

August 23, 2023

Jason Garnham, Director of Planning and Development
Town of Kittery
200 Rogers Rd.
Kittery, ME 03904

**RE: Town of Kittery, Planning Board Services
35 Badgers Island West Residential Conversion Drainage Review #3
Tax Map 1, Lot 32
CMA #591.156**

Jason:

CMA Engineers has received the following information for Assignment #156, review #3 of the plans and drainage analysis for a redevelopment at 35 Badgers Island West.

- 1) Drainage Analysis, Site Development, 35 Badgers Island West, Kittery, Maine, Prepared for Hampshire Development by Ambit Engineering, dated January 19, 2023 and Amended July 26, 2023.
- 2) Residential Conversion, 35 Badgers Island West, Kittery, Maine, Amended Site Plan, Preliminary Plan Application and supporting documentation dated January 1, 2023 and last revised August 3, 2023.
- 3) Response letter to CMA Engineers' comments dated July 13, 2023. We note that the response letter appears to have been generated prior to the current set of plans and does not reflect entirely accurate responses.

The proposed project includes two building additions and a change in use to residential at 35 Badgers Island West, Tax Map 1, Lot 32 in the Mixed-Use Badgers Island Zoning District (MU-BI), the Resource Protection Overlay (OZ-RP) and the Shoreland Overlay Zone (OZ-SL-250'). The application has been prepared by Ambit Engineering, Inc. of Portsmouth, NH on behalf of the owner B.I.W. Group, LLC.

Previously, a revetment repair was approved and completed with the exception of the landscaping installation. The project includes two proposed additions to the existing office building with heated driveways and a change in use to residential. Ten residential units are proposed. Access is from Badgers Island West. The development is located on a 1.35-acre lot. Utilities are proposed to be installed underground. Water supply is proposed off a Kittery Water District (KWD) main from Badgers Island West to the north and wastewater disposal is proposed off a Town sewer main also from Badgers Island West to the south.

We have the following comments that relate to the plans:

Sheet C1 – Existing Conditions Plan

1. Label the size and material of the water services and water main.
2. Is the 6' "ceptic" easement required to be maintained? It is not shown on any subsequent plans.

Sheet C2 – Shoreland Development Plan

1. It is not clear why the porous pavement walkway is an option and not definitively chosen or not.
2. The previous buffer planting area shows symbols that are not defined in a legend. The area could be hatched, or the symbols defined.

Sheet C3 – Utility Plan

1. The proposed sewer service contains a change in pipe direction at a three-foot drop in elevation and is serviced by a cleanout. This is not a conventional design and has the potential to easily become clogged. The design should include a manhole with a drop inlet.
2. The invert of the pipe at the cleanouts is labeled as 14.0' but 13.56' in the Sewer Plan and Profile on Sheet D4.

Sheet C4 – Grading Plan

1. The applicant is now proposing to replace DMH #1657, which is located in the Town right-of-way. Is this acceptable to the department of public works? What are the details of the pipe connections?
2. Amend the leader "Pipe to be terminated at DMH 1657..." The manhole is being replaced. The pipe should be removed or filled in and capped to the roof leader tie-in point.
3. The new 18" pipe at DMH 1657 is called out as 18" CPP on the drainage structure table. Is this correct or should it be HDPE? Is the existing 12" pipe in HDPE or CPP?

Sheet C5 – Demolition Plan

1. The leader "Tree line to be cut back to landscape plan limits" should be removed or clarified. There is no cutting back of the tree line shown on the landscape plan.
2. Call out DMH #1657 to be removed.

Sheet D4 – Details

1. The proposed sewer service contains a change in pipe direction at a three-foot drop in elevation and is serviced by a cleanout. This is not a conventional design and has the potential to easily become clogged. The design should include a manhole with a drop inlet.
2. The invert of the pipe at the cleanouts is labeled as 13.56' in the Sewer Plan and Profile but 14.0' on Sheet C3.

The lighting plan has been removed from the plan set. Is there no outside lighting proposed? The response letter indicates that the information previously requested "will be provided. Lighting will be building mounted. A significant number of lights will be in ceiling areas." Please clarify.

We have the following comments on the drainage analysis:

1. All nodes shown on the pre- and post-construction routing diagrams should be shown on their respective subcatchment plans.
2. The pipe at CB 1 is modelled as 24" but is shown as 18" on the plans. The invert is modelled as 7.63' but shown as 7.53' on the plans. Please clarify.
3. Proposed piping is modelled as CMP (with square edged headwalls) when the plans call for HDPE pipe. Please clarify.
4. The Inspection & Long-Term Maintenance Plan should be updated to remove permeable pavers since these are not shown on the plans.

Jason Garnham, Director of Planning and Development

August 23, 2023

Page 3

Should you have any questions, please do not hesitate to call.

Very truly yours,

CMA ENGINEERS, INC.

Jodie Bray Strickland, P.E.

Project Manager

cc: John Chagnon, P.E., Ambit Engineering



200 Griffin Road, Unit 3, Portsmouth, NH 03801
Phone (603) 430-9282 Fax 436-2315

24 August 2023

Jason Garnham, Director of Planning and Development
Town of Kittery
200 Rogers Road, Kittery, ME 03904

**Re: Preliminary Site Plan Review Application; Conversion to Residential
Tax Map 1, Lot 32, 35 Badgers Island West
Response to CMA Comments**

Dear Jason:

On behalf of BIW Inc. we hereby submitted revised plans and supporting material for **Final Site Plan Review Approval** to address the comments from the August 23, 2023, review letter from CMA Engineers. The specific comments, repeated below with our responses in bold text, are as follows:

Sheet C1 – Existing Conditions Plan

1. Label the size and material of the water services and water main. **There is an 8-inch sprinkler line servicing the building. Currently the domestic is tapped from that line inside the building. This is not an uncommon arrangement and has operated and has been approved. A new domestic line will be run, if required. The water services will be fully coordinated with the Water District.**
2. Is the 6’ “ceptic” easement required to be maintained? It is not shown on any subsequent plans. **No, that is an old deed reference, no pipe was installed in that location, and no septic pipe will ever be installed in that location.**

Sheet C2 – Shoreland Development Plan

1. It is not clear why the porous pavement walkway is an option and not definitively chosen or not. **We would like to install that as porous but at this time did not want to do the destructive testing to ensure that the subsurface soil conditions were suitable. It’s calculated as impervious in the chart. If a decision has to be made at this time we will.**
2. The previous buffer planting area shows symbols that are not defined in a legend. The area could be hatched, or the symbols defined. **The note labels it as “Previous Buffer Planting Area” – See Revised Plan. The Revised Plan has an entirely new design for that area; so, we can just delete that from the plan. We just wanted the Board to be able to see that we were not impacting a previously design that was not yet constructed on a portion of the site.**

Sheet C3 – Utility Plan

1. The proposed sewer service contains a change in pipe direction at a three-foot drop in elevation and is serviced by a cleanout. This is not a conventional design and has the

potential to easily become clogged. The design should include a manhole with a drop inlet. **Please see attached a PVC manhole to address the concern. Once approved we will update the plans.**

2. The invert of the pipe at the cleanouts is labeled as 14.0' but 13.56' in the Sewer Plan and Profile on Sheet D4. **Those numbers are correct. The 14.0 is the invert out at the building, consistent on both sheets.**

Sheet C4 – Grading Plan

1. The applicant is now proposing to replace DMH #1657, which is located in the Town right-of-way. Is this acceptable to the department of public works? What are the details of the pipe connections? **The reviewer previously commented.... “Has the condition of the existing structures (namely DMH 1657) been assessed? What size is DMH 1657? Is there room in the structure for two additional pipe penetrations?” This was a good comment as the review indicated that the DMH needed to be replaced.**

2. Amend the leader “Pipe to be terminated at DMH 1657...” The manhole is being replaced. The pipe should be removed or filled in and capped to the roof leader tie-in point. **Done, the pipe will be removed.**

3. The new 18” pipe at DMH 1657 is called out as 18” CPP on the drainage structure table. Is this correct or should it be HDPE? Is the existing 12” pipe in HDPE or CPP? **HDPE.**

Sheet C5 – Demolition Plan

1. The leader “Tree line to be cut back to landscape plan limits” should be removed or clarified. There is no cutting back of the tree line shown on the landscape plan. **Both the C5 Plan and the L1 Landscape Plan have been clarified.**

2. Call out DMH #1657 to be removed. **Done.**

Sheet D4 – Details

1. The proposed sewer service contains a change in pipe direction at a three-foot drop in elevation and is serviced by a cleanout. This is not a conventional design and has the potential to easily become clogged. The design should include a manhole with a drop inlet. **Please see attached a PVC manhole to address the concern. Once approved we will update the plans.**

2. The invert of the pipe at the cleanouts is labeled as 13.56' in the Sewer Plan and Profile but 14.0' on Sheet C3. **Those numbers are correct. The 14.0 is the invert out at the building, consistent on both sheets.**

The lighting plan has been removed from the plan set. Is there no outside lighting proposed? The response letter indicates that the information previously requested “will be provided. Lighting will be building mounted. A significant number of lights will be in ceiling areas.” Please clarify. **The Lighting Plan is Sheet 3 of the Architectural Package – page 113 of the digital Planning Board Packet.**

We have the following comments on the drainage analysis:

1. All nodes shown on the pre- and post-construction routing diagrams should be shown on their respective subcatchment plans. **Done.**

2. The pipe at CB 1 is modelled as 24” but is shown as 18” on the plans. The invert is modelled as 7.63' but shown as 7.53' on the plans. Please clarify. **The 24” pipe has been changed to an 18” pipe in the model, and the elevations lowered.**

3. Proposed piping is modelled as CMP (with square edged headwalls) when the plans call for HDPE pipe. Please clarify. **The pipes have been revised in the model.**

4. The Inspection & Long-Term Maintenance Plan should be updated to remove permeable pavers since these are not shown on the plans. **Done.**

The model was re-run, the results are consistent with the previous submission.

We look forward to our in-person presentation at tonight's Planning Board meeting. Thank you for your time and attention to this proposal.

Please contact me if you have any questions or concerns regarding this application.

Sincerely,

A handwritten signature in black ink, appearing to read 'JRC', with a long horizontal flourish extending to the right.

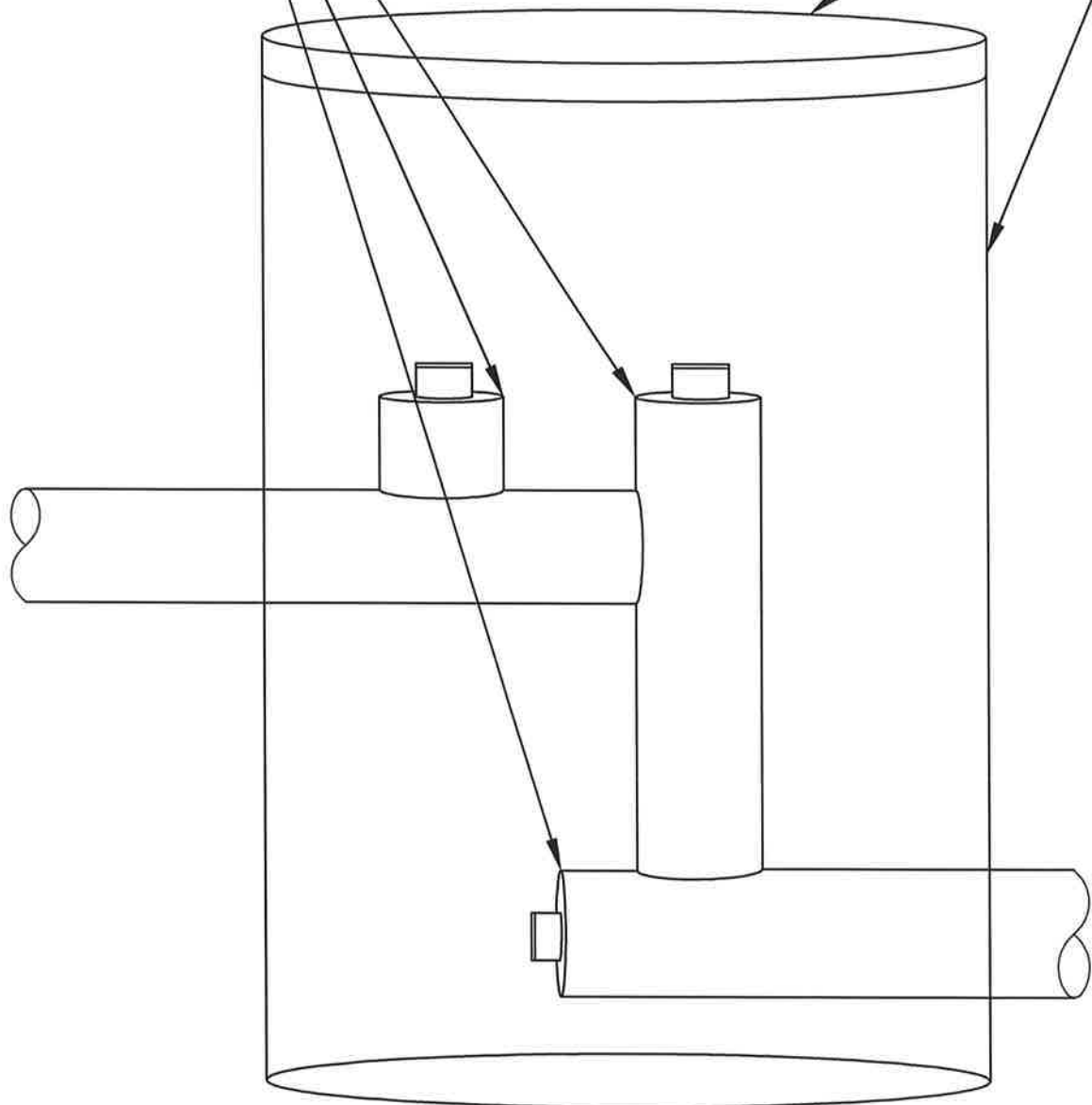
John R. Chagnon, PE
Ambit Engineering – Haley Ward
CC: Project Team

