Date	July 15, 2020
To	Town of Cumberland Planning Board
From	Carla Nixon, Town Planner
Subject	**Major (Preliminary) Subdivision and Site Plan Review: Cumberland Crossing, Phase 2 - Tuttle and Greely Roads.**

I. REQUEST/OVERVIEW:

The Applicant is Oceanview at Cumberland, LLC. The Applicant is requesting Preliminary Major Subdivision and Site Plan Review for an additional 52 lots and a community center on a 59.59 acre parcel that is connected to Phase 1 by a triangular piece of land in the southwest corner of Phase 1 into Phase 2.

Little Acres Drive which serves Phase 1 from Tuttle Road, will be extended 3300 +/- feet from the end of Phase 1 to an existing drive from Greely Road.

The project will be served by public water and sewer and natural gas. The parcel is shown on Tax Assessor Map R 04, lot 34 A in the Rural Residential 1 (RR 1) zoning district. Frederic Licht, P.E. of Licht Environmental Design, LLC is the Applicant's representative. Dan Diffin, P.E. of Sevee and Maher Engineers reviewed the plans and has provided comments for the Planning Board's consideration.

This is the second public hearing for preliminary review. The Applicants are requesting preliminary subdivision plan approval at this meeting. Note: The Town Attorney has determined that a separate review for Site Plan Ordinance standards is not required if a project requires subdivision review.

Proposed findings of fact for subdivision review have been provided. The findings show that all standards have been adequately addressed for the purpose of Preliminary Approval.

II. PROJECT HISTORY:

- Preliminary Plan Review: Tabled by Planning Board on 1/21/19.
- Sketch Plan Meetings with Planning Board in February and April, 2019.

III. DESCRIPTION:

Parcel size:	59.59 acres
Net Residential Density:	Not required for developments in the Senior Housing Community (SHC) Overlay district.
Proposed # of units:	52, plus a community center.
Zoning:	Rural Residential 1 with a Senior Housing Community Overlay
Development Type:	Clustered Subdivision Design

Min. Lot Size:	RR 1 requires a 4 acre minimum lot size; the SHC Overlay requires a 5 acres minimum lot size. The proposed project site is 59.59 acres.
Lot frontage:	50’
Setbacks:	Front: 25’, Rear: 75’, Side: 30’ (combined = 75’
Parking:	2 spaces per unit
Roads:	All roads to be private.
Buffering:	50’ undisturbed buffer along entire perimeter of site.
Water & Sewer:	Portland Water District
Electricity:	Central Maine Power
Natural Gas:	Summit Gas
Open Space:	20% required, 68% provided.
Wetlands:	17,516 sf
Vernal Pools:	None
Utilities:	Underground electric, telephone, cable, gas, water and sewer from Tuttle Road.
Street Lighting:	For street intersections and along roadways at “key locations”.
Traffic Impact Assessment:	Traffic report shows no adverse effects.
Homeowners Association:	None
Floodplain Map Classification:	23005C0536F Zone A. No structures will be built in this area of the site.
Right, Title and Interest:	Trustees’ Deed of Sale.
Fire Protection:	Public water. Fire Hydrants location approved by Fire Chief. Units will have sprinklers

Additional Approvals Required:

Agency	Type of Permit	Status
MDEP	Site Location of Dev. Permit (SLODA)	Outstanding
MDEP	NRPA Tier 1 permit	Outstanding
US Army Corp of Engineers	(wetlands) permit	Outstanding
MDOT	Entrance Permit	Amendment Needed?
Maine Natural Areas Program	Rare Botanical Data	Letter dated 2/8/19
Maine Historic Preservation Commission	Historic Properties	Letter dated 2/19/19
Maine Dept. Inland Fisheries & Wildlife	Habitat Data	Letter dated 6/14/17 appears to be for Phase 1.
Portland Water District	Ability to Serve	Outstanding
Central Maine Power	Approval of Design	Outstanding
Town of Cumberland	Sewer User Permits	Letter dated 1/14/20

WAIVER REQUESTS:

Waiver Request 1 - Road width for access drive from Greely Road to Community Center. Applicant requests a waiver to maintain the existing road width of 14.5 feet. **GRANTED.**

Waiver Request 2 - Show True North on Subdivision Plan. **GRANTED.**

Waiver Request 3 - Street Signs. Applicant requests waiver from requirement to show street signs until reviewed by Town E911 Administrator. **GRANTED.**

Waiver Request 4 - Trees over 10-inch dbh. **GRANTED.**

Waiver Request 5 – To eliminate any sidewalk from end of Station 62+00 to Community Center.

Engineer's Response to Waiver Request #5 – Sidewalk Requirement for Little Acres Drive to Community Center.

The phasing plan provided estimates 158 future residents that may use the Community Center and walks throughout the property. With this level of use and consideration for wintertime conditions on the narrowed 20-foot wide road, SME recommends a formal walk be constructed to the Community Center. The location of the proposed grassed walkway seems appropriate, but we recommend it be constructed of a surface material that allows for winter maintenance.

THE PLANNING BOARD HAS NOT ACTED ON THIS REQUEST Note: The CLCC has expressed opposition to this request (See comments below.)

IV. REVIEW COMMENTS:

DEPARTMENT HEAD REVIEWS:

- **William Longley, CEO:** No comments
- **Police Chief Charles Rumsey:** No comments
- **Fire Chief Small:** With the addition of a fire hydrant on Leonard Lane there are no other concerns.

TOWN PLANNER'S REVIEW (March 12, 2020):

1. Provide refundable entrance fee model information to confirm that there is no ownership of the units by occupants nor HOA requirement. **THIS HAS BEEN PROVIDED BY THE OWNER.**
2. Provide information on signage for both the Tuttle Road and Greely Road entrances. **APPLICANT WILL PROVIDE FOR FINAL APPROVAL.**
3. Photometric plan required for final review. **WILL BE PROVIDED FOR FINAL REVIEW.**
4. Add subdivision notes for final plan submission. **PLAN NOTES WILL REFLECT ALL ISSUES FOR FINAL REVIEW.**
5. Submit a revised letter from PWD indicating the correct number of units being approved. **REVISED LETTER PROVIDED BY PWD.**
6. Submit a revised MDOT Entrance Permit for the total number of units utilizing Tuttle Road. **APPLICANT STATES THAT THE EXISTING ENTRANCE PERMIT COVERS BOTH PHASE 1 AND 2.**

CUMBERLAND LANDS & CONSERVATION COMMISSION –

Lands and Conservation Commission Recreation Trails Subcommittee
Review of Proposed Cumberland Crossing – Phase 2 Site Plan – Addenda 2
July 14, 2020

In reviewing this and other new subdivision proposals, the goal of the Recreational Trails Subcommittee (RTS) is to ensure that adequate trails are created within new developments (including sidewalks), that new trails connect with existing trails on surrounding properties, and that any existing trails currently crossing the proposed subdivision are retained or rerouted.

Cumberland Crossing – Phase 2
SUBDIVISION AND SITE PLAN ADDENDA-2 RESUBMITTAL
(Letter dated June 30, 2020)

Significant Changes from Addenda 1 Submission

D. Sidewalks and Access to Community Center

The developer is now proposing to connect Little Acres Drive to the Community Center with a path composed of a stone-dust surface/gravel base. While the RTS agrees that this proposed path is better than the previously-proposed mowed path, the RTS thinks that a sidewalk extension to the Community Center is in the best interest of the residents and therefore opposes granting the sidewalk waiver.

F. Trail Revisions (as seen in the Trail and Walkway Masterplan)

While the RTS is aware of the proposed trail locations, the trails shown on the Trail and Walkway Masterplan are very difficult to see. For the benefit of those on the Planning Board, the RTS recommends that the developer more clearly show the trails (and trail changes) that they are proposing.

While the developer has indicated that the trail revisions in this latest submission are minor, the RTS finds that these revisions are rather significant in terms of trail connectivity. The developer sites health and safety concerns due to the COVID-19 virus. While the RTS shares health and safety concerns for all residents of Cumberland, the proposed elimination of the connecting trails between the subdivision and surrounding trails seems like an over-reaction to the current health situation. Based on the developers phasing estimates in Attachment 1, the first homes in Phase 2 are not expected to be constructed until 2023. In addition, the subdivision trails and trail connections should be designed to serve residents of the subdivision and the surrounding community for many years in the future. While the RTS does not oppose temporarily closing trails in times of health emergencies, the RTS does not agree that the current health emergency is a good reason to eliminate the connecting trails from the developer’s plans.

F1-a,b.. The developer is proposing a boundary trail running mainly through Val Halla. Due to safety concerns, the RTS does not believe that this trail is a viable option for the golfing season. The RTS still favors a trail running through the northwest side of the property as outlined in its March 5 comments.

F1-c The RTS does not oppose locating the section of trail through the field adjacent to Greely Road to the northwest side of the white fence. However, it is unclear from the latest proposal who would maintain this trail.

F2 Restricting public access to the proposed trail network is a significant reversal from previous discussions and proposals. The developer was aware that connecting trails were a priority in the town of Cumberland and had indicated that the trails would be open to the public. The RTS does not agree with this change and believes that the connecting trails are an important part of the trail network for the residents of Cumberland Crossing and the community. The RTS acknowledges that Oceanview, as a private community, would have the right to close its trails to the public in the future if safety or security problems became a significant issue, or for any other reason. However, the RTS sees no reason to change the Phase 2 trail or trail connectivity plans at this time. In addition, the RTS thinks that the developer can locate and buffer all the trails so that they enhance the values of the properties.

F3-a Based on discussions with the Town Planner, the RTS is no longer requesting that the snowmobile trail be located across the field adjacent to Greely Road.

F3-b The roadway through the Val Halla easement must allow for snowmobile traffic to cross in the winter.

F4-a Given the minimal nature of the trails being proposed, the RTS thinks that it would be more advantageous to have the trails in place early in the construction process rather than after residents have moved in. However, the RTS will defer to the developer's time table.

F4-b As with the other trails in Phase 2, the RTS thinks the trail along the existing tote road should be open to the public, unless access is limited due to an emergency situation.

CUMBERLAND LANDS & CONSERVATION COMMISSION – Previous Review: March 5, 2020

From : Mike Schwindt**,** Chair, Lands and Conservation Commission

Subject: Review of Cumberland Crossing – Phase 2 Plans

Thanks for the opportunity to review and comment on the latest submission for Cumberland Crossing – Phase 2. Included below are the comments and recommendations made by the Recreational Trails Subcommittee of the Lands and Conservation Commission. These were approved by the Commission at their March 4, 2020 meeting.

Lands and Conservation Commission Recreation Trails Subcommittee
Review of Proposed Cumberland Crossing – Phase 2 Site Plan
March 5, 2020

In reviewing this and other new subdivision proposals, the goal of the Recreational Trails Subcommittee (RTS) is to ensure that adequate trails are created within new developments (including sidewalks), that new trails connect with existing trails on surrounding properties, and that any existing trails currently crossing the proposed subdivision are retained or rerouted.

Section 5.6 of the developer's Preliminary Subdivision and Site Plan Application and the Trail and Walkway Master Plan map address the planned sidewalks and trails for the proposed subdivision. The developers have indicated that the subdivision is intended for active seniors. As such, multi-purpose recreational trails for walking, hiking, biking, running, cross country skiing, etc. should be a priority.

1. Existing Trails - The RTS finds that there are currently no existing trails that cross the proposed subdivision.

2. Phasing and Trail/Sidewalk/Walkway Connectivity - Attachment 1 of the Addenda provides estimates of the completion dates for various aspects of the development. Of note, the portion of Little Acres Drive connecting to the Community Center is not expected to be completed until 2026. Attachment 2 of the Addenda indicates that pool construction is estimated to occur in 2020-21 with occupancy in 2021.
Based on these proposed phasing estimates, the RTS finds that there would be no direct way for residents of Cumberland Crossing Phase 1 or 2 to drive, bike, or walk to the Community Center or the pool until 2026. The RTS thinks that the construction of the roads, sidewalks, and trails between Phase 1 and the Community Center should be a priority and should be completed prior to the construction of homes in Phase 2. At a minimum, the RTS would like to see a walking/biking trail developed prior to the construction of homes, and maintained during construction so that residents of the subdivision have the ability to walk or bike to the Community Center and to the pool.

3. Sidewalks - The current site plan shows pedestrian sidewalks along most of the main roads (Little Acres Drive, Monarch Drive, and Leonard Lane). The developers are requesting a waiver (Waiver 5) of the sidewalk requirement for the portion of Little Acres Drive extending from the bridge/stream area to the Community Center.

The RTS agrees that minimizing the impervious area in the development is a priority, however, the RTS thinks that a sidewalk extension to the Community Center is in the best interest of the residents, and therefore opposes granting the waiver. The RTS does not think that the proposed alternative (mowed grass trail) is adequate for all weather and seasons).

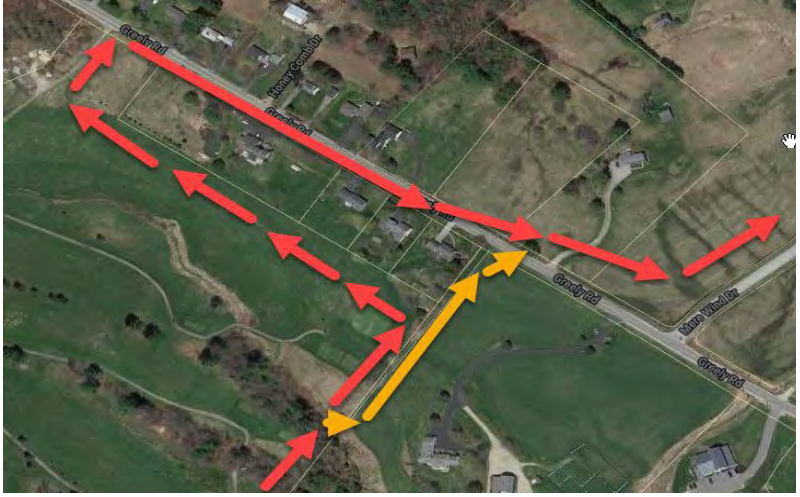
The latest addendum includes a sidewalk along Leonard Lane. Although the RTS does not oppose this sidewalk, it thinks the sidewalk to the Community Center should have a higher priority.

4. Trails and Trail Connectivity within the proposed subdivision - The developer's Trail and Walkway Master Plan shows "3' Hand Cut/Woodland Buffer Trails" within the subdivision and "4' Bark Mulch Access Trail" connections to surrounding properties.

The RTS agrees with the locations of these proposed trails, but finds trail connectivity inadequate for the period of April 1 through December 1 when the Val Halla Golf Course is closed to pedestrians. The RTS would like to see trail connectivity throughout the year. The RTS recommends that a connecting trail be developed through the subdivision from the Crossing Brook property to Greely Road, connecting the two "3' Hand Cut Trails to the Town's trail on Crossing Brook property (on the southwest) and to Greely Road (on the northeast). Per discussions with the developer and Val Halla, a small portion of this connecting trail can run through the Val Halla property where there is minimal danger of pedestrians being hit by golf balls. The RTS recognizes that there would be difficulties constructing the trail across the main stream and wetland on the property and that alternatives may need to be considered.

5. Snowmobile Trails - The proposed subdivision does not currently contain any snowmobile trails. However, the Moonlite Sno-Skimmers Snowmobile Club has asked permission to re-route a snowmobile trail through a small section of the subdivision to improve safety for the snowmobilers in the town. The current snowmobile trail passes along the side of Greely Road for about 800 ft before crossing Greely Road. This creates a dangerous situation because there is no shoulder on Greely Road and snowmobilers must avoid mailboxes and automobile traffic. The Moonlite Sno-Skimmers Snowmobile Club is asking permission that the trail be rerouted along the northwest side of the property adjacent to the white fence. This new route will create a perpendicular crossing with much safer site lines. This snowmobile trail would be active from December to April, although in most seasons, only 6-10 weeks of adequate snow is available for use. The snowmobile club would groom this section of trail, as it does for Val Halla.

The RTS supports this request as the proposed route would be a much safer alternative than the current route. The RTS recommends that this snowmobile trail be added to the subdivision plans.



TOWN ENGINEER'S REVIEW:

July 14, 2020

Ms. Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Subject: Peer Review of Cumberland Crossing – Phase 2

Preliminary Subdivision and Site Plan Application – Addenda-2 Resubmittal
Tuttle Road & Greely Road, Cumberland, Maine

Dear Ms. Nixon:

As requested, Sevee & Maher Engineers, Inc. (SME) has conducted a peer review of the Addena-2 resubmittal for the application for a Major Subdivision and Site Plan for the proposed Cumberland Crossing – Phase 2 senior living community located off Tuttle Road. In addition, the project is required to submit a Shoreland Zoning Application for impacts within a Stream Protection District. The application materials received by SME were prepared by LICHT Environmental Design, LLC (LICHT), and consist of the following:

- Application package with cover letter prepared by Frederic Licht, P.E., L.S.E., dated June 30, 2020;
- Project plan set dated June 15, 2020; and
- Responses to SME memo dated June 30, 2020.

PROJECT DESCRIPTION

The Applicant proposes to develop the 59.6-acre Godsoe farmstead as Phase 2 of the Cumberland Crossing, formerly Oceanview at Cumberland senior living facility. Phase 2 will include an additional 52 senior cottages and associated infrastructure, utilities and stormwater management. This will increase the approved senior cottages to 105 total between Phase 1 and Phase 2.

The parcel is located at 228 Greely Road which will be redeveloped and renovated from the current equestrian farm to a formal community center. The development will be accessed from Phase 1 of the development off Tuttle road by a 3,300-foot extension to Little Acres Drive. Access from Greely Road will be limited to preserve a 500-foot scenic view area. The subdivision will be served with public utilities, including water, sewer, natural gas, electric, telephone, and cable.

This project is being reviewed as a Major Subdivision as outlined in Chapter 250 - Subdivision of Land of the Town of Cumberland Ordinances, most recently amended and adopted on January 12, 2011, and Chapter 229 - Site Plan Review, most recently amended and adopted on March 26, 2012. The comments below relate to the appropriate Ordinance Sections.

Chapter 250: Subdivision of Land

SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.

Section 250-4(N) – Stormwater

1. There are two culvers shown within the 50’ utility easement on Plan Sheet C6C called out to be installed as needed. In reviewing the profile on Plan Sheet C10B, it appears that significant regrading is proposed within the easement, but that it is unnecessary to achieve the required cover for the utilities. For example, there appears to be more than 8’ of cover over the water

line. SME recommends the applicant provide grading details within the utility easement to maintain drainage and avoid the use of culverts in these areas, if possible.

2. Please confirm the methodology utilized to calculate the 100-year flood elevation mentioned in the stormwater report. If calculated using HydroCAD, please describe how it corresponds to the FEMA flood elevation, if at all.
3. Sucatchment 3S appears to have a longer Tc path in post developed conditions than in pre-developed conditions (60.3 min vs 43.8 min). Generally, pre-developed Tc paths are longer or as long in length and duration than post-developed Tc paths. Please clarify.
4. Subcatchment 8 appears to be modelled with the same Tc path in post developed conditions as pre, despite the intersection with the new road. Please update the Tc path.
5. It appears that Subcatchment 31 is modelled with an identical Tc path as Subcatchment 3S in the post developed condition. Given the significant difference in the size of the catchments, this is unlikely.
6. SME understands that the Applicant is under review w

Section 250-29 – Review and approval by other agencies.

7. SME understands the following permit applications have been submitted and are under review:
    - Maine Department of Environmental Protection (ME DEP) Site Location of Development Act (SLODA) permit,
    - ME DEP Natural Resources Protection Act (NRPA) Tier 2 permit for proposed wetland impacts,
    - United States Army Corps of Engineers (USACOE) permit for wetland impacts, proposed stream crossings, and culvert replacements,

Section 250-33 – Utilities

8. SME understands Central Maine Power (CMP) has been contacted and a final design plan for the power and communications will be provided with the Final Plan application.

Section 250-35 – Sewage disposal.

9. Please provide design of the future force main connection from the community center to the proposed force main in Little Acres Drive. It was not clear on Plan Sheet C6A where the force main and grinder pump would be constructed.
10. Please provide engineering design demonstrating that the low-pressure pumps will be able to pump sewage from the Community Center or furthest extents to the Tuttle Road sewer system. SME understands this will be submitted with the final design.

Section 250-45– Waivers and modifications.

Waiver Request 5 – Sidewalk Requirement for Little Acres Drive to Community Center.

The cover letter for Addenda-2 denotes the path will be stone dust with a gravel bases, but it is still labelled on Plan Sheet 6A and 6B as a mowed path.

Chapter 229: Site Plan Review

SME has reviewed the applicable sections of Chapter 229 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 229 requirements.

Section 229-10(H) – Exterior lighting.

11. SME understands that a Photometrics Plan will be provided with the final plan submissio

General Comments

12. Plan Sheet 3B/4B/5B/6B – The sewer line does not appear to be on in the plan drawing.
13. Plan Sheet 6A – There is an existing catch basin off the northwest corner of the barn. Please confirm where this basin outlets and whether there is adequate outlet protection.
14. Plan Sheet 6C – Please provide spot grades at the accessible parking area.
15. Plan Sheet C7 – Please confirm cover over Culvert 5. It appears to be less than 2-feet and will conflict with the proposed gas main. SME understands this will be included in the Final Plan.
16. Plan Sheet C10B – This appears to be mislabeled as the sheet is called out as C10A on the cover.

Previous Peer Review: March 4, 2020

Ms. Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Subject: Peer Review of Cumberland Crossing – Phase 2
Preliminary Subdivision and Site Plan Application – Addenda -1
Tuttle Road & Greely Road, Cumberland, Maine

Dear Ms. Nixon:

As requested, Sevee & Maher Engineers, Inc. (SME) has conducted a peer review of Addena-1 to the preliminary application for a Major Subdivision and Site Plan for the proposed Cumberland Crossing – Phase 2 senior living community located off Tuttle Road. In addition, the project is required to submit a Shoreland Zoning Application for impacts within a Stream Protection District. The application materials received by SME were prepared by LICHT Environmental Design, LLC (LICHT), and consist of the following:

- Application package with cover letter prepared by Frederic Licht, P.E., L.S.E., dated February 25, 2020;
- Project plan set dated February 24, 2020; and
- Addenda-1 to the 12-18-19 Stormwater Management Report dated February 24, 2020.

PROJECT DESCRIPTION

The Applicant proposes to develop the 59.6-acre Godsoe farmstead as Phase 2 of the Cumberland Crossing, formerly Oceanview at Cumberland senior living facility. Phase 2 will include an additional 52 senior cottages and associated infrastructure, utilities and stormwater management. This will increase the approved senior cottages to 105 total between Phase 1 and Phase 2.

The parcel is located at 228 Greely Road which will be redeveloped and renovated from the current equestrian farm to a formal community center. The development will be accessed from Phase 1 of the development off Tuttle road by a 3,300-foot extension to Little Acres Drive. Access from Greely Road will be limited to preserve a 500-foot scenic view area. The subdivision will be served with public utilities, including water, sewer, natural gas, electric, telephone, and cable.

This project is being reviewed as a Major Subdivision as outlined in Chapter 250 - Subdivision of Land of the Town of Cumberland Ordinances, most recently amended and adopted on January 12, 2011, and Chapter 229 - Site Plan Review, most recently amended and adopted on March 26, 2012. The comments below relate to the appropriate Ordinance Sections.

Chapter 250: Subdivision of Land

SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.

Section 250-4(N) – Stormwater

17. Please confirm that the stormwater model was updated with the revisions to the Community Center Impervious area and the adjustments to the FocalPoint system.
18. Please submit a full copy of the revised stormwater management report with the Final Plan for detailed review.

Section 250-29 – Review and approval by other agencies.

19. SME understands the following permit applications have been submitted and are under review:
    - Maine Department of Environmental Protection (ME DEP) Site Location of Development Act (SLODA) permit,
    - ME DEP Natural Resources Protection Act (NRPA) Tier 2 permit for proposed wetland impacts,
    - United States Army Corps of Engineers (USACOE) permit for wetland impacts, proposed stream crossings, and culvert replacements,

Section 250-33 – Utilities

20. SME understands Central Maine Power (CMP) has been contacted and a final design plan for the power and communications will be provided with the Final Plan application.

Section 250-35 – Sewage disposal.

21. Please provide design of the future force main connection from the community center to the proposed force main in Little Acres Drive.
22. Please provide engineering design demonstrating that the low-pressure pumps will be able to pump sewage from the Community Center or furthest extents to the Tuttle Road sewer system. SME understands this will be submitted with the final design.
23. Please confirm that the project will include 5-feet of cover over the sewer mains included in the project. Plan sheets C7 through C10 appear to indicate a cover in the 3-foot to 4-foot range. SME understands this will be updated, or additional info provided with the final design.

Section 250-41 – Soil Erosion

24. SME recommends erosion control devices proposed for the project be labelled on the site plan, including silt fence, check dams, catch basin protection, etc.

Section 250-45– Waivers and modifications.

Waiver Request 5 – Sidewalk Requirement for Little Acres Drive to Community Center.

The phasing plan provided estimates 158 future residents that may use the Community Center and walks throughout the property. With this level of use and consideration for wintertime conditions on the narrowed 20-foot wide road, SME recommends a formal walk be constructed to the Community Center. The location of the proposed grassed walkway seems appropriate, but we recommend it be constructed of a surface material that allows for winter maintenance.

Chapter 229: Site Plan Review

SME has reviewed the applicable sections of Chapter 229 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 229 requirements.

Section 229-10(B) – Traffic, Circulation and Parking.

25. It appears that the Road names on the plans differ from the Cover Letter Comment 2. Plan Refinements.

Section 229-10(H) – Exterior lighting.

26. SME recommends that the Applicant consider a timer for lighting at the Community Center be to turn off at night.
27. SME understands that a Photometrics Plan will be provided with the final plan submission.

General Comments

28. Plan Sheet 3A – The grading on Northwind Farm Road appears to direct flow to a ditch line at the edge of pavement on each side of the road. Will this road be curbed?
29. Plan Sheet 3A – The finished floor on unit 54 appears to be listed as 105.7, but the elevation around the building is approximately 85.
30. Plan Sheet 4A – Appears that a stone wall behind Unit 84 is not labeled and extends into the 100-foot stream buffer.
31. Plan Sheet 4A – Is retaining wall behind Unit 74 required? It appears that the 3:1 slope is suitable.
32. Plan Sheet 4A – Please add existing contours to plan sheet.
33. Plan Sheet 6A – CB51 is labelled as SD51.
34. Plan Sheet 6A – The grading on Northwind Farm Road appears to direct flow to a ditch line at the edge of pavement on each side of the road. Will this road be curbed?
35. Plan Sheet 6C – Please provide more information on the proposed improvements at the Community Center, including:
    a. Spot grades and drainage within the existing and proposed paved areas, including at the accessible parking area.
36. Plan Sheet C7 – Please confirm cover over Culvert 5. It appears to be less than 2-feet and will conflict with the proposed gas main.
37. Plan Sheet C7 – It appears that SD1 will conflict with the sewer force main.
38. Plan Sheet C9 – It appears that CB15 may not be at the low point in the road for drainage purposes. Please consider moving it to STA 22+77 to be at the low point.
39. Plan Sheet C10B – The utility lines do not show up on the profile.
40. Plan Sheet C20 – The following storm drains are listed with zero or negative slopes; SD9, SD13, and SD26. Please revise to provide positive drainage.
41. Plan Sheet C20 – The storm drain structure table appears to be missing CB 22 and CB 44.

42. Plan Sheet C27 – It appears the labels have shifted and need to be adjusted.
43. Subdivision Plat S1-3 – Additional information to the drawings prior to final approval, including stream locations and setbacks and stormwater and utility easements, if required. SME understands a final plan will be provided with the information.
44. Please provide additional information on construction of stone bermed level spreaders in the plan set, including grading, pipe outlet, and berm construction. SME understands that
45. Please provide a detail for the gravel parking lot at the Community Center.

Please call me with any questions, or if you would like, I could meet with you to discuss our comments.

Sincerely,
SEVEE & MAHER ENGINEERS, INC.
Daniel P. Diffin, P.E.
Vice President/Civil Engineer

Applicant's Engineer's Response to Town Engineer's Comments

We have been through the March 4th review memo for CC Phase 2 from Dan Diffin and will plan on forwarding to Dan the minor engineering comments addressed on specific plan sheets with a response memo on Friday the 13th. Most items are pretty minor. We have no real issues other than Waiver Request 5 – replacing sidewalk in the road across the fields with a meandering walking path. We agree that this can be upgraded from a mowed path to a stonedust trail but will still pursue the Waiver with the Board for the reasons noted in the application.

V. SUBDIVISION REVIEW:

PROPOSED FINDINGS OF FACT - Chapter 250 - Subdivision of Land

The purpose of these standards shall be to assure the comfort, convenience, safety, health and welfare of the people, to protect the environment and to promote the development of an economically sound and stable community. To this end, in approving subdivisions within the Town of Cumberland, Maine, the Board shall consider the following criteria and before granting approval shall determine that the proposed subdivision:

1. <u>Pollution</u>. The proposed subdivision will not result in undue water or air pollution. In making this determination, it shall at least consider:
   - A. The elevation of the land above sea level and its relation to the flood plains;
   - B. The nature of soils and subsoil and their ability to adequately support waste disposal;
   - C. The slope of the land and its effect on effluents;
   - D. The availability of streams for disposal of effluents; and
   - E. The applicable state and local health and water resource rules and regulations;

The parcel is above sea level. There is a Zone A area indicating likely flooding but the applicant is filing an appeal to FEMA for a redesignation of this area. The area where the homes are located in not in this Zone A area. The project will use public water and sewer. A groundwater impact assessment was provided by the applicant and reviewed and approved by the Town Engineer.

