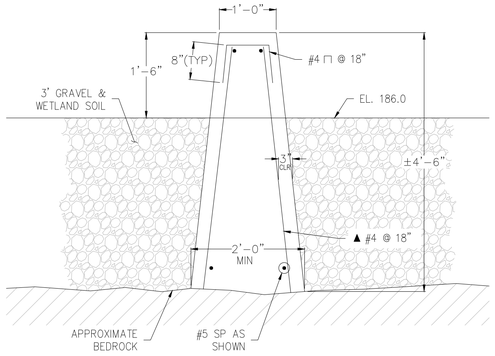
PLAN & ELEVATION

S1.1

PROJECT NO. 120006

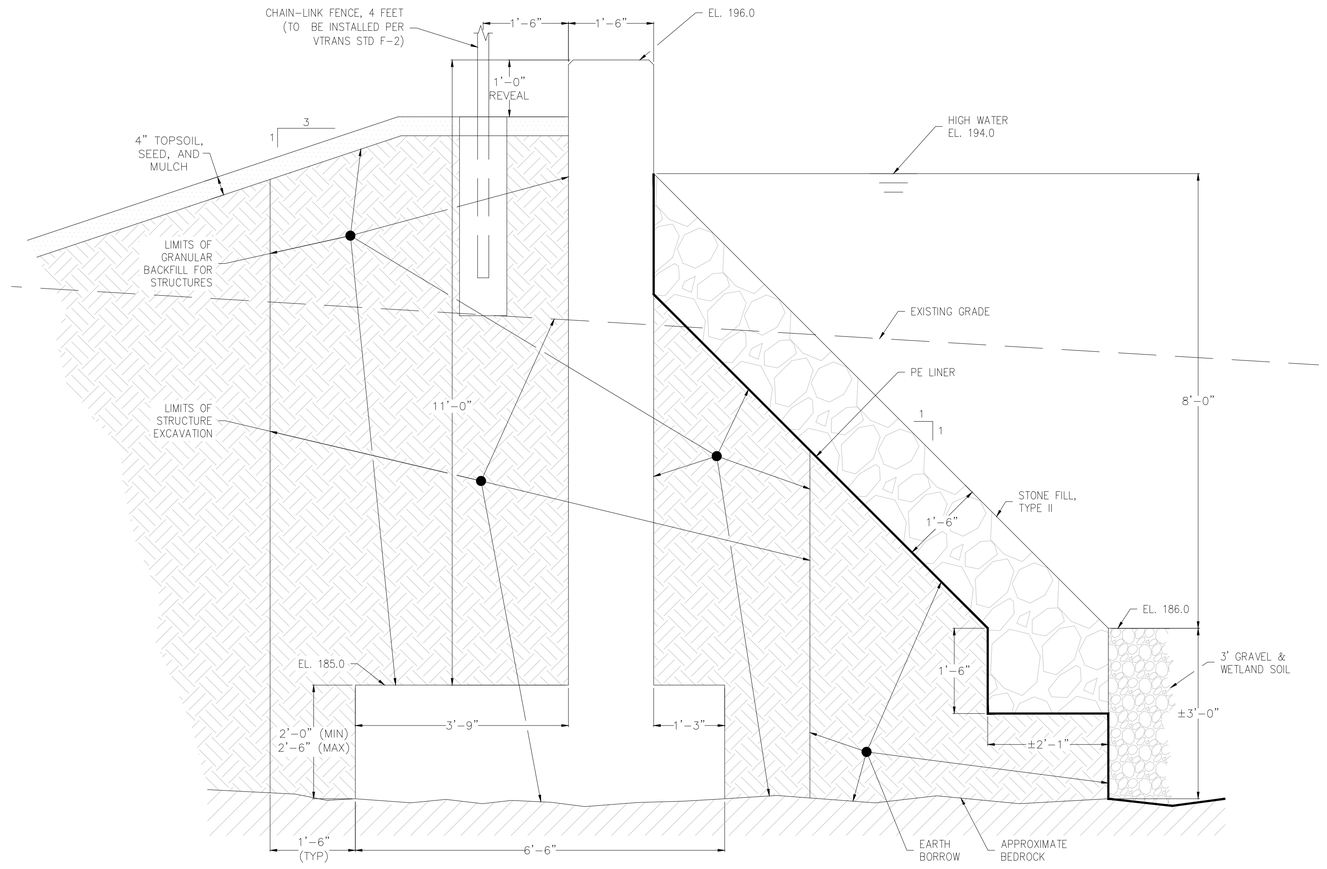
SHEET 15 OF 18

100% DESIGN SUBMITTAL



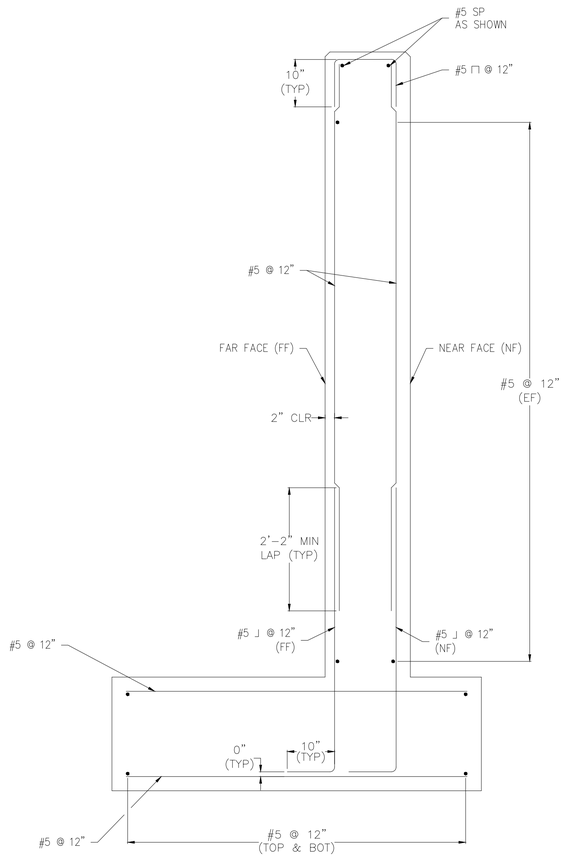
BERM WALL SECTION

SCALE: ¾" = 1'-0"



LEVEL WALL SECTION

SCALE: ¾" = 1'-0"



LEVEL WALL REINFORCEMENT

SCALE: ¾" = 1'-0"

NOTES:

SEE SHEET S-0.1 STRUCTURAL NOTES AND DRAWING INDEX FOR CONCRETE SUBFOOTING NOTES FOR AREAS WHERE BEDROCK IS MORE THAN 6" BELOW FOOTING ELEVATIONS SHOWN ON SHEETS S-1.1 PLAN AND ELEVATION.

NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2" - 9" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

STATE OF VERMONT — KEVIN C. BARNEY — No. 11816CB Civil — REGISTERED PROFESSIONAL ENGINEER

REV.	REVISION DESCRIPTION	DATE

CHECKED BY: KCB
DRAWN BY: ANS
DESIGNED BY: ANS
DATE: JANUARY 5, 2024
SCALE: AS SHOWN

HOYLE TANNER
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APPLICANT
CITY OF BURLINGTON
149 CHURCH STREET
BURLINGTON, VT 05401