P:\NH\5010135-Hampshire_Development\3050.72A-Badgers Island W.(35)-JRC\3050.72A Hampshire Development\2022 Site Permitting\Applications\Town of Kittery\Response to CMA Comments Letter 8-24-23.docx

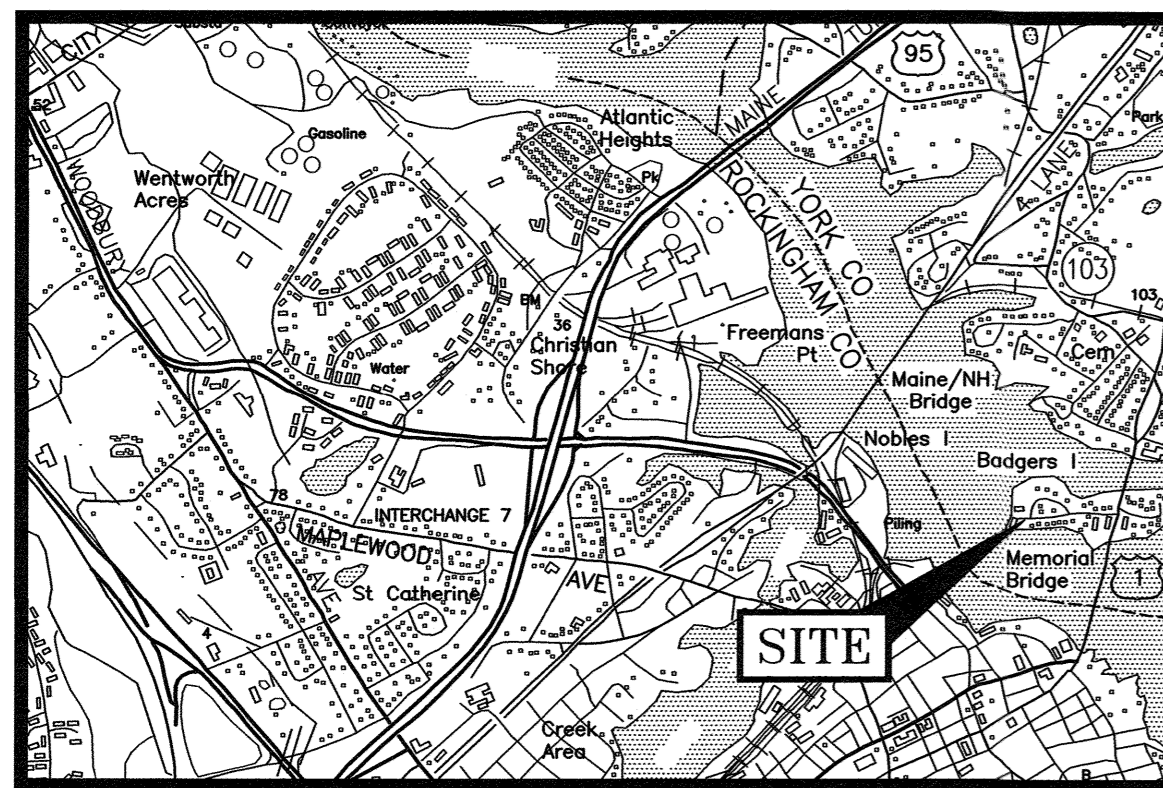
CLEANOUTS

36" PVC PIPE

SUITABLE COVER



SCHEMATIC MANHOLE



LOCATION MAP SCALE 1"=2,000'

LEGEND:

- N/F NOW OR FORMERLY
- RP RECORD OF PROBATE
- YCRD YORK COUNTY REGISTRY OF DEEDS
- MAP 11 / LOT 21
- BOUNDARY
- BUILDING SETBACK
- MEAN HIGH WATER LINE
- MSL MEAN SEA LEVEL
- MLW MEAN LOW WATER
- MLLW MEAN LOWER LOW WATER
- HAT MAINE DEP HIGHEST ANNUAL TIDE LINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC/WIRES
- S SEWER LINE
- G GAS LINE
- D STORM DRAIN
- W WATER LINE
- 100 CONTOUR
- 97x3 SPOT ELEVATION
- IRON ROD/PIPE FOUND
- IRON ROD SET
- EDGE OF PAVEMENT (EP)
- WOODS / TREE LINE
- UTILITY POLE (w/ GUY)
- METER (GAS, WATER, ELECTRIC)
- TYP. TYPICAL
- LSA LANDSCAPED AREA
- WGV WATER GATE VALVE
- SIGNS
- CORRUGATED PLASTIC PIPE
- PVC POLYVINYL CHLORIDE PIPE
- CATCH BASIN
- SEWER MANHOLE
- DRAIN MANHOLE
- EL. ELEVATION
- FF FINISHED FLOOR
- INV. INVERT
- TBM TEMPORARY BENCHMARK
- HP HEAT PUMP
- AC AIR CONDITIONER

LEGEND (CONTINUED)

- EL. ELEVATION
- FF FINISHED FLOOR
- INV. INVERT
- TBM TEMPORARY BENCHMARK
- HP HEAT PUMP
- AC AIR CONDITIONER

PLAN REFERENCES:

- 1) BADGERS LANDING CONDOMINIUM STANDARD BOUNDARY SURVEY & CONDOMINIUM SITE PLAN FOR PROPERTY AT 32 BADGERS ISLAND WEST, KITTERY, YORK COUNTY, MAINE. CLIENT ISLAND PROPERTIES, LLC PREPARED BY EASTERLY SURVEY, INC. DATED SEPTEMBER 17, 2002, FINAL REVISION DATE SEPTEMBER 30, 2002. Y.C.R.D. PLAN BOOK 581, PAGE 1.
- 2) LAND TITLE SURVEY WEATHERVANE LOBSTER - SEAFOODS, THORNERS LANE, BADGERS ISLAND, KITTERY MAINE. PREPARED BY CIVIL CONSULTANTS. DATED AUGUST 21, 1996, FINAL REVISION SEPTEMBER 20, 1996. Y.C.R.D. PLAN BOOK 231/23.
- 3) LOCATION OF A PORTION OF THE TOWN ROAD KNOWN AS BADGERS ISLAND WEST ON BADGERS ISLAND, KITTERY MAINE, FOR THE TOWN OF KITTERY, MAINE. PREPARED BY DOUCET SURVEY, INC. DATED AUGUST 26, 1994, FINAL REVISION DATE SEPTEMBER 15, 1995. Y.C.R.D. PLAN BOOK 225/12.
- 4) BOUNDARY PLAN OF LAND, CHARLES & MARYANN D. PATTEN, KITTERY, MAINE. PREPARED BY THOMAS F. MORAN, INC. DATED MAY 17, 1982. Y.C.R.D. PLAN BOOK 118/37.
- 5) GAGNER / SEWARD PROPERTY LINE EVALUATION SURVEYED SITE PLAN, KITTERY, MAINE. PREPARED BY KIMBALL CHASE. DATED SEPTEMBER 16, 1987. Y.C.R.D. PLAN BOOK 167/17.
- 6) PLAN OF LOTS, BADGERS ISLAND, KITTERY, MAINE OWNED BY JOSEPH W. THORNER. PREPARED BY JOHN W. DURGIN, CIVIL ENGINEER. DATED APRIL 1936. Y.C.R.D. PLAN BOOK 22/31.

PISCATAQUA RIVER (TIDAL)

INTERTIDAL AREA SEE NOTE 6

UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

DEVEGETATED COVERAGE CALCULATION (TO HAT LINE)

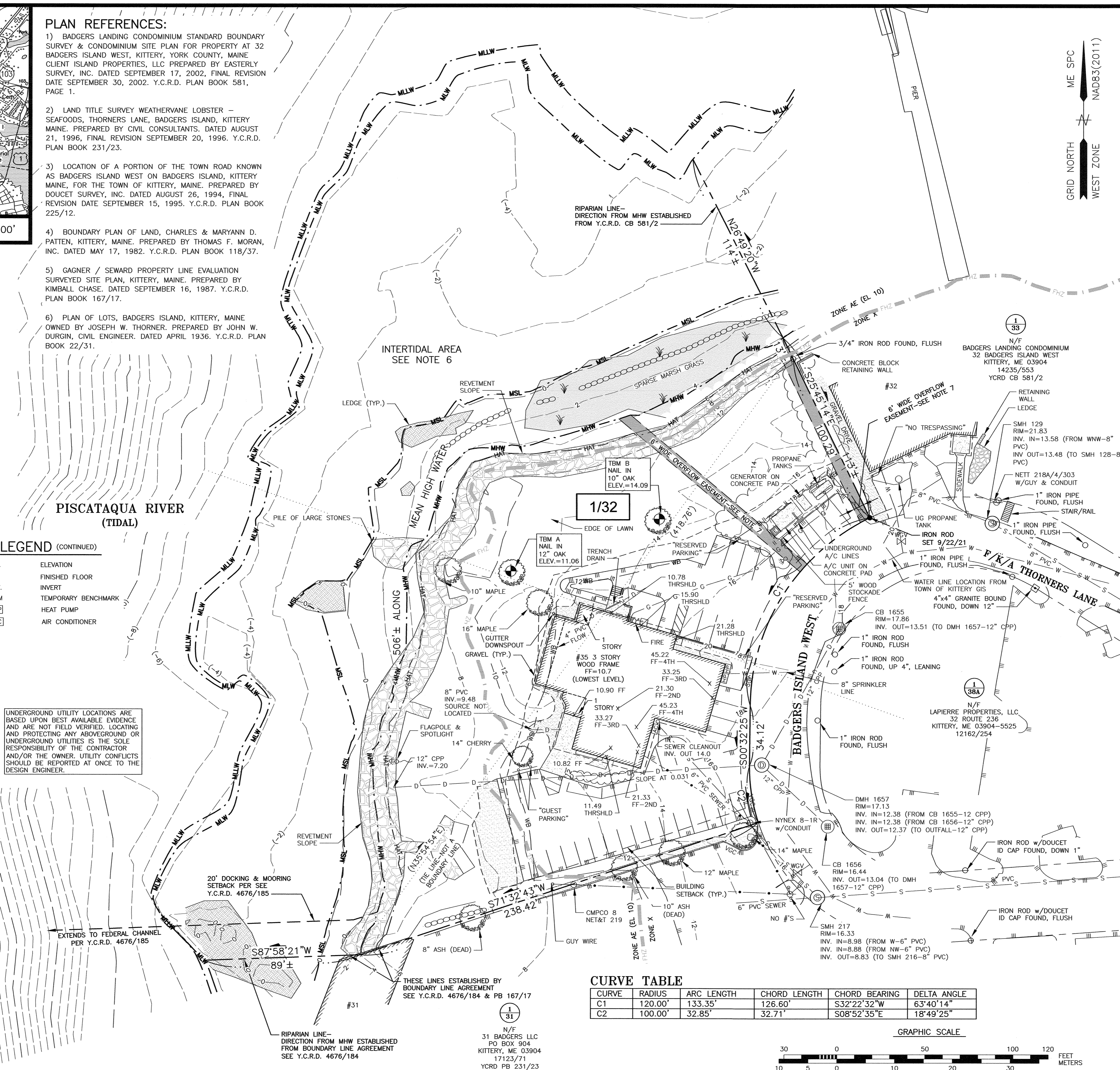
STRUCTURE	EXISTING (S.F.)
MAIN STRUCTURE	5,922
PAVEMENT	12,289
GRAVEL AREAS	2,277
RETAINING WALLS	86
CONCRETE PADS/STEPS	957
REVETMENT	5392
TOTAL	26,923
LOT SIZE	54,883
% LOT COVERAGE	49.1%

PURSUANT TO CHAPTER 90 PARTS 1 AND 2 OF THE SURVEY STANDARDS OF PRACTICE AS ADOPTED BY THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS, THE FOLLOWING EXCEPTIONS TO PART 2 ARE NOTED:

- A) NO SURVEY REPORT HAS BEEN PREPARED.
- B) NO LAND DESCRIPTION HAS BEEN PREPARED.
- C) MONUMENTS HAVE NOT BEEN SET.

THIS SURVEY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CHAPTER 90 STANDARDS OF PRACTICE, EFFECTIVE DATE APRIL 1, 2001 EXCEPT AS NOTED ON THIS PLAN.