Based on the information provided, the standards of this section have been met for preliminary approval.

2. Sufficient Water. The proposed subdivision has sufficient water available for the reasonable foreseeable needs of the subdivision;

The subdivision will be served by public water. There is a letter on file, dated July 31, 2018 from the Portland Water District stating the District's ability to serve the proposed project consisting of "50-100 housing units". An updated letter from PWD is required for final review and should be based on the final water supply design.

Based on the information provided, the standards of this section have been met for preliminary approval.

3. Municipal Water Supply. The proposed subdivision will not cause an unreasonable burden on an existing water supply, if one is to be used;

The subdivision will utilize public water. There is a letter on file, dated July 31, 2018, from the Portland Water District stating the District's ability to serve the proposed project. An updated letter from PWD is required for final review and should be based on the final water supply design.

Based on the information provided, the standards of this section have been met for preliminary approval.

4. Erosion. The proposed subdivision will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition *results;*

The applicant has submitted an erosion and sedimentation control plan that is consistent with the current Maine Erosion and Sediment Control Best Management Practices. The Town Engineer has reviewed and approved the Erosion and sedimentation control plan.

Based on the information provided, the standards of this section have been met.

5. Traffic. The proposed subdivision will not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed;

A traffic study was performed by Maine Traffic Resources. An MDOT Entrance permit was issued for Phase 1 and for "an anticipated 40-50 units in Phase 2. Staff has requested an updated MDOT permit be provided for final review which reflects the actual number of units in both phases and that also addresses the additional entrance from Greely Road.

Based on the information provided, the standards of this section have been met for preliminary approval.

6. Sewage disposal. The proposed subdivision will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services, if they are utilized

   The project will utilize public sewer. There is a letter from the PWD stating there is sufficient capacity to serve the additional units to be built in Phase 2. There is a letter dated 1/14/20 from Town Manager Bill Shane stating that the Town agrees to accept the sewer design flow from the project. A charge of $500 for each of the units will be charged to the applicant.

   Based on the information provided, the standards of this section have been met.

7. Municipal solid waste disposal. The proposed subdivision will not cause an unreasonable burden on the municipality's ability to dispose of solid waste, if municipal services are to be utilized;

   Cumberland provides curbside trash collection and recycling through a contracted waste hauler. Based on a conversation with the Director of Public Services, the addition of 52 new homes in Phase 2 will not cause a burden on the municipality's ability to dispose of solid waste.

   Based on the information provided, the standards of this section have been met.

8. Aesthetic, cultural and natural values. The proposed subdivision will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat identified by the Department of inland Fisheries and Wildlife or the municipality, or rare and irreplaceable natural areas or any public rights for physical or visual access to the shoreline;

   Letters are on file from the relevant state agencies stating that the subdivision will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat or rare and irreplaceable natural areas.

   Based on the information provided, the standards of this section have been met.

9. Conformity with local ordinances and plans. The proposed subdivision conforms to a duly adopted subdivision regulation or ordinance, comprehensive plan, development plan or land use plan, if any. In making this determination, the municipal reviewing authority may interpret these ordinances and plans;

   The plans have been reviewed and approved by the town planner, the town engineer and town department heads. There are minor plan changes that are required for final review.

   Based on the information provided, the standards of this section have been met for preliminary approval.

10. Financial and technical capacity. The subdivider has adequate financial and technical capacity to meet the standards of this section;

    Technical capacity is evidenced by the use of the following experts: a professional engineer, a licensed land surveyor, a traffic engineer, an architect and a licensed soils scientist.

    Financial capacity is evidenced by a letter dated 10/14/19 from Kennebunk Savings stating that bank has approved financing of the infrastructure for the project and that

Oceanview at Cumberland has the financial capacity to complete the land development and construction project as proposed.

Based on the information provided, the standards of this section have been met.

11. Surface waters; outstanding river segments. Whenever situated entirely or partially within the watershed of any pond or lake or within 250 feet of any wetland, great pond or river as defined in Title 38 chapter 3, subchapter I, article 2-B, the proposed subdivision will not adversely affect the quality of that body of water or unreasonably affect the shoreline of the body of water;

    The proposed subdivision will not adversely affect the quality of the mapped wetlands or unreasonably affect the shoreline of the stream on the parcel. Plans include a MEDEP 75' stream setback to protect the resource.

    Based on the information provided, the standards of this section have been met.

12. Ground water. The proposed subdivision will not alone, or in conjunction with, existing activities, adversely affect the quality or quantity of ground water;

    The project will be served by public sewer. Infiltration of stormwater is limited to the installation of BMP's along the access road which meet all DEP standards for treatment of stormwater prior to discharge of groundwater.

    Based on the information provided, the standards of this section have been met.

13. Flood areas. Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant whether the subdivision is in a flood-prone area. If the subdivision, or any part of it, is in such an area, the subdivider shall determine the 100-year flood elevation and flood hazard boundaries within the subdivision. The proposed subdivision plan must include a condition of plan approval requiring that principal structures in the subdivision will be constructed with their lowest floor, including the basement, at least one foot above the 100-year flood elevation;

    The parcel is shown on FEMA floodplain maps as being in Zone C (area of minimal flooding) and Zone A. A letter of map amendment is being proposed to FEMA to adjust Zone A.

    Based on the information provided, the standards of this section have been met for preliminary approval

14. Storm water. The proposed subdivision will provide for adequate storm water management;

    A stormwater management plan was submitted as part of the application packet and has been reviewed and approved by the Town Engineer for conformance with Chapter 250-38 of the Cumberland Subdivision Ordinance.

    Based on the information provided, the standards of this section have been met.

15. Freshwater wetlands. All potential freshwater wetlands, as defined in 30-A M.R.S.A. §4401 (2-A), within the proposed subdivision have been identified on any maps submitted as part of the application, regardless of the size of these wetlands. Any mapping of freshwater wetlands may be done with the help of the local soil and water conservation district.

All wetlands within the proposed subdivision have been delineated and mapped by Mark Hampton Associate, Inc. and shown on the project plans. The applicant has submitted plans to MDEP and Army Corp and is awaiting approval.

Based on the information provided, the standards of this section have been met for preliminary approval.

16. River, stream or brook... Any river, stream, or brook within or abutting the proposed subdivision has been identified on any map submitted as a part of the application. For purposes of this section, "river, stream or brook" has the same meaning as in Title 38, Section 480-B, Subsection 9. [Amended; Effective. 11/27/89]

    There is a stream on the property which is depicted on the plans.

    Based on the information provided, the standards of this section have been met.

PROPOSED CONDITIONS OF PRELIMINARY APPROVAL

1. That all outstanding items listed in this review be provided for final review along with all outside agency letters of approval.

LICHT
ENVIRONMENTAL DESIGN, LLC

February 25, 2020 (Via Delivery & Email) 16.084.A

Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Cumberland Crossing – Phase 2,
228 Greely Road, Cumberland
SUBDIVISION AND SITE PLAN ADDENDA-1 RESUBMITTAL
(Map R04 Parcel 34A)

Dear Carla:

On behalf of OceanView at Cumberland, LLC, we are pleased to present for Planning Board review this **Addenda-1** submittal to address Planning Board, staff and engineering peer review comments from our initial submittal dated December 31, 2019 and the Planning Board hearing of January 21, 2020.

This submittal includes 2 hard copies and an electronic copy of the following information:

A. Cover Letter
    Exhibit 1 – Community Center Septic and Parking Submittal to Bill Longley dated 02-24-20
    Exhibit 2 - Revised Stormwater Report Addenda-1
    Exhibit 3 – Summit Geoengineering Boring Logs
    Exhibit 4 – Architectural Elevations – Cottage A and B
    Exhibit 5 - Responses to Sevee & Maher review letter dated January 13, 2020
B. Subdivision/Site Plans entitled "Cumberland Crossing – Phase 2, Tuttle and Greely Roads, Cumberland Maine" prepared by Belanger Engineering and Titcomb Associates, Surveyors, revised 02-24-20.

Comments received and addressed include:

1. Planning Board & Public comments January 21, 2020
2. Staff Memo dated January 14, 2020
3. Sevee and Maher peer review letter dated January 13, 2020
4. Fire Chief Small & Police Chief Rumsey emails dated January 20, 2020 (no responses required)
5. Meetings with abutters

I. PLANNING BOARD & PUBLIC COMMENTS & PLAN UPDATES:

1. Sidewalks:

Sidewalks were discussed at the January meeting and areas where esplanades are provided and those where due to site constraints, wetlands, etc. the sidewalks are directly behind the curb. The SHC Ordinance (§315-28.4) Section I Road Standards references the residential subcollector road standards (Article VI) and Table 2, Chapter 250 Subdivision of Land and furthermore provides specific standards to be used in the SHC Overlay District.

a. C. 250-37 G. states that "Walkways shall be provided along all roads within a proposed subdivision." However the SHC Ordinance, Section I provides superseding standards that "*Paved sidewalk (applies only to primary access roads connecting from Tuttle Road"* with a standard of " *5 feet (one side only)"* with no standard for an esplanade or not.
b. Table 2 (Geometric Design Standards) for residential access roads > 50 vpd indicates sidewalk width is "TBD by project" with no reference to esplanades. Attachment 1.4 Section graphic shows no sidewalks at all.

The project proposes 5 foot paved sidewalks and esplanades as follows:

- Little Acres Drive Sta. 39+43 (End Phase 1) to Station 57+50+/- (1,807 lf) with esplanade.
- Little Acres Drive Sta 57+50 to 62+00 (450 lf) with no esplanade due to culvert crossing.
- Monarch Drive (loop road) Sta. 20+00 to end Sta 30+60+/- with esplanade.
- Leonard Lane (culdesac) Sta. 0+15 to culdesac Sta. 7+15+/- (700 lf) no esplanade due to wetland crossing and tight unit windows to rear buffer. A crosswalk has been added at the intersection of Little Acres Drive and Leonard Lane.

Areas not proposing sidewalks:

- The 6 small side roads which act as small private roads or drives, which consistent with a *Complete Streets* strategy, allow for pedestrian sharing of these minor 18 foot roads serving from 2 to 7 units, similar to Phase 1.
- The extension of Little Acres Drive from Sta. 62+00 at the lower edge of the farm fields to the Community Center, Sta. 73+63 at the Community Center Drive (1,163 lf). This section of roadway is mostly 20 feet wide, has no curb and is intended to act as a park-like roadway with minimal traffic. Alternatively, a mowed pathway will provide a pedestrian access across the fields to the barns and Community Center (See Plans C6A). A sidewalk would only increase impervious area in our opinion and interrupt the quiet character of this low level of traffic roadway.
  - **An additional sidewalk waiver is being requested in Section II below for this section of Little Acres Drive.**

Walking path and existing wood bridge at stream:

- Additional grading refinements for the path which diverges from the Little Acres Drive sidewalk to cross the existing bridge have been added with maximum grades of 10-12.5% by flattening the road fill slopes. (Refer to Plan C5B).

2. **Plan Refinements:**

Several minor improvements were made on the small side streets to reduce pavement width.

a. Unit 59 driveway was shortened
b. Unit 68 Firefly Lane was shifted to the end of the lane shortening the lane.
c. Units 74 & 75 Grasshopper Lane were rotated and the drive shortened.
d. Cicada Way was shifted to minimize wetland impacts and Unit 82 rotated to shorten the road.
e. Unit 80 was shifted to eliminate grading in the 50 foot perimeter buffer.
f. A mowed pedestrian path has been added from Station 62+00 Little Acres Drive extension across and up the open fields to the barns and Community Center area.

g. Additional detail and minor changes have been added at the stream culvert and focal point stormwater system to increase setbacks to the stream and adjust grading. The culvert has been widened to 15 feet per Corps of Engineers recommendations.
h. Tree lines have been corrected in several locations.

3. Community Center Area: (Site Plan Sheet C6A):

Additional detail and labeling has been added to Plan Sheet C6A and minor several key improvements made:

a. The overflow gravel parking lot has been shifted from south of the barn to behind the barn inside the fenced paddock area with an 18 foot gravel access drive and 24 foot parking aisle. Twenty four (24) spaces are provided in this lot, combining with the 10 spaces around the Community Center totals 34 spaces. The paddock fencing will remain creating a unique parking area blending in with the farmstead and completely blocked from the view of the abutters. Two light fixtures are proposed at the gravel parking area.
b. The plan indicates existing gravel areas to remain along with new gravel parking and paved parking and access.
c. The 18 foot "structural grass" and paved section of Little Acres Drive within the 500 foot preservation area has been added as presented at the January meeting.
d. Site Data and Parking tables have been added.
e. Notes regarding phased use of the existing wastewater system and a general phasing timeline have been added.
f. We have widened and paved the south barn doors gravel access and created 25 foot radii to provide a 30 by 50 foot apron to the barn gravel utility area and doubling as a fire vehicle turnaround as requested by Chief Small.

Additionally the development team met with Bill Longley, CEO and Carla Nixon, Planner to review the approach to the improvements at the former Godsoe residence to create a new Community Center. The applicant has engaged an architect, Gawron-Turgeon Associates, to evaluate life safety and building code requirements for the proposed use(s) to be presented to the CEO for review relative to internal and site ADA required improvements for use as a Community Center. That process is ongoing.

Secondly we have prepared for an estimated analysis for the Phase 1 & 2 build out with phasing of utilities and improvements at the Community Center including specifically temporary use of the existing subsurface wastewater disposal system (until sewer is extended), water service and a parking code analysis. This has been presented to the CEO for review under separate cover and a copy included herein for Planning Board review as *Exhibit 1*.

4. Buffering to Map R04 Lot 34 (Cumberland Animal Clinic and Netland Lot):

The applicant's design team has had several meetings with Thomas Netland, abutter to the northeast to review landscaping and buffering (and stormwater). In addition to moving the Community Center parking to behind the barn, a specific planting plan has been prepared by J. David Haynes, RLA and reviewed with Mr. Netland. The plan includes clusters of plantings just south of the barns on the east side of the new Little Acres Drive and additional shrubs or trees lining the easterly property line. Refer to the revised Landscaping Plans, Sheets C11A and 11B.

5. **Trails:**

The design team has met with John Jensenius (Chair, Recreational Trails Subcommittee) to review the trail master plan (Plan Sheet C12) and assess options for best locations of connectors and linkages. We are continuing to work on a main connector trail from the Val Halla Golf 5th tee to Greely Road along the common boundary of the project and Val Halla and will be conducting another site walk with Mr. Jensenius and Toby Young on February 26th . We will continue to work with the Trails Subcommittee to update and refine the trails master plan to present at the March Planning Board meeting.

   a. The applicant has agreed to a mowed path marked in the fields adjacent to the northwestern fence to access Greely Road.
   b. No snowmobile use will be permitted.

6. **Stormwater and Stream Culvert:**

In response to comments from the U.S. Army Corps of Engineers, the stream culvert width has been increased from 10 to 15 feet using a double culvert. Final shop drawings will be provided for construction by Summit Geoengineering. The change has an insignificant impact on stormwater calculations with no increases in the post development flows over pre-development flows. Refer to *Exhibit 2* for updated stormwater data and tables.

In response to a peer review comment, the Post Development subwatersheds 3S and 38S were adjusted for woods area which were inadvertently not included when lawn areas were reduced in the original stormwater report. The pre and post development areas for the entire stream watershed now total 1163.98 acres. Refer to *Exhibit 2 Stormwater Management Report Addenda-1* and separately bound hydrologic data.

7. **Existing Godsoe Drive Geotechnical Data:**

Summit Geoengineering performed six borings onsite in June, 2019 to evaluate subbase gravels in the existing Godsoe driveway and farm access and at the stream culvert crossing. That data was omitted from the December, 2019 submittal Section 6, Soils and is provided as *Exhibit 3*, attached. The testing indicated satisfactory depths and grain size analysis for the base/subbase gravels in the existing drive for re-use under the proposed new grind and surface paving for the driveway.

8. **Generator Noise:**

A request was made by the Town Manager at the January 21 Planning Board meeting to provide some data on individual cottage generator noise – assuming they were all running during a power outage. Site Plan Standards Section 229-9. J. - Noise has a standard to not create a nuisance for neighboring properties. While we do not believe this standard applies to emergency conditions, our electricians, Mancini Electric have consulted with Kohler® generators regarding sound levels and we can provide the following:

a. Each cottage unit will have a Kohler® Model 8RESV, 8 KW generator located behind the garage typically. Per the manufacturer, 8 point logarithmic average sound levels are 66 dB(A) during weekly engine exercise and 72 dB during full-speed generator diagnostics and normal operation measured at 7 meters or around 23 feet away. As a comparison a gas powered mower is around 80-85 dB[1].

b. Although we are not sound engineers, the cumulative impact of multiple generators operating simultaneously is not a liner addition of decibels. Factors affecting sound generation include intensity, where the sound is measured from and distance away from the source, opaque objects such as a unit blocking or mitigating sound in a particular direction, vegetation and topography.

c. Antedoctedly, we provide the following generalizations to demonstrate that the likely offsite noise would be negligible with the caveat that this is not a scientific assessment:
   1. The generators are state of the art and supplied by natural gas. They are not the noisy portable gas powered generators which reverberate through neighborhoods during extended power outages.
   2. Generators are located behind the units.
   3. Testing can be done in small groups at different times to minimize impact to residents in a neighborhood, although most units would be operating in an extended power outage.
   4. The closest adjacent uses which could be affected in Phase 2 are:
      a. Golfers at Val Halla Golf course (closest general green, tee or cart path over 80 feet from any cottage unit - separated by woods. (How many golfers will be out in a storm?)
      b. Adjacent residences northwest of the Godsoe farmhouse along Greely Road –over 930 feet to the closest cottage unit.
      c. Cumberland Animal Clinic and adjacent residence on Greely Road –over 1000 feet to the closest cottage unit.
      d. Over 480 feet from the closest residences at Cumberland Crossing through an entirely wooded buffer to the closest cottage unit. (It is likely that some of the residences at Cumberland Crossing may have noisy gas powered generators cancelling out any potential noise from Cumberland Crossing.)
      e. The community center has had and will continue to use a generator located near the barns. This is not a new installation.

II. ADDITIONAL WAIVER REQUESTS

WAIVER REQUEST 5: Sidewalk Waiver Station 62+00 to 73+63 Little Acres Drive;

As noted in Section I.1 above we are requesting a waiver from the SHC Ordinance, § 315-28. I. (2) – Paved sidewalk on primary access road connecting from Tuttle Road - for Stations 62+00 to 73+63 along the Little Acres Drive Extension connecting to the existing Godsoe driveway. This request is based on the following.

d. This section of road is expected to see minimal traffic and is designed to be a simple park style 20 foot paved road with one section of 18 feet, allowing for pedestrians to

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[1] Ref. Centers for Disease Control and Prevention (CDC) Website

safely walk or bicycle on the road. Multi-use of a low volume road such as the Little Acres Drive Extension is in keeping with *Complete Streets* philosophies to "share the road".

e. The road is in an open field providing a pastoral feel and adding a sidewalk would only increase impervious area.

f. A mowed path across the beautiful fields will be provided as an alternative to access the barns and Community Center areas.

For the reasons stated, we respectfully request approval of the sidewalk waiver.

III. PLANNER'S COMMENTS JAN 14TH, 2020 MEMO: *(responses in italics)*

1. Discrepancy between acreage reported: *The parcel size is 59.59 acres plus the 0.72 acres for the golf easement. The wetland report dated 10-02-17 and vernal pool report dated 05-27-19 prepared by Hampton Associates references a 40 acre Godsoe parcel. The acreages in the reports are incorrect and are administrative in nature. Refer to the Subdivision application acreage above. There is no impact on wetland calculations.*

2. The 09-12-17 MDIF&W Letter references Catalpa Lane. *The letter apparently copied the heading from the Phase 1 review referencing Catalpa Lane, but is indeed a response from an August 16, 2017 request by LED regarding the 60+/- acre Godsoe Phase 2 property. Refer to the area polygon/map, page 4 of that response letter which clearly indicates the Godsoe parcel.*

3. Deed/RTI Clarification: *This has been addressed with a submittal from Scott Anderson, Esq. in January.*

4. Draft HOA documents and Draft Deed: *OceanView at Cumberland LLC (OV) will provide under separate cover a description of the nationally recognized "refundable entrance fee" model for operations of Cumberland Crossing, There is no formal HOA. OV maintains ownership of the property and units and is responsible for all site maintenance and operations, taxes, security, etc. A summary of their operations can be provided by OV if needed to help clarify this management and ownership structure.*

5. Total Wetlands Disturbance: *Total Phase 2 wetland impacts are 14,476 s.f. under a Tier 2 DEP-NRPA Application and 3,040 s.f. associated with the Permit by Rule application for the culvert-stream crossing for a total Phase 2 impacts of 17, 516 s.f. (Refer to NRPA Application on file, dated 01-14-20.*

6. Floodplain Map/#: *Refer to Exhibit 12 of January application. FIRM Map # 23005C0536F.*

7. Street Sign at Greely Road Entrance*: Street names and signs are being reviewed with the Assessor currently. We would expect that a private way sign would be required. This can be added to the final plans.*

8. Entrance Signs at both Entrances (Tuttle and Greely Roads.): Only minimal signage is proposed at the Tuttle Road entrance. Signage has not been determined for the Greely Road entrance and will be reviewed by the applicant.

9. Information on Trails & Conservation Commission review letter needed:
    a. Trails – *the applicant's team is working currently with the Trails Subcommittee and others to finalize the trails system and will update the Board at the March Planning Board Meeting.*
    b. Conservation Commission Review letter*: We will await a response from the Conservation Commission.*

10. Road Names: *Names have been submitted to the Assessor's and Planning Offices for review and approved names added to the Subdivision Plats and Engineering Plans. All roads will remain private.*

11. Dumpster at the Community Center: *Without a full commercial kitchen, the applicant is proposing to use "rollaway" bins for waste and recycling and store in the garage.*

12. Photometric Plan: *As with Phase 1 there are a minimal number of LED light fixtures proposed. This is consistent with residents' desire for soft lighting and respect for dark sky policies. A photometric plan is being prepared by Mancini Electric for submittal with the Final Plans or can be supplied to staff under separate cover. Lighting cuts are provided in the January submittal, Exhibit 9 and are the same LED-Cutoff Beacon® models as installed in Phase 1A.*

13. Note on Status of internal roads*: Refer to the Subdivision Plat, General Notes, Note 6 – all roads to remain private.*

14. Standard Conditions of Approval Note: *Subdivision Plat General Note 10 refers to the requirement for recording within 90 days of approval. Please provide any additional notations regarding the Conditions of Approval. We recommend the additional note be added at Final plan review.*

15. Are speed tables proposed? *Not at this time. However the applicant would reserve the right to install speed tables should there be a need for traffic control.*

16. Building Elevations: *Unit photographs have been supplied in the December application report. Refer to Exhibit 5 for architectural elevations of both cottage A and B models.*

17. Additional Waivers*: Waivers 1-4 were approved at the January meeting. Refer to the above Section II for an additional Waiver 5 for the sidewalk along the open field portion of Little Acres Drive Extension.*

IV. SEVEE & MAHER REVIEW COMMENTS

Refer to *Exhibit 5* for a response memo to the January 13th Sevee & Maher review letter.

V. SUMMARY:

We believe we have addressed all comments and with requested additional waivers believe the project can be found to be complete for review by the Planning Board under the Preliminary Subdivision, Site Plan and Shoreland Zoning approval standards.

We look forward to meeting with the Planning Board at the March 17th Planning Board meeting to review the plan updates in further detail. In the meantime should you have any comments or questions please do not hesitate to contact me.

Sincerely,

Frederic (Rick) Licht, PE, LSE
Principal

Encl: As Noted

Cc: Chris Wasileski; OceanView at Cumberland LLC
Christian Haynes; OceanView at Cumberland LLC
David Haynes; SeaCoast Management Company
Scott Anderson; Verrill Dana LLP
Chris Belanger; Belanger Engineering
Rex Croteau; Titcomb Associates
Rebecca Dillon: Gawron-Turgeon Associates

Exhibit 1

COMMUNITY CENTER SEPTIC & PARKING
SUBMITTAL TO CEO 02-24-20

LICHT
ENVIRONMENTAL DESIGN, LLC

February 24, 2020 (Via Email) JN 16.084.A

William Longley, Codes Enforcement Officer
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Cumberland Crossing – Phase 2
228 Greely Road, Cumberland
Community Center Wastewater System and Parking Analysis
(Map R04 Parcel 34A)

Dear Bill:

We are following up with you and Planning staff to provide background information to support the conversion of the former Godsoe residence located at 228 Greely Road into the Cumberland Crossing Community Center facility. The two areas we discussed which we would appreciate your input on are:

1. Temporary use of the subsurface wastewater disposal system until sewer can be installed.
2. Analysis of parking requirements.

We have attached the following documents relating to the Community Center:

Attachment 1: Phase 1 & 2 Phasing and Occupancy Estimates Table
Attachment 2: Estimated Wastewater Flow Projections
Attachment 3: Maine Subsurface Wastewater Code Table 4 Flows
Attachment 4: Parking Tables
Attachment 5: Community Center Site Plan - Sheet C6A revised 02-24-20.

I. BACKGROUND & PHASING;

As you are aware from our meeting last week, pending approvals for Phase 2 of the project, the developers anticipate getting a jump start on the Godsoe farmhouse conversion to a Community Center using a phased approach to support residents as the population of the community increases over an expected 5-6 year timeline pending market conditions. This will require phasing of some of the supporting infrastructure for the Community Center commensurate with the progress of the overall project Phases 1-2 infrastructure development. Key to phasing is the projected build out/occupancy of Phase 1 followed by Phase 2 units.

Attachment 1 – Phasing and Occupancy Estimates provides a rough estimate of an expected build out of Phase 1 and 2 of the project to use as a baseline for influences on wastewater generation, parking needs, etc.

Following are the three key areas related to a phased approach to renovations to the former Godsoe farmhouse for use as a Community Center for Planning staff and your review:

1. **Wastewater and Sewer:** Following anticipated approvals in the year 2020, construct the outdoor pool and supporting locker room & ADA improvements in the Community Center and utilize the existing wastewater disposal system for several years until sewer is extended through Phase 2 to the farmstead. The current circa 1984 stone bed subsurface wastewater disposal system has a design capacity of 303 gallons and has been inspected and found to be in good condition[1]. (The septic tank and d-box will be replaced and the tank/piping relocated when the pool/patio is constructed.)

   Attachment 2 –Community Center Estimated Wastewater Flow Projections provides an analysis of projected occupancy rates of units for Phases 1-2 along a 3-4 year timeline until the low pressure sewer can be connected. *Attachment 3* provides design flow guidelines from the Maine Subsurface Wastewater Disposal Rules (10-144 Chapt. 241). Based on estimated occupancy and build out rates, we have correlated the projected water usage for the next 3+/- years to demonstrate that the current system has sufficient capacity to support a phased operation of the community center.

   We welcome your thoughts on our assessment and understand that the phased improvements and increased usage of the Community Center over the next few years are directly tied to wastewater capacity. We would also recommend monitoring actual water usage to compare with projected usage rates.

2. **Water Service:** The residence and barns are currently serviced by a drilled well. A new public water service from Greely Road will be extended in 2020-21 to service the facilities and provide for life safety requirements and the well converted for irrigation purposes and possibly farm animal drinking water. Completion of Phase 2 infrastructure will include a 12-inch water main extension to Greely Road to add fire protection mains and a hydrant or services to the farm/community center as needed, (estimated 2024+/-).

3. **Parking:** The draft Site Plan provides for additional parking at the Community Center which would be expected to be phased in as the resident population and use of the facility increases. We have referenced Zoning Chapter 315-57 Parking and Loading standards to come up with a best approximation of parking requirements. (Refer to *Attachment 4 –Parking Tables.)* Parking includes 5 paved and 5 gravel primary spaces and an expansion gravel lot of 24 spaces for a total of 34 parking spaces.

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[1] Reference Advanced Leachfields LLC inspection Report, 228 Greely Road, dated June 23, 2017.

We will include this submittal with our February 25th Subdivision/Site Plan re-submittal to the Planning Department for review by Planning staff as well and look forward to your comments or concurrence on our assessments.