PROJECT
CCRPC POMERLEAU/CHT 3-ACRE SW MANAGEMENT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

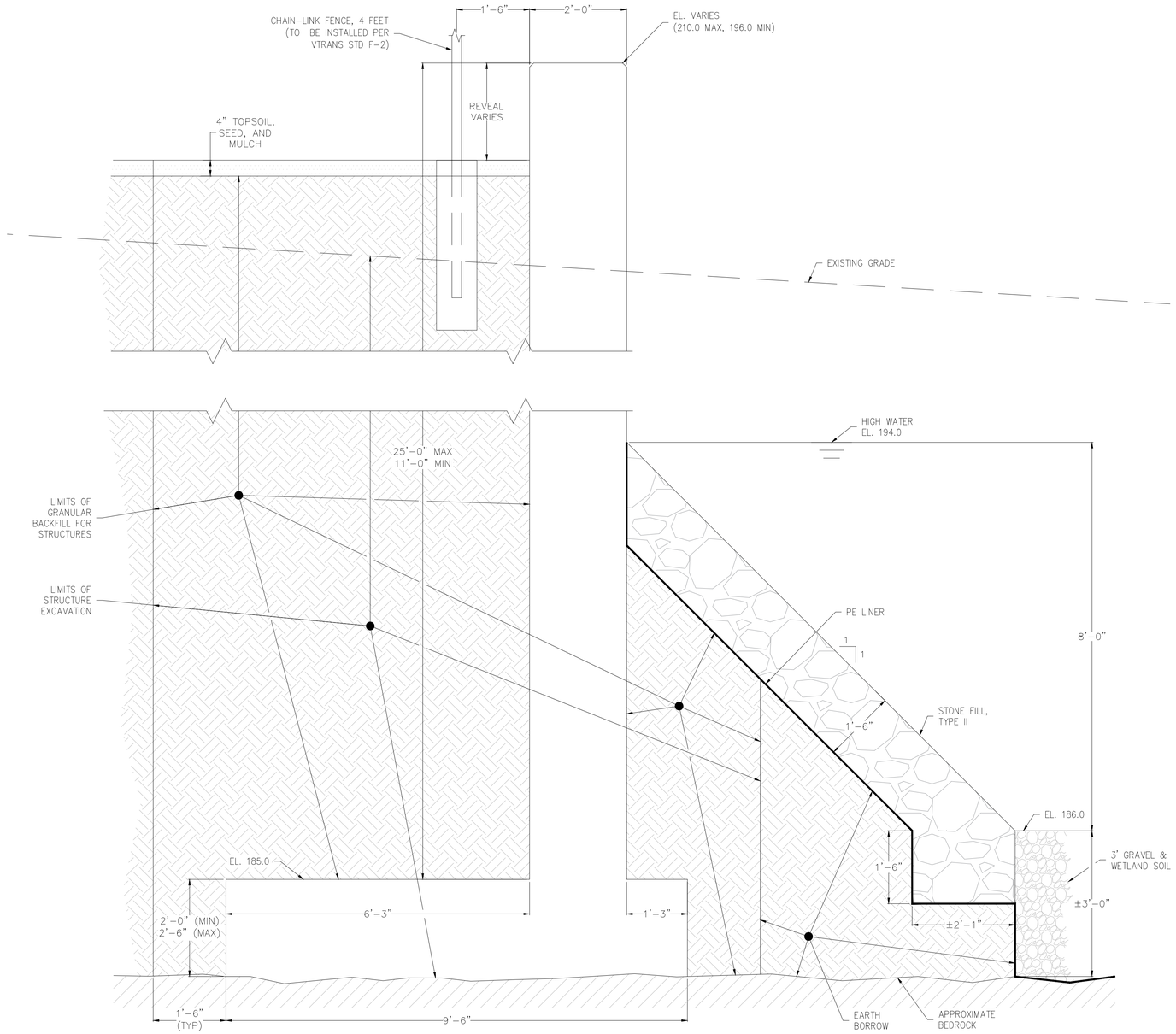
LEVEL WALL DETAILS

S1.2

PROJECT NO. 120006

SHEET 16 OF 18

100% DESIGN SUBMITTAL

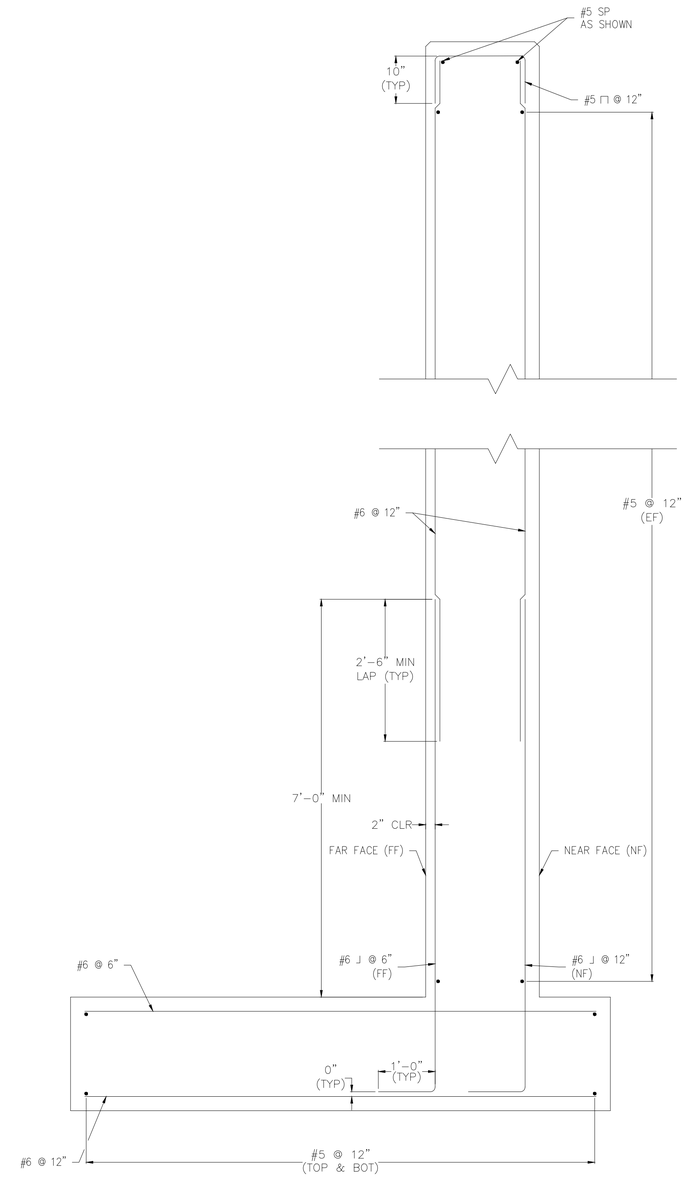


NOTE:

SEE S–1.4 MSE WALL DETAILS FOR EXCAVATION AND BACKFILL DETAILS FOR MSE WALL. ALL EXCAVATION AND BACKFILL ASSOCIATED WITH THE MSE WALL IS INCIDENTAL TO ITEM 900.670 "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)", EXCEPT WHERE STRUCTURE EXCAVATION LIMITS AT SLOPED WALL CONFLICT. IN THAT LOCATION, STRUCTURE EXCAVATION TO THE LIMITS SHOWN ON THIS SHEET SHALL BE PAID.

SLOPED WALL SECTION