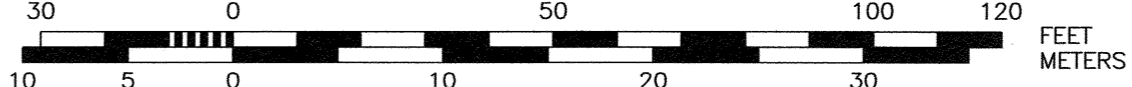
JOHN R. CHAGNON, PLS #2276
DATE 8.3.23



CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	120.00'	133.35'	126.60'	S32°22'32"W	63°40'14"
C2	100.00'	32.85'	32.71'	S08°52'35"E	18°49'25"

GRAPHIC SCALE



NOTES:

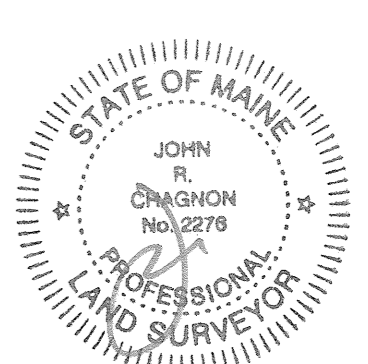
- 1) PARCEL IS SHOWN ON THE TOWN OF KITTERY ASSESSOR'S MAP 1 AS LOT 32.
- 2) OWNER OF RECORD: B.I.W. GROUP, LLC 41 INDUSTRIAL DRIVE, UNIT 20 EXETER, NH 03833 18503/331 (FIRST PARCEL) PLAN BOOK 22/31 (LOTS 14, 15, 16, & 17)
- 3) A PORTION OF THE PARCEL IS IN A SPECIAL FLOOD HAZARD AREA, ZONE AE (EL 10), AS SHOWN ON PRELIMINARY FIRM PANEL 23031C0709G. REVISED PRELIMINARY 4/14/2017.
- 4) EXISTING LOT AREA: 58,985± S.F. (TO MEAN HIGH WATER) 1.3541± ACRES (TO MEAN HIGH WATER)
- 5) PARCEL IS LOCATED IN THE MIXED USE - BADGERS ISLAND (MU-BI) ZONING DISTRICT AND IS SUBJECT TO THE RESOURCE PROTECTION (OZ-RP) AND SHORELAND-WATER BODY / WETLAND PROTECTION AREA (OZ-SL-250') OVERLAY DISTRICTS.
- 6) DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:	6,000 SF
FRONTAGE:	50 FEET
SETBACKS:	FRONT 5 FEET
	SIDE 10 FEET
	REAR 10 FEET
MAXIMUM BUILDING HEIGHT:	40 FEET
MINIMUM OPEN SPACE:	40%
- 7) THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON ASSESSOR'S MAP 1 LOT 32 IN THE TOWN OF KITTERY.
- 8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS. MHW, MSL, MLW, AND MLLW BASED ON NOAA STATION 8419870-SEAVEY ISLAND, PORTSMOUTH HARBOR, ME.
- 9) AREA BETWEEN MEAN HIGH WATER AND MEAN LOW WATER ARE SUBJECT TO THE RIGHTS OF THE PUBLIC.
- 10) PARCEL IS SUBJECT TO A 6' WIDE EASEMENT FOR "LAYING AND MAINTAINING AN OVERFLOW PIPE FROM A CEPTIC (sic) TANK ON THE CONVEYED LOT UNDER THE ROADWAY". BENEFITING LOTS 1, 2, 3, 4, AND 5 ON PLAN REFERENCE 6 (NOW ASSESSOR'S MAP 1 LOTS 38 & 38A). SAID EASEMENT WAS GRANTED AS BEING ON LOT 14 BUT ALONG THE COMMON LOT LINE OF 14 & 15 OR COMMON LINE OF 13 & 14. SEE Y.C.R.D. 1301/275. IT IS NOT CLEAR IN WHICH LOCATION THE PIPE WAS CONSTRUCTED.
- 11) HIGHEST ANNUAL TIDE LINE SHOWN AT ELEVATION 5.8 PER LOCATION SEAVEY ISLAND IN MAINE DEP HIGHEST ANNUAL TIDE (HAT) LEVELS FOR YEAR 2018.

SITE DEVELOPMENT 35 BADGERS ISLAND WEST KITTERY, MAINE

NO.	DESCRIPTION	DATE
5	EXISTING SEWER	8/03/23
4	LOT 1-EXISTING CONDITIONS	6/20/23
3	LEGEND	5/18/23
2	ADD PRELIMINARY FEMA FHZ LINES	2/24/23
1	ISSUED FOR APPROVAL	1/19/23

REVISIONS



8-3-23

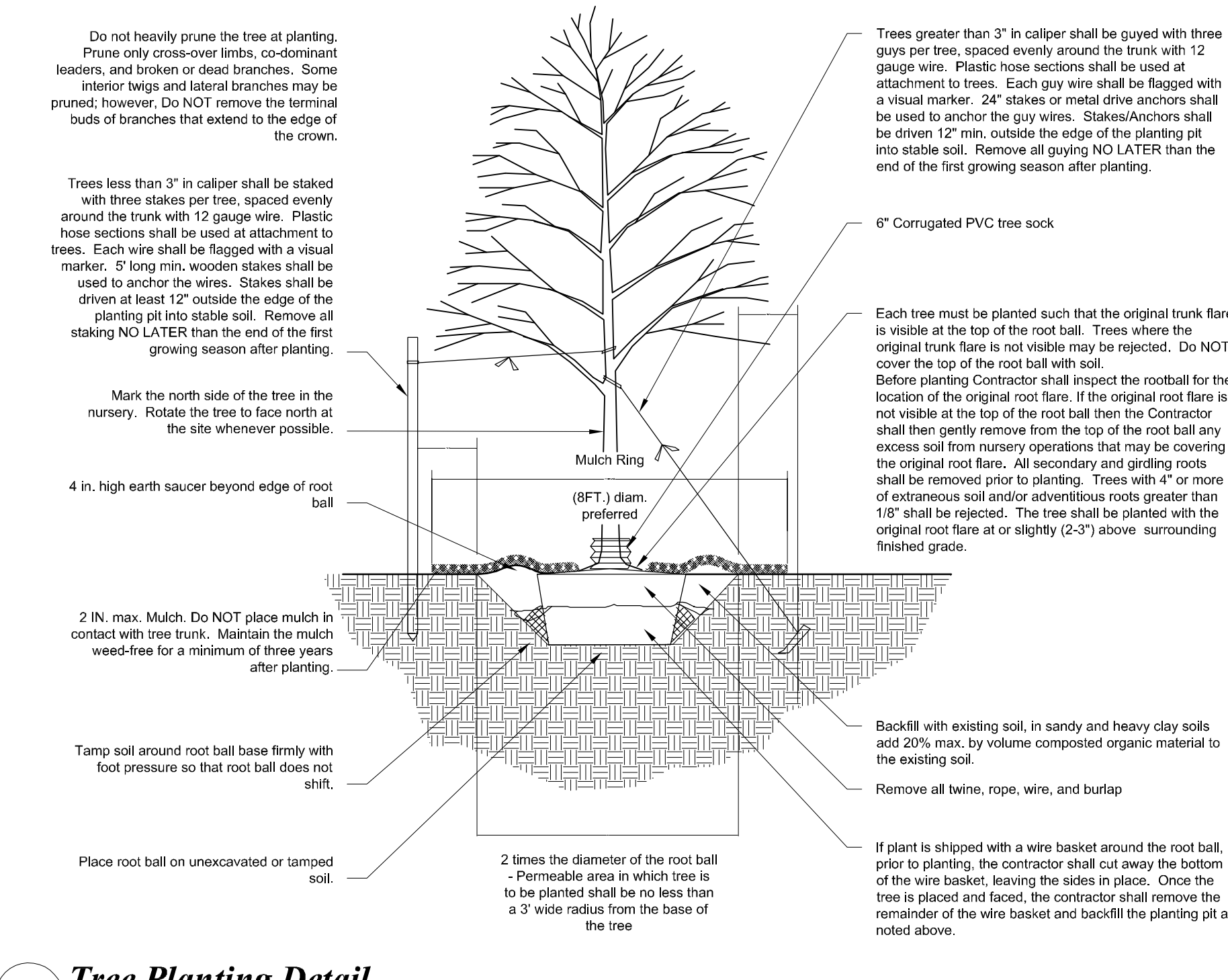
SCALE 1"=30' AUGUST 2021

EXISTING CONDITIONS PLAN

C1

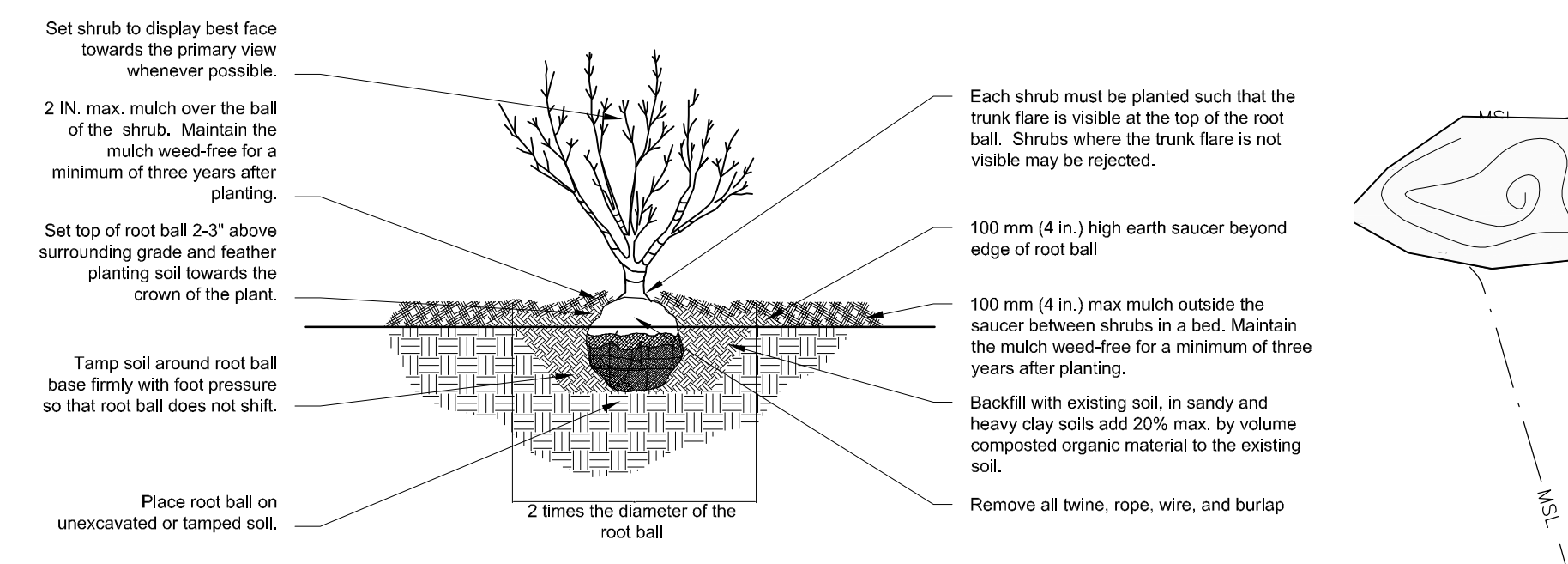
Landscape Notes

- Design is based on drawings by Ambit Engineering dated 2023-06-27. Drawings may require adjustment due to actual field conditions.
- This plan is FOR REVIEW purposes ONLY, NOT for Construction. Construction Documents will be provided upon request.
- The contractor shall follow best management practices during construction and shall take all means necessary to stabilize and protect the site from erosion.
- Erosion Control shall be in place prior to construction.
- Erosion Control shall comply with State and Local Erosion & Sedimentation Control Practices
- The Contractor shall verify layout and grades and inform the Landscape Architect or Client's Representative of any discrepancies or changes in layout and/or grade relationships prior to construction.
- It is the contractor's responsibility to verify drawings provided are to the correct scale prior to any bid, estimate or installation. A graphic scale bar has been provided on each sheet for this purpose. If it is determined that the scale of the drawing is incorrect, the landscape architect will provide a set of drawings at the correct scale, at the request of the contractor.
- Trees to Remain within the construction zone shall be protected from damage for the duration of the project by snow fence or other suitable means of protection to be approved by Landscape Architect or Client's Representative. Snow fence shall be located at the drip line or at the distance in feet from the trunk equal to the diameter of the tree caliper in inches, whichever is greater, and shall be expanded to include any and all surface roots. Do not fill or mulch on the trunk flare. Do not disturb roots. In order to protect the integrity of the roots, branches, trunk and bark of the tree(s) no vehicles or construction equipment shall drive or park in or on the area within the drip line(s) of the tree(s). Do not store any refuse or construction materials or portalets within the tree protection area.
- Location, support, protection, and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor.
- The Contractor shall verify exact location and elevation of all utilities with the respective utility owners prior to construction. Call DIGSAFE at 811 or 888-DIG-SAFE (1-888-344-7233.)
- The Contractor shall procure any required permits prior to construction.
- Prior to any landscape construction activities Contractor shall test all existing loam and loam from off-site intended to be used for lawns and plant beds using a thorough sampling throughout the supply. Soil testing shall indicate levels of pH, nitrates, macro and micro nutrients, texture, soluble salts, and organic matter. Contractor shall amend all soils to be used for lawns and plant beds per testing results' recommendations and review with Landscape Architect. All loam to be used on site shall be amended as approved by the Landscape Architect prior to placement.
- Contractor shall notify landscape architect or owner's representative immediately if at any point during demolition or construction a site condition is discovered which may negatively impact the completed project. This includes, but is not limited to, unforeseen drainage problems, unknown subsurface conditions, and discrepancies between the plan and the site. If a Contractor is aware of a potential issue and does not bring it to the attention of the Landscape Architect or Owner's Representative immediately, they may be responsible for the labor and materials associated with correcting the problem.
- The Contractor shall furnish and plant all plants shown on the drawings and listed in the notes. All plants shall be nursery-grown under climatic conditions similar to those in the locality of the project. Plants shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the American Standard of Nursery Stock, American Standards Institute, Inc. 230 Southern Building, Washington, D.C. 20005.
- A complete list of plants, including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant materials list, the planting plans shall govern.
- All plants shall be legibly tagged with proper botanical name.
- Owner or Owner's Representative will inspect plants upon delivery for conformity to Specification requirements. Such approval shall not affect the right of inspection and rejection during or after the progress of the work. The Owner reserves the right to inspect and/or select all trees at the place of growth and reserves the right to approve a representative sample of each type of shrub, herbaceous perennial, annual, and ground cover at all places of growth. Such sample will serve as a minimum standard for all plants of the same species used in this work.
- No substitutions of plants may be made without prior approval of the Owner or the Owner's Representative for any reason.
- All landscaping shall be provided with the following:
 - Outside hose attachments spaced a maximum of 150 feet apart, and
 - An underground irrigation system, or
 - A temporary irrigation system designed for a two-year period of plant establishment.
- If an automatic irrigation system is installed, all irrigation valve boxes shall be located within planting bed areas.
- The contractor is responsible for all plant material from the time their work commences until final acceptance. This includes but is not limited to maintaining all plants in good condition, the security of the plant material once delivered to the site, watering of plants, including seeding and weeding. Plants shall be appropriately watered prior to, during, and after planting. It is the Contractor's responsibility to provide clean water suitable for plant health from off site, should it not be available on site.
- All disturbed areas will be dressed with 6" of loam and planted as noted on the plans or seeded except plant beds. Plant beds shall be prepared to a depth of 12" with 75% loam and 25% compost.
- Trees, ground cover, and shrub beds shall be mulched to a depth of 2" with one-year-old, well-composted, shredded native bark not longer than 4" in length and 1/2" in width, free of woodchips and sawdust. Mulch for ferns and herbaceous perennials shall be no longer than 1" in length. Trees in lawn areas shall be mulched in a 5' diameter min. saucer. Color of mulch shall be black.
- Drip strip shall extend to 6" min. beyond roof overhang and shall be edged with 3/16" thick metal edger.
- In no case shall mulch touch the stem of a plant nor shall mulch ever be more than 3" thick total (including previously applied mulch) over the root ball of any plant.
- Secondary lateral branches of deciduous trees overhanging vehicular and pedestrian travel ways shall be pruned up to a height of 8' to allow clear and safe passage of vehicles and pedestrians under tree canopy. Shrubs and ornamental plantings adjacent to vehicular travel way shall not exceed three feet in height where sightlines would be blocked. If pruning is necessary to maintain the required maximum height, plants shall be pruned to a natural form and shall not be sheared.
- Snow shall be stored a minimum of 5' from shrubs and trunks of trees.
- The Landscape Contractor shall guarantee all lawns and plant materials for a period of not fewer than two years. Dead, dying, or diseased planting shall be removed and replaced within the growing season.
- Landscape Architect is not responsible for the means and methods of the Contractor.