Sincerely,

Frederic (Rick) Licht, PE, LSE
Principal

Encl: As Noted

Cc: Carla Nixon; Town of Cumberland Planner
Chris Wasileski; OceanView at Cumberland LLC
Christian Haynes; OceanView at Cumberland LLC
David Haynes; SeaCoast Management Company
Scott Anderson; Verrill Dana LLP
Chris Belanger; Belanger Engineering

ATTACHMENT 1

CUMBERLAND CROSSING PHASE 1 & 2 PHASING ESTIMATES

						DATE/REV:	02-20-2020
OCCUPANCY (UNITS)						INFRASTRUCTURE DEVELOPMENT	
YEAR	PHASE 1A (23 UNITS)	PHASE 1B (30 UNITS)	PHASE 2 (53 UNITS)	TOTAL UNITS	ESTIMATED RESIDENTS (3.)	PHASE 1B	PHASE 2
2020	15	0	0	15	23	MALLARD/LAD 75% COMPLETE	POOL, DECK, ADA AND LOCKER ROOM FIT UP
							NEW 2 INCH WATER SERVICE
							RELOCATE/ REPLACE SEPTIC TANK
							USE WASTEWATER LEACHFIELD
2021	20	10	0	30	45	MALLARD/LAD 100% COMPLETE	ADD 10 PARKING SPACES AT CC
							USE WASTEWATER LEACHFIELD
							TRAILS 30%
2022	23	22	0	45	68	COMPLETED	COM. CENTER GRAVEL PARKING (24 SPACES)
							START PHASE 2 INFRASTRUCTURE LAD
							PHASE 2 INFRASTRUCTURE 25% COMPLETE
							TEMP .GRAVEL CONSTR. ROAD FARM TO CULVERT (5.)
							INSTALL CULVERT #3 FOR CONSTR. ACCESS
							BEGIN INSTALLATION OF BUFFER L/S TO NETLAND (6.)
							TRAILS 60%
2023	23	30	7	60	90	COMPLETED	PHASE 2 INFRASTRUCTURE 50%
							INSTALL ELECTRIC FROM GREELY ROAD?
							TRAILS 100%
2024	23	30	22	75	113	COMPLETED	PHASE 2 INFRASTRUCTURE 75%
							CULDESAC ROAD COMPLETED.
							INSTALL LOW PERSSURE SEWER TO COM. CENTER
2025	23	30	37	90	135	COMPLETED	PHASE 2 INFRASTRUCTURE 100%
2026	23	30	52	105	158	COMPLETED	LAD PAVED CONNECTION TO GODSOE DRIVE
							ELIMINATE CONSTRUCTION ACCESS DRIVE

NOTES:

1. LITTLE ACRES DRIVE = LAD
2. **OCCUPANCY/UNIT CONSTRUCTION & TIMELINE ESTIMATED ONLY. DETERMINED BY MARKET CONDITIONS AND MAY VARY. USE FOR PLANNING PURPOSES ONLY.**
3. RESIDENT COUNTS BASED ON 1.5 RESIDENT /UNIT AVERAGE.
4. INTERNAL RENOVATIONS TO COMMUNITY CENTER OR BARNS NOT INCLUDED
5. NOTE - PROJECT O GRIND AND REPAVE GODSOE DRIVE FROM GREELY ROAD. TIMING TO BE DETERMINED BASED ON CONSTRUCTXION ROUTE ACCESS AS PROJECT DEVELOPS.
6. LANDSCAPE BUFFER PLANTS TO NETLAND PROPERTY TO BE PHASED IN AS CONSTRUCTION ACCESS ROAD ACROSS FIELD IS DEVELOPED AND FINAL ROAD IS CONSTRUCTED.
7. TOTAL PHASE 1 + 2 = 105 UNITS + COMMUNITY CENTER

ATTACHMENT 2

CUMBERLAND CROSSING PH 2 COMMUNITY CENTER ATTACHMENT 2

ESTIMATED WASTEWATER FLOW PROJECTIONS

Licht Environmental Design, LLC

DATE/REV: 02-19-2020

PROJECT DESCRIPTION: 105 SENIOR COTTAGES AND COMMUNITY CENTER

ASSUME 2020-2026 BUILD OUT AND OCCUPANCY TIMELINE

EXISTING SUBSURFACE WASTEWATER DISPOSAL SYSTEM DATA:

20 X 50 FOOT STONE BED INSTALLED 1984

INSPECTION 2017 - SYSTEM IN GOOD CONDITION -REPLACE TANK AND D BOX

DESIGN FLOWS 303 GPD (HHE -200 R. SWEET, 1984)

COMMUNITY CENTER DESIGN FLOWS BASED ON PHASED RENOVATIONS TO FORMER RESIDENCE 2020-2023

				Phased buildout of Community Center						
				Annual Estimated Design Flows (gpd)						
Item	**Type of Use (Plumbing Code Table 4)**	**Design Flows (pgd)**	**Units**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
1	Swimming pool/locker room facility	10	gpd or 250 gpd/toilet	30	68	102	135	LOW PRESSURE SEWER CONNECTED WASTEWATER SYSTEM ABANDONED		
2	Sales office/employees (no use of showers)	12	gpd/employee	48	48	48	48			
3	Assembly area	2	gpd/pp	100	100	100	100			
4	Barns -employees (no showers)	12	gpd/employee	24	24	24	24			
	TOTALS			202	240	274	307			
							At system Capacity			

PHASE 1 &2 DEVELOPMENT PROJECTED TIMELINE ESTIMATES

2020	13 Units/20 residents/pool & lockerooms installed
2021	30 units/45 residents/additional CC improvements
2022	45 units / 68 residents/additional CC improvements
2023	60 units/90 residents
2024	75 units/113 residents - connect to sewer
2025	90 units/135 residents
2026	105 units/158 residents

NOTES:

1. Assume based on other OV Facilities that a max. 15% residents use pool daily.

2. Pool contruction 2020-21. Occupy summer 2021.

3. Barns/Equestrian Lease -Assumes current 2 pp/day. Lease expected to expire by 2021. Carry 24 gpd/day to be conservative beyond 2021.

4 All buildout projections and timelines are estimated and may vary. Use for estimating max. use of community center as project becomes occupied.

MAINE SUBSURFACE WASTEWATER DISPOSAL CODE.

ATTACHMENT 3

TABLE 4C
DESIGN FLOWS FOR OTHER FACILITIES

NOTE: The design flows calculated in this table represent the design flow for purposes of calculating the septic tank capacity (Section 6(G)) and the size of the disposal field (Table 4D), unless otherwise noted. Important: See notes 1, 2, and 3 at end of Tables.

Type of facility	Design flow per user or unit
Airports	5 gpd per passenger plus 12 gpd per employee [1]
Assembly areas (Meeting hall, no seats)	2 gpd per person
Auditoriums/Stadiums:	5 gpd per seat
Bakery	100 gpd per bakery plus 12 gpd per employee [1, 2]
Bar/Tavern/Cocktail lounge	add 12 gpd per employee to each
w/ limited food	15 gpd per seat or13 gpd per patron
w/o food	10 gpd per seat or 7 gpd per patron
Barber shop	50 gpd per chair
Beauty salon	100 gpd per chair
Bed and breakfast	90 gpd per bedroom per operator's quarters and 75 gpd per rental room
Boarding houses with meals	180 gpd per house plus 40 gpd per boarder
Bottle club	10 gpd per seat plus 12 gpd per employee
Bunkhouses (no plumbing)	20 gpd per bed
Bus service areas	5 gpd per passenger plus 12 gpd per employee [1]
Butcher shop or department	100 gpd per shop plus 12 gpd per employee [1,2]
Cafeteria, open general public	30 gpd per seat plus 12 gpd per employee [1,2]
Cafeteria, private	15 gpd per seat plus 12 gpd/employee [1,2]
Campground sites served by central toilets	60 gpd per site
Campground sites served by individual water and sewer hookups	75 gpd per site
Campground/Transient dump station	50 gpd per user not served by individual water and sewer hookups
Campground park model trailer sites	125 gpd per site
Children's camps, day use only	15 gpd per camper plus 12 gpd per staff person
Children's camps, day and night	20 gpd per camper plus 20 gpd per staff person
Churches	4 gpd per seat for general seating and 8 gpd per seat for seats in a dining area
Dance hall	5 gpd per attendee plus 12 gpd per employee [1]
Day care facilities serving meals	15 gpd per child plus 12 gpd per adult
Day care facilities not serving meals	10 gpd per child plus 12 gpd per adult
Dining hall (separate from any other facility)	5 gpd per meal per seat [2]
Dog kennel (boarding and grooming)	15 gpd per dog or per run, cage, kennel or stall, whichever is greater; add 7 gpd per dog bath given; add 12 gpd per employee [5]
Eating Places	add 12 gpd per employee for each [2, 4]
Banquet /Dining hall	5 gpd per seat per meal
Cafeteria	5 gpd per customer
Catering	50 gal/ 100 sq. ft. floor space
Delicatessen, food prepared and no seats	100 gpd per deli or 1 gpd per meal served plus ~~15~~ 12 gpd per employee [1, 2] (whichever is larger)
Delicatessen, no food prepared and no seats	50 gpd per deli plus 12 gpd per employee [1]
Drive-in, no full meals and no china service	30 gpd per car space plus 12 gpd/ employee [1, 2]
Eating place, takeout	100 gpd or 1 gpd per meal served plus 12 gpd per employee [1, 2] (whichever is larger)
Eating place, paper service	7 gpd per seat plus 12 gpd/ employee [1, 2]
Ice Cream Stands, ice cream only with no seats	150 gpd per stand plus 12 gpd per employee. [1, 2]
Eating Place 1meal/day	10 gpd per seat plus 12 gpd per employee [1, 2]
Eating Place, 2 meals/day	20 gpd per seat plus 12 gpd per employee (1,2)
Eating Place, 3 meals/day	30 gpd per seat plus 12 gpd/employee [1, 2]
Specialty food stand or kiosk	50 gpd per 100 sq. ft.
Employees at place of employment with no showers	12 gpd per employee [1]
Employees at place of employment with showers	20 gpd per employee [1]
Fairgrounds/Flea market	3 gpd per attendee based on average daily attendance
Gyms, not associated with schools	10 gpd per participant plus 3 gpd per spectator plus 12 gpd per employee [1]

Type of Facility	Design Flow per User or Unit
Health care facility :	add 12 gpd per employee to each
Adult daycare (no overnight, 4 to 8 Hrs. per day)	25 gpd per client
Hospitals, medical	165 gpd per bed (includes laundry)
Hospitals, psychiatric	100 gpd per bed
Nursing/Convalescent home	w/ laundry 125 gpd per bed
Nursing/Convalescent home	w/o laundry 75 gpd per bed
Medical office/Dental office	80 gpd per medical staff, plus 5 gpd per patient
Residential care/ Retirement home	60 gpd per resident
Health clubs	10 gpd per participant plus 3 gpd per spectator plus ~~15~~ 12 gpd per employee [1]
Hotels and motels with shared baths	80 gpd per bedroom plus 12 gpd per employee [1]
Hotels and motels with private baths	100 gpd per bedroom plus 12 gpd per employee [1]
Hotels/Motel with kitchen	60 gpd per bed (2 person)
Hotels/Motel without kitchen	50 gpd per bed (2 person)
Laundry, self-service	300 gpd per machine plus 12 gpd per employee [1]
Limited operation hunting camp	45 gpd per owner/occupant plus 12 gpd per hunter/guest
Marina	100 gpd plus 10 gpd per slip or mooring (clothes washers are not included; design flow for clothes washers must be calculated separately); w/bathrooms add 30 gpd per slip; w/o bathrooms add 100 gpd per slip.
Medical offices, clinics, and dental offices	80 gpd per medical staff plus 5 gpd per patient plus 15 gpd/office employee [1]
Nursing Homes	150 gpd per bed plus 12 gpd per employee [1]
Parks and picnic areas, public rest rooms and no showers	3 gpd per attendee or 40 gpd per parking place, whichever is greater, plus 12 gpd per employee [1]
Parks and picnic areas, public rest rooms and showers	8 gpd per attendee or 40 gpd per parking place, whichever is greater, plus 12 gpd per employee [1
Prison/jail	120 gpd per inmate, plus 12 gpd per employee
Public restrooms	325 gpd toilet, 162 gpd per urinal, or 3 gpd per user
Rooming houses, no meals	180 gpd per house plus 30 gpd per roomer
Recreation/sporting camps	45 gpd per owner/occupant plus 25 gpd per bed/sportsperson
Rental cabins and cottages	50 gpd per bed plus 12 gpd per employee [1]
Rental cabins, housekeeping	50 gpd per cabin, plus 50 gpd per bed
Rental cabins, with no plumbing fixtures	20 gpd per bed
School, Grades Kindergarten to 12	10 gpd per student plus 12 gpd per teacher and other employees; w/cafeteria add 3 gpd per student; w/cafeteria, gym & showers add 8 gpd per student. [1]
School, boarding	75 gpd per student plus 12 gpd per teacher and other employees [1]
Dormitory/Boarding hall (no eating facilities)	40 gpd per student, plus 12 gpd per employee
Service stations	100 gpd per fuel pump cabinet or 250 gpd per toilet plus 12 gpd per employee [1]
Shopping centers or stores, public rest rooms and showers [3]	325 gpd per toilet plus 20 gpd per shower plus ~~15~~ 12 gpd per employee [1] Design flows for any eating places or butcher shops must be determined and added to total design flow.
Sports Bars	20 gpd per seat plus 12 gpd per employee [1, 2]
Sports centers	add 12 gpd per employee
Bowling center w/ snack bar	75 gal per lane
Country clubs	60 gal per member or patron
Fitness, exercise, karate or dance center	50 gal per 100 sq. ft.
Tennis or racquetball	300 gpd per court
Gyms/Health clubs (not associated with schools)	10 gpd per member, plus 3 gpd per spectator
Golf course/Driving ranges, only snack food, no showers	250 gpd per toilet
Go-kart/Motocross/Batting cages/Mini-golf	250 gpd per toilet
Pool halls/Arcades	250 gpd per toilet
Swimming pools, Bathhouses & Spas	10 gpd per person or 250 gpd per toilet

Type of Facility	Design Flow per User or Unit
Theaters indoor	5 gal per day per seat add 12 gpd per staff/employee
Theaters drive-in	10 gals per car space add 12 gpd per staff/employee
Veterinary hospital no boarding or grooming	250 gal per practitioner/shift [5]
w/ kennels & boarding	add 15 gpd per run, cage, kennel or stall
w/ grooming	add 7 gpd per dog bath given
Visitors center	5 gpd per visitor plus 12 gpd/ employee (Includes libraries, museums, similar uses) [1]
Warehouse	100 gpd or 12 gpd per employee, whichever is greater

NOTES:

1. The design flow for employees is based on the total number of employees present in any 24-hour period.
2. Multiply the hydraulic loading rate by 1.8 for sizing the disposal field. The initial value taken from the table is used to size the septic tank and for minimum lot size determinations.
3. 22 M.R.S. §1672 requires a public rest room for shopping centers containing 6 or more separate retail establishments with an off street public parking area of not less than 2 acres.
4. Requires an external grease interceptor sized and installed pursuant to Section 6(L).
5. Requires outlet filter in septic tank.

ATTACHMENT 4

02-20-20
CC-Phase 2 Parking Table

COMMUNITY CENTER PARKING REQUIRED

BASIS (ZONING C. 315-57 PARKING & LOADING)	STANDARD	UNITS	REQUIRED
SALES OFFICES (PROF. OFFICES/BUSINESS)	1 SP/250 SF. GROSS AREA	948 SF (2ND STORY SALES OFFICE)	4
PRIVATE CLUB/LODGE (CLOSEST COMPARABLE USE)	1 SP/ 4 MEMBERS (UNITS)	105 COTTAGE UNITS	27
TOTAL REQUIRED			**31**

NOTES:

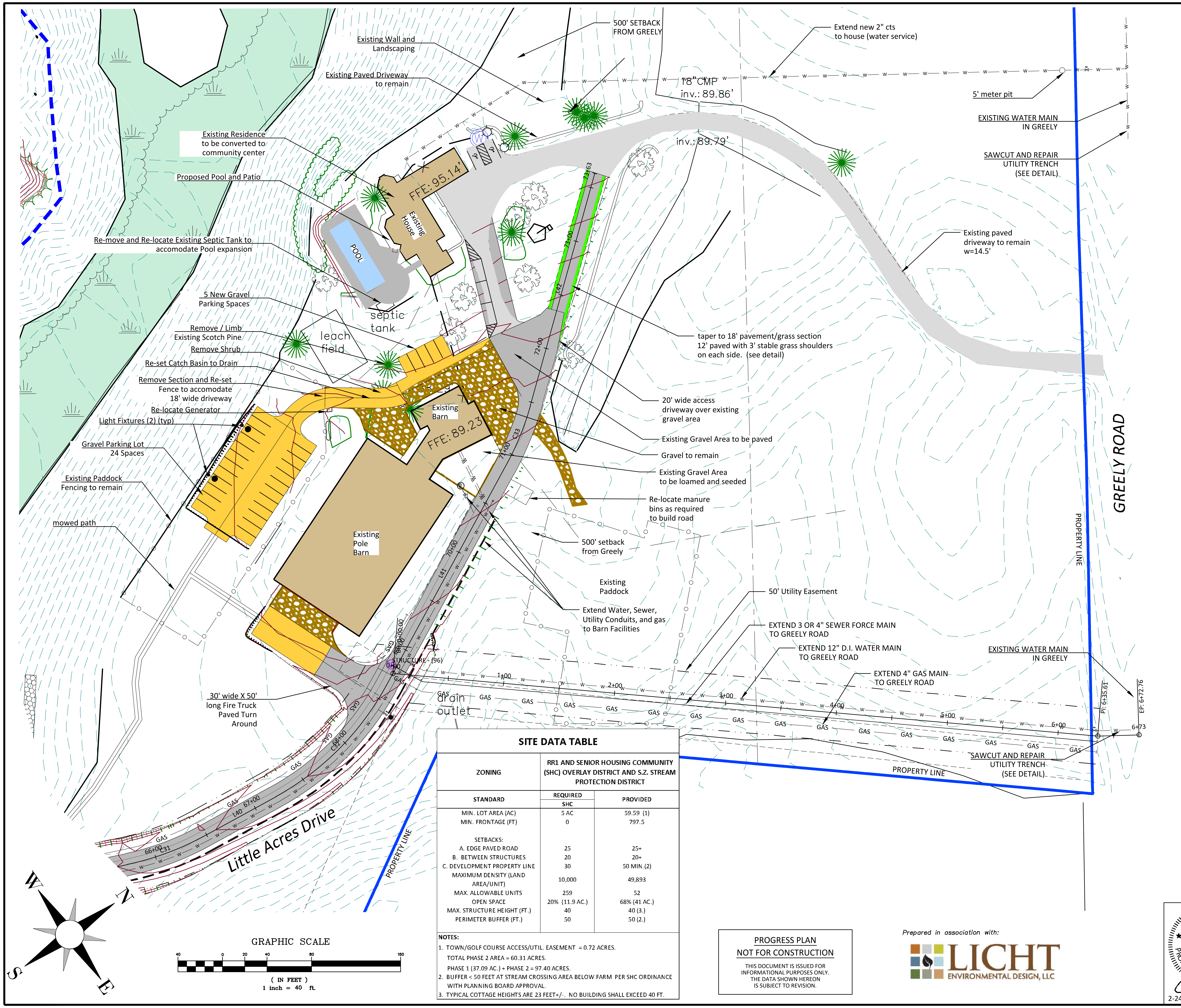
1. USES BASED ON BEST COMPARISON OF “COMMUNITY CENTER’ ACTIVITIES WITH ORDINANCE PRESCRIBED USES.

PARKING PROVIDED

LOCATION	REGULAR	ADA	TOTAL
FRONT OF CC BUILDING (PAVED)	3	2	5
SIDE OF CC BUILDING (GRAVEL)	5	0	5
BEHIND BARN (GRAVEL)	24	0	24
TOTAL PROPOSED	**32**	**2**	**34**

NOTES:

1. PARKING COUNT DOES NOT INCLUDE THE 2 GARAGE SPACES AT THE CC.
2. PARKING COUNTS DO NOT INCLUDE EXISTING GRAVEL FARM/AGRICULURAL AREAS USED FOR DAILY PARKING, TRAILERS AND FARM EQUIPMENT ACCESS. ETC.



1. FORMER GODSOE RESIDENCE TO BE CONVERTED INTO A COMMUNITY CENTER FOR THE PHASE 1 AND 2 CUMBERLAND CROSSING PROJECT. USES TO INCLUDE BUT NOT BE LIMITED TO MEETING/GAME ROOMS, SALES OFFICES, ACTIVITY AREAS, LOCKER ROOMS, OUTDOOR POOL FACILITY AND ADA IMPROVEMENTS. DETAILS OF INTERNAL BUILDING IMPROVEMENTS & ADA ACCESS TO BE FILED UNDER A BUILDING PERMIT TO THE CODE ENFORCEMENT OFFICER AND ARE NOT A PART OFF THIS SITE PLAN REVIEW.
2. COMMUNITY CENTER USE/IMPROVEMENTS TO BE PHASED. THE FOLLOWING PROVIDES A GENERAL PHASING APPROACH AS A GUIDELINE. ACTUAL TIMING AND IMPLEMENTATION OF IMPROVEMENTS MAY VARY DEPENDING ON FINAL PERMITS, MARKET ABSORPTION OF UNITS IN PHASES 1 AND 2 AND OTHER FACTORS:
    A. 2020-21:
        a. INSTALL POOL, PATIO, ADA & LOCKER ROOM IMPROVEMENTS.
        b. LIFE SAFETY CODE REVIEW.
        c. INSTALL NEW 2 INCH WATER SERVICE. USE WELL FOR IRRIGATION.
        d. MAINTAIN EX. WASTEWATER LEACHFIELD. REPLACE/MOVE SEPTIC TANK AND PIPING.
    B. 2021-22:
        a. CREATE CC AREA PARKING-10 SPACES.
        b. INTERNAL BUILDING IMPROVEMENTS, UTILITY UPGRADES.
        c. MAINTAIN EX. WASTEWATER LEACHFIELD.
    C. 2022-25:
        a. CONSTRUCT REAR GRAVEL PARKING AREA.
        b. RELOCATE GENERATOR.
        c. EXTEND LITTLE ACRES DRIVE FROM PHASE 2 AND CONNECT TO EXISTING 14.5 FOOT DRIVE.
        d. EXTEND UTILITIES FROM LITTLE ACRES DRIVE TO GREELY ROAD. CONNECT SERVICES TO BARNS AND COMMUNITY CENTER.
        e. ABANDON WASTEWATER SYSTEM & CONNECT CC TO NEW SANITARY SEWER FORCEMAIN.
        f. GRIND AND RE-PAVE EXISTING DRIVEWAY.

3. WASTEWATER SYSTEM - THE CURRENT SYSTEM HAS A DESIGN FLOW OF 303 GPD. LICHT ENVIRONMENTAL DESIGN, LLC HAS INCLUDED IN THE SUBDIVISION APPLICATION, A PROJECTED USE AND PHASING OF FLOWS TO THE SYSTEM TO DEMONSTRATE THE CAPACITY OF THE SYSTEM UNTIL SEWER IS EXTENDED TO THE COMMUNITY CENTER/BARNS. THE 1000 GALLON SEPTIC TANK SHALL AND D-BOX SHALL BE REPLACED AND RELOCATED COMMENSURATE WITH THE 2020-21 POOL IMPROVEMENTS.

COMMUNITY CENTER PARKING REQUIRED

BASIS (ZONING C. 315-57 PARKING & LOADING)	STANDARD	UNITS	REQUIRED
SALES OFFICES (PROF. OFFICES/BUSINESS)	1 SP/250 SF. GROSS AREA	948 SF (2ND STORY SALES OFFICE)	4
PRIVATE CLUB/LODGE (CLOSEST COMPARABLE USE)	1 SP/ 4 MEMBERS (UNITS)	105 COTTAGE UNITS	27
TOTAL REQUIRED			31

NOTES:
1. USES BASED ON BEST COMPARISON OF "COMMUNITY CENTER' ACTIVITIES WITH ORDINANCE PRESCRIBED USES.

PARKING PROVIDED

LOCATION	REGULAR	ADA	TOTAL
FRONT OF CC BUILDING (PAVED)	3	2	5
SIDE OF CC BUILDING (GRAVEL)	5	0	5
BEHIND BARN (GRAVEL)	24	0	24
TOTAL PROPOSED	32	2	34

NOTES:
1. PARKING COUNT DOES NOT INCLUDE THE 2 GARAGE SPACES AT THE CC.
2. PARKING COUNTS DO NOT INCLUDE EXISTING GRAVEL FARM/AGRICULURAL AREAS USED FOR DAILY PARKING, TRAILERS AND FARM EQUIPMENT ACCESS. ETC.

SITE DATA TABLE

ZONING	RR1 AND SENIOR HOUSING COMMUNITY (SHC) OVERLAY DISTRICT AND S.Z. STREAM PROTECTION DISTRICT	
STANDARD	REQUIRED SHC	PROVIDED
MIN. LOT AREA (AC)	5 AC	59.59 (1)
MIN. FRONTAGE (FT)	0	797.5
SETBACKS:		
A. EDGE PAVED ROAD	25	25+
B. BETWEEN STRUCTURES	20	20+
C. DEVELOPMENT PROPERTY LINE	30	50 MIN.(2)
MAXIMUM DENSITY (LAND AREA/UNIT)	10,000	49,893
MAX. ALLOWABLE UNITS	259	52
OPEN SPACE	20% (11.9 AC.)	68% (41 AC.)
MAX. STRUCTURE HEIGHT (FT.)	40	40 (3.)
PERIMETER BUFFER (FT.)	50	50 (2.)

NOTES:
1. TOWN/GOLF COURSE ACCESS/UTIL. EASEMENT = 0.72 ACRES.
   TOTAL PHASE 2 AREA = 60.31 ACRES.
   PHASE 1 (37.09 AC.) + PHASE 2 = 97.40 ACRES.
2. BUFFER < 50 FEET AT STREAM CROSSING AREA BELOW FARM PER SHC ORDINANCE WITH PLANNING BOARD APPROVAL.
3. TYPICAL COTTAGE HEIGHTS ARE 23 FEET+/-. NO BUILDING SHALL EXCEED 40 FT.

PROGRESS PLAN
NOT FOR CONSTRUCTION
THIS DOCUMENT IS ISSUED FOR
INFORMATIONAL PURPOSES ONLY.
THE DATA SHOWN HEREON
IS SUBJECT TO REVISION.

Prepared in association with:
LICHT
ENVIRONMENTAL DESIGN, LLC

Cumberland Crossing - Phase 2
Farm Area Site Plan

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
2-24-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=40'	SHEET:
DRN BY:	JOB #: 109	C6A
CH'D BY:	SS:	
DATE: 2-24-2020	FILE:	

Exhibit 2

REVISED STORMWATER DATA – ADDENDA-1

(REFER TO SEPARATELY BOUND VOLUME FOR ACCOMPANYING HYDROCAD DATA)

CUMBERLAND CROSSING-PHASE 2
STORMWATER MANAGEMENT REPORT
ADDENDA -1 to 12-18-19 REPORT

REVISED POST DEVELOPMENT TOTAL WATERSHED AREA AND HYDRO CALCS
DATE: 02-24-20
BELANGER ENGINEERING & LICHT ENVIRONMENTAL DESIGN, LLC

ADDENDA-1 SUMMARY:

In response to peer review comments that the pre and post development total watershed areas were slightly different, the post development watershed areas were adjusted to account for prior areas where developed lawn area was reduced in the original study and the corresponding minor acreage was not replaced with woods such that the Pre and Post Development areas varied slightly. The adjustments were made to watersheds 3S and 38S such that the Pre and Post Development total watershed acreage equals 1163.98 acres. Additionally the proposed concrete culvert in the main stream was increased from 10 feet wide to a total of 15 feet wide (double culvert) to address bankfull width comments from the Corps of Engineers. The revised Pre and Post Development tables for Pond 38P (railroad culvert), 81P (offsite farm pond) and 3P (southern wetlands to railroad) are included below and continue to show a decrease in peak flows in the Post Development conditions.