SCALE: ¾" = 1'–0"



NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2" – 9" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

SLOPED WALL REINFORCEMENT

SCALE: ¾" = 1'–0"

STATE OF VERMONT
KELLY C. BARNETT
No. 11816
Civil
LICENSED
PROFESSIONAL ENGINEER

REV.	REVISION DESCRIPTION	DATE

CHECKED BY KCB
DRAWN BY ANS
DESIGNED BY ANS

HOYLE TANNER
125 College St, 4th Floor
Burlington, VT 05408
(802) 860-1331
www.hoyletanner.com

DATE: JANUARY 5, 2024
SCALE: AS SHOWN

APPLICANT
CITY OF BURLINGTON
149 CHURCH STREET
BURLINGTON, VT 05401

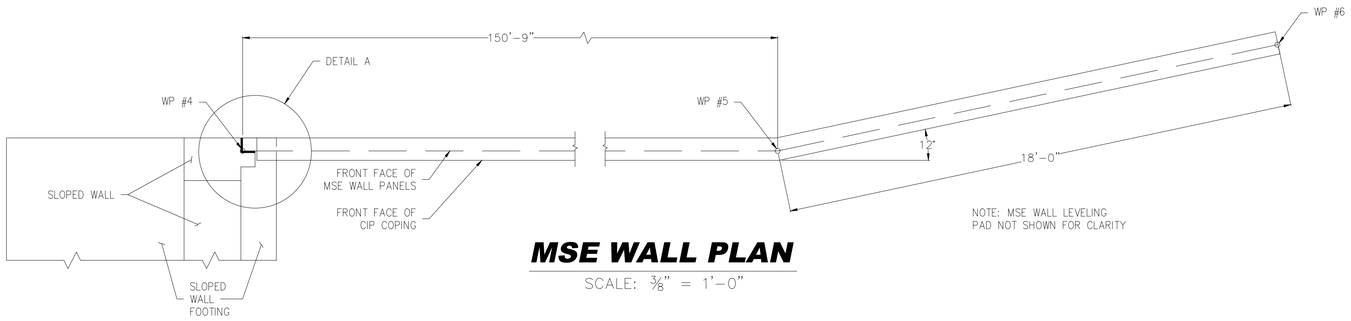
PROJECT
CCRPC POMERLEAU/CHT 3-ACRE SW MANAGEMENT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