Tree Planting Detail

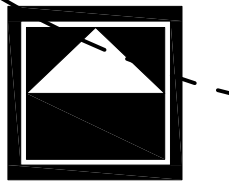
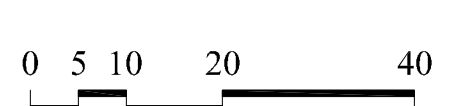
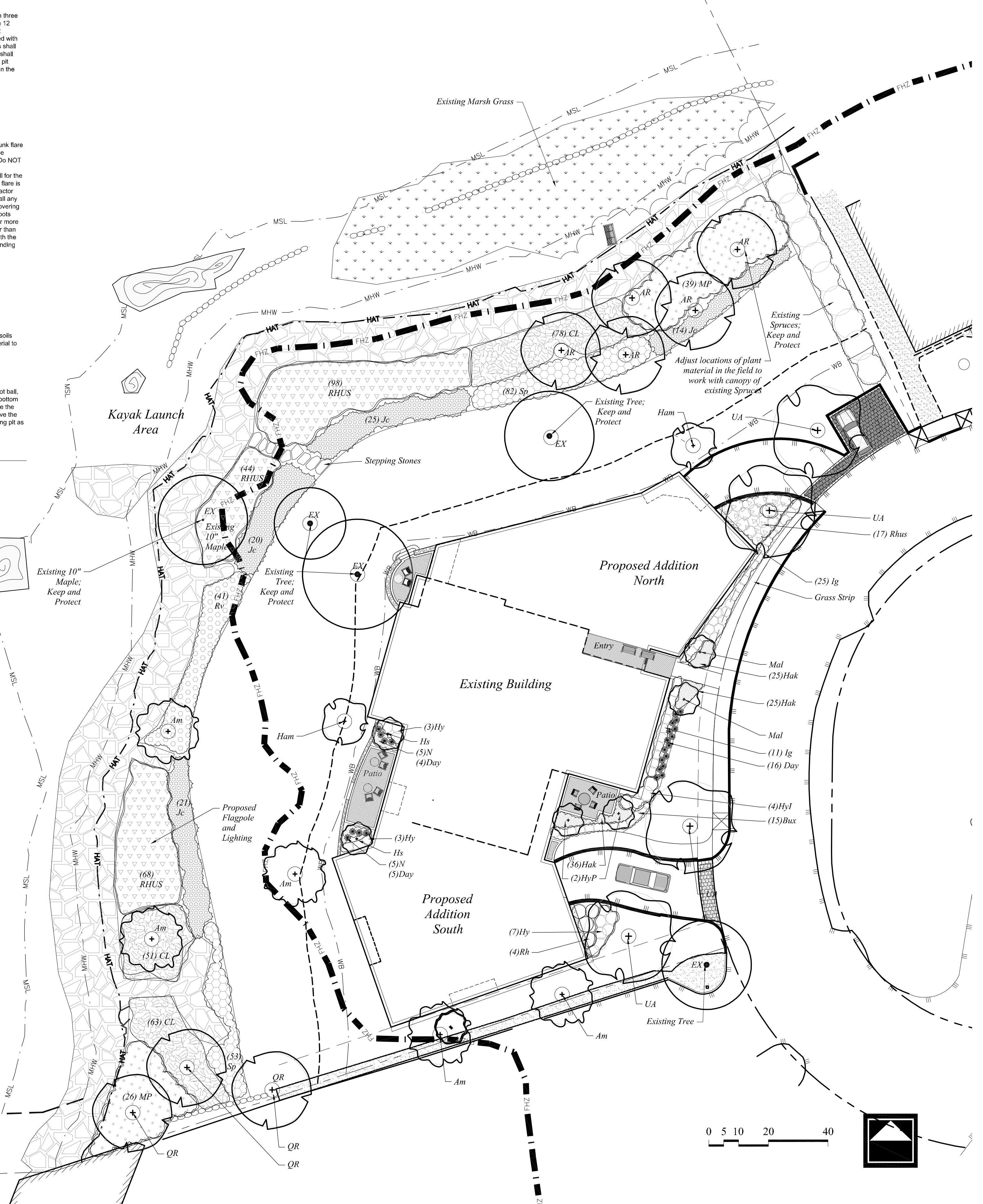
Scale: NTS



Shrub Planting Detail

Scale: NTS

Plant List						
TREES						
Symbol	Botanical Name	Common Name	Quantity	Size	Comments	
Am	<i>Amelanchier grandiflora</i> 'Autumn Brilliance'	Autumn Brilliance Serviceberry	5	8-10' ht	BB multistemmed	
Ar	<i>Acer rubrum</i> 'October Glory'	October Glory Red Maple	5	3" cal.	BB	
Ex	Existing tree to remain					
Ham	<i>Hamamelis x 'Arnold Promise'</i>	Arnold Promise Witch Hazel	2	7-8' ht.	BB multistemmed	
Mal	<i>Malus 'Tina'</i>	Tina Crabapple	2	2.5" cal.	BB	
QR	<i>Quercus rubra</i>	Northern Red Oak	3	3" cal	BB	
UA	<i>Ulmus americana</i> 'Princeton'	Princeton Elm	4	3" cal	BB	
SHRUBS						
Symbol	Botanical Name	Common Name	Quantity	Size	Comments	
CL	<i>Clethra alnifolia</i> 'Hummingbird'	Hummingbird Clethra	192	3 gal		
Bux	<i>Buxus 'Green Gem'</i>	Green Gem Boxwood	15	5 gal	2-2.5ht.	
Hs	<i>Hibiscus syriacus</i> 'Blue Satin'	Blue Satin Rose of Sharon	2	5-6 HT.	BB treeform	
HY	<i>Hydrangea macrophylla</i> 'All Summer Beauty'	All Summer Beauty Hydrangea (Blue)	13	3 gal		
HYI	<i>Hydrangea a 'Incrediball'</i>	Incrediball Hydrangea	4	5 gal		
HYP	<i>Hydrangea paniculata</i> 'Limelight'	Limelight Hydrangea	2	10 gal	treeform	
IG	<i>Ilex glabra</i> 'Shamrock'	Shamrock Inkberry	36	5 gal		
JC	<i>Juniperus communis</i>	Common Juniper	80	3 gal		
MP	<i>Myrica pennsylvanica</i>	Bayberry	65	5 gal		
RH	<i>Rhododendron chionoides</i>	Chionoides Rhododendron	4	5 gal		
RHUS	<i>Rhus aromatica</i> 'Grow Low'	Grow Low Sumac	227	3 gal		
ROS	<i>Rosa 'Blush Knockout'</i>	Blush Knockout Rose	7	3 gal		
ROS	<i>Rosa 'Apricot Drift'</i>	Apricot Drift Rose	7	3 gal		
SP	<i>Spiraea latifolia</i> 'Pink Mountain'	Pink Mountain Spiraea	135	3 gal		
PERENNIALS, GROUNDCOVERS, VINES and ANNUALS						
Symbol	Botanical Name	Common Name	Quantity	Size	Comments	
DAY	<i>Daylily mix</i>	Mixed Daylilies	25	1 gal		
HAL	<i>Hakoneclao aurea</i>	Junior Walker Catmint	86	1 gal		
N	<i>Nepeta 'Junior Walker'</i>	Junior Walker Catmint	10	1 gal		



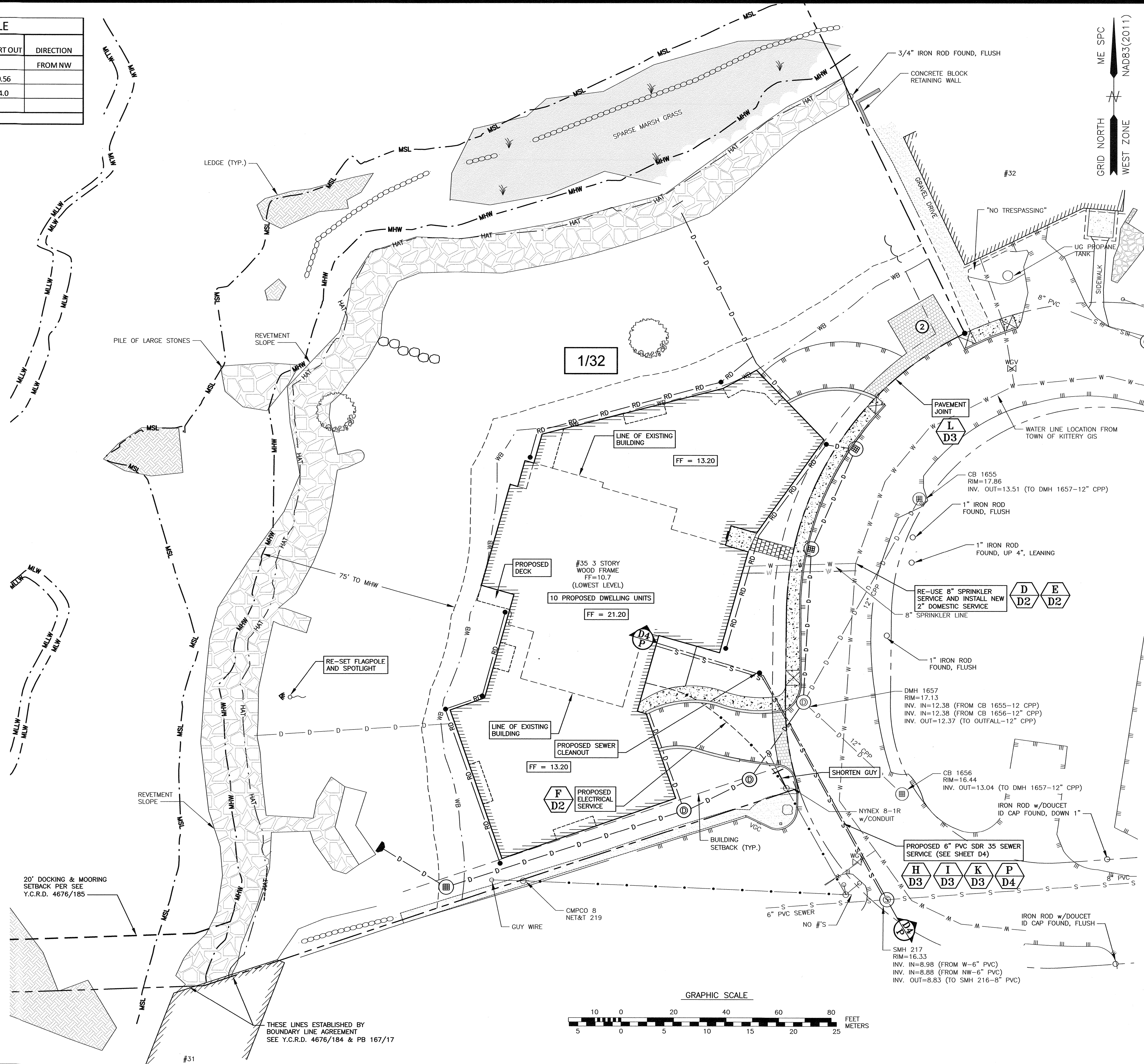
Woodburn & company
 LANDSCAPE ARCHITECTURE
 108 Kent Place
 Newmarket, New Hampshire
 Phone: 603.659.5949

35 Badger's Island West
 LANDSCAPE PLAN
 for Hampshire Development Corporation
 35 Badger's Island West, Kittery, Maine

Drawn By: WSA
 Checked By: RW
 Scale: 1"=20'-0"
 Date: 2023-05-25 for PB submission
 2023-06-29
 Revisions: ISSUED SUBMISSION
 2023-08-03
 RESUBMIT
 2023-08-06
 snow
 2023-08-24
 Spruce notes

L-1
 Sheet 1 of 1

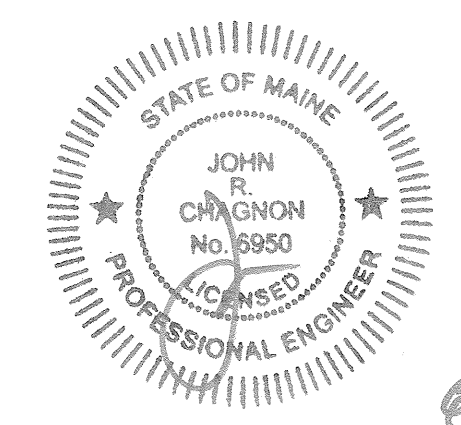
SEWER STRUCTURE SCHEDULE						
STRUCTURE	PROP/EX	RIM	PIPE SIZE/TYPE	INVERT IN	INVERT OUT	DIRECTION
SMH 217	EX	16.33	6" PVC	8.80		FROM NW
DROP	PROP	N/A	6" PVC	13.56	10.56	
BLDG.	PROP	N/A	4" PVC		14.0	



- NOTES:**
- 1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.
 - 2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.
 - 3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP's" PUBLISHED BY THE MAINE D.E.P. IN 2016.
 - 4) CONTRACTOR SHALL FIELD VERIFY THE DEPTH OF EXISTING UTILITIES AND COORDINATE WITH THE ENGINEER PRIOR TO CONSTRUCTION OF THE PROPOSED UTILITIES.
 - 5) ALL UTILITIES SHOWN ARE TO REMAIN UNLESS NOTED OTHERWISE.
 - 6) COORDINATE UTILITY CONNECTIONS AND INSTALLATIONS WITH RESPECTIVE UTILITY COMPANIES AND SERVICE PROVIDERS.
 - 7) CONTRACTOR SHALL MAINTAIN EXISTING UTILITY SERVICES TO ADJACENT PROPERTIES DURING CONSTRUCTION. PROVIDE PROPER NOTIFICATION OF ANY SERVICE INTERRUPTIONS.
 - 8) ALL WATER, SEWER, AND ROADWAY WORK TO BE COMPLETED TO KITTERY WATER DISTRICT AND TOWN OF KITTERY STANDARDS. WORK IN BADGER'S ISLAND WEST SUBJECT TO TOWN MORATORIUM.