REVISED POA DISCHARGE SUMMARY TABLES –PEAK FLOWS

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.66	-2%
10 YEAR	83.43	82.09	-2%
25 YEAR	125.6	125.27	0%
50 YEAR	178.55	162.5	-10%
100 YEAR	242.48	230.17	-5%

FLOODING STANDARD RESULTS POND 81P

Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	12.04	9.39	-28%
10 YEAR	25.22	20.78	-21%
25 YEAR	42.47	28.36	-50%
50 YEAR	64.8	42.3	-53%
100 YEAR	85.78	56.55	-52%

Exhibit 3

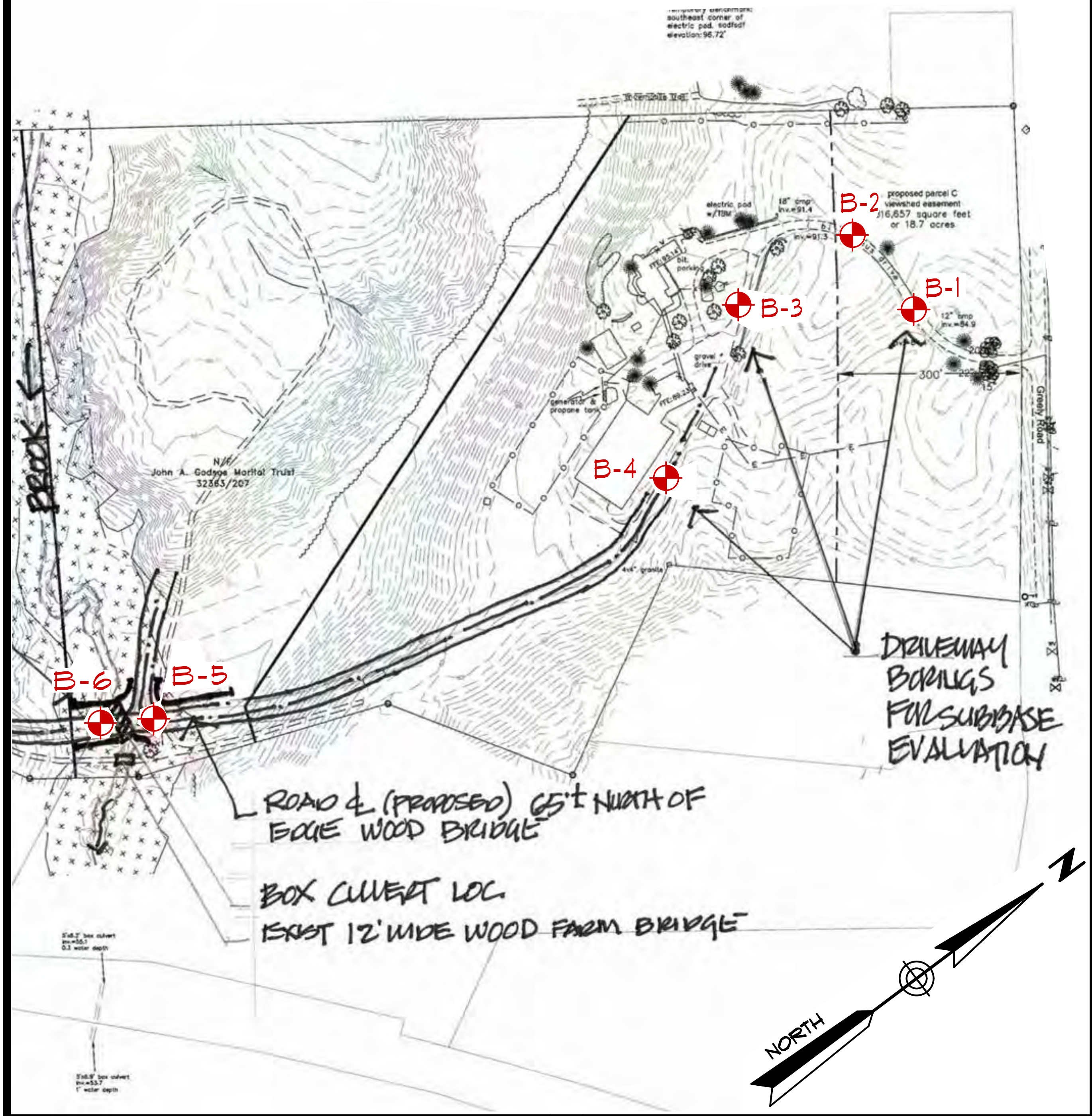
SUMMIT GEOENGINEERING BORING LOGS

LEGEND

⊕ B-1	SUMMIT TEST BORING (JUNE 6, 2019)

PLAN REFERENCE

"PLAN OF EXISTING CONDITIONS",
REVISION DATED FEBRUARY 22, 2019,
PREPARED BY TITCOMB ASSOCIATES.



TEST BORING LOCATION PLAN
WETLAND CROSSING #3 & FARM DRIVE

LITTLE ACRES DRIVE - CUMBERLAND, MAINE
PREPARED FOR
SEACOAST MANAGEMENT CO.

DATE: 7-9-2019	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 18058	SCALE: 1" = 250'	FILE: 18058 BOR

145 LISBON ST. - SUITE 701
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

SUMMIT
GEOENGINEERING SERVICES
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SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Boring #:	**B-1**
Location:	228 Greely Rd	Project #:	18058
City, State:	Cumberland, ME	Sheet:	1 of 1
		Chkd by:	WMP

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	87 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started: 7/8/2019	Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	NE	N/A	None Encountered

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	**SAMPLE DESCRIPTION**	Geological/ Test Data	Geological Stratum
	SP-1	15/15	0 to 1.25	PUSH		Bituminous Pavement		3" PAVEMENT
1						Brown Gravelly SAND, trace Silt and Cobbles, humid, loose, SW		
	S-1	24/1	1 to 3	8		Rock lodged in spoon tip		
2				10		Same as above, humid, loose, SW		
				10				TOPSOIL
3				4				
	S-3	24/18	3 to 5	4		Brown coarse SAND with fine Gravel, trace Silt, loose,		6"
4				6		wet, SW		
				8		Olive gray Silty CLAY, heavily mottled, very stiff,		12"
5				10		humid, blocky, CL		
	S-4	24/24	5 to 7	5		Same as above, stiff, humid, CL	PP = 3 tsf	GLACIAL MARINE
6				7				
				8				
7				10				
						End of Exploration at 7 ft, No Refusal		
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES:

PP = Pocket Penetrometer, MC = Moisture Content

LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test

Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints

Shallow = 0 to 35 degrees

Dipping = 35 to 55 degrees

Steep = 55 to 90 degrees

S = Split Spoon Sample

SP = Gravel Punch Sample

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches

Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition

Dry: S = 0%

Humid: S = 1 to 25%

Damp: S = 26 to 50%

Moist: S = 51 to 75%

Wet: S = 76 to 99%

Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Project #:	18058
Location:	228 Greely Rd	Sheet:	1 of 1
City, State:	Cumberland, ME	Chkd by:	WMP

Boring #: **B-2**

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	91 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started:	7/8/2019 Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	NE	N/A	None Encountered

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	SP-1	15/15	0 to 1.25	PUSH		Bituminous Pavement		3" PAVEMENT
1						Brown coarse Gravelly SAND, trace Silt, moist, loose, SW or SP		
	S-1	24/20	1 to 3	8		Same as above, moist, loose, SW or SP		
2				8				TOPSOIL
				7				
3				3				
	S-3	24/18	3 to 5	4		Same as above, SW or SP		2"
4				5		Olive gray Silty CLAY, heavily mottled, blocky, humid,		
				6		firm, CL		GLACIAL MARINE
5				8				
	S-4	24/24	5 to 7	5		Same as above, moist, firm, CL	PP = 3 tsf	
6				7				
				8				
7				10				
						End of Exploration at 7 ft, No Refusal		
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #:	**B-3**		
Project:	Oceanview at Cumberland Culvert 3	Project #:	18058
Location:	228 Greely Rd	Sheet:	1 of 1
City, State:	Cumberland, ME	Chkd by:	WMP

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	91 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started:	7/8/2019 Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	6.8 ft	84.2 ft	Summit Geotech Boring Loc. Plan

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	**SAMPLE DESCRIPTION**	Geological/ Test Data	Geological Stratum
	S-1	24/18	0 to 2	9		Brown SAND with fine Gravel, little Silt, friable, damp,		16" TOPSOIL
1				7		loose, SW		
				3		Dark gray Clayey SILT, some mottling, trace sand, firm,		
2				2		damp, CL-ML		GLACIAL MARINE
	S-2	24/24	2 to 4	2		Same as above, firm, damp, CL-ML		4"
3				4		Olive gray Silty CLAY, frequent Silt seams, blocky,		
				5		heavily mottled, firm, damp, CL		
4				8				
5								
	S-3	24/24	4 to 6	4		Brown SILT, some Sand, firm, wet, ML		5"
6				4		Olive gray Silty CLAY, little Silt seams, stiff, blocky,	PP = 3 tsf	
				6		mottled, humid, CL		
7				7			▽ Groundwater	
						End of Exploration at 7 ft, No Refusal		
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition	Soil Moisture Condition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487	Dry: S = 0%
0-4	V. Loose	<2	V. soft		Humid: S = 1 to 25%
5-10	Loose	2-4	Soft	< 5% Trace	Damp: S = 26 to 50%
11-30	Compact	5-8	Firm	5-15% Little	Moist: S = 51 to 75%
31-50	Dense	9-15	Stiff	15-30% Some	Wet: S = 76 to 99%
>50	V. Dense	16-30	V. Stiff	> 30% With	Saturated: S = 100%
		>30	Hard		

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Project #:	18058
Location:	228 Greely Rd	Sheet:	1 of 1
City, State:	Cumberland, ME	Chkd by:	WMP

Boring #: **B-4**

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	85 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started: 7/8/2019	Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	NE	N/A	None Encountered

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/16	0 to 2	4		Brown coarse Gravelly SAND, trace Silt, friable, moist,		TOPSOIL
1				5		loose, SW		
				1				
2				1		Brown Sandy SILT, wet, soft, ML		2"
	S-2	24/24	2 to 4	3		Brown Sandy SILT, some fine Gravel, damp, soft, ML		4"
3				3		Olive gray Clayey SILT, trace Sand, damp, mottled,		GLACIAL MARINE
				7		some Silt and fine Sand seams, ML		
4				10				
5								
	S-3	24/24	5 to 7	3		Olive gray Silty CLAY, firm, blocky, mottled, moist,	PP = 2 tsf	
6				4		some coarse Sand seams, CL		
				5				
7				6				
						End of Exploration at 7 ft, No Refusal		
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition	Soil Moisture Condition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487	Dry: S = 0%
0-4	V. Loose	<2	V. soft		Humid: S = 1 to 25%
5-10	Loose	2-4	Soft	< 5% Trace	Damp: S = 26 to 50%
11-30	Compact	5-8	Firm	5-15% Little	Moist: S = 51 to 75%
31-50	Dense	9-15	Stiff	15-30% Some	Wet: S = 76 to 99%
>50	V. Dense	16-30	V. Stiff	> 30% With	Saturated: S = 100%
		>30	Hard		

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Boring #:	**B-5**
Location:	228 Greely Rd	Project #:	18058
City, State:	Cumberland, ME	Sheet:	1 of 1
		Chkd by:	WMP

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	61 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started:	7/8/2019 Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	9 ft	52 ft	"Cumb Crossing PH2 Culvert Schematic"

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	**SAMPLE DESCRIPTION**	Geological/ Test Data	Geological Stratum
	S-1	24/12	0 to 2	1		Olive gray Clayey SILT, some mottling, damp, soft,	PP = .5 to 1 tsf	
1				1		trace organics, ML		GLACIAL MARINE
				2				
2				2				
3								
4								
5								
	S-2	24/20	5 to 7	WOH		Same as above, damp, firm, ML		6"
6				WOH		Medium brown very fine Silty SAND, trace organics,		
				1		damp, some wood pieces, SM-SC		
7				1				
8								
9							▽ Groundwater	
10								
	S-3	24/12	10 to 12	1		Gray fine to coarse SAND, trace wood pieces and Silt,		
11				WOH		wet, loose, SP or SW		
				1				
12				1		Dark gray Silty fine SAND, wet, loose, trace clay,		4"
						trace wood pieces, SM-SC		
13								
14								
15								
	S-4	24/24	15 to 17	1		Gray Silty CLAY, very soft, wet, CL	PP ≤ 1 tsf	
16				1				
				WOH				
17				1				
18								
19								
20								
	S-5	24/24	20 to 22	WOH		Same as above, very soft, wet, CL		
21				WOH				
				WOH				
22				WOH				
						End of Exploration at 22 ft, No Refusal		

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Boring #:	**B-6**
Location:	228 Greely Rd	Project #:	18058
City, State:	Cumberland, ME	Sheet:	1 of 3
		Chkd by:	WMP

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	61 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started:	7/8/2019 Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	7 ft	54 ft	"Cumb Crossing PH2 Culvert Schematic"

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/12	0 to 2	1		Dark brown SILT, some Sand, trace rootlets, damp,		6" TOPSOIL
1				1		very loose, ML		
				2		Light brown Silty SAND, loose, damp, SM		
2				2				GLACIAL MARINE
3								
4								
5								
	S-2	24/10	5 to 7	WOH		Medium brown Silty SAND, little wood pieces, loose,		
6				WOH		saturated, SW-SM		
				1				
7				1			▽ Groundwater	
8								
9								
10								
	S-3	24/16	10 to 12	1		Olive Sandy SILT, saturated, soft, some wood pieces,		
11				1		slightly mottled, SP-SM		
				1				
12				1		Olive gray Clayey SILT, wet, soft, ML		
13								
14						Attempted vane shear		
						Some disturbance due to vane shear		
15								
	S-4	24/16	15 to 17	2		Gray fine to medium grained SAND, some Silt, wet,		
16				2		loose, SP-SM		
				1				
17				1				
18								
19								
20								
	S-5	24/24	20 to 22	WOH		Gray Silty CLAY, very soft, little medium sand seams,		
21				WOH		wet, CL		
				WOH				
22				WOH				
				PUSH				
				↓				

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES:

PP = Pocket Penetrometer, MC = Moisture Content

LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test

Bedrock Joints Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Shallow = 0 to 35 degrees

Dipping = 35 to 55 degrees

Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches

Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition

Dry: S = 0%

Humid: S = 1 to 25%

Damp: S = 26 to 50%

Moist: S = 51 to 75%

Wet: S = 76 to 99%

Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Boring #:	**B-6**
Location:	228 Greely Rd	Project #:	18058
City, State:	Cumberland, ME	Sheet:	2 of 3
		Chkd by:	WMP

Drilling Co:	Summit Geoengineering, Inc.
Driller:	S. Floyd
Summit Staff:	S. Anderson

Boring Elevation: 61 ft +/-
Reference: Summit Geotech Boring Loc. Plan June 2019
Date started: 7/8/2019 Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	7 ft	54 ft	"Cumb Crossing PH2 Culvert Schematic"

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	**SAMPLE DESCRIPTION**	Geological/ Test Data	Geological Stratum
				PUSH				
23								
24								GLACIAL MARINE
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
				▼				

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES:
PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Oceanview at Cumberland Culvert 3	Project #:	18058
Location:	228 Greely Rd	Sheet:	3 of 3
City, State:	Cumberland, ME	Chkd by:	WMP
		Boring #:	B-6

Drilling Co:	Summit Geoengineering, Inc.	Boring Elevation:	61 ft +/-
Driller:	S. Floyd	Reference:	Summit Geotech Boring Loc. Plan June 2019
Summit Staff:	S. Anderson	Date started: 7/8/2019	Date Completed: 7/8/2019

DRILLING METHOD		SAMPLER	
Vehicle:	Track	Length:	24" SS
Model:	AMS PowerProbe	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/8/2019	7 ft	54 ft	"Cumb Crossing PH2 Culvert Schematic"

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
				PUSH				
45								
46								GLACIAL MARINE
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
						More dense at 61 ft		
62								
63						Vibrate at 71 ft		
						Sand seams near 73 ft		
64								
						Vibrate to 88.5 ft		
65						End of Exploration at 88.5 ft on Refusal		PROBABLE BEDROCK
66								
				▼				

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

GRAIN SIZE ANALYSIS - ASTM D6913

PROJECT NAME: Oceanview Culvert #3
PROJECT LOCATION: Cumberland, ME
CLIENT: Belanger Engineering
TECHNICIAN: S. Anderson
SOIL DESCRIPTION: SAND with Gravel, little Silt, SP-SM

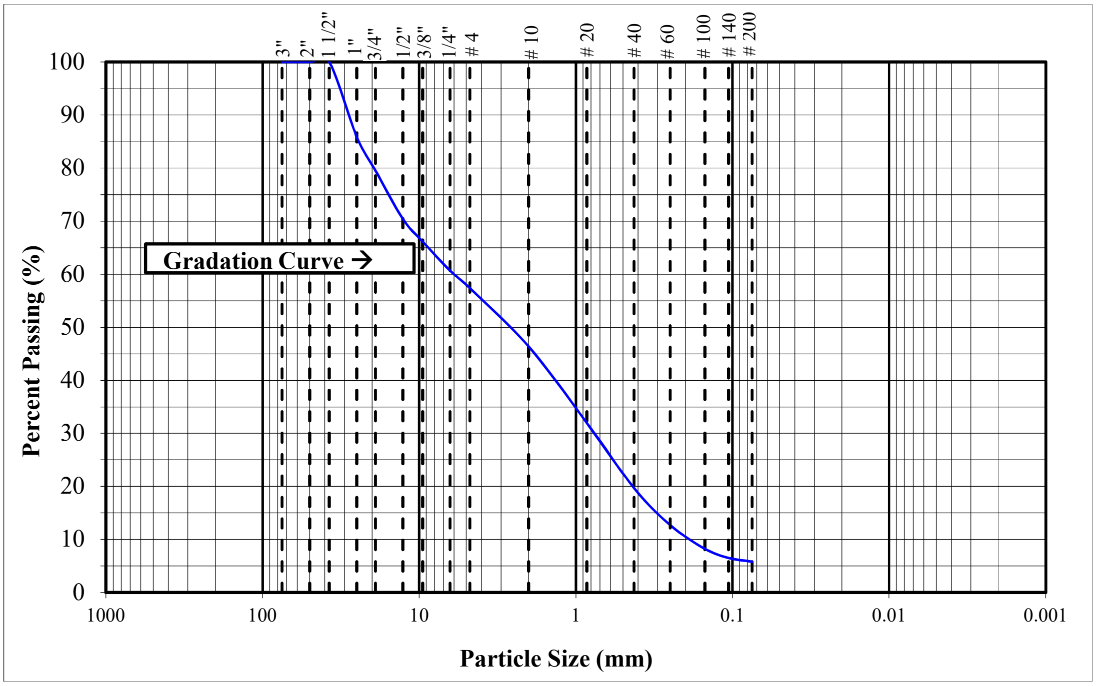
PROJECT #: 18058
EXPLORATION #: B-2
SAMPLE #: SP-1
SAMPLE DEPTH: 0.25'-1'
TEST DATE: July 25th, 2019

TEST PROCEDURE

Sample Source: Gravel Punch	**Sieve Stack:** Composite	**Specimen Procedure:** Moist
Test Method: Method A	**Separating Sieve(s):** 3/8 Inch	**Dispersion Type:** Tap Water

DATA

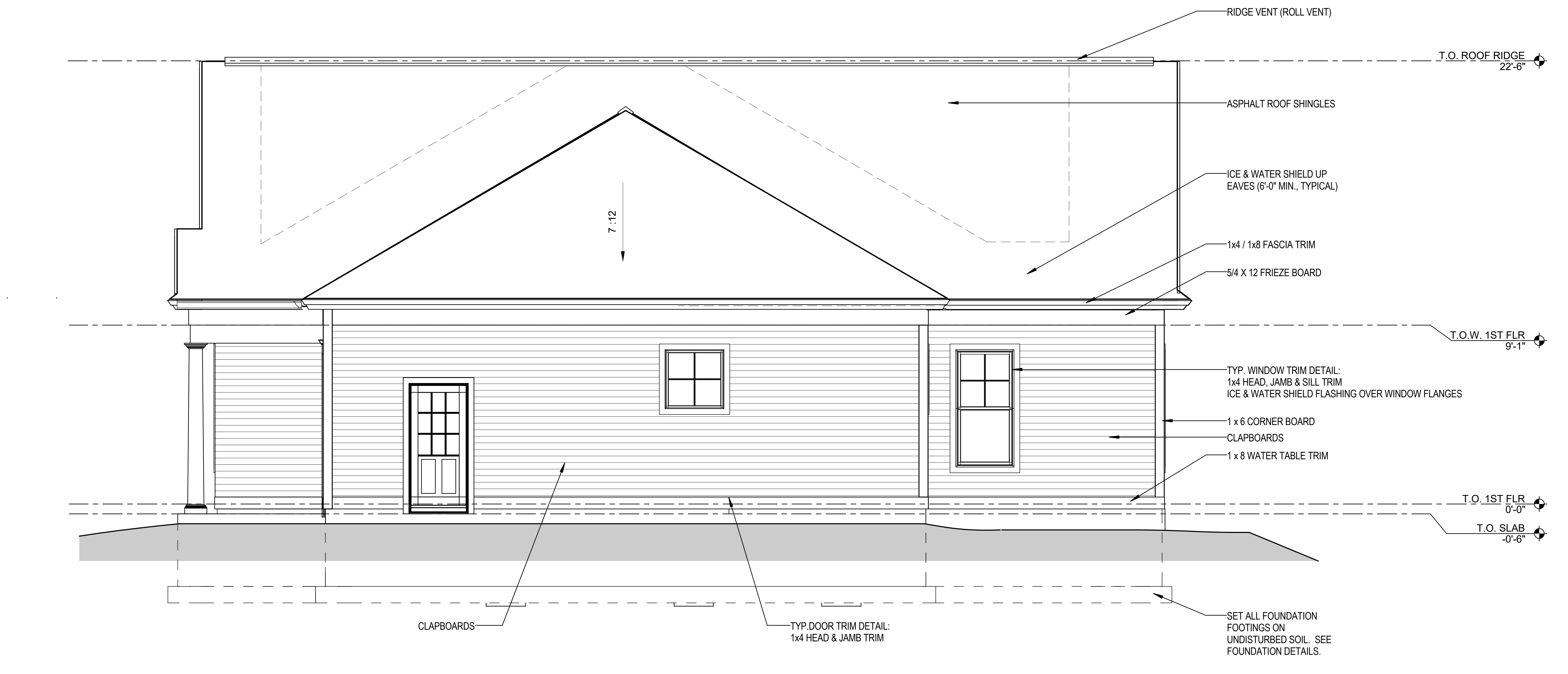
STANDARD SIEVE DESIGNATION (mm)	ALTERNATIVE SIEVE DESIGNATION (in)	PERCENT PASSING (%)
75	(3 in)	100
50	(2 in)	100
37.5	(1-1/2 in)	100
25.0	(1 in)	86
19.0	(3/4 in)	80
12.7	(1/2 in)	70
9.5	(3/8 in)	66
6.35	(1/4 in)	61
4.75	(No. 4)	57
2.00	(No. 10)	46
0.850	(No. 20)	32
0.425	(No. 40)	20
0.250	(No. 60)	13
0.150	(No. 100)	8
0.106	(No. 140)	7
0.075	(No. 200)	6



REMARKS: Moisture Content = 3.7%. Sample is undersized based on maximum particle size.

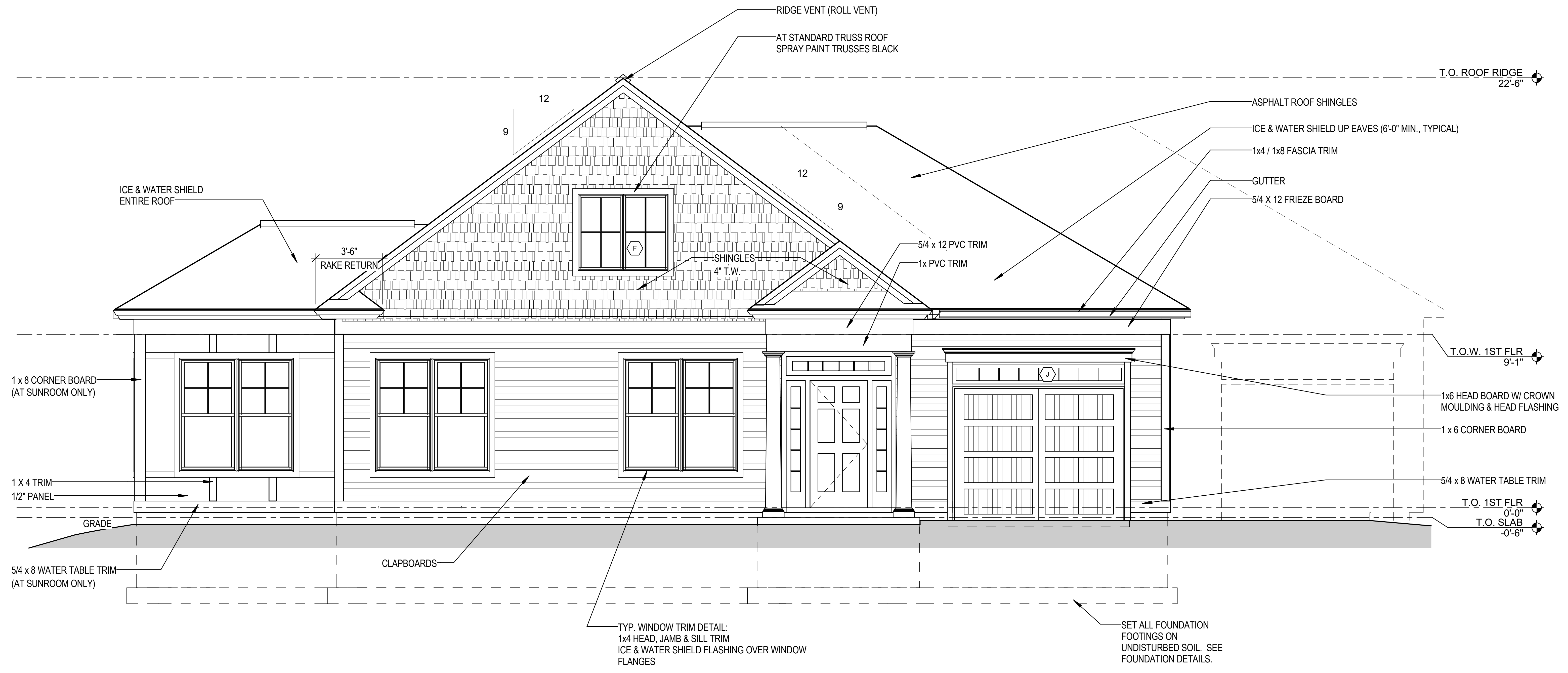
Exhibit 4

ARCHITECTURAL ELEVATIONS



J1 RIGHT ELEVATION

1/4" = 1'-0"



A1 FRONT ELEVATION

1/4" = 1'-0"

7/12/2016 12:01:34 PM AEP

29 BLACK POINT ROAD
SCARBOROUGH, MAINE 04074
207-883-6307
WWW.GAWRONTURGEON.COM

GAWRON TURGEON
ARCHITECTS

SCHOOLHOUSE COTTAGES - A

FALMOUTH, MAINE

REVISIONS

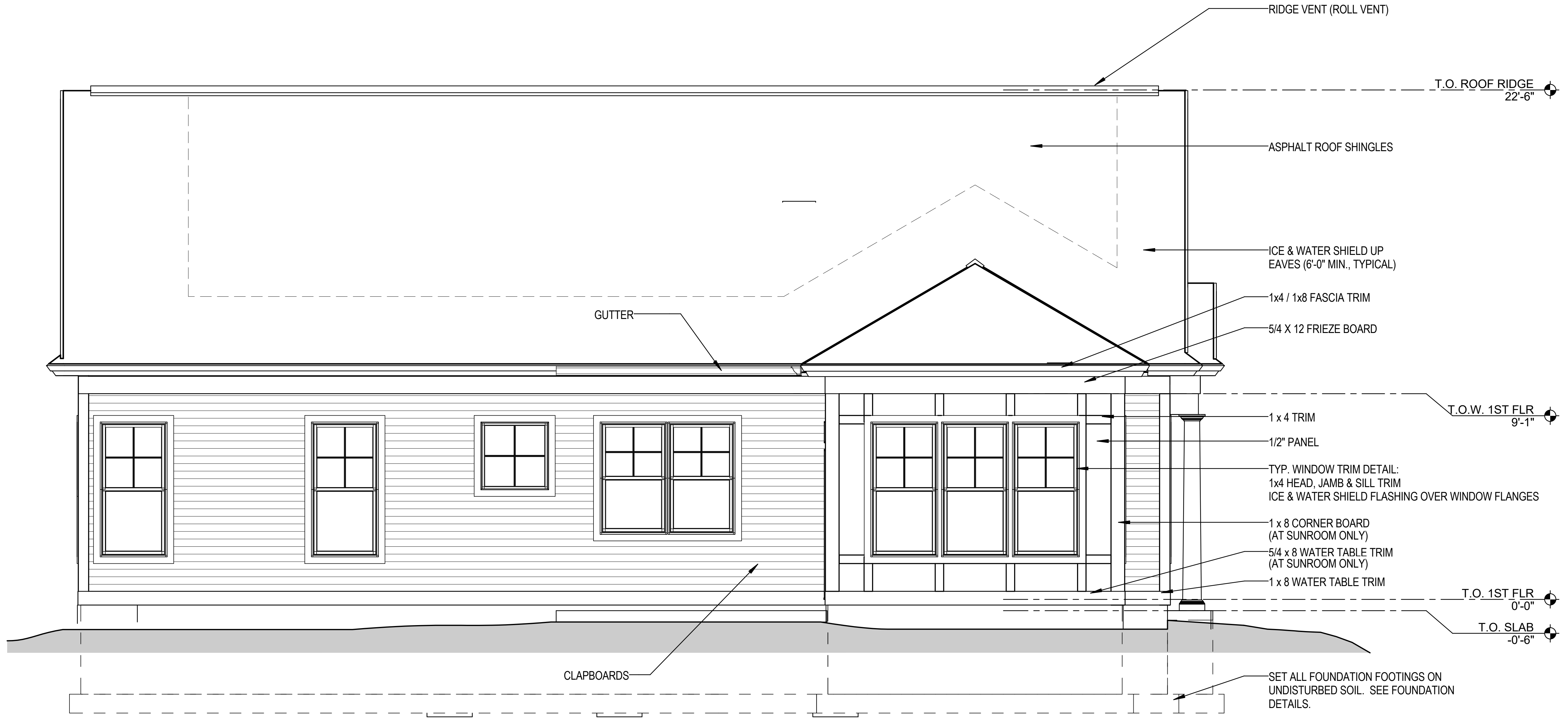
#	DATE	DESCRIPTION
1	07.11.16	PRICING SET-PHASE FOUR

DATE:	07.11.16
PROJECT #	050712
DRAWN BY:	AEP
CHECKED BY:	RLD
DRAWING SCALE	1/4" = 1'-0"