SLOPED WALL DETAILS

S1.3

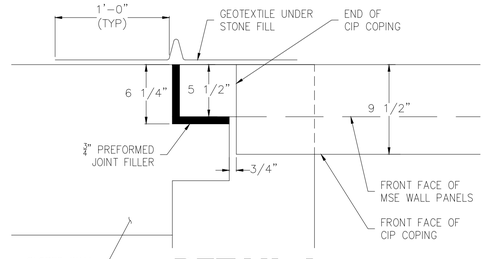
PROJECT NO. 120006

SHEET 17 OF 18



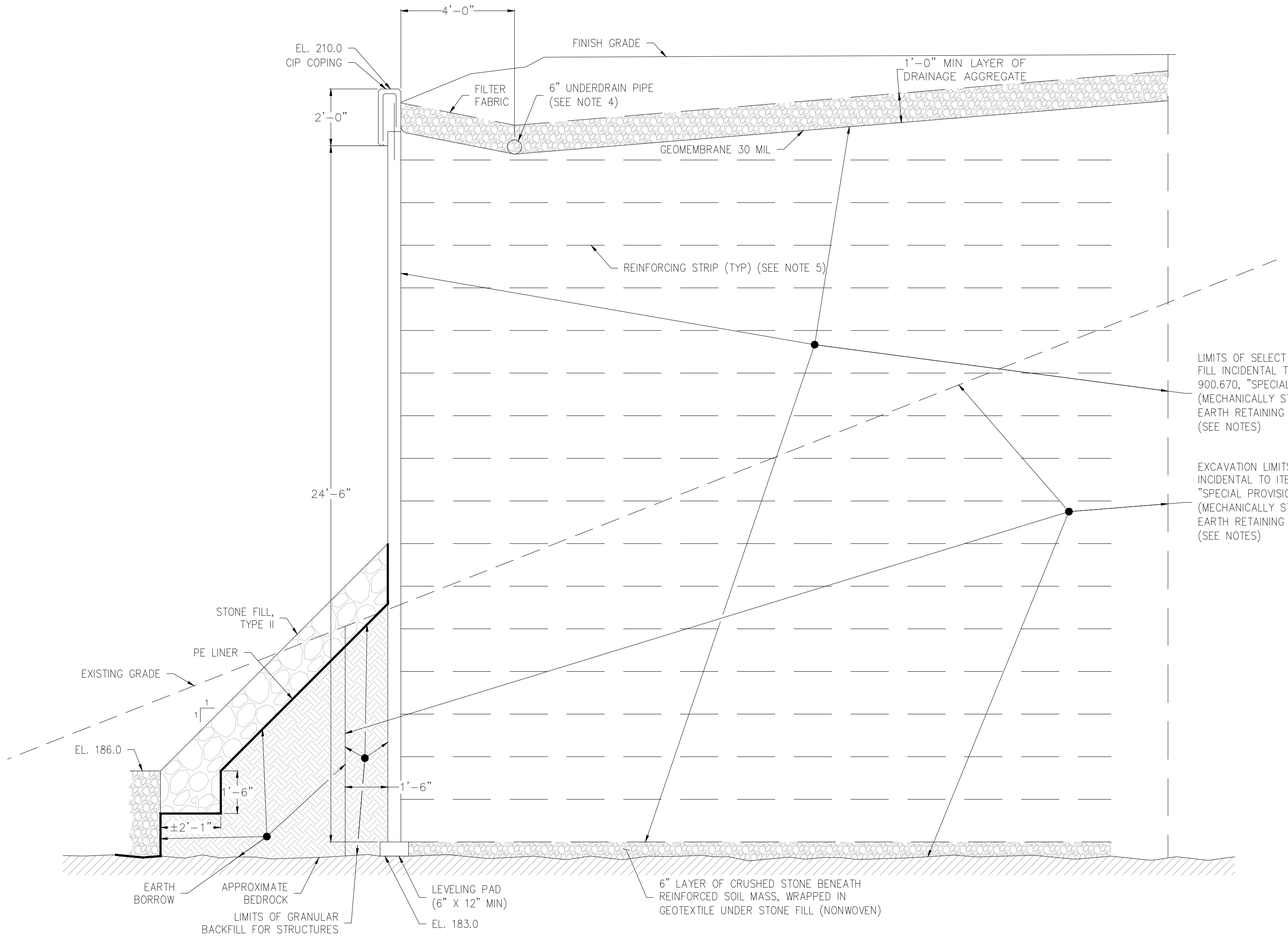
MSE WALL PLAN

SCALE: 3/8" = 1'-0"



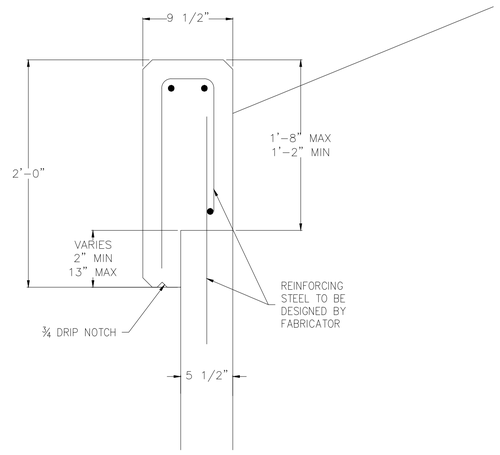
DETAIL A

SCALE: 1½" = 1'-0"