**SITE DEVELOPMENT
35 BADGERS
ISLAND WEST
KITTERY, MAINE**

NO.	DESCRIPTION	DATE
1	BUILDING, LAYOUT, SEWER	8/3/23
0	ISSUED FOR COMMENT	6/29/23



SCALE 1"=20' AUGUST 2022

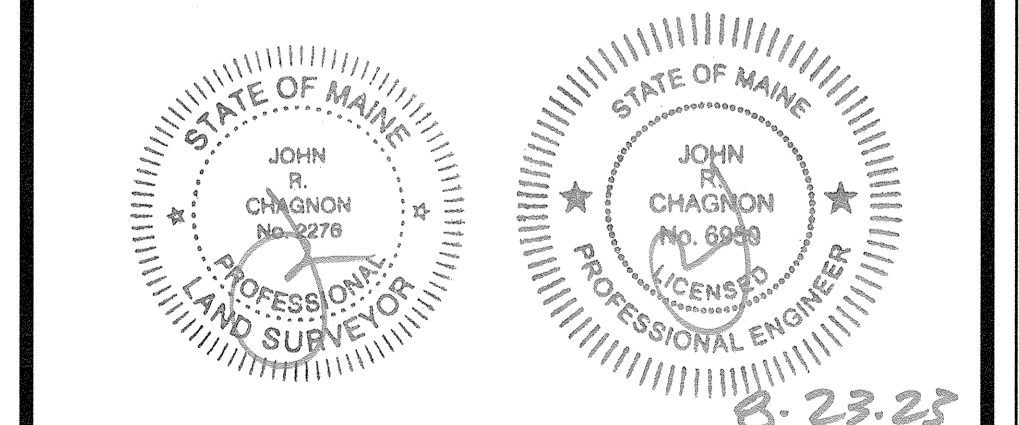
UTILITY PLAN **C3**

NOTES:

- 1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.
- 2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.
- 3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S" PUBLISHED BY THE MAINE D.E.P. IN 2016.
- 4) TOTAL PROJECT DISTURBED AREA 41,535 S.F.
- 5) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

**SITE DEVELOPMENT
35 BADGERS
ISLAND WEST
KITTERY, MAINE**

NO.	DESCRIPTION	DATE
2	GENERAL NOTES	8/23/23
1	BUILDING, LAYOUT, SAWCUTS	8/3/23
0	ISSUED FOR COMMENT	6/29/23
REVISIONS		



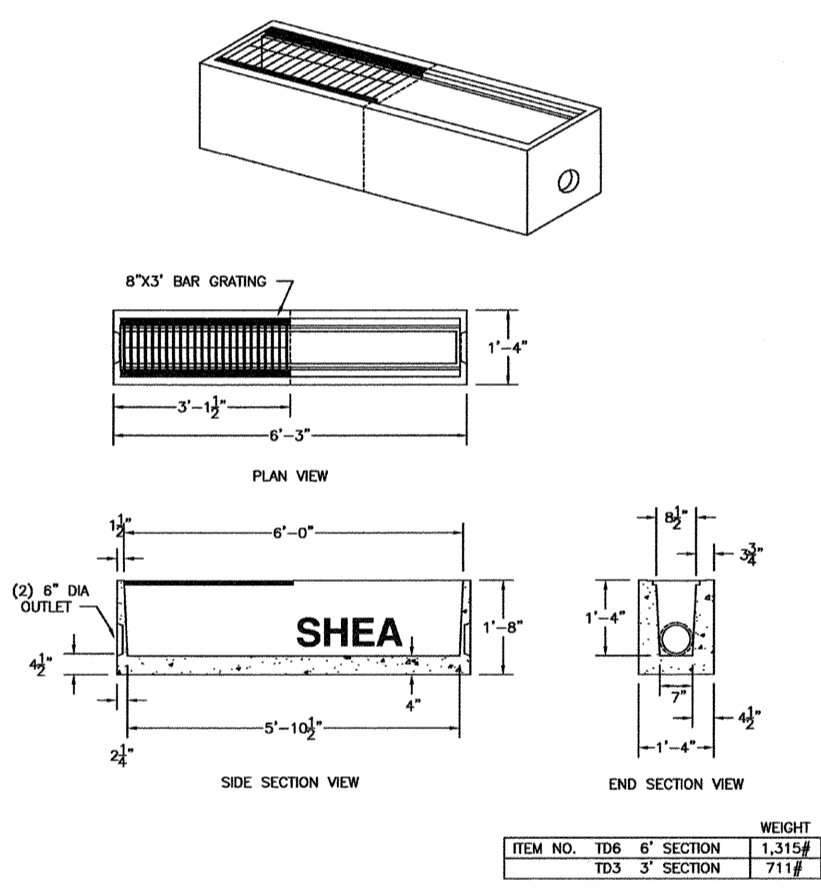
SCALE 1"=20' AUGUST 2022

GRADING PLAN **C4**

STRUCTURE	PROP/EX	RIM	PIPE SIZE/TYPE	INVERT IN	INVERT OUT	DIRECTION
DMH 1657	PROP	17.13	18" HDPE 12" CPP	12.38 12.38	12.37	SW
TD 1	PROP	13.1	6" PVC	11.77	11.57	SE
TD 2	PROP	13.1	6" PVC	11.77	11.57	NW
DMH 1	PROP	16.0	18" HDPE	10.91	10.81	SW
DMH 2	PROP	14.0	18" HDPE	10.07	9.97	SW
CB 1	PROP	13.0	6" PVC	10.89		
CB 2	PROP	9.9	18" HDPE	7.63	7.53	NW
CB 2	PROP	16.8	12" HDPE		13.63	S
CB 2	PROP	16.8	6" PVC	14.63		W
CB 3	PROP	18.3	12" HDPE	12.79	12.69	S

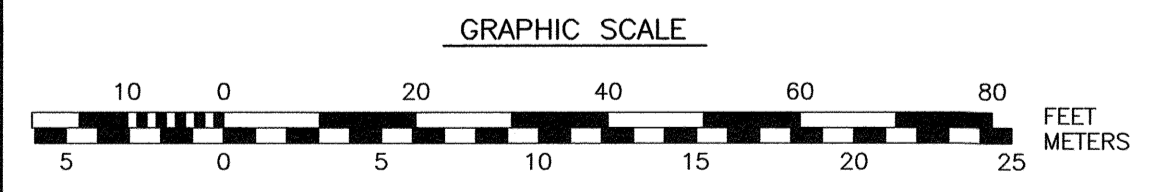
PIPE #	PIPE SIZE	LENGTH	SLOPE
P1	18"	30'	0.049
P2	18"	22'	0.034
P3	18"	90'	0.026
P4	18"	25'	0.028
P5	6"	16'	0.014
P6	12"	64'	0.007
P7	12"	8'	0.004
P8	12"	36'	0.023
P9	12"	53'	0.004
P10	6"	14'	0.014
P11	6"	22'	0.040

*ALL PIPE TO BE HDPE/PVC
**P5 AND P10 ARE STRIP DRAINS



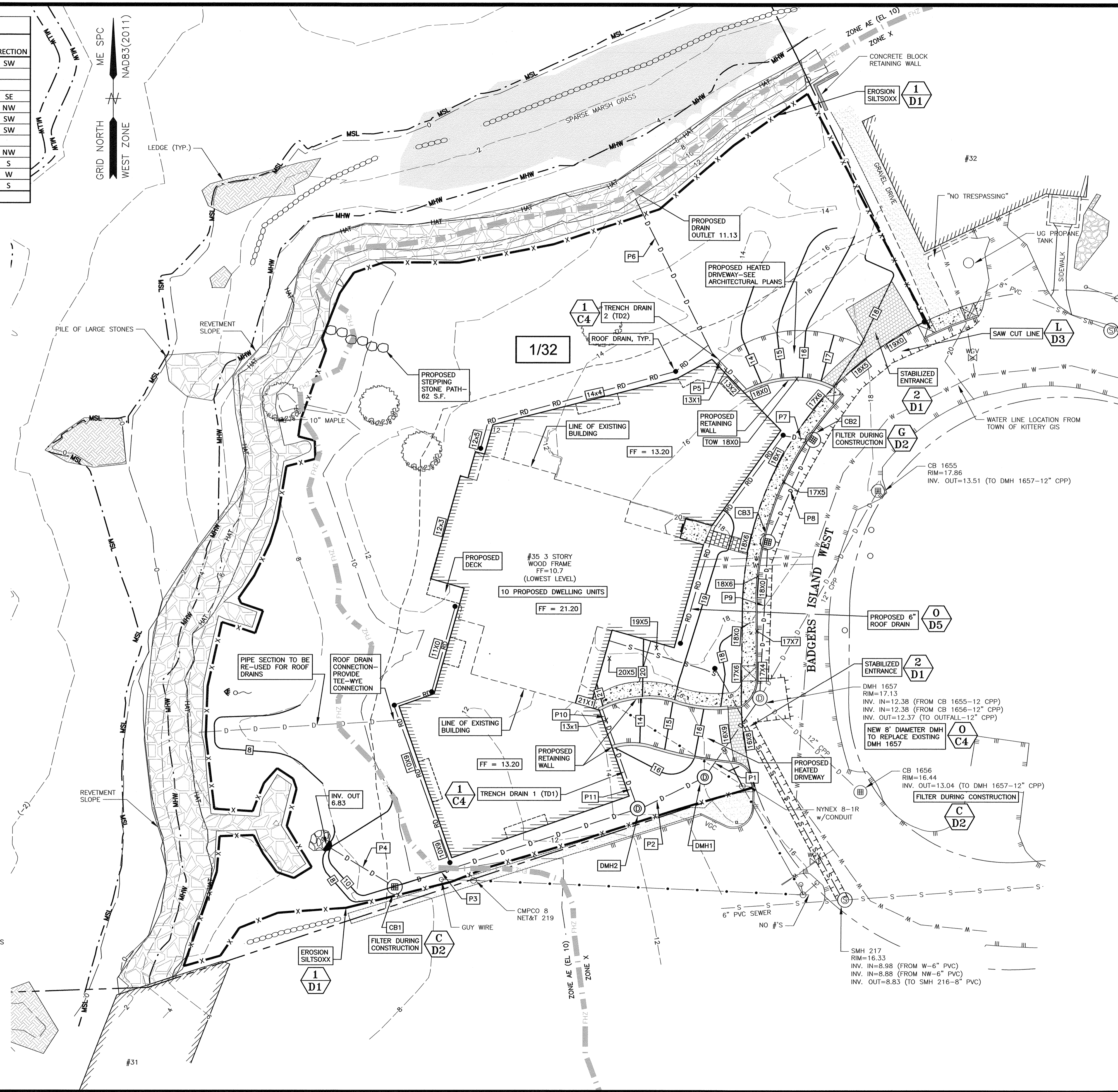
- NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
 2. AVAILABLE IN 3" AND 6" SECTIONS.
 3. AVAILABLE IN END, MIDDLE, OR CLOSED SECTIONS.
 4. DESIGNED FOR HEIGHT 145-20' LOADING.