SHEET TITLE

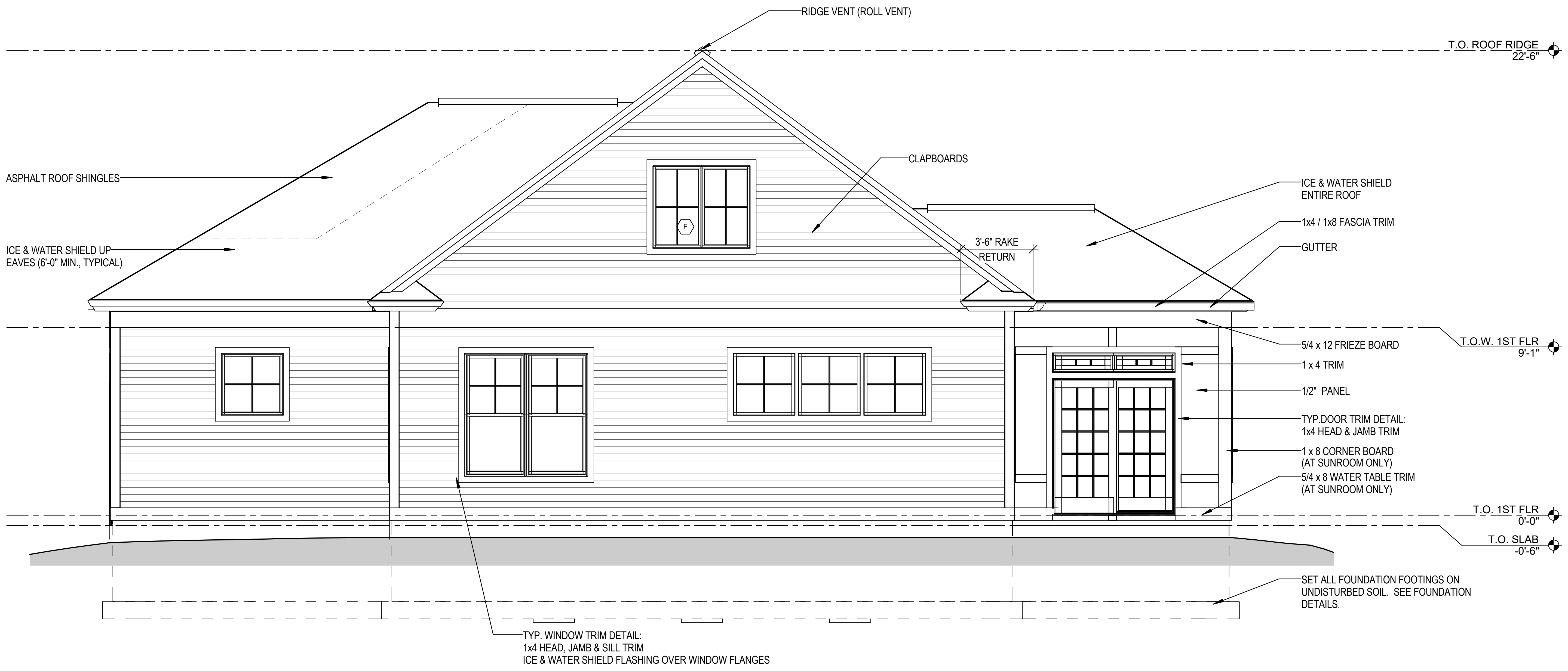
BUILDING ELEVATIONS

A401
CRAWL SPACE



J1 LEFT ELEVATION

1/4" = 1'-0"



A1 REAR ELEVATION

1/4" = 1'-0"

7/12/2016 12:01:36 PM AEP

29 BLACK POINT ROAD
SCARBOROUGH, MAINE 04074
207-883-6307
WWW.GAWRONTURGEON.COM

GAWRON TURGEON ARCHITECTS

SCHOOLHOUSE COTTAGES - A

FALMOUTH, MAINE

REVISIONS

#	DATE	DESCRIPTION
1	07.11.16	PRICING SET- PHASE FOUR

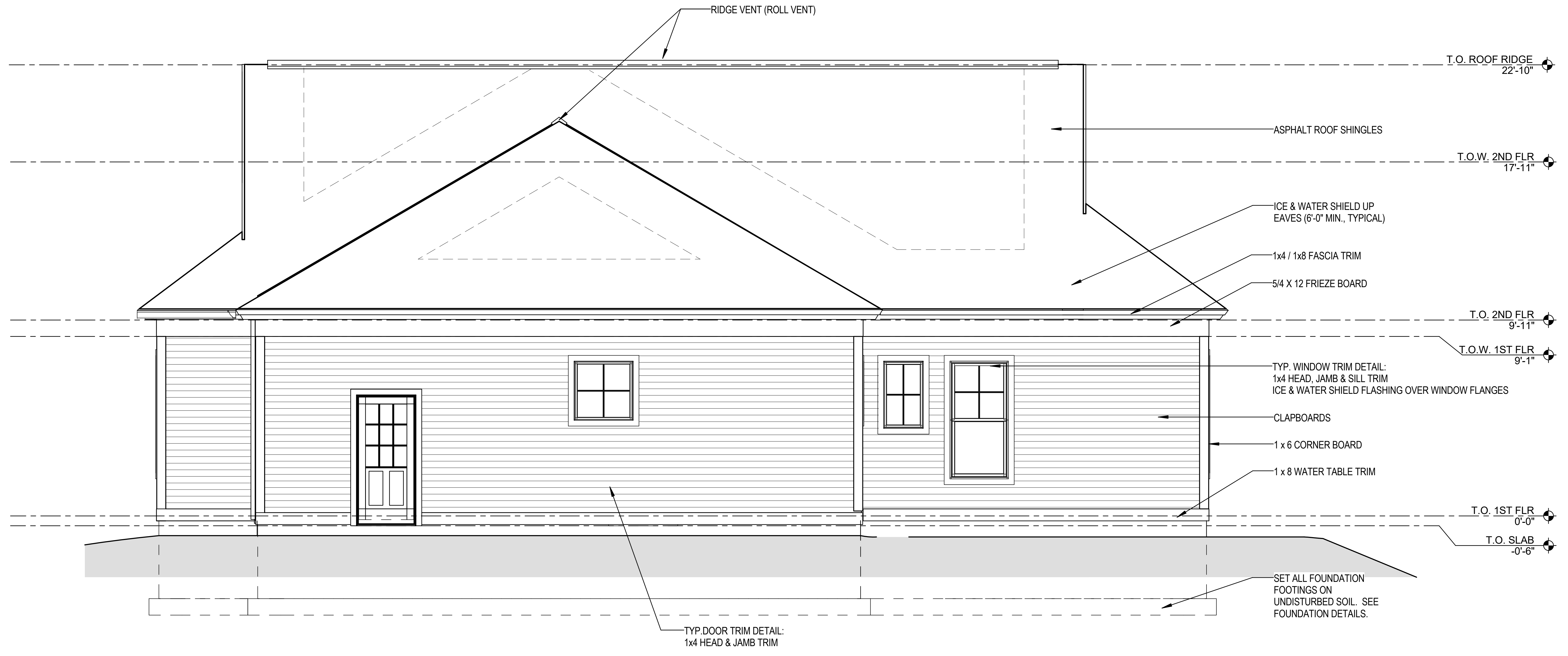
DATE:	07.11.16
PROJECT #	050712
DRAWN BY:	AEP
CHECKED BY:	RLD
DRAWING SCALE	1/4" = 1'-0"

SHEET TITLE

BUILDING ELEVATIONS

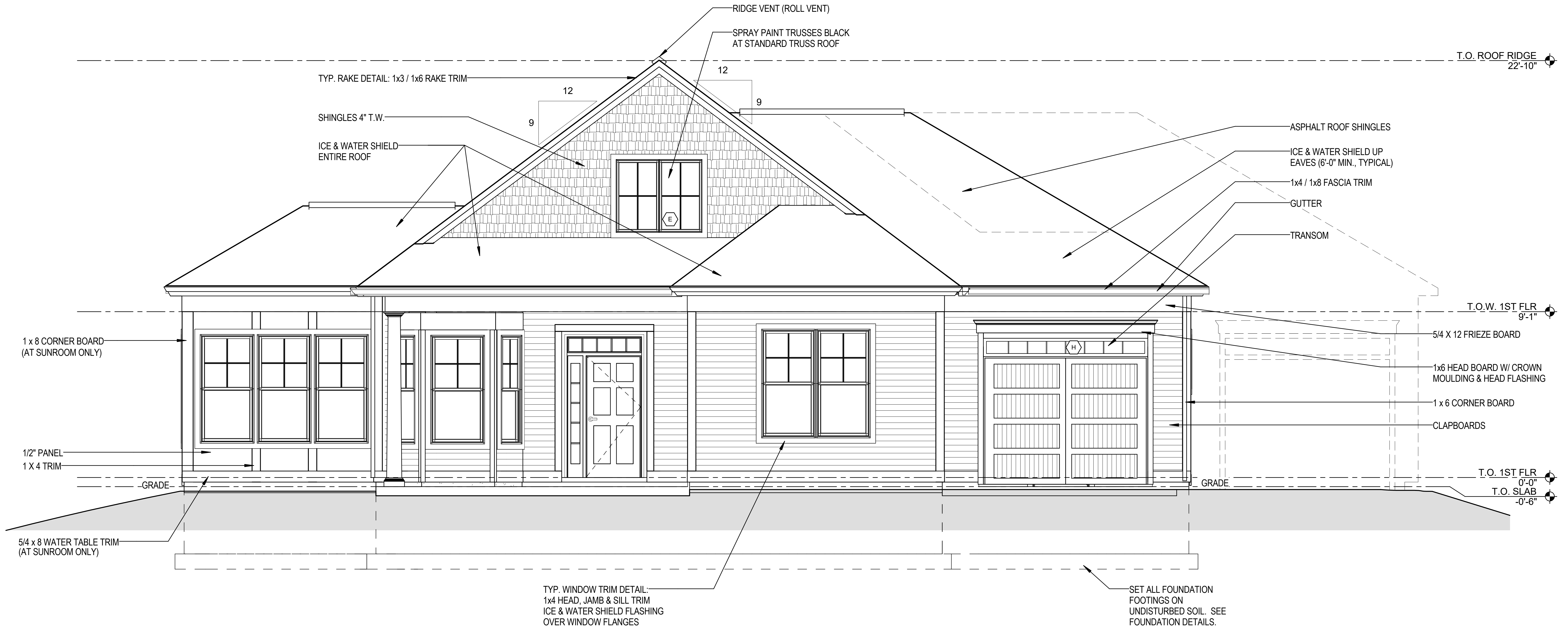
A402

CRAWL SPACE



J1 RIGHT ELEVATION

1/4" = 1'-0"



A1 FRONT ELEVATION

1/4" = 1'-0"

7/12/2016 12:23:09 PM JWW

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SCARBOROUGH, MAINE 04074
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GAWRON
TURGEON
ARCHITECTS

SCHOOLHOUSE
COTTAGES -B
FALMOUTH, MAINE

REVISIONS

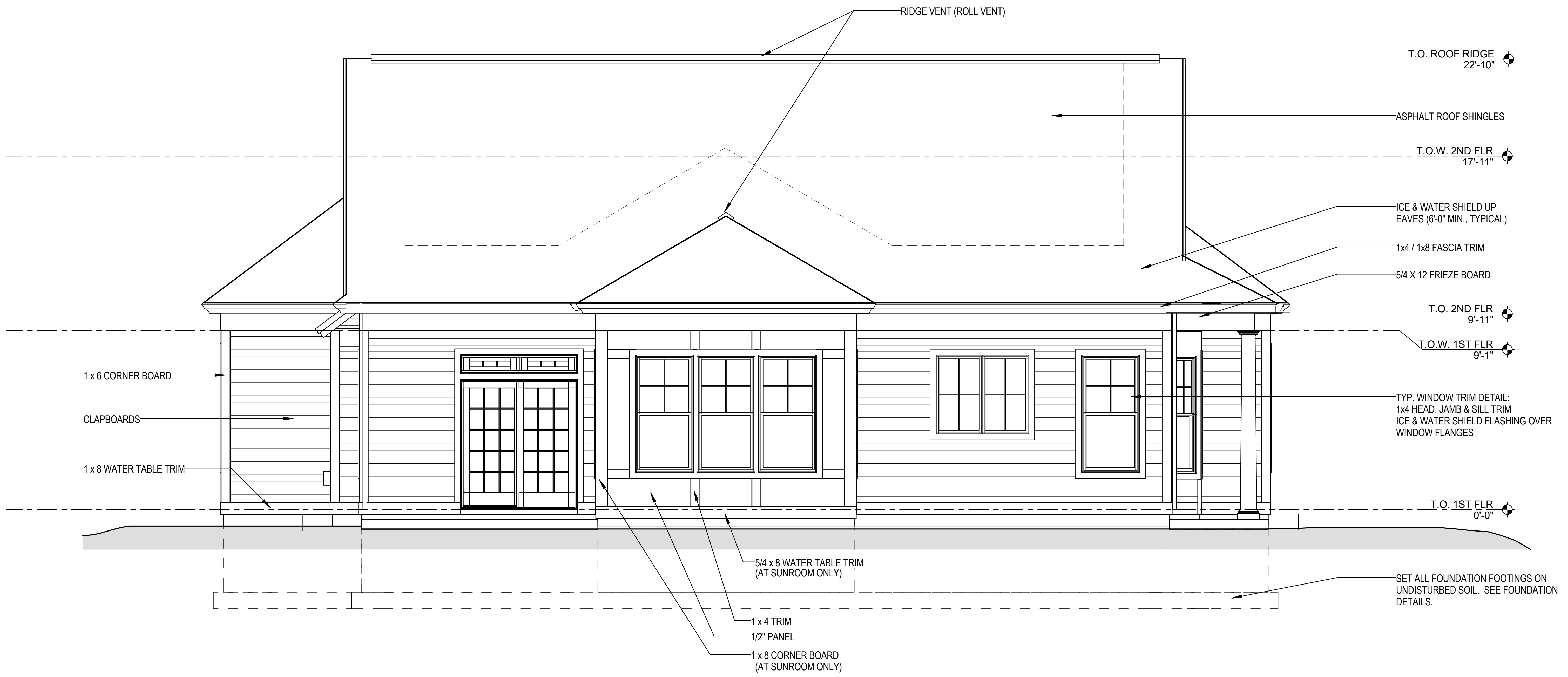
#	DATE	DESCRIPTION
1	07.11.16	PRICING SET- PHASE FOUR

DATE:	07.11.16
PROJECT #	050712
DRAWN BY:	JWW
CHECKED BY:	RLD
DRAWING SCALE	1/4" = 1'-0"

SHEET TITLE

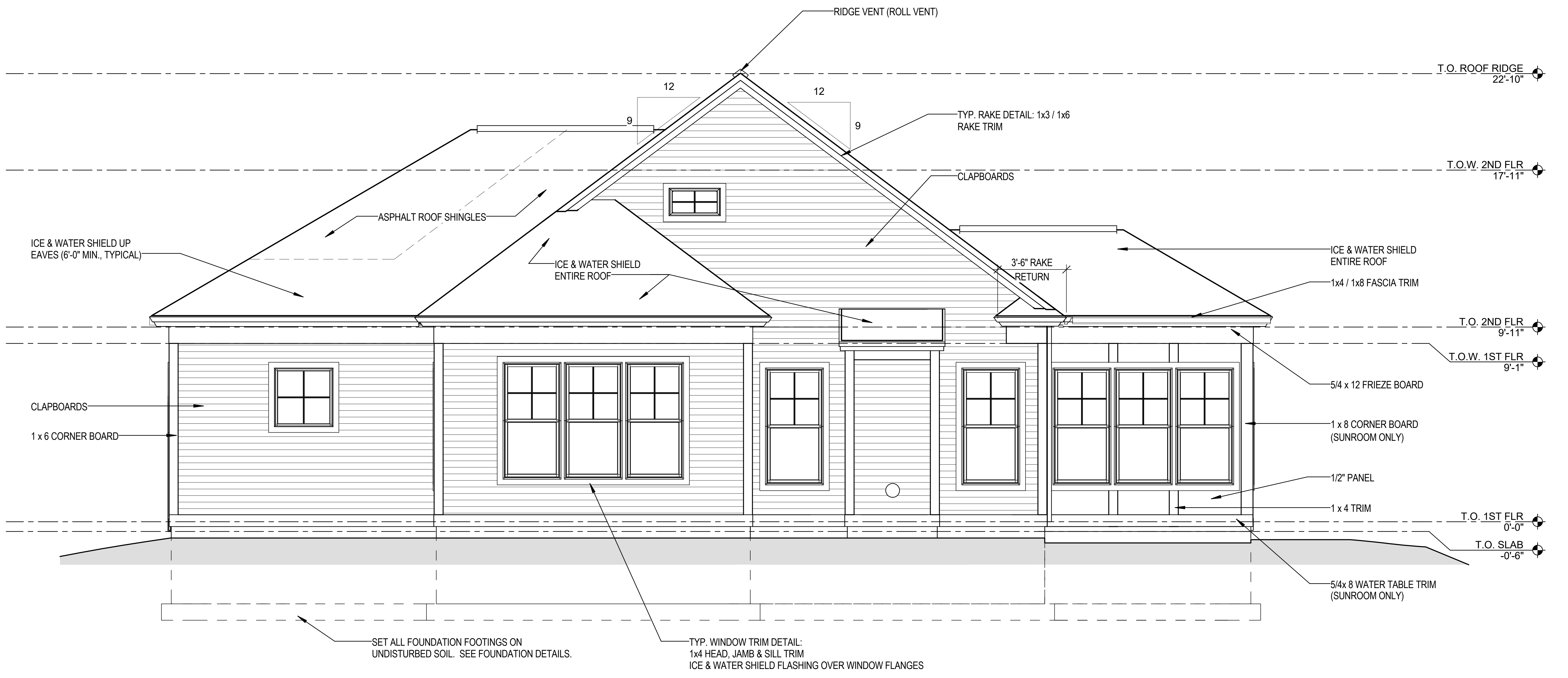
BUILDING
ELEVATIONS

A401
CRAWL SPACE



J1 LEFT ELEVATION

1/4" = 1'-0"



A1 REAR ELEVATION

1/4" = 1'-0"

7/12/2016 12:23:11 PM JWW

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TURGEON
ARCHITECTS

SCHOOLHOUSE COTTAGES -B

FALMOUTH, MAINE

REVISIONS

#	DATE	DESCRIPTION
1	07.11.16	PRICING SET- PHASE FOUR

DATE:	07.11.16
PROJECT #	050712
DRAWN BY:	JWW
CHECKED BY:	RLD
DRAWING SCALE	1/4" = 1'-0"

SHEET TITLE

BUILDING ELEVATIONS

A402

CRAWL SPACE

Exhibit 5

RESPONSES TO SEVEE & MAHER LETTER DATED
JAN. 13, 2020

LICHT
ENVIRONMENTAL DESIGN, LLC

February 25, 2020 (Via Delivery & Email) 16.084.A

Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Cumberland Crossing – Phase 2,
228 Greely Road, Cumberland
RESPONSE TO JANUARY 13. 2020 SEVEE & MAHER REVIEW LETTER
(Map R04 Parcel 34A)

Dear Carla:

On behalf of OceanView at Cumberland, LLC, we have provided below responses to the January 13, 2010 Sevee and Maher review letter provided by Dan Diffen, PE. The responses to comments are listed below each comment in red.

Sevee and Maher Review Comments:

Chapter 250: Subdivision of Land

SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.

Section 250-4(N) – Stormwater

1. Please provide clarification on why the cumulative predevelopment watershed areas do not appear to match the total post development watershed areas in the Stormwater Management Report provided. The pre and post areas have been corrected to match. Refer to the Exhibit 2 Stormwater Data, attached.

Section 250-29 – Review and approval by other agencies.

2. SME understands the following permit applications are underway for the project and applications will be filed with appropriate agencies following submittal of the preliminary subdivision and site plan application:

    - Maine Department of Environmental Protection (ME DEP) Site Location of Development Act (SLODA) permit, Application Filed –Under Review.
    - ME DEP Natural Resources Protection Act (NRPA) Tier 2 permit for proposed wetland impacts, Application Filed, Under Review
    - United States Army Corps of Engineers (USACOE) permit for wetland impacts, proposed stream crossings, and culvert replacements, Application Filed –Under Review

2. Please confirm that the site work associated with the Focal Point system at the intersection of Little Acres Drive and Road 1 does not occur within the 25-foot setback of the stream and

require an NRPA Individual Permit. The system is within the 25 foot stream setback and has been adjusted to be a minimum of 7-10 away from the stream bank in the closest location. This was reviewed with DEP Staff and is currently under DEP NRPA Tier II and Corps review and we are awaiting any review comments.

Section 250-33 – Utilities

3. SME understands Central Maine Power (CMP) has been contacted to provide electricity for the development. SME recommends that the location of underground electric lines, transformers, and electrical easements be added to the plan. The design team is working with CMP on the final 905 Plan design. CMP has indicated preliminarily that they may have to come from Greely Road with the underground primary service. We will include the CMP 905 design plan information on our civil plans and include the CMP plan in the final plan set when a final design is received

Section 250-35 – Sewage disposal.

4. SME recommends the applicant provide more detail on the sewage disposal intended for the new community center. Will the septic system be abandoned? If so, please provide details on proposed connection from the house and pool to the proposed sewer system. The design team has met with Bill Longley, CEO and Carla Nixon, Planner to review the community center and wastewater system. Refer to Site Plan C6A and Exhibit 1 Wastewater and Parking Assessment for a phasing plan for utilizing the existing septic system for several years until sewer can be installed to the community center.
5. If the septic system will remain, please provide evaluation of the condition and capacity of the septic system to handle the proposed use. See above response and Exhibit 1 analysis.
6. Please provide engineering design demonstrating that the low-pressure pumps will be able to pump sewage from the Community Center or furthest extents to the Tuttle Road sewer system. The low pressure sewer system design is being prepared by Crane Pumps and data will be provided with the final design or as received. Their engineers have evaluated the system for the main sizing including the addition of up to 25 units on Greely Road in the future as requested by the Town of Cumberland for future growth and planning.
7. Please confirm that the project will include 5-feet of cover over the sewer mains included in the project. Plan sheets C7 through C10 appear to indicate a cover in the 3-foot to 4-foot range. The forcemain has been shown typically with 4 feet of cover. We will review this standard with Crane pumps to advise whether 5 feet of cover is recommended. We also have a concern with conflicts with water at the 5.5 foot standard depth.
8. SME recommends that a letter from the Town of Cumberland demonstrating capacity for sewer disposal be required prior to final approval. Letter from Bill Shane has been provided dated January 14th and is attached.

Section 250-38 – Design and construction standards.

9. SME understands proposed streets will be constructed to urban standards. Portions of Little Acres Drive do not include an esplanade between the street and sidewalk. SME recommends the applicant request a waiver to address these items. Refer to the summary of sidewalks in the attached February 25th Cover Letter to the Planning Board. Most of the walks will have an esplanade (which is preferred by the applicant, residents and design team where space allows)

except for two locations the culdesac (Leonard Lane) –due to the tight window between the road and the MDIFW buffer and for the section of Little Acres Drive over and just past the stream culvert to minimize wetland impacts. The cover letter is requesting a Waiver 5 for no sidewalk from Station 62+00 to the end at Station 73+63 however we have not found a requirement for esplanades. Can you please provide reference to the standard or we can discuss over the phone.

Section 250-40 – Fire Protection

10. Please provide additional information on the fire protection planned for the proposed Community Center (Godsoe Farm). It does not appear from the plans that a new hydrant is proposed near the existing buildings. The design team has met with Chief Dan Small and he has recommended a hydrant be placed just south of the large pole barn along Little Acres Drive. This has been added to the plans. The Community Center fire and life safety requirements are being evaluated by the project architects, Gawron-Turgeon Architects to determine fire suppression requirements. A new 2 inch main is proposed from Greely Road to service the Community Center and if additional capacity if required for building sprinklering, the plans will be updated in coordination with Portland Water District.

Section 250-41 – Soil Erosion

11. SME recommends erosion control devices proposed for the project be included on the site plan, including silt fence, check dams, catch basin protection, etc. E&S BMP's have been added to the Grading and Drainage plans.

Section 250-45– Waivers and modifications. The Planning Board granted all four waivers at the anuary 21st meeting. Again refer to the attached cover letter Waiver request 5 for no sidewalk along a portion of the Little Acres Drive extensions to the farmstead.

Waiver Request 1 - Road width for access drive from Greely Road to Community Center. Applicant requests a waiver to maintain the existing road width of 14.5 feet. SME recommends that the Applicant provide detail on the projected use of the entrance.

- What is the projected use of this access road after full build-out?
- Will this drive be the primary access for Phase 1 Residents prior to completion of the Phase 2 roadway (projected in 2024/2025 timeframe).
- Is it possible to make this drive one-way to prevent conflicting traffic?

Waiver Request 2 - Show True North on Subdivision Plan. SME recommends approval of this waiver request.

Waiver Request 3 - Street Signs. Applicant requests waiver from requirement to show street signs until reviewed by Town E911 Administrator. SME recommends approval of this waiver request.

Waiver Request 4 - Trees over 10-inch dbh. SME recommends approval of this waiver request.

Chapter 229: Site Plan Review

SME has reviewed the applicable sections of Chapter 229 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 229 requirements.

Section 229-10(B) – Traffic, Circulation and Parking.

12. Please provide more detail on the anticipated use of the existing driveway from Greely Road to the proposed Community Center. The driveway will likely be used in a limited capacity by the Phase 2 residents travelling to restaurants or shopping in Yarmouth and will serve as an access for sales staff, prospects, and visitors. The traffic report prepared by Sewall Co. (Diane Morabito, PE, PTOE) is consistent with a low level use.
13. SME recommends that the Applicant provide additional detail on the required parking for the Community Center in accordance with Zoning Section 315-57. If this community center will be private, it appears that parking should be provided at the rate of one space per member. Refer to Exhibit 1 Wastewater and Parking Analysis for an comparative analysis of the Sectoin 315-57 requirements which do not fit specifically to the proposed Community Center use. The design team has used the closest use standards to apply to the Community Center Parking and submitted to the CEO for review. Refer to Sheet C6A for the parking tables as well.
14. Please provide additional information on pedestrian access within the Community Center site proper. Pedestrian access will be provided through the Community Center to the new gated pool facility via interior locker rooms to be part of internal building renovations. Access from the residences will be guided via a mowed path though the fields to the new parking and barn area and via walking along or on the Little Acres Drive extension. Circulation around the Community Center Building will be via the driveways into the building (with new ADA Access to be designed as part of the building permit process) so as not to encroach into the lawn and maple trees around the side of the Community Center.

Section 229-10(H) – Exterior lighting.

15. Please outline locations for exterior lighting on the Community Center, if any will be added. The 24 space lot will have two of the 16 foot Beacon® Light fixtures (See Exhibit 9 of January submittal). The barns have wall mounted security lights currently which illuminate the gravel areas around the barn. Final lighting around the pool and building is proposed to be coordinated with the building permit process If acceptable to staff.

General Comments

(Note –sheet numbers have been revised in cases and an additional plan sheet added).

16. Plan Sheet C1 – SME recommends that the label for Phase 1 be revised to indicate 53 cottage units so that the total is 105 on the plan, as proposed. Revised.
17. Plan Sheet C2 – Please add and label the stream locations and setbacks on the plan to demonstrate where development is proposed within the Maine IF&W setback, if it is. Added Labels.
18. Plan Sheets C3 through C6A – Please provide contour labels and identify areas where slopes are in excess of 3:1 and require stabilization beyond loam and seed. Added contour labels and slope designations.
19. Plan Sheets C3 through C6A – Please edit storm drain and structure labels so that they are easily identified. Several of them appear to be behind other lines or labels. SD labels added.
20. Plan Sheet C3 – Please provide details on utility sizes on Road 3. It appears the utilities dead end at the end of the road. Will these require a blow-off, cap and plug, or additional measures at the end of the pipes? Additional Utility information has been added to the plans.