MSE WALL SECTION

SCALE: 3/8" = 1'-0"



CIP COPING SECTION

SCALE: 1½" = 1'-0"

WORKING POINTS		
WORKING POINT	NORTHING	EASTING
WP #4	710839.0056	1454774.6284
WP #5	710828.7016	1454924.9646
WP #6	710831.2940	1454942.7805

100% DESIGN SUBMITTAL

NOTES:

1. GEOTEXTILE UNDER STONE FILL SHALL BE ADHERED TO THE BACK FACE OF MSE WALL PANELS AND RETAINING WALL. PAYMENT WILL BE MADE UNDER ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)."
2. ALL EXCAVATION AND BACKFILL ASSOCIATED WITH THE MSE WALL IS INCIDENTAL TO ITEM 900.670, "SPECIAL PROVISION (MECHANICALLY STABILIZED EARTH RETAINING WALL)" EXCEPT WHERE STRUCTURE EXCAVATION LIMITS AT SLOPED WALL CONFLICT. IN THAT LOCATION, STRUCTURE EXCAVATION TO THE LIMITS SHOWN ON SHEET S-1.3 SLOPED WALL DETAILS SHALL BE PAID.
3. IN LOCATIONS WHERE SLOPED WALL FOOTING CONFLICTS WITH MSE WALL, MSE WALL SHALL BE STEPPED UP TO CLEAR THE SLOPED WALL FOOTING. 2" OF PREFORMED JOINT FILLER SHALL BE INSTALLED VERTICALLY AND HORIZONTALLY BETWEEN MSE WALL LEVELING PAD AND SLOPED WALL FOOTING. 3/4" OF PREFORMED JOINT FILLER SHALL BE INSTALLED BETWEEN THE VERTICAL FACED OF THE SLOPED WALL AND MSE WALL.
4. MAINTAIN A 1% SLOPE MINIMUM FOR 6" UNDERDRAIN PIPE.
5. MINIMUM STRIP LENGTH EQUAL TO 0.7 TIMES THE HEIGHT OF EXPOSED WALL.

STATE OF VERMONT
PEARCE C. BANNER
No. 118158
Civil
REGISTERED PROFESSIONAL ENGINEER

REV.	REVISION DESCRIPTION	DATE

CHECKED BY	DRAWN BY	DESIGNED BY
KCB	ANS	ANS

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DATE: JANUARY 5, 2024

SCALE: AS SHOWN

APPLICANT
CITY OF BURLINGTON
149 CHURCH STREET
BURLINGTON, VT 05401

PROJECT
CCRPC POMERLEAU/CHT 3-ACRE SW MANAGEMENT
84 SOUTH MEADOW DRIVE
BURLINGTON, VT 05401

MSE WALL DETAILS

S1.4

PROJECT NO. 120006

SHEET 18 OF 18

Conservation Board Meeting Minutes
Monday, July 1st, 2024 – 5:30 pm
Remote Meeting

Attendance

- Board Members: Zoe Richards (ZR), Miles Waite (MW), Hannah Brislin (HB), Caryn Connolly (CC), Rebecca Roman (RR), Don Meals (DM), Leslie Spencer (LS), Kyle Tansley (KT), Elizabeth Cunningham (EC), Ryan Crehan (RC)
- Absent:
- Public: Sharon Bushor
- Staff: Garret King (Permitting & Inspections) Megan Moir (Division Director of Water Resources)

ZR, chair, called the meeting to order at 5:33 p.m.

Annual Organizational Meeting

Nomination and election of Chair:

Nomination- Rebecca Roman, Motion by CC and 2nd by MW

Election- Rebecca Roman Vote all yes

Nomination and election of Vice Chair:

Nomination- Caryn Connolly, Motion by RC and 2nd by RR

Election- Caryn Connolly Vote all yes

Nomination and election of Long Range Planning Committee representative

Nomination- Ryan Crehan, Motion RR and 2nd by ZR

Election- Ryan Crehan Vote all yes

Minutes

June 3, 2024 minutes

Comments

Stephan white: page 2 contamination “former petroleum storage tank”

A MOTION as amended was made by (ste white) and SECONDED by (RC) :

Motion to approve the June 3 minutes as amended.

Vote: (all yes), motion carried

Board Comment

Stefn white: This will be my last meeting here as I have been appointed to the DRB and will have my first meeting there on the 16th, it has been great working with you all and it has been a good time. Now going to DRB I will still see all the same projects just further down the line.