SHEA PRODUCT ID: TD3/TD6
TRENCH DRAIN 8"x16"
WEIGHT (LBS): 711#/1,315#



"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

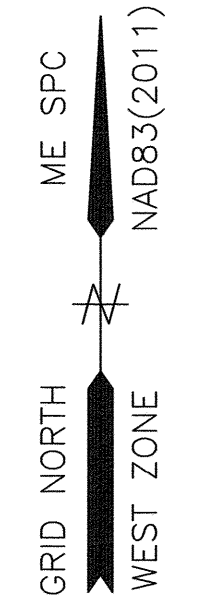
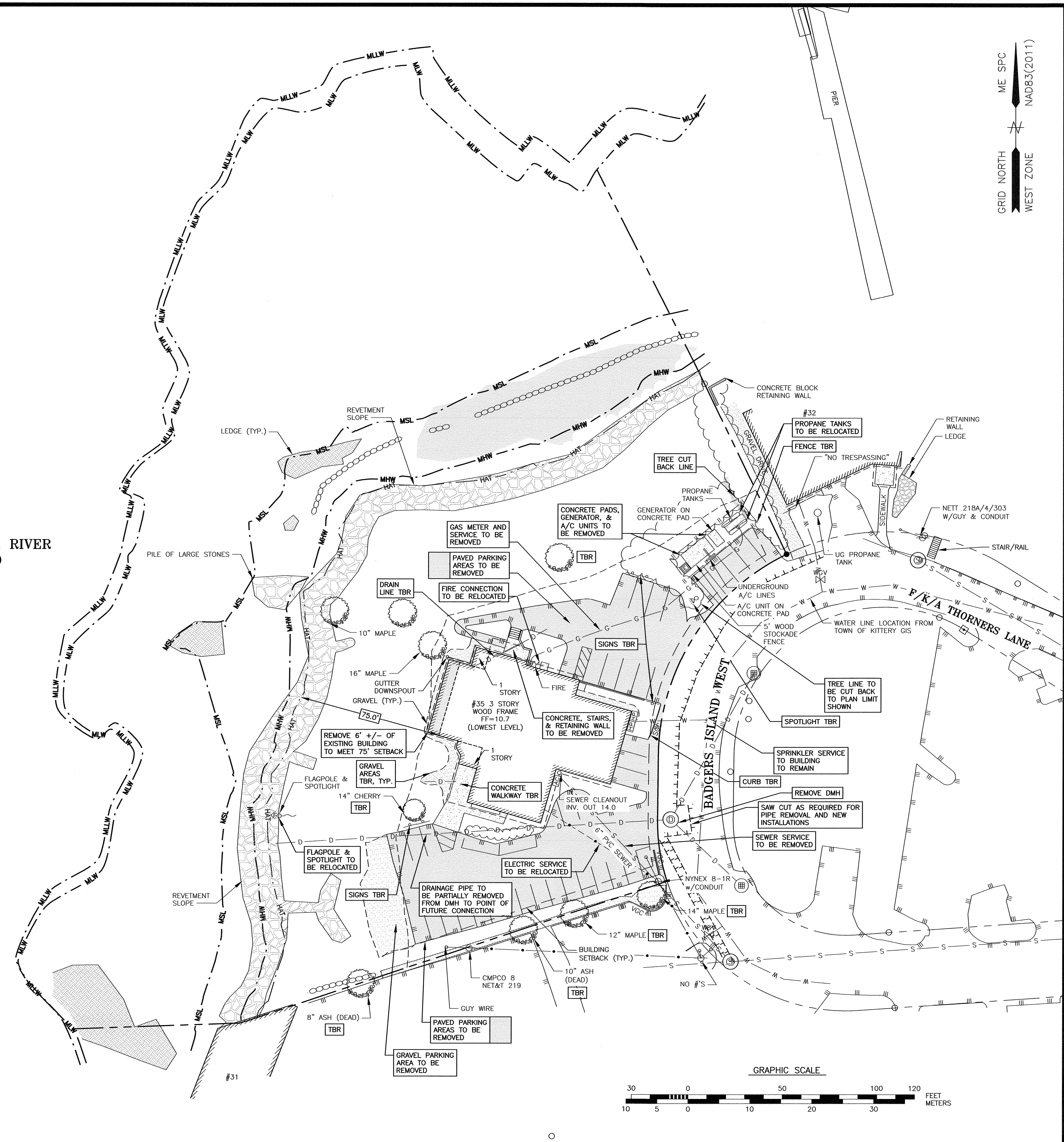
John R. Chagnon
JOHN R. CHAGNON, LLS
DATE: 8.23.23



DEMOLITION NOTES:

- A) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE DESIGNER. IT IS THE CONTRACTORS' RESPONSIBILITY TO LOCATE UTILITIES AND ANTICIPATE CONFLICTS. CONTRACTOR SHALL REPAIR EXISTING UTILITIES DAMAGED BY THEIR WORK AND RELOCATE EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED PRIOR TO COMMENCING ANY WORK IN THE IMPACTED AREA OF THE PROJECT.
- B) ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTORS UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
- C) ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO THE ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- D) THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
- E) SAWCUT AND REMOVE PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT TRENCH IN AREAS WHERE PAVEMENT IS TO BE REMOVED.
- F) IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL THE PERMIT APPROVALS.
- G) THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL CONSTRUCTION PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR ANY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK.
- H) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE, UTILITIES, VEGETATION, PAVEMENT, AND CONTAMINATED SOIL WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ANY EXISTING DOMESTIC / IRRIGATION SERVICE WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR PROPER CAPPING / RE-USE.
- I) ALL WORK WITHIN THE TOWN OF KITTEERY RIGHT OF WAY SHALL BE COORDINATED WITH THE TOWN OF KITTEERY DEPARTMENT OF PUBLIC WORKS (DPW).
- J) REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
- K) CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED, THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR TO REPLACE THEM.
- L) PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS WITHIN CONSTRUCTION LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE HIGH FLOW SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF WARRANTED OR FABRIC BECOMES CLOGGED. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
- M) THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
- N) ANY CONTAMINATED MATERIAL REMOVED DURING THE COURSE OF THE WORK WILL REQUIRE HANDLING IN ACCORDANCE WITH MEDEP REGULATIONS. CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN IN PLACE, AND COMPLY WITH ALL APPLICABLE PERMITS, APPROVALS, AUTHORIZATIONS, AND REGULATIONS.

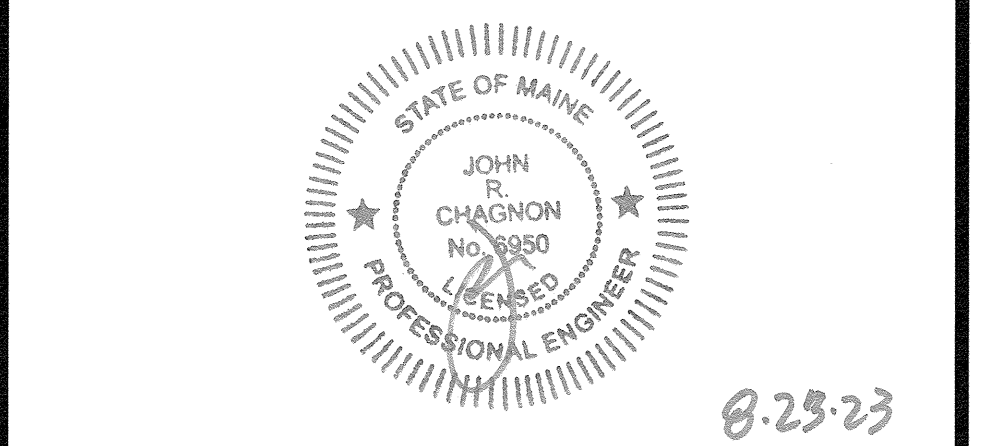
PISCATAQUA RIVER
(TIDAL)



- NOTES:**
- A) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.
 - B) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.
 - C) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S" PUBLISHED BY THE MAINE D.E.P. IN 2014.

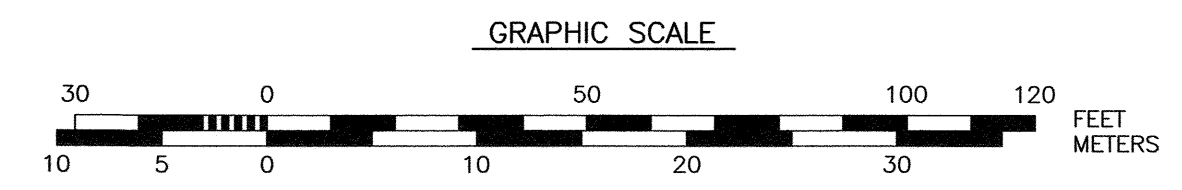
**SITE DEVELOPMENT
35 BADGERS
ISLAND WEST
KITTEERY, MAINE**

NO.	DESCRIPTION	DATE
1	SAWCUT LINES, TREE LINES	8/3/23
0	ISSUED FOR COMMENT	6/29/23



SCALE 1"=30' AUGUST 2021

DEMOLITION PLAN **C5**



B.I.W. GROUP, LLC
 35 BADGERS ISLAND WEST
 KITTERY, MAINE

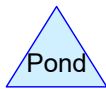
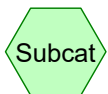
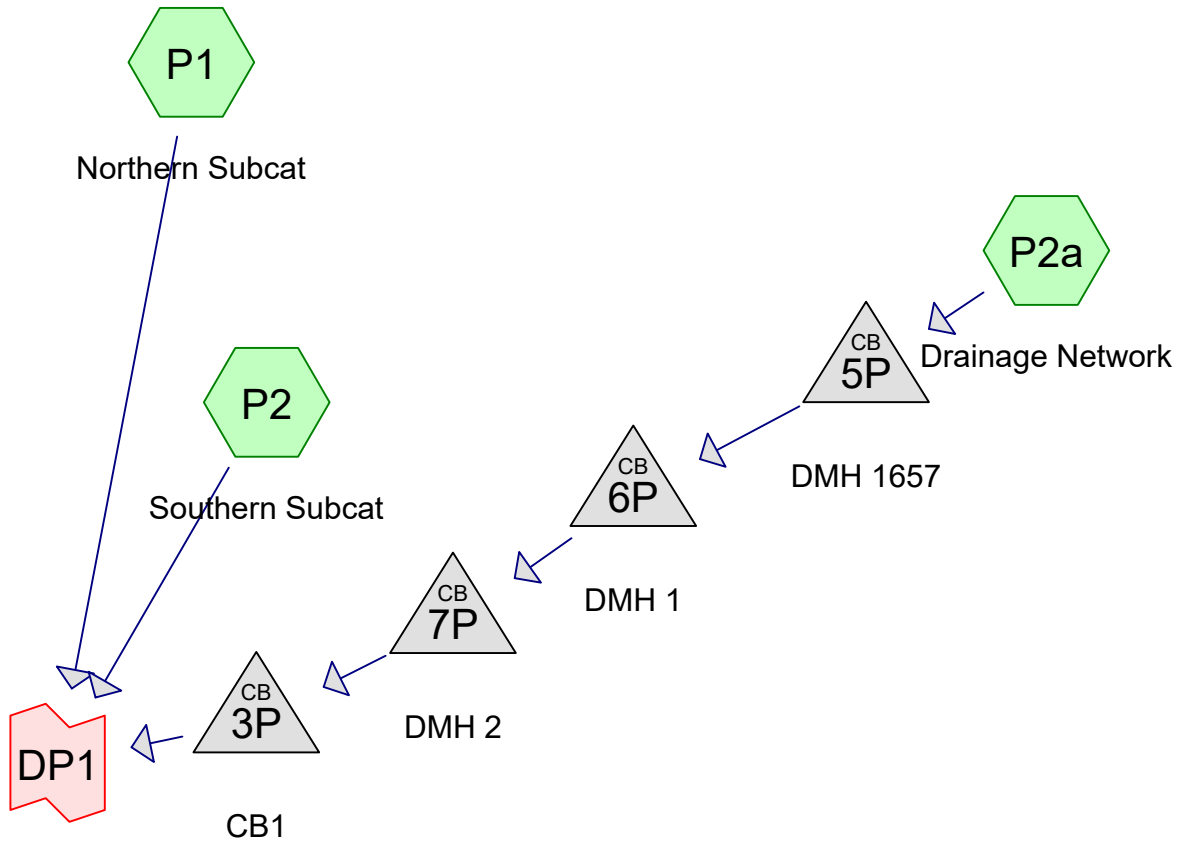
JOB NUMBER: 5010135.3050.72A
 SCALE: 1" = 100'
 SUBMITTED: 08-24-2023



B.I.W. GROUP, LLC
 35 BADGERS ISLAND WEST
 KITTERY, MAINE

JOB NUMBER: 5010135.3050.72A
 SCALE: 1" = 100'
 SUBMITTED: 08-24-2023





Routing Diagram for Proposed Conditions 2023-05-23 David T
 Prepared by Haley Ward, Printed 8/23/2023
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Project Notes

Defined 5 rainfall events from output (39) IDF

Proposed Conditions 2023-05-23 David T

Prepared by Haley Ward

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Page 3

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.20	2
2	10-yr	Type II 24-hr		Default	24.00	1	4.86	2
3	25-yr	Type II 24-hr		Default	24.00	1	6.16	2

Proposed Conditions 2023-05-23 David T

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.984	80	>75% Grass cover, Good, HSG D (P1, P2, P2a)
0.109	96	Gravel surface, HSG D (P1, P2)
0.925	98	Paved parking, HSG D (P1, P2a)
0.335	98	Roofs, HSG D (P1, P2, P2a)
0.097	98	Water Surface, 0% imp, HSG D (P1)
0.924	98	Water Surface, HSG D (P1, P2)
0.004	77	Woods, Good, HSG D (P1)
3.378	93	TOTAL AREA

Proposed Conditions 2023-05-23 David T

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
3.378	HSG D	P1, P2, P2a
0.000	Other	
3.378		TOTAL AREA

Proposed Conditions 2023-05-23 David T

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Page 6

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.984	0.000	0.984	>75% Grass cover, Good	P1, P2, P2a
0.000	0.000	0.000	0.109	0.000	0.109	Gravel surface	P1, P2
0.000	0.000	0.000	0.925	0.000	0.925	Paved parking	P1, P2a
0.000	0.000	0.000	0.335	0.000	0.335	Roofs	P1, P2, P2a
0.000	0.000	0.000	0.924	0.000	0.924	Water Surface	P1, P2
0.000	0.000	0.000	0.097	0.000	0.097	Water Surface, 0% imp	P1
0.000	0.000	0.000	0.004	0.000	0.004	Woods, Good	P1
0.000	0.000	0.000	3.378	0.000	3.378	TOTAL AREA	

Proposed Conditions 2023-05-23 David T

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	3P	7.53	6.83	25.1	0.0279	0.013	0.0	18.0	0.0	
2	5P	12.37	10.91	30.0	0.0487	0.013	0.0	18.0	0.0	
3	6P	10.81	10.07	22.0	0.0336	0.013	0.0	18.0	0.0	
4	7P	9.97	7.63	90.0	0.0260	0.013	0.0	18.0	0.0	

Proposed Conditions 2023-05-23 David T

Type II 24-hr 2-yr Rainfall=3.20"