21. Plan Sheet C3 – It appears that the 12-inch water line is shown through Culvert 1 near STA 47+75. This has been corrected.
22. Plan Sheet C3 – Does Underdrained Soil Filter drain to Buffer 3? It drains to Buffer 1 through the piping in Little Acres Drive.
23. Plan Sheet C4 – Please add storm drain pipe and structure labels for review. Information added.
24. Plan Sheet C5 through C6A – Please provide additional information on the drainage proposed at the Community Center and how flows will be directed to Buffer 4. Currently, the grading in the area appears to require a culvert at the entrance to the 39-space parking area. Refer to the newly numbered CC Site Plan Sheet C6C. The parking lot has been moved to behind the barn eliminating the need for a culvert. The parking will sheet flow to the buffer on the grass slope below.
25. Plan Sheet 6A – Please provide more information on the proposed improvements at the Community Center, including: (Refer to Plan C6C for additional information, parking data, notes, and general phasing information.)
    a. Labels and dimensions for proposed parking, access-ways, paved areas, and site improvements.
    b. Spot grades and drainage within the existing and proposed paved areas, including at the accessible parking area.
    c. Will the 5 parking spaces east of the leach field will be grassed parking spaces?
    d. It appears that the 39-space parking area will be paved and lit? This does not seem to match the language in the application that refers to this area as overflow parking during gatherings.
    e. The test pit symbols on the plan are large and not labelled. (Refer also to the Geotechnical boring logs in Exhibit 3 to this submittal.)
    f. Please provide additional information on landscaping around the community center. Refer to Plan C12. There is substantial matured landscaping along with specimen trees which provide the character of the facility. Minimal additional landscaping is required and the SHC Ordinance (Chapter 315-28) discourages changing the character or landscaping in the view shed and in front of the buildings.
26. Plan Sheet C7 – Please show cross-pipe SD01 on the profile. It appears it may interfere with 12" water line . Plan corrected.
27. Plan Sheet C7 – It appears that the water line conflicts with Culvert 1. Plan corrected.
28. Plan Sheet C7 – Please confirm that the pipe slope and outlet of SD06 will work with the grading around the stone berm level spreader at Buffer 2. This has been reviewed and we feel it is satisfactory.
29. Plan Sheet C7 – Please add sewer manholes to profile sheet. Plan has been updated.
30. Plan Sheet C8 – Please add vertical grid labels for review of project specifics. Plans have been updated.
31. Plan Sheet C9 – Please add the sewer main and structures to the profile. Plan has been updated.
32. Will Plan Sheets C7 through C10 – Please label utility pipes and structures shown on the plans. Plan has been updated.
33. Plan Sheet C12 – Please clarify if additional snowmobile trail is proposed. It is shown in the legend, but not on the plans. No additional snowmobile trail is proposed. We are working currently with the Recreational Trails Subcommittee on trail locations and will be updating the Trails Masterplan as well.

34. Subdivision Plat S1-3 – Additional information to the drawings prior to final approval, including stream locations and setbacks and stormwater and utility easements, if required. The plats have been updated. Some information was overlooked and will be added for Final Plan preparation
35. Roadway Sections and Details Sheet C13 – Please add a detail or notes for the section of road that transitions from 22-feet wide to 20-feet wide, including sections for the transition. A transition area has been labeled on the plans and notes added.
36. Civil details C15 – The Town of Cumberland does not usually include ladder rungs in catch basin structures. SME recommends the applicant amend the plans to reflect Town Construction Standards. We will address this for final plans.
37. Plan Sheet C28 – It appears that a specific module detail was missing on this drawing. The plans have been reviewed with Focal Point and minor adjustments made.
38. Plan Sheet C28 – Please provide grading details over the R-Tank units and treatment modules. Grading over and adjacent to the R tanks has been revised on the Grading and Drainage sheets to both lower the grades and eliminate a large section of the Stone Strong® Wall.
39. Please confirm that there is no PRE2 Drainage Plan included with the set. Confirmed, No Pre2 Plan.
40. Please provide additional information on construction of stone bermed level spreaders in the plan set, including grading, pipe outlet, and berm construction. Some of the BMP Details have been updated and notes added regarding BMP's. Several remain and we would request that these be included for Final Plan review.
41. Please provide information on proposed wetland impacts. There did not appear to be labels for impacts included within the plan set. Refer also to the January 14, NRPA Application for locations of wetland impacts. The plans have added a wetland impact layer to the grading plans.
42. SME recommends that the areas of boulder or segmental block retaining walls be labeled on the plans with grading design details confirmed. Walls have been labeled over the CAD contours.
43. There does not appear to be a profile for Road 1 in the drawing set provided.
44. Please provide any review comments from the Maine DEP on the stormwater general and flooding standards received during the application process. Comments will be provided as they are received. We did receive one comment from the Corps of Engineers recommending widening the stream culvert closer to 1.2 times bankful width. The culvert width has been increased to 15 feet (double box).

Sincerely,

Frederic (Rick) Licht, PE, LSE
Principal

Encl: As Noted

Cc: Chris Wasileski; OceanView at Cumberland LLC
Christian Haynes; OceanView at Cumberland LLC
David Haynes; SeaCoast Management Company
Scott Anderson; Verrill Dana LLP
Chris Belanger; Belanger Engineering
Rex Croteau; Titcomb Associates
Mark Hampton; Hampton Associates

TOWN OF CUMBERLAND, MAINE
290 TUTTLE ROAD
CUMBERLAND, MAINE 04021
TEL: 207-829-2205 FAX: 829-2224

January 14, 2020

Mr. Rick Licht, PE, LSE
Licht Environmental Design, LLC
35 Fran Circle
Gray, Maine 04039

Re: Ocean View Phase II
Cumberland, Maine

Dear Rick:

The Town of Cumberland agrees to accept the sewer design flow from Phase II of your project off Tuttle Road. The Town has the capacity to handle the requested flow amounts. Each of the units will be required to have its own account and each permit will be $500 plus a $50 inspection fee. Monthly bills will be assessed upon occupancy through the Portland Water District. All inspections and permits are coordinated through the Codes office at Cumberland Town Hall.

Cumberland is a relatively new sewer system (less than 30 years in age) and we have been fortunate to have limited inflow and infiltration in our system. We presently own 30% of the Falmouth Treatment Plant. This new flow would be pumped via our Tuttle Road / Rt 88 distribution system.

Please let me know if you have any additional questions regarding this request.

Sincerely,

William R. Shane, P.E.
Town Manager

cc: Carla Nixon, Director of Planning
Bill Longley, Code Enforcement Officer

LICHT
ENVIRONMENTAL DESIGN, LLC

June 30, 2020 (Via Delivery & Email) 16.084.1

Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Cumberland Crossing – Phase 2,
228 Greely Road, Cumberland
SUBDIVISION AND SITE PLAN ADDENDA-2 RESUBMITTAL
(Map R04 Parcel 34A)

Dear Carla:

On behalf of OceanView at Cumberland, LLC, we are pleased to present for Planning Board review this **Addenda-2** submittal which supplements the Plans and Addenda-1 Submittal of February 25th, 2020 and follows up on the January 21st Planning Board meeting. Given the Covid-19 situation, our schedule has been pushed back somewhat and we felt it would be a prudent use of time to further address comments as well as update Staff and the Planning Board with some minor revisions to the site program. Addenda-1 and Addenda 2 should be reviewed together to provide a foundation for the updates and minor modifications proposed since the last Planning Board meeting in January.

This submittal includes 2 hard copies and an electronic copy of the following information:

A. Cover Letter
   Attachment 1 - Responses to Sevee & Maher review letter dated March 4, 2020
   Attachment 2 - Portland Water District Ability to Serve Letter
   Attachment 3 - CMP 905 Electrical Plan (11 by 17 inch reduced)
B. Subdivision/Site Plans entitled "Cumberland Crossing – Phase 2, Tuttle and Greely Roads, Cumberland Maine" prepared by Belanger Engineering and Titcomb Associates, Surveyors, revised 06-15-20.
C. Stormwater Management Report prepared by Belanger Engineering, revised June 15, 2020 (Submitted as PDF Electronic Copy)

Comments received and addressed herein include:

1. Staff Memo dated March 12, 2020.
2. Sevee and Maher peer review letter dated March 4th, 2020
3. Conservation Commission Recreation Trails Subcommittee memo dated March 5th, 2020.
4. Meetings with abutters

I. GENERAL PLAN UPDATES:

A. E911 Road Names: Road Names have been assigned and revised based on initial comments from the Assessor and updated on the current plan set for final acceptance.

B. Utility Updates:

1. Minor plan revisions have been made per peer review comments. (Refer to Attachment 1 for specific changes.)
2. Water Service – After careful consideration of the anticipated opening of the Community Center and best approach to servicing that facility, it has been decided to not have a separate water service on the north side of the community center and instead install the first phase of the municipal 12 inch watermain from Greely Road up to the southeast corner of the barns in the 50-foot easement in the early phases of the project and connect the fire and domestic services to the barn and community center to replace the existing well system. The remainder of the water system would commence at the end of Phase 1 on the opposite end of the project and continue northward through the project to loop through to Greely Road in the later phases of the development.
3. Electric Service – CMP has indicated that electric service must come from Greely Road. This will require a drop pole and underground service from Greely Road southerly to the first marketing phase of the Phase 2 development at the beginning of the Phase 2 project. Due to logistics of timing with the culvert crossing in Phase 2 the project team is exploring directional drilling for electric and communications under the main stream for coordination with the final CMP "905" design plan. (See Attachment 3 for a reduced copy of the CMP 905 plan.)
4. Sewer and Water service to Val Halla Golf Course – At the request of the Town Manager a 20-foot easement from the culdesac at Leonard Lane to the golf course near the 14th green has been added and utility stubs for the low pressure sewer and a 2 inch water service added. The developer will provide service stubs and a meter to the property line for the Town to extend through the easement into the golf course for a planned restroom facility.
5. Lighting Plan (See Plans ES-1 and 2): An additional light has been added near the golf course "triangle" easement. A final photometric plan will be provided for Final Plan review.

C. Community Center Design:

Responding to Planning and CEO comments, the applicant has retained the services of Gawron-Turgeon Architects to perform a code and life safety review of the existing farmhouse for re-purposing as the Community Center. Additionally a review of fire suppression is being conducted by Eastern Fire which will be reviewed with the State Fire Marshall. This design effort is ongoing currently.

1. Parking and Access: Refer to the February Addenda-1 Section 1.3 and Plan C6A for details of the parking located to behind the barn. At total of 34 parking spaces are provided.
2. Subsurface Wastewater Disposal System and new Low Pressure Sewer Connection: Refer to Addenda-1, Attachment 1 and Plan C6A for a detailed analysis of projected water/wastewater usage and phasing out of the septic system.

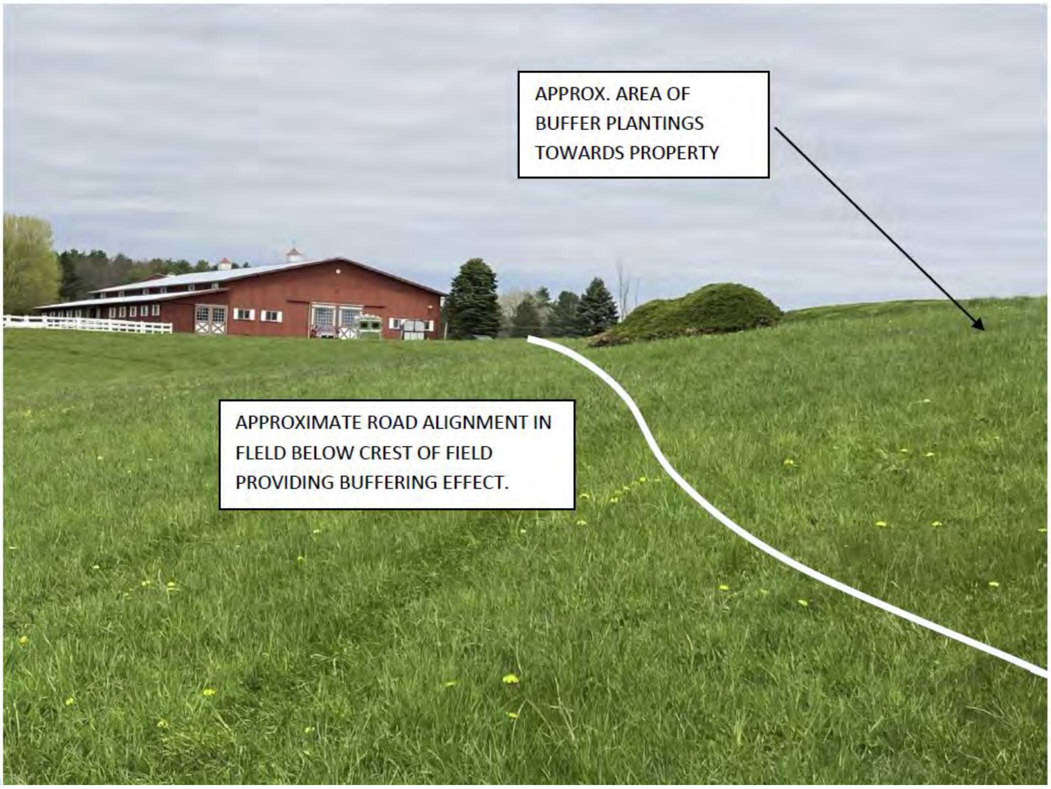
D. Sidewalks and Access to Community Center:

In the February 25th Addenda-1, a waiver request #5 was made to eliminate any sidewalk from Station 62+00 past the main culvert to the Community Center and instead create a grass walking path across the field connecting to the barns and parking behind the barn. That waiver request remains in effect for the Board to act on, however the path has been revised to a stonedust surface with gravel base to provide a more stable walking surface.

Based on comments received and a field review with the abutter, Tom Netland, the location of the sidewalk transition/crosswalk to the stonedust path has been moved further "down the hill" towards the culvert and the path to the Community Center shown as stonedust as noted above.

E. Landscape Buffer at fields:

The applicant's team and landscape architect have been working closely with Tom Netland to provide and refine a landscaped buffer (Buffer Area B) along Little Acres Drive in the open field areas. A subsequent (Covid safe) site meeting was held in May and the Landscape Plans revised (Plan Sheets C11A and C11B). The buffer plantings were modified from approximate Stations 61+50 to 63+50 and a note added to field coordinate plant locations with Mr. Netland when the buffer is installed. The phasing of installation will be commensurate with the construction of the road in this area. (See Photograph below which also shows the relation of the road to the crest of the field further providing additional visual buffer from Mr. Netland's property and clinic.



Landscape Buffer and Little Acres Drive Road Alignment at field.

F. Trail Revisions: Minor changes in the trail system and linkages. (Refer also to Section I.5 of the February Addenda-1 and to Plan Sheets C2A –Aerial Plan and C12 –Trail and Walkway Masterplan.). **The following updated trail information also responds to the Lands and Conservation Commission Recreation Trails Subcommittee memo of March 5th, 2020.**

The applicant's team conducted a site walk on February 26th with Toby Young and John Jensenius, Chair of the Recreation Trails Subcommittee to walk the so-called Val Halla Boundary trail and discuss internal trails. Since that time with the onset of the Covid-19 pandemic there have been some very real consequences and changing attitudes from seniors and prospective residents on issues of security, health and safety on internal trails and effects on sales not only at Cumberland Crossing but at OceanView's other communities. The developer has had to adjust the philosophy towards public use of on-site trails. The following are now proposed and reflected in the Trail and Walkway Masterplan:

1. The Val Halla boundary has been staked in the field to identify the property line. The proposed Boundary trail can follow from the 5th tee area northerly along the property line mostly in woods areas on the golf course side of the boundary except for a few areas where it makes sense to go onto the Cumberland Crossing property.
    a. The trail will utilize the existing 17th cart bridge over the stream. We would recommend a bell or other safety system be installed by the Town to advise golfers and walkers.
    b. It was discovered that a portion of the project boundary buffer has been cut near the 17th green by accident leaving this section open for location of the trail at the property line.
    c. The northern section to Greely Road at the farm fields starting at the 13th tee will be located on the Cumberland Crossing property but on the west or golf course side of the white vinyl fence. There is approximately 10-18 feet of trees and scrub on the west side of the fence to locate a trail to Greely Road.
2. Internal Trail Loops: The two internal woods trails will be looped internally with no connection to the Boundary trail for purposes of security and safety of the residents who have expressed concerns with open access to the public walking behind their homes. By the same notion, Cumberland Crossing will not advertise internal trails as public.
3. Snowmobile Trail:
    a. As stated at the January 2020 Planning Board meeting and reinforced in Addenda-1 there will be no snowmobile use or connection allowed to Greely Road or elsewhere on the property.
    b. The only exception to 3.a is the winter connection of the Town Trail at the current 5th tee to access the winter golf cart paths as a marked snowmobile trail. The construction of Little Acres Drive will provide sidewalk and curb tip downs to an at- grade crossing on the road and a marked crosswalk for snow machines to continue to use this trail link from the Town land to the golf course. Refer to Plan Sheet C3A for the crossing location and details.
4. Phasing of Trail Construction:
    a. In general trails will be constructed in a phased manner consistent with the development and build-out of the neighborhoods where the trails are located – not prior to such time.

   b. Phase 1 pedestrian connection to the Community Center (until Little Acres Drive and sidewalks are constructed.): The applicant intends to provide recreational access from Phase 1 into the former Godsoe property, connecting to the existing farm tote roads and/or the farm property for "recreational use" by the Cumberland Crossing residents if desired. Access to the Community Center or pool from Phase 1 (until the road connection is completed) will typically be via driving or via Cumberland Crossing vans for transport.

G. Stormwater Management: Refer to the accompanying Stormwater Management Report Revised 06-15-20 by Belanger Engineering (submitted as a PDF file) and the Subdivision Plans for revisions to the stormwater analysis which include:

   1. Stream Crossing Culvert – Increased in size per Corps of Engineers comments to 16 foot wide by 9 feet tall (or double 8 by 9 foot culvert.). The plans reflect additional grading and wall modifications in this area.
   2. Hydrologic Calculations have been updated reflecting the new culvert and minor stormwater system modifications. The post development analysis demonstrates that there will be no increase in storm event peak flows at the property line of Mr. Netland as well as at the outfall of the railroad culvert offsite. The 100 year FEMA Zone A revised elevation is shown for a LOMA submittal to FEMA.
   3. Focal Point Stormwater System – This system has been adjusted to provide DEP stream setbacks of 25 feet and reduced the amount of walls required.

II. RESPONSES TO SEVEE & MAHER REVIEW COMMENTS:

Refer to Attachment 1 for responses to Sevee & Maher review comments dated March 4, 2020.

III. RESPONSES TO TOWN PLANNER COMMENTS DATED MARCH 12, 2020

1. Entrance Fee Model in lieu of HOA Association: The applicant will provide information on this form of ownership which is based on a national model, under separate cover to the Planner.
2. Signage Tuttle Road and Greely Road Entrances: The applicant requests that this information be provided at Final Plan review. Signage will be very subtle in character to maintain a residential feel for the project.
3. Photometric Plan: The applicant agrees to provide for Final Plan review.
4. Subdivision Notes: The Subdivision Plats, Sheets 1-4 of 4 have been updated. Any additional notes required by the ordinance or staff can be added for Final Plan review.
5. PWD Ability To Serve Letter: An updated letter is provided as Attachment 2.
6. MDOT Entrance Permit: The entrance permit, issued for Phase 1 was based on 52 units in Phase 1 and an "anticipated 40-50 units in a future Phase 2." The geometrics and conditions of the MDOT entrance permit will not change with the addition of Phase 2. The current entrance permit is valid for Phase 1 and 2 of the project.

IV. DEP PERMITTING:

The applicant has received comments from the DEP and Corps of Engineers and expects to provide responses in a supplemental submittal to these agencies in the next week.

V. SUMMARY:

We believe that this Addenda -2 submittal together with the information submitted with the February 25th, 2020 Addenda -1 submittal address Planning Board comments provided at the January Planning Board meeting together with additional refinements and improvements to the plans as noted herein.

We look forward to a virtual on-line meeting with the Planning Board on July 21st to review the plan and project updates in further detail. In the meantime should you have any comments or questions please do not hesitate to contact me.

Sincerely,

Frederic (Rick) Licht, PE, LSE
Principal

Encl: As Noted

Cc: Chris Wasileski; OceanView at Cumberland LLC
Christian Haynes; OceanView at Cumberland LLC
David Haynes; SeaCoast Management Company
Scott Anderson; Verrill Dana LLP
Chris Belanger; Belanger Engineering
Rex Croteau; Titcomb Associates
Gino Mancini; Mancini Electric
Diane Morabito; Sewall

Attachment 1

RESPONSES TO SEVEE & MAHER REVIEW MEMO
DATED 03-04-20

SME
SEVEE & MAHER
ENGINEERS

4 Blanchard Road, P.O. Box 85A
Cumberland, ME 04021
Tel: 207.829.5016 • Fax: 207.829.5692
info@smemaine.com
smemaine.com

March 4, 2020

06-30-20 RESONSES PROVIDED
LICHT ENVIRONMENTAL DESIGN, LLC
AND BELANGER ENGINEERING IN RED.

Ms. Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Road
Cumberland, Maine 04021

Subject: Peer Review of Cumberland Crossing – Phase 2
Preliminary Subdivision and Site Plan Application – Addenda -1
Tuttle Road & Greely Road, Cumberland, Maine

Dear Ms. Nixon:

As requested, Sevee & Maher Engineers, Inc. (SME) has conducted a peer review of Addena-1 to the preliminary application for a Major Subdivision and Site Plan for the proposed Cumberland Crossing – Phase 2 senior living community located off Tuttle Road. In addition, the project is required to submit a Shoreland Zoning Application for impacts within a Stream Protection District. The application materials received by SME were prepared by LICHT Environmental Design, LLC (LICHT), and consist of the following:

- Application package with cover letter prepared by Frederic Licht, P.E., L.S.E., dated February 25, 2020;
- Project plan set dated February 24, 2020; and
- Addenda-1 to the 12-18-19 Stormwater Management Report dated February 24, 2020.

PROJECT DESCRIPTION

The Applicant proposes to develop the 59.6-acre Godsoe farmstead as Phase 2 of the Cumberland Crossing, formerly Oceanview at Cumberland senior living facility. Phase 2 will include an additional 52 senior cottages and associated infrastructure, utilities and stormwater management. This will increase the approved senior cottages to 105 total between Phase 1 and Phase 2.

The parcel is located at 228 Greely Road which will be redeveloped and renovated from the current equestrian farm to a formal community center. The development will be accessed from Phase 1 of the development off Tuttle road by a 3,300-foot extension to Little Acres Drive. Access from Greely Road will be limited to preserve a 500-foot scenic view area. The subdivision will be served with public utilities, including water, sewer, natural gas, electric, telephone, and cable.

This project is being reviewed as a Major Subdivision as outlined in Chapter 250 - Subdivision of Land of the Town of Cumberland Ordinances, most recently amended and adopted on January 12, 2011, and Chapter 229 - Site Plan Review, most recently amended and adopted on March 26, 2012. The comments below relate to the appropriate Ordinance Sections.

Chapter 250: Subdivision of Land

SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.

Section 250-4(N) – Stormwater

1. Please confirm that the stormwater model was updated with the revisions to the Community Center Impervious area and the adjustments to the FocalPoint system.
   Refer to updated Stormwater Report dated 06-15-20 which includes CC Impervious area updates.
2. Please submit a full copy of the revised stormwater management report with the Final Plan for detailed review.
   A PDF Copy of the revised Stormwater Report is included with the June Addenda-2 Submittal.

Section 250-29 – Review and approval by other agencies.

3. SME understands the following permit applications have been submitted and are under review: Reviews are in progress. Responses to Agency Comments are being submitted.
   - Maine Department of Environmental Protection (ME DEP) Site Location of Development Act (SLODA) permit,
   - ME DEP Natural Resources Protection Act (NRPA) Tier 2 permit for proposed wetland impacts,
   - United States Army Corps of Engineers (USACOE) permit for wetland impacts, proposed stream crossings, and culvert replacements,

Section 250-33 – Utilities

4. SME understands Central Maine Power (CMP) has been contacted and a final design plan for the power and communications will be provided with the Final Plan application.
   Correct. CMP is working on the Phase 2 CMP -905 Plan Design with power to be supplied from Greely Road to an underground system. The design team and Mancini Electric are evaluating a directional bore under the main stream due to the timing of the full culvert and fill at the crossing. A final CMP plan is expected shortly.

Section 250-35 – Sewage disposal.

5. Please provide design of the future force main connection from the community center to the proposed force main in Little Acres Drive.

The force main from the Community Center and restroom in the barn have been added to Plan C6A. It is anticipated that a single grinder pump will service both buildings. Final details are under review with Crane Pumps.

6. Please provide engineering design demonstrating that the low-pressure pumps will be able to pump sewage from the Community Center or furthest extents to the Tuttle Road sewer system. SME understands this will be submitted with the final design.
   Correct. We will submit final engineering calculations from the designers at Crane Pumps with the Final Plans. This system is being evaluated to include 25 dwelling units (future potential) off Tuttle Road and the proposed Val Halla Golf Restroom being proposed near the 14th green.
7. Please confirm that the project will include 5-feet of cover over the sewer mains included in the project. Plan sheets C7 through C10 appear to indicate a cover in the 3-foot to 4-foot range. SME understands this will be updated, or additional info provided with the final design.
   The sewer force main has been lowered to 4-5 feet of cover typical.

Section 250-41 – Soil Erosion

8. SME recommends erosion control devices proposed for the project be labelled on the site plan, including silt fence, check dams, catch basin protection, etc.
   Erosion Control BMP Callouts have been added to the plans.

Section 250-45– Waivers and modifications.

Waiver Request 5 – Sidewalk Requirement for Little Acres Drive to Community Center.

The phasing plan provided estimates 158 future residents that may use the Community Center and walks throughout the property. With this level of use and consideration for wintertime conditions on the narrowed 20-foot wide road, SME recommends a formal walk be constructed to the Community Center. The location of the proposed grassed walkway seems appropriate, but we recommend it be constructed of a surface material that allows for winter maintenance.

The plans have been updated to both move the start of the pathway to the community center down the hill to the south (Station 62+50 Little Acres Drive) and make the path a 4 foot stonedust walkway. The Little Acres Drive connection to the Community Center is expected to see very light use – it is important both to the abutter and to the project to keep this road as a simple “park like” connection rather than a built up residential subdivision “road” which can also be used as a walking path in keeping with complete street policies.

On behalf of the applicant we wish to pursue the request for the Sidewalk Waiver #5 for this section of the road.

Chapter 229: Site Plan Review

SME has reviewed the applicable sections of Chapter 229 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 229 requirements.

Section 229-10(B) – Traffic, Circulation and Parking.

9. It appears that the Road names on the plans differ from the Cover Letter Comment 2. Plan Refinements.
   The road names have been updated and corrected. Refer to Plan C2 for an overall masterplan with E911 road names.

Section 229-10(H) – Exterior lighting.

10. SME recommends that the Applicant consider a timer for lighting at the Community Center be to turn off at night.
    We agree. Mancini Electric will add a timer to the lights.
11. SME understands that a Photometrics Plan will be provided with the final plan submission.
    Correct. A photometric plan will be provided with the final submission.

General Comments

12. Plan Sheet 3A – The grading on Northwind Farm Road appears to direct flow to a ditch line at the edge of pavement on each side of the road. Will this road be curbed?
    No. The 18 foot side drives are typically not curbed. Since the lawns and shoulders are sodded and drainage is minimal, this design simplifies the area and has been used successfully in all of the OV development communities. The sod edge acts as a gutter and this keeps the neighborhoods more intimate.
13. Plan Sheet 3A – The finished floor on unit 54 appears to be listed as 105.7, but the elevation around the building is approximately 85.
    The FFE Elevation has been corrected.
14. Plan Sheet 4A – Appears that a stone wall behind Unit 84 is not labeled and extends into the 100-foot stream buffer.
    A wall has been added at the south side of the stone level spreader. We will also evaluate the potential for a walk out unit for final plan design to reduce the wall height.
15. Plan Sheet 4A – Is retaining wall behind Unit 74 required? It appears that the 3:1 slope is suitable.
    Agree. A 3:1 slope has been added.
16. Plan Sheet 4A – Please add existing contours to plan sheet.
    The existing contours layer has been turned on and the line type darkened throughout the plan set to be more prominent for the reader.
17. Plan Sheet 6A – CB51 is labelled as SD51.
    CB 51 label has been corrected.
18. Plan Sheet 6A – The grading on Northwind Farm Road appears to direct flow to a ditch line at the edge of pavement on each side of the road. Will this road be curbed?
    The road off the end of Leonard Lane was incorrectly labeled and has been corrected to “Skipper Way”. See response to comment #12 which also applies here.
19. Plan Sheet 6C – Please provide more information on the proposed improvements at the Community Center, including:

    a. Spot grades and drainage within the existing and proposed paved areas, including at the accessible parking area.
    The plans have been updated with additional spot grades as noted.