ZR: Can we work to try and fill that spot you are leaving, and do you know of anyone that will be able to fill your spot and your expertise.

Stef: I have a few in mind and I will work to find someone and provide suggestions.

RC: I think that we as a board should take a look at our city wetland regulations due to changes at the federal level. Can we discuss the cities wetland rules. I see some things that would be good to go over our rules to come up with recommendations.

RR and ZR: Sounds like a good idea, how should we go about this?

RC: We can have a discussion and then work to make it a reality, if Scott may be able to help us facilitate this process.

ZR: I agree Scoot will be the point person on this work.

RR: Any public comments?

Public Comment

Sharron Bushor: First, congratulations Rebeca for your new appointment and thank you Zoe for your time as Chair. For Miles, are you looking at projects that are here today again when you move to the DRB at your first meeting? I know you are looking at finding a replacement but Paul Berman is a professor in my ward and I think his name is one that can be included in your consideration. Lastly thank you for looking further at our wetlands. If we look at our how we should also look at the state level and then compare how we align up against the state. Do we need to reconsider the regulations in the neighborhood code and how we missed protection for mature trees. We should look at how we should have things in place to prevent removing trees or getting permits to remove trees. Proposed projects have had tree removal and we should consider retaining trees. Thanks again all for all of your work.

ZR: This work should start to get covered in open space sub-committee work and discussions.

Project Review

5.1 ZP-24-148, 49-55 Chase Street

Applicant (Missa, and Brett) appeared for this item

Bret: Missa can present the overview for this project.

Missia: Current site overview shows that there are 3 existing buildings and there is space for additional development under the new zoning regulations. We are proposing new subdivision and additional development to add to what is there. We are proposing two new 2-unit additions and then a new 4-unit building. Shared parking is also included. The Rumsey Lane building will be pulled closer to Rumsey than currently depicted as required by zoning. From meeting with neighbors the biggest concerns we heard was about about trees, we are trying to retain trees while removing smaller shrubs and brush, only removing the trees necessary to create the parking area. We are aware of the birds and aim to keep screening for the neighbors. We are also required to include 3 additional shade trees around the parking area that are not depicted in these drawings.

Stefan: Do you have an engineer for this project and are you working on the stormwater aspect for this project?

Brett: Yes, we are currently working on that stormwater plan and are expecting to have that information ready for DRB

Stefan: Please in the future bring the stormwater management documents to us so that we can see and review this project with better understanding. Do we have drawings of elevation or how stormwater might flow on the property?

Missa: Our site is currently quite flat and the site never has standing water, we have never witnessed runoff flowing into neighboring properties even during the largest storms. The soil and site seems to be a capture area that we have seen.

CC: There may be a groundwater issue and flooding into the basement have you considered how to address this?

Missa: No basement is proposed and we are proposing a stone drip-edge to catch additional water. We are intended to keep everything on site, we are currently working with engineers to create a detailed site plan to show this.

Stefan: You have good partners but I expect you will have to have some sort of detention basins to manage the water for the project.

Missa: We have a large parking lot already and over all we are not changing impervious surface amounts by a large margin.

RC: Have you altered your plan from hearing comments from the neighbors?

Missa: Yes, we have some additional landscaping and we are also including 3 new trees for the parking area.

ZR: Do we want to move forward with this application as we see currently or so we want to see a full stormwater plan before moving this forward.

Stef: I do not think that we should allow this project to proceed as we do not see a full stormwater review, we have not done this in the past and I do not see why we should make an exception. Also, there is public comment.

Brett: Garret, why was I not alerted to this document from the neighbor

Garret: This was a public comment that was submitted today, around noon, and was uploaded as a comment for the board in line with standard practice, you can view them in the agenda.

Brett: I have not seen this comment and have not had a chance to read it, I should have been informed of this message. I do not think this was a smooth process and many things have changed, this has been a very frustrating process. I thought that these meetings would be a smooth process. I was under the impression that initially that the process was going to be a two week process so these changes have been very disruptive to us and are costing us lots of time and money.

Missa: We are trying to get these through in a way that would get us to meet our deadlines. We are now following the process as things are included all at once. If we spread this out then we would have never had to be here at this meeting. Why do we have to have this level of review and get punished for doing this all at once.

RR: We see people here for comment, we have Megan Moir here that may want to comment on this project.