Prepared by Haley Ward

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Northern Subcat Runoff Area=65,505 sf 51.78% Impervious Runoff Depth=2.26"
Flow Length=585' Slope=0.0374 '/' Tc=7.2 min CN=91 Runoff=5.48 cfs 0.283 af

Subcatchment P2: Southern Subcat Runoff Area=30,379 sf 54.47% Impervious Runoff Depth=2.17"
Tc=5.0 min CN=90 Runoff=2.63 cfs 0.126 af

Subcatchment P2a: Drainage Network Runoff Area=51,243 sf 87.19% Impervious Runoff Depth=2.75"
Flow Length=411' Slope=0.0155 '/' Tc=6.7 min CN=96 Runoff=4.89 cfs 0.270 af

Pond 3P: CB1 Peak Elev=8.62' Inflow=4.89 cfs 0.270 af
18.0" Round Culvert n=0.013 L=25.1' S=0.0279 '/' Outflow=4.89 cfs 0.270 af

Pond 5P: DMH 1657 Peak Elev=13.46' Inflow=4.89 cfs 0.270 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0487 '/' Outflow=4.89 cfs 0.270 af

Pond 6P: DMH 1 Peak Elev=11.90' Inflow=4.89 cfs 0.270 af
18.0" Round Culvert n=0.013 L=22.0' S=0.0336 '/' Outflow=4.89 cfs 0.270 af

Pond 7P: DMH 2 Peak Elev=11.06' Inflow=4.89 cfs 0.270 af
18.0" Round Culvert n=0.013 L=90.0' S=0.0260 '/' Outflow=4.89 cfs 0.270 af

Link DP1: below 1,000.00 cfs Inflow=12.81 cfs 0.679 af
Primary=12.81 cfs 0.679 af Secondary=0.00 cfs 0.000 af

Total Runoff Area = 3.378 ac Runoff Volume = 0.679 af Average Runoff Depth = 2.41"
35.33% Pervious = 1.193 ac 64.67% Impervious = 2.184 ac

Proposed Conditions 2023-05-23 David T

Type II 24-hr 2-yr Rainfall=3.20"

Prepared by Haley Ward

Printed 8/23/2023

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Summary for Subcatchment P1: Northern Subcat

Runoff = 5.48 cfs @ 11.98 hrs, Volume= 0.283 af, Depth= 2.26"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.20"

Area (sf)	CN	Description
3,570	96	Gravel surface, HSG D
27,640	98	Water Surface, HSG D
4,206	98	Water Surface, 0% imp, HSG D
173	77	Woods, Good, HSG D
2,771	98	Roofs, HSG D
23,639	80	>75% Grass cover, Good, HSG D
3,506	98	Paved parking, HSG D
65,505	91	Weighted Average
31,588		48.22% Pervious Area
33,917		51.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	585	0.0374	1.35		Lag/CN Method,

Summary for Subcatchment P2: Southern Subcat

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.63 cfs @ 11.95 hrs, Volume= 0.126 af, Depth= 2.17"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-yr Rainfall=3.20"

Area (sf)	CN	Description
1,183	96	Gravel surface, HSG D
12,607	98	Water Surface, HSG D
3,939	98	Roofs, HSG D
12,650	80	>75% Grass cover, Good, HSG D
30,379	90	Weighted Average
13,833		45.53% Pervious Area
16,546		54.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment P2a: Drainage Network

Runoff = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af, Depth= 2.75"
 Routed to Pond 5P : DMH 1657

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type II 24-hr 2-yr Rainfall=3.20"

Area (sf)	CN	Description
7,903	98	Roofs, HSG D
6,564	80	>75% Grass cover, Good, HSG D
36,776	98	Paved parking, HSG D
51,243	96	Weighted Average
6,564		12.81% Pervious Area
44,679		87.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	411	0.0155	1.03		Lag/CN Method,

Summary for Pond 3P: CB1

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 0.97'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 2.75" for 2-yr event
 Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
 Outflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
 Routed to Link DP1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 8.62' @ 11.97 hrs
 Flood Elev= 9.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	7.53'	18.0" Round Culvert L= 25.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.53' / 6.83' S= 0.0279 ' S= 0.0279 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.76 cfs @ 11.97 hrs HW=8.60' (Free Discharge)
 ↑1=Culvert (Inlet Controls 4.76 cfs @ 3.52 fps)

Summary for Pond 5P: DMH 1657

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 2.75" for 2-yr event
 Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
 Outflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
 Routed to Pond 6P : DMH 1

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Type II 24-hr 2-yr Rainfall=3.20"

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 13.46' @ 11.97 hrs
Flood Elev= 17.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.37'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.37' / 10.91' S= 0.0487 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.76 cfs @ 11.97 hrs HW=13.44' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.76 cfs @ 3.52 fps)

Summary for Pond 6P: DMH 1

[79] Warning: Submerged Pond 5P Primary device # 1 OUTLET by 0.97'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 2.75" for 2-yr event
Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
Outflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
Primary = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
Routed to Pond 7P : DMH 2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 11.90' @ 11.97 hrs
Flood Elev= 14.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	10.81'	18.0" Round Culvert L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.81' / 10.07' S= 0.0336 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.76 cfs @ 11.97 hrs HW=11.88' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.76 cfs @ 3.52 fps)

Summary for Pond 7P: DMH 2

[79] Warning: Submerged Pond 6P Primary device # 1 INLET by 0.23'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 2.75" for 2-yr event
Inflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
Outflow = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
Primary = 4.89 cfs @ 11.97 hrs, Volume= 0.270 af
Routed to Pond 3P : CB1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 11.06' @ 11.97 hrs
Flood Elev= 13.00'

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Type II 24-hr 2-yr Rainfall=3.20"

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Device	Routing	Invert	Outlet Devices
#1	Primary	9.97'	18.0" Round Culvert L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.97' / 7.63' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.76 cfs @ 11.97 hrs HW=11.04' (Free Discharge)

↳ **1=Culvert** (Inlet Controls 4.76 cfs @ 3.52 fps)

Summary for Link DP1:

Inflow Area = 3.378 ac, 64.67% Impervious, Inflow Depth = 2.41" for 2-yr event
 Inflow = 12.81 cfs @ 11.97 hrs, Volume= 0.679 af
 Primary = 12.81 cfs @ 11.97 hrs, Volume= 0.679 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 1,000.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type II 24-hr 10-yr Rainfall=4.86"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Northern Subcat Runoff Area=65,505 sf 51.78% Impervious Runoff Depth=3.85"
Flow Length=585' Slope=0.0374 '/' Tc=7.2 min CN=91 Runoff=9.03 cfs 0.482 af

Subcatchment P2: Southern Subcat Runoff Area=30,379 sf 54.47% Impervious Runoff Depth=3.74"
Tc=5.0 min CN=90 Runoff=4.40 cfs 0.217 af

Subcatchment P2a: Drainage Network Runoff Area=51,243 sf 87.19% Impervious Runoff Depth=4.39"
Flow Length=411' Slope=0.0155 '/' Tc=6.7 min CN=96 Runoff=7.59 cfs 0.431 af

Pond 3P: CB1 Peak Elev=9.07' Inflow=7.59 cfs 0.431 af
18.0" Round Culvert n=0.013 L=25.1' S=0.0279 '/' Outflow=7.59 cfs 0.431 af

Pond 5P: DMH 1657 Peak Elev=13.91' Inflow=7.59 cfs 0.431 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0487 '/' Outflow=7.59 cfs 0.431 af

Pond 6P: DMH 1 Peak Elev=12.35' Inflow=7.59 cfs 0.431 af
18.0" Round Culvert n=0.013 L=22.0' S=0.0336 '/' Outflow=7.59 cfs 0.431 af

Pond 7P: DMH 2 Peak Elev=11.51' Inflow=7.59 cfs 0.431 af
18.0" Round Culvert n=0.013 L=90.0' S=0.0260 '/' Outflow=7.59 cfs 0.431 af

Link DP1: below 1,000.00 cfs Inflow=20.73 cfs 1.130 af
Primary=20.73 cfs 1.130 af Secondary=0.00 cfs 0.000 af

Total Runoff Area = 3.378 ac Runoff Volume = 1.130 af Average Runoff Depth = 4.02"
35.33% Pervious = 1.193 ac 64.67% Impervious = 2.184 ac

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Type II 24-hr 10-yr Rainfall=4.86"

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Summary for Subcatchment P1: Northern Subcat

Runoff = 9.03 cfs @ 11.98 hrs, Volume= 0.482 af, Depth= 3.85"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.86"

Area (sf)	CN	Description
3,570	96	Gravel surface, HSG D
27,640	98	Water Surface, HSG D
4,206	98	Water Surface, 0% imp, HSG D
173	77	Woods, Good, HSG D
2,771	98	Roofs, HSG D
23,639	80	>75% Grass cover, Good, HSG D
3,506	98	Paved parking, HSG D
65,505	91	Weighted Average
31,588		48.22% Pervious Area
33,917		51.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	585	0.0374	1.35		Lag/CN Method,

Summary for Subcatchment P2: Southern Subcat

[49] Hint: Tc<2dt may require smaller dt

Runoff = 4.40 cfs @ 11.95 hrs, Volume= 0.217 af, Depth= 3.74"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.86"

Area (sf)	CN	Description
1,183	96	Gravel surface, HSG D
12,607	98	Water Surface, HSG D
3,939	98	Roofs, HSG D
12,650	80	>75% Grass cover, Good, HSG D
30,379	90	Weighted Average
13,833		45.53% Pervious Area
16,546		54.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type II 24-hr 10-yr Rainfall=4.86"

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Summary for Subcatchment P2a: Drainage Network

Runoff = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af, Depth= 4.39"
Routed to Pond 5P : DMH 1657

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=4.86"

Area (sf)	CN	Description
7,903	98	Roofs, HSG D
6,564	80	>75% Grass cover, Good, HSG D
36,776	98	Paved parking, HSG D
51,243	96	Weighted Average
6,564		12.81% Pervious Area
44,679		87.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	411	0.0155	1.03		Lag/CN Method,

Summary for Pond 3P: CB1

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 1.41'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 4.39" for 10-yr event
Inflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Outflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Routed to Link DP1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 9.07' @ 11.97 hrs
Flood Elev= 9.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	7.53'	18.0" Round Culvert L= 25.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.53' / 6.83' S= 0.0279 ' S= 0.0279 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 11.97 hrs HW=9.03' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.38 cfs @ 4.18 fps)

Summary for Pond 5P: DMH 1657

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 4.39" for 10-yr event
Inflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Outflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Routed to Pond 6P : DMH 1

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Type II 24-hr 10-yr Rainfall=4.86"

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 13.91' @ 11.97 hrs
Flood Elev= 17.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.37'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.37' / 10.91' S= 0.0487 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 11.97 hrs HW=13.87' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.38 cfs @ 4.17 fps)

Summary for Pond 6P: DMH 1

[79] Warning: Submerged Pond 5P Primary device # 1 OUTLET by 1.41'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 4.39" for 10-yr event
Inflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Outflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Routed to Pond 7P : DMH 2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 12.35' @ 11.97 hrs
Flood Elev= 14.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	10.81'	18.0" Round Culvert L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.81' / 10.07' S= 0.0336 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 11.97 hrs HW=12.31' (Free Discharge)
↑**1=Culvert** (Inlet Controls 7.38 cfs @ 4.18 fps)

Summary for Pond 7P: DMH 2

[79] Warning: Submerged Pond 6P Primary device # 1 INLET by 0.67'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 4.39" for 10-yr event
Inflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Outflow = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 7.59 cfs @ 11.97 hrs, Volume= 0.431 af
Routed to Pond 3P : CB1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 11.51' @ 11.97 hrs
Flood Elev= 13.00'

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Type II 24-hr 10-yr Rainfall=4.86"

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Device	Routing	Invert	Outlet Devices
#1	Primary	9.97'	18.0" Round Culvert L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.97' / 7.63' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=7.38 cfs @ 11.97 hrs HW=11.47' (Free Discharge)

↑**1=Culvert** (Inlet Controls 7.38 cfs @ 4.18 fps)

Summary for Link DP1:

Inflow Area = 3.378 ac, 64.67% Impervious, Inflow Depth = 4.02" for 10-yr event
 Inflow = 20.73 cfs @ 11.97 hrs, Volume= 1.130 af
 Primary = 20.73 cfs @ 11.97 hrs, Volume= 1.130 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 1,000.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

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Type II 24-hr 25-yr Rainfall=6.16"

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Northern Subcat Runoff Area=65,505 sf 51.78% Impervious Runoff Depth=5.11"
Flow Length=585' Slope=0.0374 '/' Tc=7.2 min CN=91 Runoff=11.79 cfs 0.641 af

Subcatchment P2: Southern Subcat Runoff Area=30,379 sf 54.47% Impervious Runoff Depth=5.00"
Tc=5.0 min CN=90 Runoff=5.77 cfs 0.291 af

Subcatchment P2a: Drainage Network Runoff Area=51,243 sf 87.19% Impervious Runoff Depth=5.69"
Flow Length=411' Slope=0.0155 '/' Tc=6.7 min CN=96 Runoff=9.70 cfs 0.557 af

Pond 3P: CB1 Peak Elev=9.57' Inflow=9.70 cfs 0.557 af
18.0" Round Culvert n=0.013 L=25.1' S=0.0279 '/' Outflow=9.70 cfs 0.557 af

Pond 5P: DMH 1657 Peak Elev=14.41' Inflow=9.70 cfs 0.557 af
18.0" Round Culvert n=0.013 L=30.0' S=0.0487 '/' Outflow=9.70 cfs 0.557 af

Pond 6P: DMH 1 Peak Elev=12.85' Inflow=9.70 cfs 0.557 af
18.0" Round Culvert n=0.013 L=22.0' S=0.0336 '/' Outflow=9.70 cfs 0.557 af