20. Plan Sheet C7 – Please confirm cover over Culvert 5. It appears to be less than 2-feet and will conflict with the proposed gas main.
    The profile on Sheet C7A has been revised to indicate a gas main lowering at the culvert 5 crossing. We will evaluate the cover over the culvert with additional field survey data to verify the channel invert and provide for the Final Plans.
21. Plan Sheet C7 – It appears that SD1 will conflict with the sewer force main.
    The sewer force main has been lowered to avoid a conflict with SD-1.
22. Plan Sheet C9 – It appears that CB15 may not be at the low point in the road for drainage purposes. Please consider moving it to STA 22+77 to be at the low point.
    CB's 12 and 13 have been re-located at the low point at 22+77. CB 15 is located on the road slope/gutter at approx. Station 22+50.
23. Plan Sheet C10B – The utility lines do not show up on the profile.
    The utility lines have been added to Plan Sheet C10B profile. Additionally two culverts have been added to drain low points in the field. Inverts to be field adjusted as needed to match the existing field grades.
24. Plan Sheet C20 – The following storm drains are listed with zero or negative slopes; SD9, SD13, and SD26. Please revise to provide positive drainage.
    The Storm Drains have been corrected with positive slopes.
25. Plan Sheet C20 – The storm drain structure table appears to be missing CB 22 and CB 44.
    The numbers CB 22 and 44 were not assigned to a CB and skipped over.
26. Plan Sheet C27 – It appears the labels have shifted and need to be adjusted.
    The labels have been corrected. Note that the system has been reconfigured to reduce walls and provide a NRPA 25 foot offset from disturbance to the stream bank.
27. Subdivision Plat S1-3 – Additional information to the drawings prior to final approval, including stream locations and setbacks and stormwater and utility easements, if required. SME understands a final plan will be provided with the information.
    The Subdivision Plans have been updated (revised dated 06-15-20) Any missing information can be added for Final Plan review.
28. Please provide additional information on construction of stone bermed level spreaders in the plan set, including grading, pipe outlet, and berm construction. SME understands that
    Additional stone berm/level spreader information has been provided on the Grading Plans C3A-C5A and details on Sheet C17 Erosion Control Notes and Details.
29. Please provide a detail for the gravel parking lot at the Community Center.
    A gravel drive (& parking) Section has been added to Plan Sheet C13.

Please call me with any questions, or if you would like, I could meet with you to discuss our comments.

Sincerely,

SEVEE & MAHER ENGINEERS, INC.

Daniel P. Diffin, P.E.
Vice President/Civil Engineer

Attachment 2

PWD PHASE 2 ABILITY TO SERVE LETTER

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

December 2, 2019

Frederic (Rick) Licht, PE, LSE
Licht Environmental Design, LLC
35 Fran Circle
Gray, Maine 04039

Re: Oceanview at Cumberland Phase 2, CU
Ability to Serve with PWD Water

Dear Mr. Licht:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on September 10, 2019. Based on the information provided per plans dated November 27, 2019, we can confirm that the District will be able to serve the proposed project as further described in this letter. **Please note that this letter constitutes approval of the water system as currently designed. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- The District can confirm that the existing water and sewer systems in Tuttle Road and Little Acres Drive have the capacity to serve the additional single family house lots proposed within Phase 2 of the Oceanview at Cumberland Subdivision in Cumberland. A 12-inch ductile iron water main extension will be required within Little Acres Drive from the end of the Phase 1 water main extension to at least the center of the last lot to be served within Phase 2; a 4-inch ductile iron water main extension will be required within Mallard Way, from Little Acres Drive to the lost lot to be served within Phase 2.
- New 1.5-inch domestic water services may be installed from the 12-inch and 4-inch water main extensions within Phase 2 of the proposed subdivision.
- It is the District's understanding that all single family homes within the subdivision will require an NFPA 13D life safety sprinkler system. A single service line may be used to serve both domestic and fire protection needs. The split for the sprinkler service must be located after the water meter and must include a non-testable backflow prevention device.

Prior to construction, the owner or contractor will need to complete the Main Extension Initiation form and pay all necessary fees. PWD will guide the applicant through the new development process.

Existing Site Service

According to District records, the project site does currently have existing water service. A 12-inch diameter ductile iron water main installed in Little Acres Drive provides water service to the site.

225 DOUGLASS STREET P.O. BOX 3553 PORTLAND, MAINE 04104-3553
PHONE: 207.774.5961 FAX: 207.761.8307 WEB: WWW.PWD.ORG

Water System Characteristics

According to District records, there is an 12-inch diameter ductile iron water main in Little Acres Drive and a public fire hydrant located approximately 600 feet from the site. Recent flow data is not available in this area.

Public Fire Protection

The installation of new public hydrants to be accepted into the District water system will most likely be required. It is your responsibility to contact the Town of Cumberland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project. Based on the high water pressure in this area, we recommend that you consider the installation of pressure reducing devices that comply with state plumbing codes.

Private Fire Protection Water Needs

You have indicated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact MEANS to request a hydrant flow test and we will work with you to get more complete data.

Should you disagree with this determination, you may request a review by the District's Internal Review Team. Your request for review must be in writing and state the reason for your disagreement with the determination. The request must be sent to MEANS@PWD.org or mailed to 225 Douglass Street, Portland Maine, 04104 c/o MEANS. The Internal Review Team will undertake review as requested within 2 weeks of receipt of a request for review.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District

Robert A. Bartels, P.E.
Senior Project Engineer

Attachment 3

CMP 905 ELECTRIC DISTRIBUTION PLAN

This document and any attachments are considered:
BUSINESS CONFIDENTIAL
PROTECTED CRITICAL INFRASTRUCTURE INFORMATION

THIS DRAWING SHALL BE REVISED ON THE CADD SYSTEM ONLY

GPS COORDINATES DMS

//MAINE.MAPS.ARCGIS.COM

1.	43.80043	-70.231088
2.	43.797331	-70.225914
3.	43.794633	-70.236415
4.	43.792707	-70.232669

Customer:OCEANVIEW AT CUMBERLAND LLC
277 TUTTLE ROAD, CUMBERLAND, MAINE

Site Plan Produced By: BELANGER ENGINEERING
Address / Phone / Email:63 SECOND AVENUE
AUGUSTA, MAINE 04330
TEL:207-622-1462

Sheet Title: CUMBERLAND CROSSING PHASE 2 OVERALL PLAN
Revision #:N/A Date:12-18-19 Drawn By:N/A

Notification# 10300642168

X Primary Riser
▲ ○ Transformer Foundation
J ○ Junction Box
- - - Primary UG
〰 Secondary UG

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

PROPRIETARY

Central Maine Power Company (CMP) provides this drawing "as-is" and solely for the initial recipient's use. The recipient may not disclose the material or data in any form to any third party without CMP's prior written consent.

CMP does not guarantee or warrantee the accuracy of this drawing,or its use for any particular purpose. Comments concerning additions, omissions or errors should be sent to the CMP Distribution Automation and GIS Department. Any use of this drawing is at the user's sole risk. CMP shall not be Responsible for,and the recipient releases CMP from any and all claims or damages based on in any way on any use of this material or data.

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0	INITIAL DRAWING RELEASE	04/22/20	AJP	MLR	MLR	13430

Professional Engineer Seal
4/22/2020
MARSHALL LINWOOD RIPLEY
13430

DESIGNED MLR/
DRAWN AJP
CHECKED MLR/
APPROVED MLR
REVIEWED MLR

CUMBERLAND CROSSING
OFF POLE #76 GREELY ROAD
CUMBERLAND, MAINE
UNDERGROUND ELECTRICAL LAYOUT

CENTRAL MAINE POWER COMPANY
DISTRIBUTION DEPARTMENT
CENTRAL MAINE POWER
SCALE 1" =100' DATE 04/22/2020

905–5118
REV. 0

FILE NAME: 905-5118.dgn

BELANGER
ENGINEERING
CONSULTING ENGINEERS

Maine DEP SLODA
Permit Application
STORMWATER MANAGEMENT REPORT

Project: Cumberland Crossing Phase 2
Greely Road, Cumberland, Maine

Prepared By:
Belanger Engineering
63 Second Avenue
Augusta, ME 04330
207-622-1462

Prepared For:
Seacoast Management Company
20 Blueberry Lane
Falmouth, Maine
207-233-4194 – Chris Wasileski

CHRISTOPHER
S.
BELANGER
9098
LICENSED

Date: June 15, 2020

Table of Contents
Cumberland Crossing Phase 2, Greely Road, Cumberland, Maine

Stormwater Narrative – June 15, 2020
Cumberland Crossing – Phase 2 Godsoe Farm Expansion
Greely Road, Cumberland, Maine

Belanger Engineering has evaluated the proposed stormwater impacts resulting from the creation of a new residential Senior Housing Community located off Tuttle and Greely Roads in Cumberland. The property is shown on Town Tax Map R4 Lot 34A and is approximately 59.53 acres in size.

This approval will focus on the proposed development expansions located on Lot 34A (a.k.a. Godsoe parcel). In particular, the project creates 7.66 acres of new impervious area and 18.93 acres of new developed area. Approximately 3.91 acres of road, 0.88 acres of driveway, and 2.87 acres of building roof will be created. We expect to construct 52 residential cottages and community facilities to support them. An expansion of the Godsoe farm is also planned to support the project. We have modeled 0.71 acres of new impervious area to include parking around the barn and expansion of the access road to 20' wide per Town standards.

Project Location: The project is located off Tuttle and Greely Roads in Cumberland, Maine. The site is located across the street from the Cumberland Town Hall building.

DEP Jurisdiction: The proposed project includes the development of 18.93 acres of developed area and 7.66 acres of impervious area. The project does trigger the Site Law. The project is not within an urban impaired stream or a severely blooming lake. As a result, the Basic Standards, General Standards, and the Flooding Standard apply to this project. See Section 4A and 4B of the Chapter 500 Rules, pages 4&5.

Basic Standards
1. Erosion and sedimentation control plan – See Appendix A of Chapter 500 Rules
2. Inspection and Maintenance Plan – See Appendix A and B of Chapter 500 Rules
3. Housekeeping – See Appendix C of the Chapter 500 Rules

General Standards
1. Narrative
2. Drainage Plans
3. Calculations
4. Details, designs, and specifications for Underdrained vegetated filters, & Buffers.

Flooding Standards
1. Stormwater Management System must detain, retain, or result in infiltration of stormwater for the 2,10,25 storms such that the peak flows do not exceed "pre-development" conditions.

Surface water on or abutting the site: Runoff from the site drains southerly toward an existing 5'X6' Box Culvert under the railroad. Part of the farm area drains to an off site pond. The pond outlets and crosses the railroad. We have assumed a 24" outlet in this case. Runoff continues to drain toward Mill Brook and the Piscataquis River.

Alterations to Land Cover: The drainage study is conducted on the sites 59.53 acres. The existing ground cover is 100% woods and meadow in the cottage area. The Godsoe farm is open and has existing for many years. The proposed ground cover will result in approximately: 18% impervious, 17% lawn, and 65% woods and meadow.

Downstream ponds and Lakes: Runoff from the site drains to Mill Brook and the Piscataquis River. Enclosed is a U.S.G.S. Map showing the site location.

Historic Flooding: The property is fairly uniform with mildly irregular topography and typical slopes between 2 % and 18 %. The stream area may have localized flooding but is located within ravine areas and outside development areas. A portion of the site in the vicinity of the railroad and culvert crossings are shown as flood areas on the FEMA maps. We have calculated the 100 year flood elevations for the box culvert. We found the 100 year flood is at approximately elevation 62.0. See enclosed Firm Maps.

Alterations to natural drainage ways: Natural drainage ways will not be altered as a result of the proposed development. Pipe Arch's and Culverts will be installed to maintain current drainage flow patterns.

Proposed BMP's: Steep slopes will be rip rapped. Silt fence is shown at the bottom of all fill slopes, hay bale barriers and stone check dams will be used in ditches and/or around catch basins. BMP's proposed for this project are shown and described on the enclosed plans.

Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 6-15-2019						
Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

Proposed Conditions – Cumberland Crossing

The project will be accessed from Little Acres Drive and will extend a new road to the project area. The main access road is approximately 2257' long, 22' wide, curbed, and a 5' sidewalk will be installed on the right side. Several other spurs are located off this road. The spur roads will be 18' and 22' wide. The roads create 3.09 acres of impervious area.

The developer is proposing to construct 52 residential homes. We have assumed each house will have approximately 2400 s.f. (.055 ac.) of building footprint area including an optional garage. We have also assumed each driveway will be 24' by 32' (.017 acres) in area. This will accommodate a 2 bay garage option. Impervious area per cottage is .072 acres each based on the above assumptions. The driveways create 0.88 acres of impervious area. The cottages create 2.87 acres of impervious area. We have assumed the farm area will expand the road and parking and add 0.71 acres of impervious area.

The project creates 7.66 acres of impervious area and 18.93 acres of developed area. This is the basis of the general standards calculations below.

OV Cumberland Phase 2 Impervious Area Summary 6-15-2020								
Description	Road Length feet	New Impervious Area		New Lawn Area		New Developed Area		Comments
		s.f.	acres	s.f.	acres	s.f.	acres	
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Leonard Lane - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Monarch - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Skipper Way - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Firefly Lane - Sta 90+00-Sta92+30	140	4140	0.10					18', no curb
Luna Lane - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Grasshopper Lane - Sta 96+00-Sta98+00	140	3600	0.08					18' no curb
Crickett Lane & Northwind Farm Road	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5416	333733	7.66	459874	10.56	824534	18.93	

General Standard Narrative and Selected BMP's:

The developer will utilize the following BMP's for stormwater treatment and storage.

1. Grassed Underdrained Soil Filter Pond (1) – Maine BMP's Chapter 7.
2. Roof Dripline BMP – Maine BMP's Chapter 7.5.
3. FocalPoint Proprietary Subsurface Treatment and Storage Systems.
4. Forested Buffers adjacent to development
5. Forested Buffers with Stone Bermed Level Lip Spreader

Filter Pond

One Pond will be developed to support the project. The pond has been sized to store 1" X the watershed impervious area and 0.4" X the watershed disturbed area. An outlet control structure and spillway has been implemented in the pond to provide emergency overflow as required. The outlet control structure will also be the gravel drain outlet. Runoff will discharge to the adjacent wetland.

Roof Dripline

Roof driplines with capture roof areas and drain them through foundation backfill and discharge to footing drains. The roof dripline will be 3' wide and 1.5' deep and will be installed in roof drainage areas. Once treated, 4" drain pipes will outlet into the street catch basins or can daylight in forested areas behind the buildings as conditions allow. The roof driplines will store 1" X roof areas utilizing 40% voids.

Focal Point Proprietary System

Along the main access road, **we will utilize focalpoint which is an approved proprietary stormwater treatment system at one location along Little Acres Drive Extension.** We have followed the sizing guidelines from the manufacturer and the Departments approval letter dated February 2, 2017. Utilizing the Chapter 500 Design Worksheet / Checklist enclosed, we have sized the focal point system based on the drainage area being captured and treated. The following design elements are included with each location.
1. FocalPoint Bed Area (min. 174 square feet per acre of impervious area (e.g. 0.2 acres=35 s.f.)).
2. Verify a 0.95 inch Type III rainfall event is treated prior to activation of the overflow (typically 6-12"). We have provided 12" of storage in each treatment area.
3. Maintain a ratio of filter media (s.f.) to the temporary ponding volume (c.f.) at 1:5.

4. Subsurface Chamber Treatment row must be sized to treat the peak flow from a 1 year-24 hr storm event. The cultic 150XLHD requires (1 chamber per 0.185 cfs).
5. The subsurface storage basin will provide storage of 1" X Impervious Area and will control release over 24-48 hrs.
6. The design has been reviewed by the Manufacturer. The letter is attached.

Stormwater from 1.71 acres of impervious area and 2.41 acres of lawn area will drain to the focal point system. Runoff passes through a grassed filter strip or sediment forebay prior to entering the focalpoint filter system. This forebay captures the majority of the coarse sediment and provides pre-treatment prior to draining into the focalpoint media. Runoff then drains from the focalpoint system to the subsurface treatment row sized for the 1 year peak flow. In this case the system treats 1.71 acres of impervious area and 2.41 acres of lawn area. The minimum focalpoint bed area is calculated to be 466 s.f.. We have provided a 18'X26' bed area (466' s.f.). The system was modeled with a 0.95 inch storm and stores the volume without breaching the overflow outlet as required. The ratio of surface area to temporary volume is approximately 1:5. The subsurface treatment row requires 36 units of cultic 150XLHD chambers by ACF environment. In addition, approximately 931 R-tank "double-mini" units are needed to provide storage of the Water quality volume.

Forested Buffer

Portions of the back yard lawn areas that cannot be practically captured will drain toward the buffers located along the stream protection corridor. The back yards are largely pervious and will be graded to sheet flow into the undeveloped forested area below the back yard area. Note that buildings and pavement are being routed to other BMP devices and will not drain to the buffers. We have provided 100' buffers below the back yard lawn areas along the stream corridor as required by site law projects. We will utilize BMP 5.1 – Buffer Adjacent to Residential, Largely Pervious or Small Impervious Area. The buffer slopes are 9-15% generally and they are HSG C soils. Maine DEP BMP 5.1 - Table 5.2 suggests a forested buffer of 90 feet for a C soil. Table 5.3 requires a 70' buffer width from single family residential areas. We have provided a minimum 100' buffers adjacent to the back yard lawn areas which exceeds the minimum lengths. The added buffer width compensates for portions of the buffer that exceed 15%.

Forested Buffer with Stone Berm Level Spreader

Three forest buffers will be used to treat the project. Forested Buffer #1 treats 1.07 acres of impervious area and 1.59 acres of lawns. Buffer #2 treats 0.58 acres of impervious area and 0.26 acres of lawn area. Buffer #3 treats 0.16 acres of impervious area and 0.23 acres of lawn area. Buffer #4 treats 0.54 acres of impervious area and 0.17 acres of lawn. Table 5.5 requires 180' of berm per acre of impervious area and 54' of berm per acre of lawn area for slopes 9-15%. Soils are listed as Lamoine which is a C soil.

Cumberland Crossing Phase 2

Buffer Treatment Table

Treatment BMP	Soil Name	HSG	Slope	Buffer Length Feet	Impervious Area Treated Acres	Lawn Area Treated Acres	Stone Berm Level Spreader Width (180' X Imp.+54' X lawn) FB (240' X Imp.+72' X lawn) MB Linear Feet
Forest Buffer #1	Lamoine	C	9-15%	100'	1.07	1.59	278
Forest Buffer #2	Lamoine	C	9-15%	100'	0.58	0.26	118
Forest Buffer #3	Lamoine	C	0-8%	100'	0.16	0.23	34
Meadow Buffer #4	Lamoine	C	9-15%	100'	0.41	0.17	111
Meadow Buffer #5	Lamoine	C	9-15%	100'	0.16	0	38

General Standard Calculations

Calculations: BMP's will be utilized to treat impervious and developed areas as far as practical. The project is required to effectively treat 95% of the impervious area and 80% disturbed area as described in the rules as far as practical. Certain areas cannot practically receive treatment. Where treatment of 95% of the impervious area is not practical, the department may allow treatment as low as 90% of the impervious area if the applicant is able to demonstrate that treatment of a greater depth of runoff than specified in the standards will result in at least an equivalent amount of overall treatment for the impervious area. As described in the calculation, the project captures 98% of the "new" projects impervious area and 80% of the projects overall developed areas. At 90-95%, DEP recommends 05" & 0.02" additional storage per % below 95%. The BMP's captures proposed areas to the extent practical. The treatment area summary and general standard calculations are attached.

The project as developed meets the General Standards as outlined in the Chapter 500 stormwater rules. The General Standard calculation is shown on the post development drainage plan and is included in this report.

Post Area Summary and General Standard Calculation

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 6-15-2020

Subarea	Total Area sf	Total Area acres	Existing Impervious acres	New Impervious Area acres	New Impervious Area Treated acres	Existing Lawn acres	New Lawn acres	New Developed Area acres	New Developed Area Treated acres	Existing Woods/Field Undeveloped acres	Treatment BMP
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.41	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	369.00	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	122.00	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	8.51	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.32	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.31	4.02	4.03	0.86	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.36	0.94	0.94	0.00	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.00	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	3.20	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.06	719	
				>95%	98%	✓		>80%	80%	✓	

Flooding Standard

This drainage study will focus on the proposed impacts created by the Oceanview Cumberland Crossing residential project. The model compares flooding standard results as they cross the project boundary. The intent is to meet the pre-development peak flows.

The watershed has been estimated to be 1163 acres and is adjacent to Greely Road and Main Street. The top end of the watershed is above Main Street and is routed to several large road culverts installed under Greely Road and upper Main Street (Route 9). Runoff travels through the residential neighborhood and crosses through the Golf Course. Runoff travels overland through woods and field until it drains to a stream above the Cumberland Crossing Phase 2 site. Soils in the vicinity of the project site show the natural wooded areas to Lamoine soils which is a "C" soil. This stream drains through the development site and crosses the railroad by one 5'X6' box culvert.

These drainage areas are defined in our Stormwater Model as shown on the HydroCAD diagrams. Full-size drainage plans and stormwater calculations for the existing and developed site conditions are included with this report. Refer to the HydroCAD diagrams, calculations, report and drainage plans for modeling assumptions, subcatchments, flowpaths, drainage reaches, etc. Runoff calculations were performed for the 2-year, 10 year, and 25 year storm events in accordance with Cumberland Ordinances and DEP requirements. Results of the calculations are shown in the Summary Table for ease of comparison. In order to significantly reduce the volume of paper required to reproduce complete data and calculation reports for all design storms, partial HydroCAD reports were generated for the 2-10-25-year storm events (pre- & post-) for selected subcatchments.

Modeling assumptions: The flooding standard is required with this development because this is a Site Law Project. We have modeled the pond areas to demonstrate that the outlets have the required storage volume capacity and that they will pass the 25 year storm event without flooding the pond embankments. The “HydroCad” computer program was used to determine the peak storm water runoff for the pre- and post-development conditions. HydroCad is a storm water modeling system, which utilizes the TR-20 method developed by the Soil Conservation Service (SCS).

The design assumptions used for this project are:
Design storm: 24 hour, Type III rainfall distribution.
Rainfall: 24 hour precipitation values from U.S. Weather Bureau Technical Release No. 40:
2 year storm = 3.1 inches
10 year storm = 4.6 inches
25 year storm = 5.80 inches
50 year storm = 6.90 inches
100 year storm = 8.10 inches
500 year storm = 12.10 inches

Site specific parameters for the project are listed below:

Soils: Soils information to determine the hydrologic soil group for the site, are derived from the Soil Survey of Cumberland County by the United States Department of Agriculture Soil Conservation Service. The soils and hydrologic group are listed below:

Soil Classification	Hydrologic Group
BgB – Belgrade very fine Sandy Loam	HSG B
BuB – Lamoine silt loam	HSG C
BuC2 – Buxton Silt Loam	HSG D
DeB - Deerfield Loam Sand	HSG B
EmB – Elmwood Fine Sandy Loam	HSG C
Ls – Limerick – Saco silt loams	HSG C
Sn – Scantic Silt Loam	HSG D
SuC2 – Suffield Silt Loam	HSG C
SuD2 – Suffield Silt Loam	HSG C
SuE2 – Suffield Silt Loam	HSG C
WmB – Windsor Loamy Sand	HSG A
MeC – Melrose fine sandy loam	HSG C
Sz – Swanton fine sandy loam	HSG C/D

Ground Cover:

Pre-& Post Development: The watershed ground cover is modeled as woods, grass, meadow and impervious.

Cover Description	Curve Number:
Impervious	98
Woods	70
Lawn	74

PRE- & POST-DEVELOPMENT HYDROLOGIC RESULTS

Pond 38P – 5'X6' Box Culvert at Railroad

FLOODING STANDARD RESULTS POND 38P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.57	-9%
100 YEAR	242.48	234.44	-3%

Pre Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

Post Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.42
10 YEAR	58.06
25 YEAR	59.17
100 YEAR	61.65

Pond 81P – Pond and outlet at Railroad

FLOODING STANDARD RESULTS POND 81P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

Pre Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

Post Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

Pond 3P – outlet at Railroad

FLOODING STANDARD RESULTS POND 3P			
Storm	PRE	POST	DIFFERENCE
	C.F.S.	C.F.S.	%
2 YEAR	12.04	9.39	-28%
10 YEAR	25.22	20.78	-21%
25 YEAR	42.47	28.36	-50%
50 YEAR	64.8	42.3	-53%
100 YEAR	85.78	56.55	-52%

Pre Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.64
10 YEAR	57.78
25 YEAR	59.3
100 YEAR	59.86

Post Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.39
10 YEAR	56.89
25 YEAR	58.52
100 YEAR	59.51

Conclusion:

The above analysis points are located where the project crosses the property line and points of interest along the railroad. (See Ponds 3P, 34P, and 81P above). Peak flows are being maintained for the 2, 10 and 25 year storms at the existing 5'X6' Box Culvert at the Railroad Crossing (pond 38P). Peak flows are less than pre development flows. Pond 3P is located toward the back and drains toward a culvert at the RR crossings. Peak flows are being maintained in all three locations below the site. The project will maintain the pre-development peak flow as required for the existing project. Reach 43R, 55R and Pond 81P model the stream, wetland, and off site pond as it crosses the property line. These locations also maintain the pre-development flows as required.

One Filter Pond, 4 Buffers, stream buffer, and a focal point drainage system provide water quality and quantity treatment. The proposed pond has the capacity to control flow from the 100 year storm which exceeds the DEP Flooding Standards. Adjacent properties will not be flooded as a result of this project. The project does not significantly impact downstream structures or properties. We submit that the Flooding Standard has been met or exceeded with this development.

The proposed project captures 98% of the newly developed impervious area and 80% of the developed area as required to meet the General Standards. One Pond will be constructed to provide impervious treatment and storage. Each cottage will provide roof driplines (BMP 7.6) to provide building roof treatment and storage. The access road will install focal point devices to provide treatment and storage along the road. Finally, back yard lawn areas, that cannot be practically captured, adjacent to the stream will be sent to the forested buffer for treatment. The General Standard will be met with the above BMP's installed.

The Basic Standards will be met with the proposed erosion control plans and stabilization details provided. No additional water quality or quantity measures are warranted for the Cumberland Crossing Phase 2 Expansion Project. We submit that the project meets the Basic, General, and the Flooding standard as outlined in the Maine DEP Chapter 500 Stormwater Rules. The proposal maintains these standards as required.

Cumberland Crossing Property Maintenance:

PART 1: RESPONSIBILITY FOR MAINTENANCE

Cumberland Crossing Retirement Community will be responsible for maintenance of the stormwater systems. Contact Chris Wasileski at Seacoast Management Company.

PART 2: INSPECTIONS – During Construction and Post Construction

- Detention Facilities: One (1) Grassed Under drained Filter Pond
  Two (2) wet ponds
  - Embankment inspection and maintenance
  - Spillway maintenance
  - Outlet Structure sump cleaning and maintenance
  - Sediment removal and disposal
  - Stone Bermed Level Spreader Maintenance at outlet

- Detention Facilities: Focalpoint Devices and Detention Ponds
  - Debris removal from stone storage area (leaves, branches, trash, etc.)
  - Sediment removal and disposal

- Ditches, Swales, or other open stormwater channels
  - Embankment inspection and maintenance
  - Channel inspection
  - Sediment removal and disposal

- Culverts, catch basins, stormwater control structures
  - Embankment inspection and maintenance
  - Inlet and Outlet inspection
  - Debris removal and disposal
  - Stone Bermed Level Spreader Maintenance

- Buffers with Stone Bermed Level Spreaders
  - Buffer inspection and maintenance
  - Outlet inspection
  - Debris removal and disposal
  - Stone Bermed Level Spreader Maintenance

- Roof Dripline Filter BMP Maintenance
  - Sediment removal and disposal
  - Filter and Underdrain replacement
  - Debris removal and disposal
  - Stone Dripline Replacement
  - Foundation Sealant
  - Foundation Backfill

- Focalpoint filter media and underground pipe storage
    - Embankment inspection and maintenance
    - Channel inspection
    - Sediment removal and disposal
    - Pipe flushing and cleaning
    - Filter media replacement
    - Coarse sediment removal at focalpoint media inlet

The owners representative will inspect the detention ponds, roof driplines, swales, channels, stormwater structures, focalpoint devices to determine if the soil blockage or impaired capacity to pass flow exists. Inspections will be performed on a monthly basis from March to November, and quarterly during the remainder of the year. A record of inspections and maintenance or corrective measures shall be kept by the owner (see part 4).

PART 3: MAINTENANCE AND CLEANING

The owner will regularly inspect for sediment accumulation, obstructions, debris, and other potential causes for operational difficulty in the conveyance and detention system as described in Part 2. Immediate action shall be taken to remedy detrimental obstructions. This may include replacing the filter pond and roof driplines filter beds as necessary to allow infiltration and treatment to occur.

Cleaning out of catch basins, culvert cleaning, and other means necessary to ensure the stormwater system is maintained. Some additional measures (but not limited to) are shown below:

- Under drained filter Maintenance (One Filter Pond – Pond 47):
    - Soil Filter Inspection
    - Soil Filter replacement
    - Sediment removal and disposal
    - Mowing
    - Harvesting and Weeding

The owner will regularly inspect the soil filter after every major storm event in the first few months to ensure proper function. There after the filter should be inspected bi-annually to ensure that it is draining within 24 hours. The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. Sediment shall be removed from the filter bed annually. The bed shall be hand raked and re-seeded as necessary. The removed sediment shall be hauled off site and disposed of in a stabilized area. Mowing of the filter area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the filter zone will be completed as necessary.

- Stormwater Facilities: Stormwater Buffers with Stone Berm Level Lip Spreaders

Inspect the culvert outlets to ensure it is working and in proper function. Inspect the stone berm level spreader to ensure the level lip is working and that runoff is evenly distributed along the entire stone berm. Inspect the buffer below the stone berm to ensure it is stable. Repair erosion areas immediately. Install erosion blanket if needed to prevent additional erosion.