Megan Moir: Please reach out to me tomorrow as well, we are seeing new things and if you reach out to me we can work this out. This is something new so if we work on this in person then it may be best.

RR: Any further questions or comment.

RR: Neighbors are concerned about trees, you have three trees for shade but the current drawings do not show these shade trees.

Missa: Yes these are items that we are aware of and we have this in our plan but it is not in this current drawings that you have today.

RR: You may want to even go beyond this and add additional trees.

Missa: We have two on the north and one on the south but are also limited by snow, more trees might not be possible.

Stefanie: Have you thought about plans for runoff and erosion mitigation during construction. Sediment erosion during construction are plans that we do not see.

Missa: I typically do these plans but for this project we are waiting on the engineers.

RR: We are usually looking at stormwater and landscaping plan as well as everything environmentally focused, as the name conservation board implies.

Missa: I was not told this information, and that these things were all included in for this review. I feel that staff has not communicated these requirements and we were not provided a detailed list by staff. I think we could have had all this laid out if we were given the whole list with all of these requirements by staff but this was not done.

ZR: I feel that we would have not been able to review this unless we had all the information including stormwater plans, just the landscaping plans alone would have not worked.

Brett: This is extremely frustrating and that we have had a terrible time going through this process with what to be a constantly changing process. This is a costly process and learning this along the way has not been helpful in this project. From here on out I want to have a list of everything that will be required for reviews.

A Motion was made by (CC) and was SECONDED by (ZR)

-Come back to the next meeting with planting/landscaping, erosion, stormwater plans. With the recommendation of more native plants and trees.

-Friendly amendment, better and additional shade trees

Vote: (all agree), motion to request the applicant to come back with additional information.

5.2 ZP-24-263, 1074 Pine Street

Applicant (Ernie, Andres) appeared for this item

Ernie Pomerlow: We have been working on this for a long time and we are working on combining our lands so that we can do this project, we are collaborating with many partners.

Megan: This is in an impaired stormwater area that is identified by the state, this urban stream may be able to meet the requirements of a class-b waterway after this project. The regulations requires us to manage flow, mainly the highs and lows, some streams dry up and others wash out. The city is required to develop a plan for this project and the city is working with South Burlington on this project. This Pomerlow project is working with grants and we are working to have the best process that we can. We are working though the city to give us a grant that will be a total of 2 million for this project. The environmental bonus will be much greater than any potential impact.

Andres: We are working with a large scale project and that manages runoff that comes from impervious service that gets lots of use meaning high levels of contamination. The existing area is highly degraded and we have gone through the army core of engineers for some of this work. We do have a new outlet pipe that is in the bank of potash brook and replaces the current pipe. This will be our disturbance to the brook and we have an erosion plan that we have provided. We are putting in a stone that is interlinking and a stabilization plan with vegetation designed as a wetland seed mix. A new path is also going through the area and we are attempting to work with them in this process. The review is mostly the new outfall pipe.

Stefanie: Is there any underdrain plans where you can get some of this stormwater back underground or is the stormwater just going through the proposed system.

Andres: We did some soil work and the conditions were found to be heavy soils and are not good for drainage or absorption, we think it is best to just treat the stormwater as proposed.

Megan: In order to treat the water it is required to have the soil sit in the water. We were told that is it best to have the infiltration, and has to comply with the flow restoration plan.

Stefan: Currently work is underway, will this new wetland be able to be seen from this new path.

Andreas. Yes, all this work and the new wetland will be able to be seen.

ZR: Can we have any sign or information to be able to tell the story of this project so that the public is able to know what this work is benefiting and how great of a win this project is.

Andres: Yes, that sounds like a good idea, we will take a look to see what we can do.

RC: What is the wetland seed mix?

Andres: It is planned to be a native seed mix and if from Vermont wetland supply that we are hoping to buy but I do not have the exact details today.

RR: Any further comments, hearing none, we need a motion.

A Motion was made by (stefans) and was SECONDED by (ZR):

- Motion to approve

Vote: (all), motion approved.

Open Space Subcommittee

No meeting today

Update & Discussion

Review of draft letter to the Mayor as to shoreline naturalization in the urban Reserve.

RR: We talked about urban reserve and collaboration with the city and to make a full management project for the urban reserve, the easement does not mention the management plan as a requirement

RC: We have looked at the shoreline and talked with the parks committee and the park planners as well as CEDO so that we can all work together as well as with the Mayor`s office to decide our proccess.

RR: Any further questions, hearing none we can adjourn

ZR motion to adjourn Stefan 2nd

Adjournment

7:00pm.