Pond 7P: DMH 2 Peak Elev=12.01' Inflow=9.70 cfs 0.557 af
18.0" Round Culvert n=0.013 L=90.0' S=0.0260 '/' Outflow=9.70 cfs 0.557 af

Link DP1: below 1,000.00 cfs Inflow=26.88 cfs 1.489 af
Primary=26.88 cfs 1.489 af Secondary=0.00 cfs 0.000 af

Total Runoff Area = 3.378 ac Runoff Volume = 1.489 af Average Runoff Depth = 5.29"
35.33% Pervious = 1.193 ac 64.67% Impervious = 2.184 ac

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Type II 24-hr 25-yr Rainfall=6.16"

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Summary for Subcatchment P1: Northern Subcat

Runoff = 11.79 cfs @ 11.98 hrs, Volume= 0.641 af, Depth= 5.11"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=6.16"

Area (sf)	CN	Description
3,570	96	Gravel surface, HSG D
27,640	98	Water Surface, HSG D
4,206	98	Water Surface, 0% imp, HSG D
173	77	Woods, Good, HSG D
2,771	98	Roofs, HSG D
23,639	80	>75% Grass cover, Good, HSG D
3,506	98	Paved parking, HSG D
65,505	91	Weighted Average
31,588		48.22% Pervious Area
33,917		51.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	585	0.0374	1.35		Lag/CN Method,

Summary for Subcatchment P2: Southern Subcat

[49] Hint: Tc<2dt may require smaller dt

Runoff = 5.77 cfs @ 11.95 hrs, Volume= 0.291 af, Depth= 5.00"
Routed to Link DP1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr Rainfall=6.16"

Area (sf)	CN	Description
1,183	96	Gravel surface, HSG D
12,607	98	Water Surface, HSG D
3,939	98	Roofs, HSG D
12,650	80	>75% Grass cover, Good, HSG D
30,379	90	Weighted Average
13,833		45.53% Pervious Area
16,546		54.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment P2a: Drainage Network

Runoff = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af, Depth= 5.69"
 Routed to Pond 5P : DMH 1657

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type II 24-hr 25-yr Rainfall=6.16"

Area (sf)	CN	Description
7,903	98	Roofs, HSG D
6,564	80	>75% Grass cover, Good, HSG D
36,776	98	Paved parking, HSG D
51,243	96	Weighted Average
6,564		12.81% Pervious Area
44,679		87.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	411	0.0155	1.03		Lag/CN Method,

Summary for Pond 3P: CB1

[79] Warning: Submerged Pond 7P Primary device # 1 OUTLET by 1.89'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 5.69" for 25-yr event
 Inflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
 Outflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
 Routed to Link DP1 :

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 9.57' @ 11.97 hrs
 Flood Elev= 9.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	7.53'	18.0" Round Culvert L= 25.1' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 7.53' / 6.83' S= 0.0279 ' S= 0.0279 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.44 cfs @ 11.97 hrs HW=9.51' (Free Discharge)
 ↑1=Culvert (Inlet Controls 9.44 cfs @ 5.34 fps)

Summary for Pond 5P: DMH 1657

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 5.69" for 25-yr event
 Inflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
 Outflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
 Primary = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
 Routed to Pond 6P : DMH 1

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Type II 24-hr 25-yr Rainfall=6.16"

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Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 14.41' @ 11.97 hrs
Flood Elev= 17.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	12.37'	18.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 12.37' / 10.91' S= 0.0487 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.44 cfs @ 11.97 hrs HW=14.35' (Free Discharge)
↑**1=Culvert** (Inlet Controls 9.44 cfs @ 5.34 fps)

Summary for Pond 6P: DMH 1

[79] Warning: Submerged Pond 5P Primary device # 1 INLET by 0.43'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 5.69" for 25-yr event
Inflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
Outflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
Primary = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
Routed to Pond 7P : DMH 2

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 12.85' @ 11.97 hrs
Flood Elev= 14.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	10.81'	18.0" Round Culvert L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.81' / 10.07' S= 0.0336 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=9.44 cfs @ 11.97 hrs HW=12.79' (Free Discharge)
↑**1=Culvert** (Inlet Controls 9.44 cfs @ 5.34 fps)

Summary for Pond 7P: DMH 2

[79] Warning: Submerged Pond 6P Primary device # 1 INLET by 1.15'

Inflow Area = 1.176 ac, 87.19% Impervious, Inflow Depth = 5.69" for 25-yr event
Inflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
Outflow = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af, Atten= 0%, Lag= 0.0 min
Primary = 9.70 cfs @ 11.97 hrs, Volume= 0.557 af
Routed to Pond 3P : CB1

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 12.01' @ 11.97 hrs
Flood Elev= 13.00'

Proposed Conditions 2023-05-23 David T

Type II 24-hr 25-yr Rainfall=6.16"

Prepared by Haley Ward

Printed 8/23/2023

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Device	Routing	Invert	Outlet Devices
#1	Primary	9.97'	18.0" Round Culvert L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 9.97' / 7.63' S= 0.0260 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

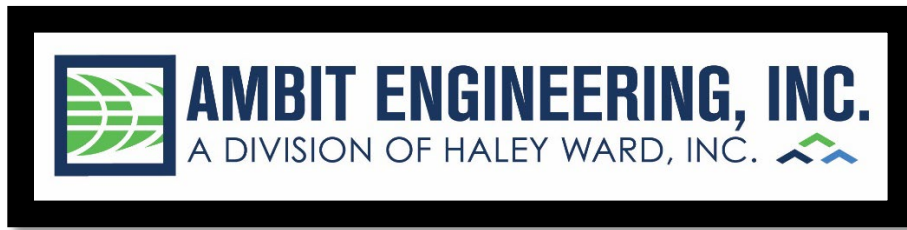
Primary OutFlow Max=9.44 cfs @ 11.97 hrs HW=11.95' (Free Discharge)

↳ **1=Culvert** (Inlet Controls 9.44 cfs @ 5.34 fps)

Summary for Link DP1:

Inflow Area = 3.378 ac, 64.67% Impervious, Inflow Depth = 5.29" for 25-yr event
 Inflow = 26.88 cfs @ 11.97 hrs, Volume= 1.489 af
 Primary = 26.88 cfs @ 11.97 hrs, Volume= 1.489 af, Atten= 0%, Lag= 0.0 min
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow below 1,000.00 cfs, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs



***INSPECTION & LONG-TERM MAINTENANCE PLAN
FOR
SITE DEVELOPMENT***

**35 BADGERS ISLAND WEST
KITTERY, ME**

Introduction

The intent of this plan is to provide Hampshire Development (herein referred to as “owner”) with a list of procedures that document the inspection and maintenance requirements of the stormwater management system for this development. Specifically, the proposed closed drainage network and associated drainage structures (collectively referred to as the “Stormwater Management System”). The contact information for the owner shall be kept current, and if there is a change of ownership of the property this plan must be transferred to the new owner.

The following inspection and maintenance program is necessary to keep the stormwater management system functioning properly and will help in maintaining a high quality of stormwater runoff to minimize potential environmental impacts. By following the enclosed procedures, the owner will be able to maintain the functional design of the stormwater management system and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Annual Report

The owner shall prepare an annual Inspection & Maintenance Report. The report shall include a summary of the system’s maintenance and repair by transmission of the Inspection & Maintenance Log and other information as required. A copy of the report shall be delivered annually by July 1st to the Kittery Code Enforcement Officer.

Inspection & Maintenance Checklist/Log

The following pages contain the Stormwater Management System Inspection & Maintenance Requirements and a blank copy of the Stormwater Management System Inspection & Maintenance Log. These forms are provided to the owner as a guideline for performing the inspection and maintenance of the Stormwater Management System. This is a guideline and should be periodically reviewed for conformance with current practice and standards.

Stormwater Management System Components

The Stormwater Management System is designed to mitigate the quality of site-generated stormwater runoff. As a result, the design includes the following elements:

Non-Structural BMPs

Non-Structural best management practices (BMP's) include temporary and permanent measures that typically require less labor and capital inputs and are intended to provide protection against erosion of soils. Examples of non-structural BMP's on this project include but are not limited to:

- Temporary and Permanent mulching
- Temporary and Permanent grass cover
- Trees
- Shrubs and ground covers
- Miscellaneous landscape plantings
- Dust control
- Tree protection
- Topsoiling
- Sediment barriers
- Stabilized construction entrance
- Catch basin basket

Structural BMPs

Structural BMPs are more labor and capital-intensive structures or installations that require more specialized personnel to install. Examples on this project include but are not limited to:

- Storm Drains with Deep Sumps

Inspection and Maintenance Requirements

The following summarizes the inspection and maintenance requirements for the various BMP's that may be found on this project.

1. **Grassed areas (until established):** After each rain event of 0.5" or more during a 24-hour period, inspect grassed areas for signs of disturbance, such as erosion. If damaged areas are discovered, immediately repair the damage. Repairs may include adding new topsoil, lime, seed, fertilizer and mulch.
2. **Plantings:** Planting and landscaping (trees, shrubs) shall be monitored bi-monthly during the first year to insure viability and vigorous growth. Replace dead or dying vegetation with new stock and make adjustments to the conditions that caused the dead or dying vegetation. During dryer times of the year, provide weekly watering or irrigation during the establishment period of the first year. Make the necessary adjustments to ensure long-term health of the vegetated covers, i.e. provide more permanent mulch or compost or other means of protection.

3. **Storm Drains and Trench Drains:** Monitor accumulation of debris in catch basins and trench drains monthly or after significant rain events. Remove sediments when they accumulate within the outlet pipe. During construction, maintain inlet protection until all roadways and parking areas have been stabilized. Prior to the end of construction, inspect the drains and basins for accumulations and remove and clean by jet-vacuuming.
4. **Roof Drains:** Monitor roof drains for damage or clogging twice yearly. Check any outlets for erosion.

Pollution Prevention

The following pollution prevention activities shall be undertaken to minimize potential impacts on stormwater runoff quality. The Contractor is responsible for all activities during construction. The Owner is responsible thereafter.

Spill Procedures

Any discharge of waste oil or other pollutant shall be reported immediately to the Maine Department of Environmental Protection (Maine DEP). The Contractor/Owner will be responsible for any incident of groundwater contamination resulting from the improper discharge of pollutants to the stormwater system, and may be required by Maine DEP to remediate incidents that may impact groundwater quality. If the property ownership is transferred, the new owner will be informed of the legal responsibilities associated with operation of the stormwater system, as indicated above.

Sanitary Facilities

Sanitary facilities shall be provided during all phases of construction.

Material Storage

No on site trash facility is provided until homes are constructed. The contractors are required to remove trash from the site. Hazardous material storage is prohibited.

Material Disposal

All waste material, trash, sediment, and debris shall be removed from the site and disposed of in accordance with applicable local, state, and federal guidelines and regulations. Removed sediments shall be if necessary dewatered prior to disposal.

Invasive Species

Monitor the Stormwater Management System for signs of invasive species growth. If caught early, their eradication is much easier. The most likely places where invasions start is in wetter, disturbed soils or detention ponds. Species such as phragmites and purple loose-strife are common invaders in these wetter areas. If they are found, the owner shall refer to the Invasive Plants List created by the Maine Department of Agriculture, Conservation & Forestry or contact a wetlands scientist with experience in invasive species control to implement a plan of action for eradication. Measures that do not require the application of chemical herbicides should be the first line of defense.



Figure 1: *Lythrum salicaria*, Purple Loosestrife. Photo by Liz West.

Figure 2: *Phragmites australis*. Photo by Le Loup Gris

CATCH BASIN BASKET CONSTRUCTION MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	FREQUENCY	MAINTENANCE REQUIREMENTS
-Check for damage to basket -Remove sediment from basket	Within 24 hours of rainfall, Daily during extended rainfall	-Repair basket as necessary to prevent particles from reaching drainage system, or to prevent flooding. -Empty basket after every storm, or if clogged.

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	INSPECTOR CONTACT INFO
DATE OF INSPECTION	REASON FOR INSPECTION <input type="checkbox"/> LARGE STORM EVENT <input type="checkbox"/> PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? <input type="checkbox"/> YES <input type="checkbox"/> NO	DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE
DATE OF MAINTENANCE	PERFORMED BY
NOTES	

CLOSED DRAINAGE STRUCTURE LONG-TERM MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	FREQUENCY	MAINTENANCE REQUIREMENTS
-Outlet Control Structures -Drain Manholes -Catch Basins and Trench Drains	Every other Month	<i>Check for erosion or short-circuiting Check for sediment accumulation Check for floatable contaminants</i>
-Drainage Pipes -Roof Drains	1 time per 2 years	<i>Check for sediment accumulation/clogging, or soiled runoff. Check for erosion at outlets.</i>

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	INSPECTOR CONTACT INFO
DATE OF INSPECTION	REASON FOR INSPECTION <input type="checkbox"/> LARGE STORM EVENT <input type="checkbox"/> PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? <input type="checkbox"/> YES <input type="checkbox"/> NO	DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE
DATE OF MAINTENANCE	PERFORMED BY
NOTES	

STABILIZED CONSTRUCTION ENTRANCE CONSTRUCTION MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	FREQUENCY	MAINTENANCE REQUIREMENTS
ENTRANCE SURFACE <i>-Check for sediment accumulation/clogging of stone</i> <i>-Check Vegetative filter strips</i>	After heavy rains, as necessary	<i>-Top dress pad with new stone.</i> <i>-Replace stone completely if completely clogged.</i> <i>-Maintain vigorous stand of vegetation.</i>
WASHING FACILITIES (if applicable) <i>-Monitor Sediment Accumulation</i>	As often as necessary	<i>-Remove Sediments from traps.</i>

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	INSPECTOR CONTACT INFO
DATE OF INSPECTION	REASON FOR INSPECTION <input type="checkbox"/> LARGE STORM EVENT <input type="checkbox"/> PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? <input type="checkbox"/> YES <input type="checkbox"/> NO	DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE
DATE OF MAINTENANCE	PERFORMED BY
NOTES	