- Wet Pond maintenance – (2 Total) Periwinkle Wet Pond and Mallard Way Wet Pond
  - Gravel Drain Inspection
  - Gravel Drain replacement
  - Outlet Structure sump cleaning and maintenance
  - Sediment removal and disposal
  - Mowing
  - Harvesting and Weeding

The owner will regularly inspect the wet pond after every major storm event in the first few months to ensure proper function. There after the pond should be inspected bi-annually to ensure that it is draining within 24 hours. Sediment shall be removed from the pond when sediment reduces the pond volume by 25%. The removed sediment shall be hauled off site and disposed of. Mowing of the pond area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the pond and pond back slopes will be completed as necessary. The pond outlet shall be inspected for erosion and make repairs as needed annually.

- Focalpoint filter Maintenance – one (1) locations Sta 19+50 right side along Little Acres Drive:
  - Soil Filter Inspection
  - Soil Filter replacement
  - Outlet Structure sump cleaning and maintenance
  - Sediment removal and disposal
  - Mowing
  - Harvesting and Weeding

The owner will regularly inspect the soil filter after every major storm event in the first few months to ensure proper function. There after the filter should be inspected bi-annually to ensure that it is draining within 24 hours. The top several inches of the filter shall be replaced with fresh material when water ponds on the surface of the bed for more than 72 hours. Sediment shall be removed from the filter bed annually. The bed shall be hand raked and re-seeded as necessary. The removed sediment shall be hauled off site and disposed of in a stabilized area. Mowing of the filter area shall be limited to 2 times per year to maintain grass heights to less than 12". Weeding and pruning of growth within the filter zone will be completed as necessary. Replacement of the Treatment Row and sediment removal will be completed when 40% full or when the system is bypassed and no longer treating stormwater. The R-Tanks storage units shall be maintained as suggested by the manufacturer.

- Stormwater Facilities: Catch basins, Wet Ponds, Culverts,

A mandatory scheduled maintenance will be performed every four weeks for a period of one hundred and twenty (120) days and will begin after satisfactory completion and acceptance of landscape construction. Ongoing maintenance will be required as necessary.

- Parking/Display Areas:

All sand, salt, etc. accumulated when sweeping the parking and display areas, shall be trucked off-site for disposal. The parking lot shall be swept annually in the spring.

PART 4: RECORD KEEPING

The owner will maintain inspection records, with recordings of condition of basins, and pipes and annotation of substantial precipitation events or mitigating circumstances in the intervening time for trending to develop the anticipated preventive maintenance schedule.

PART 5: MAINTENANCE CONTRACT

Should proprietary devices be utilized, a maintenance contract will be established with the manufacturer for regular maintenance and cleaning of the device. Focalpoint manufactures will be on site through the installation process. A maintenance contract will be maintained as necessary to ensure proper system performance of the focal point system. Other facilities included catch basins, culverts, wet ponds will also be maintained annually or as required by inspection. The intent being to maintain a working system.

PART 6: RE-CERTIFICATION

The owner shall submit a certification to Maine DEP within three months of the expiration of each five year interval from the date of issuance of the permit. The owner shall submit the maintenance log which identifies inspections completed, erosion problems found, when corrective action was taken, and who completed the work. The certification will include a statement indicating that the stormwater system is working and is being maintained in working condition in accordance with the permit requirements.

Maintenance Log Sheet

OceanView @ Cumberland Retirement Community

Name	Maintenance Task Completed	Date

Maine DEP Chapter 500 Appendix C. Housekeeping – Updated 2020

These performance standards apply to all projects.

1. Spill prevention. Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at http://www.maine.gov/dep/spills/emergspillresp/

2. Groundwater protection. During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust. Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Dewatering a stream without a permit from the Department may violate state water quality standards and the Natural Resources Protection Act.

4. Debris and other materials. Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering. Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the "Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection."

6. Authorized Non-stormwater discharges. Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

(a) Discharges from firefighting activity;
(b) Fire hydrant flushings;
(c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
(d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);
(e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
(f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
(g) Uncontaminated air conditioning or compressor condensate;
(h) Uncontaminated groundwater or spring water;
(i) Foundation or footer drain-water where flows are not contaminated;
(j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));
(k) Potable water sources including waterline flushings; and
(l) Landscape irrigation.

7. Unauthorized non-stormwater discharges. The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non_stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:

(a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
(b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
(c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
(d) Toxic or hazardous substances from a spill or other release.
(8) Additional requirements. Additional requirements may be applied on a site-specific basis.

Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 6-15-2019

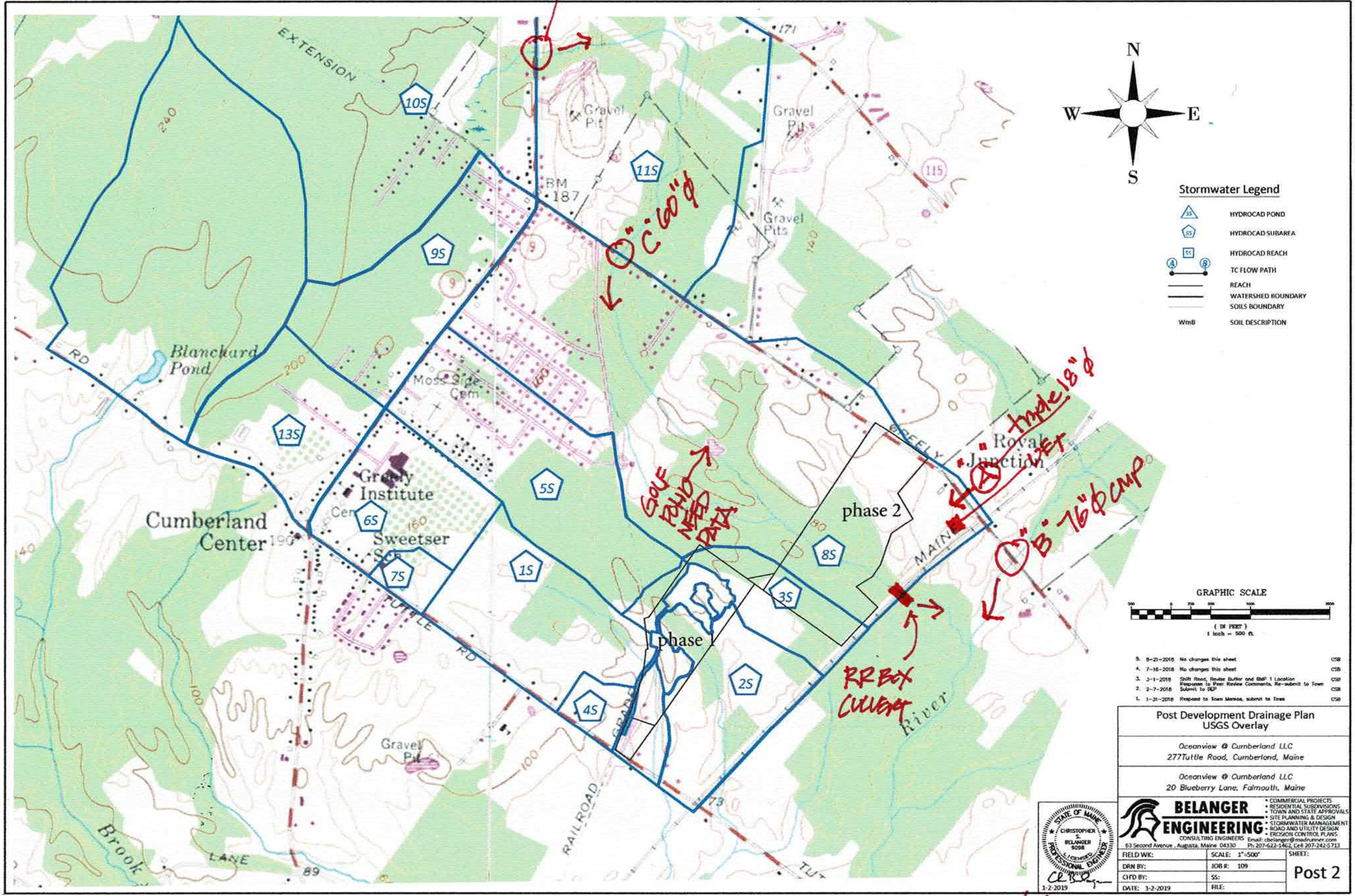
Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

OV Cumberland Phase 2 Impervious Area Summary 6-15-2020								
Description	Road Length feet	New Impervious Area		New Lawn Area		New Developed Area		Comments
		s.f.	acres	s.f.	acres	s.f.	acres	
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Leonard Lane - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Monarch - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Skipper Way - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Firefly Lane - Sta 90+00-Sta92+30	140	4140	0.10					18', no curb
Luna Lane - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Grasshopper Lane - Sta 96+00-Sta98+00	140	3600	0.08					18' no curb
Crickett Lane & Northwind Farm Road	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5416	333733	7.66	459874	10.56	824534	18.93	

Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 6-15-2020

Subarea	Total Area sf	Total Area acres	Existing Impervious acres	New Impervious Area acres	New Impervious Area Treated acres	Existing Lawn acres	New Lawn acres	New Developed Area acres	New Developed Area Treated acres	Existing Woods/Field Undeveloped acres	Treatment BMP
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.41	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	369.00	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	122.00	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	8.51	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.32	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.31	4.02	4.03	0.86	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.36	0.94	0.94	0.00	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.00	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	3.20	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.06	719	
				>95%	98%	✓		>80%	80%	✓	

"D" ROUTE 9. 48"Ø



"C" 60"Ø

GOLF POND NEED DATA

"A" triple 18"Ø WET

"B" 76"Ø CMP

RR BOX CULVERT

5. 8-21-2018 No changes this sheet CSB
4. 7-16-2018 No changes this sheet CSB
3. 3-1-2018 Shift Road, Revise Buffer and BMP 1 Location CSB
Response to Peer Review Comments, Re-submit to Town
2. 2-7-2018 Submit to DEP CSB
1. 1-31-2018 Respond to Town Memos, submit to Town CSB

Post Development Drainage Plan
USGS Overlay

Oceanview @ Cumberland LLC
277Tuttle Road, Cumberland, Maine

Oceanview @ Cumberland LLC
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

CHRISTOPHER S. BELANGER 9098
1-2-2019

FIELD WK:	SCALE: 1"=500'	SHEET:
DRN BY:	JOB #: 109	Post 2
CH'D BY:	SS:	
DATE: 1-2-2019	FILE:	

• 4/3/19 FIELD DATA STREAM/CULVERTS.

- REFERENCE : March 2019 LED Photos

Culvert C outlet Greely Road at main brook

Culvert D - 48 inch HDPE inlet and embankment
At Route 9 at main brook

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos

Golf Course Pond above Outlet

Golf Course Pond outlet structure from Bridge Above

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CONSULTING ENGINEERS

LICHT
ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19

- JOB NO:
16.084.1

EX.

- REFERENCE : March 2019 LED Photos

Main brook along Hole 17 at eddy/widening

Main Brook at Golf Course Hole 17 above Cartpath Crossing

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CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos

Inlet 60 inch dia. Greely Road Culvert C –Main Brook to Golf Course and Site

Upstream Floodplain Watershed and Main Brook at Greely Road Culvert C

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ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos

76 inch dia. Greely Road Culvert B- at Maxfield Brook – East of Site & RR Tracks

Culvert A - Three partially buried 18 inch dla HDPE culverts (inlet) across from Cumberland Animal Hospital wetland drainage

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PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos

Maine Central RR Culvert Inlet

Existing Wood Farm Bridge and Stream looking north

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CONSULTING ENGINEERS

LICHT ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

OCEANVIEW AT CUMBERLAND SENIOR COMMUNITY

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 01-30-18

- JOB NO: 16.084.1

EX.

- REFERENCE : March 2019 LED Photos

Upstream 100 ft from Proposed Road Crossing looking South (Downstream)

Proposed Road/Box Culvert Crossing location north of existing farm bridge

BELANGER ENGINEERING
CONSULTING ENGINEERS

LICHT ENVIRONMENTAL DESIGN, LLC

- PREPARED FOR:

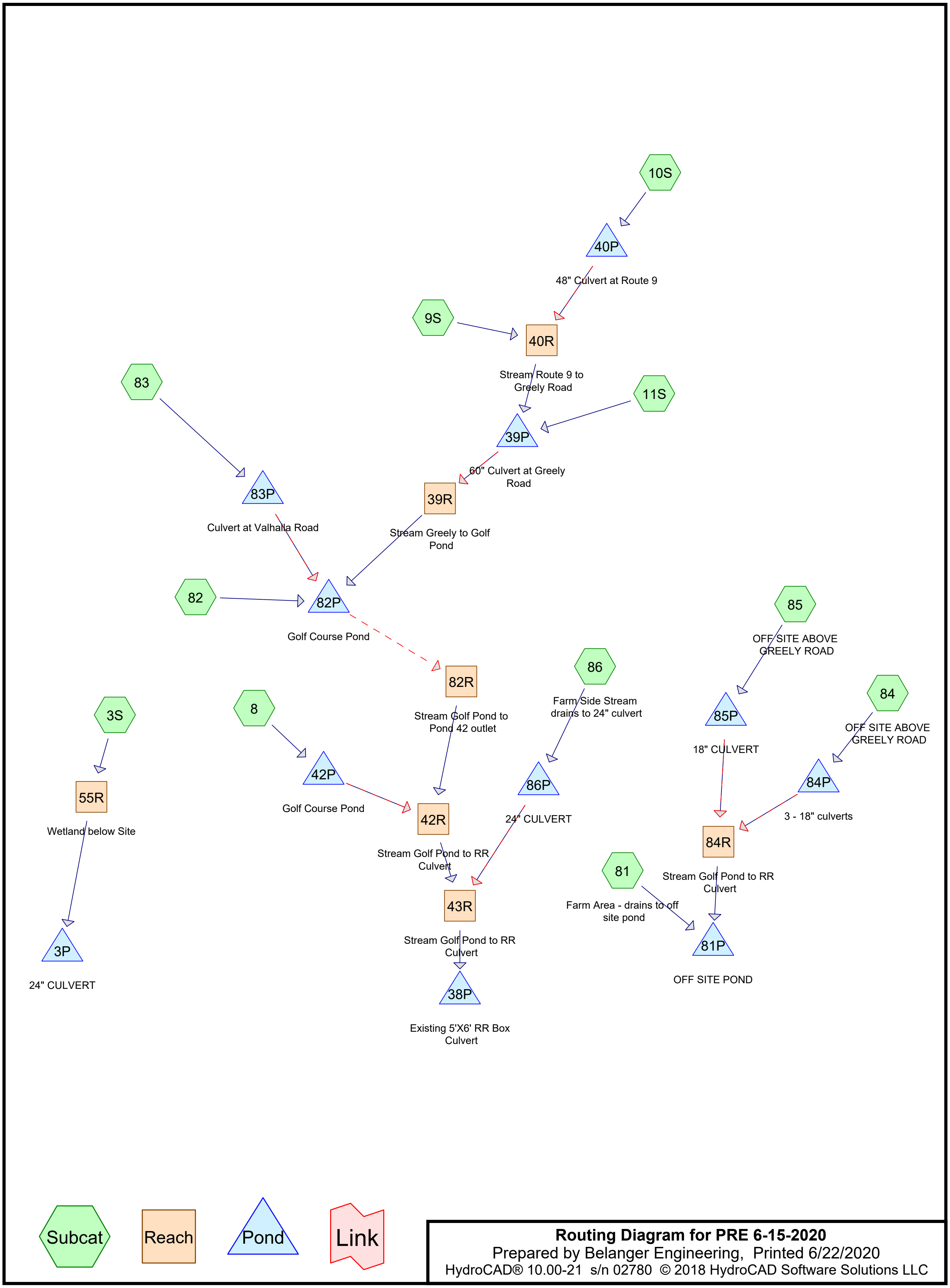
CUMBERLAND CROSSING
PHASE 2
CUMBERLAND, MAINE

- TITLE:

SITE PHOTOS

- SCALE: NA
- DATE: 12-30-19
- JOB NO: 16.084.1

EX.



Routing Diagram for PRE 6-15-2020
Prepared by Belanger Engineering, Printed 6/22/2020
HydroCAD® 10.00-21 s/n 02780 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
20.000	70	1/2 acre lots, 25% imp, HSG B (11S)
15.000	75	1/4 acre lots, 38% imp, HSG B (10S)
103.300	61	>75% Grass cover, Good, HSG B (11S)
0.520	98	EXISTING BARN AND HOUSE (81, 84)
0.130	98	EXISTING GRAVEL/PAVED FARM (86)
0.260	98	EXISTING HOUSE AND BARN (86)
1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE (86)
13.000	98	EXISTING IMPERVIOUS AREA (9S)
112.060	74	EXISTING LAWN C (3S, 9S, 10S, 81, 82, 83, 84, 85)
74.270	61	EXISTING LAWNS B (8)
54.530	61	EXISTING LAWNS B - OFF SITE (86)
1.640	98	EXISTING PAVED/GRAVEL FARM (81, 84)
21.910	98	EXISTING ROADS (8, 10S, 81, 82, 83, 84, 85)
0.870	98	EXISTING ROADS-OFF SITE (86)
5.000	98	ROADS (11S)
31.060	70	WOODS / FIELD HSG C (3S)
18.320	74	WOODS / FIELD HSG C/D (81)
205.000	30	Woods, Good, HSG A (8, 9S, 10S, 11S)
178.000	55	Woods, Good, HSG B (8, 9S, 10S, 11S, 82, 83)
244.000	70	Woods, Good, HSG C (8, 9S, 10S, 11S)
64.000	77	Woods, Good, HSG D (10S, 11S)
1,163.970	**61**	**TOTAL AREA**

Summary for Subcatchment 3S:

Runoff = 13.13 cfs @ 12.68 hrs, Volume= 1.989 af, Depth> 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 12.23 cfs @ 13.91 hrs, Volume= 4.095 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 16.96 cfs @ 13.28 hrs, Volume= 3.916 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 19.38 cfs @ 13.45 hrs, Volume= 5.703 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 15.02 cfs @ 12.77 hrs, Volume= 2.377 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

```
Runoff      =       4.29 cfs @  13.37 hrs,  Volume=         1.228 af,  Depth>  0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  2 YEAR Rainfall=3.10"

     Area (ac)   CN   Description
-------------------------------------------------------------------------
       44.000    55   Woods, Good, HSG B
*       2.000    98   EXISTING ROADS
*       7.680    74   EXISTING LAWN C
-------------------------------------------------------------------------
       53.680    59   Weighted Average
       51.680         96.27% Pervious Area
        2.000         3.73% Impervious Area

    Tc  Length     Slope  Velocity  Capacity  Description
 (min)  (feet)    (ft/ft)  (ft/sec)     (cfs)
-------------------------------------------------------------------------
  69.3     150   0.0100      0.04             Sheet Flow, AB
                                              Woods: Dense underbrush   n= 0.800   P2= 3.10"
   7.3     220   0.0400      0.50             Shallow Concentrated Flow, BC
                                              Forest w/Heavy Litter   Kv= 2.5 fps
   1.8     700   0.0100      6.33    253.05   Trap/Vee/Rect Channel Flow, CD
                                              Bot.W=10.00'  D=4.00'
                                              n= 0.040  Winding stream, pools & shoals
-------------------------------------------------------------------------
  78.4   1,070   Total
```

Summary for Subcatchment 83:

```
Runoff      =      10.04 cfs @  13.17 hrs,  Volume=         2.098 af,  Depth>  0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  2 YEAR Rainfall=3.10"

     Area (ac)   CN   Description
-------------------------------------------------------------------------
        6.000    55   Woods, Good, HSG B
*       3.500    98   EXISTING ROADS
*      21.810    74   EXISTING LAWN C
-------------------------------------------------------------------------
       31.310    73   Weighted Average
       27.810         88.82% Pervious Area
        3.500         11.18% Impervious Area

    Tc  Length     Slope  Velocity  Capacity  Description
 (min)  (feet)    (ft/ft)  (ft/sec)     (cfs)
-------------------------------------------------------------------------
  69.3     150   0.0100      0.04             Sheet Flow, AB
                                              Woods: Dense underbrush   n= 0.800   P2= 3.10"
  12.3     370   0.0400      0.50             Shallow Concentrated Flow, BC
                                              Forest w/Heavy Litter   Kv= 2.5 fps
-------------------------------------------------------------------------
  81.6     520   Total
```

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 6.29 cfs @ 13.75 hrs, Volume= 1.842 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

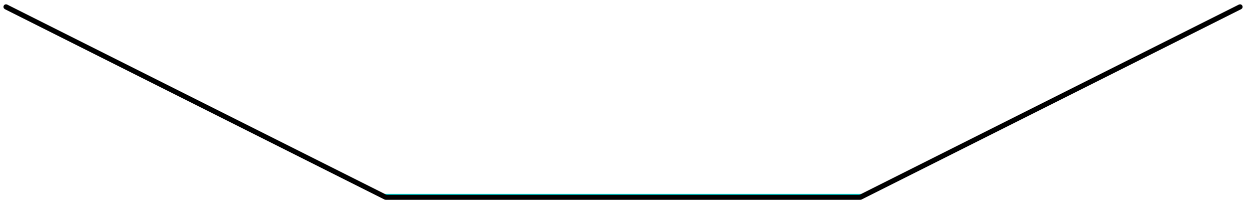
Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.00" for 2 YEAR event
Inflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Outflow = 0.20 cfs @ 20.00 hrs, Volume= 0.008 af, Atten= 76%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 53.6 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 71.8 min

Peak Storage= 1,886 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   0.22"    for  2 YEAR event
Inflow      =       17.23 cfs @   15.31 hrs,  Volume=             8.944 af
Outflow     =       17.12 cfs @   16.23 hrs,  Volume=             7.939 af,  Atten= 1%,  Lag= 55.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 32.8 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 38.8 min

Peak Storage= 33,658 cf @ 15.68 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      184.270 ac,    5.43% Impervious,  Inflow Depth >   0.44"    for  2 YEAR event
Inflow      =       20.63 cfs @   14.42 hrs,  Volume=             6.765 af
Outflow     =       20.49 cfs @   14.72 hrs,  Volume=             6.556 af,  Atten= 1%,  Lag= 17.9 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 10.1 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 14.3 min

Peak Storage= 12,440 cf @ 14.55 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: Stream Golf Pond to RR Culvert

```
Inflow Area =      241.160 ac,    5.13% Impervious,  Inflow Depth >   0.42"    for  2 YEAR event
Inflow      =       25.34 cfs @   14.62 hrs,  Volume=            8.388 af
Outflow     =       25.30 cfs @   14.75 hrs,  Volume=            8.271 af,  Atten= 0%,  Lag= 8.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 6.4 min

Peak Storage= 7,006 cf @ 14.67 hrs
Average Depth at Peak Storage= 1.14'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 55R: Wetland below Site

```
Inflow Area =       35.060 ac,    0.00% Impervious,  Inflow Depth >   0.68"    for  2 YEAR event
Inflow      =       13.13 cfs @   12.68 hrs,  Volume=            1.989 af
Outflow     =       13.07 cfs @   12.76 hrs,  Volume=            1.976 af,  Atten= 0%,  Lag= 4.7 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 5.6 min

Peak Storage= 2,247 cf @ 12.71 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af
Outflow = 10.64 cfs @ 14.30 hrs, Volume= 2.986 af, Atten= 3%, Lag= 29.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 24.4 min

Peak Storage= 10,164 cf @ 14.03 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 0.93" for 2 YEAR event
Inflow = 13.43 cfs @ 12.88 hrs, Volume= 2.227 af
Outflow = 13.11 cfs @ 13.12 hrs, Volume= 2.190 af, Atten= 2%, Lag= 14.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 16.2 min

Peak Storage= 6,419 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

```
Inflow Area =     35.060 ac,   0.00% Impervious,  Inflow Depth >   0.68"    for  2 YEAR event
Inflow      =     13.07 cfs @   12.76 hrs,  Volume=          1.976 af
Outflow     =     12.04 cfs @   12.91 hrs,  Volume=          1.952 af,  Atten= 8%,  Lag= 9.0 min
Primary     =     12.04 cfs @   12.91 hrs,  Volume=          1.952 af
Secondary =        0.00 cfs @    5.00 hrs,  Volume=          0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.64' @ 12.91 hrs   Surf.Area= 6,162 sf   Storage= 6,999 cf

Plug-Flow detention time= 12.4 min calculated for 1.952 af (99% of inflow)
Center-of-Mass det. time= 8.3 min ( 871.7 - 863.3 )

Volume        Invert     Avail.Storage   Storage Description
   #1         54.00'        56,342 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store         Cum.Store
    (feet)             (sq-ft)        (cubic-feet)      (cubic-feet)
     54.00               2,362                 0                 0
     56.00               6,990             9,352             9,352
     58.00              10,000            16,990            26,342
     60.00              20,000            30,000            56,342

Device   Routing           Invert   Outlet Devices
   #1    Primary           54.00'   24.0"  Round Culvert
                                    L= 50.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                    Inlet / Outlet Invert= 54.00' / 53.00'   S= 0.0200 '/'   Cc= 0.900
                                    n= 0.011  Concrete pipe, straight & clean,  Flow Area= 3.14 sf
   #2    Secondary         59.00'   25.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                    Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=12.03 cfs @ 12.91 hrs  HW=55.64'   (Free Discharge)
└─1=Culvert  (Inlet Controls 12.03 cfs @ 4.36 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=54.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 0.41" for 2 YEAR event
Inflow = 25.30 cfs @ 14.75 hrs, Volume= 8.271 af
Outflow = 25.26 cfs @ 14.82 hrs, Volume= 8.243 af, Atten= 0%, Lag= 3.9 min
Primary = 25.26 cfs @ 14.82 hrs, Volume= 8.243 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.45' @ 14.82 hrs Surf.Area= 6,257 sf Storage= 3,946 cf

Plug-Flow detention time= 2.5 min calculated for 8.243 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (974.8 - 973.1)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert**
			L= 90.0' RCP, sq.cut end projecting, Ke= 0.500
			Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900
			n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.23 cfs @ 14.82 hrs HW=56.45' (Free Discharge)
↑—**1=Box Culvert** (Inlet Controls 25.23 cfs @ 3.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 29.22 cfs @ 14.17 hrs, Volume= 13.642 af
Outflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af, Atten= 97%, Lag= 349.7 min
Primary = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

```
Peak Elev= 120.64' @ 20.00 hrs   Surf.Area= 953,534 sf   Storage= 588,117 cf

Plug-Flow detention time= 403.8 min calculated for 0.082 af (1% of inflow)
Center-of-Mass det. time= 188.3 min ( 1,155.6 - 967.3 )

Volume      Invert    Avail.Storage   Storage Description
  #1        120.00'   149,235,760 cf  Custom Stage Data (Prismatic)Listed below (Recalc)  x 2

 Elevation       Surf.Area        Inc.Store       Cum.Store
    (feet)          (sq-ft)     (cubic-feet)    (cubic-feet)
   120.00          439,044                0               0
   140.00        1,613,877       20,529,210      20,529,210
   160.00        3,794,990       54,088,670      74,617,880

Device  Routing          Invert   Outlet Devices
  #1    Primary          120.50'  60.0"  Round 60" Culvert  w/ 6.0" inside fill
                                  L= 90.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                  Inlet / Outlet Invert= 120.00' / 118.20'   S= 0.0200 '/'   Cc= 0.900
                                  n= 0.022  Earth, clean & straight,  Flow Area= 18.61 sf
  #2    Secondary        131.50'  25.0' long  x 100.0' breadth Broad-Crested Rectangular Weir
                                  Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                  Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=0.55 cfs @ 20.00 hrs  HW=120.64'   (Free Discharge)
└─1=60" Culvert  (Inlet Controls 0.55 cfs @ 1.21 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=120.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 40P: 48" Culvert at Route 9

```
Inflow Area =       405.950 ac,    2.64% Impervious,  Inflow Depth >   0.22"    for  2 YEAR event
Inflow      =        23.03 cfs @   13.52 hrs,  Volume=            7.443 af
Outflow     =        11.94 cfs @   16.18 hrs,  Volume=            5.028 af,  Atten= 48%,  Lag= 159.6 min
Primary     =        11.94 cfs @   16.18 hrs,  Volume=            5.028 af
Secondary =           0.00 cfs @    5.00 hrs,  Volume=            0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 161.48' @ 16.18 hrs   Surf.Area= 108,987 sf   Storage= 131,360 cf

Plug-Flow detention time= 152.2 min calculated for 5.028 af (68% of inflow)
Center-of-Mass det. time= 82.6 min ( 1,012.5 - 929.9 )

Volume      Invert    Avail.Storage   Storage Description
  #1        160.00'    22,928,710 cf  Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation       Surf.Area        Inc.Store       Cum.Store
    (feet)          (sq-ft)     (cubic-feet)    (cubic-feet)
   160.00           68,874                0               0
   180.00          611,999        6,808,730       6,808,730
   200.00          999,999       16,119,980      22,928,710
```

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.69 cfs @ 16.18 hrs HW=161.48' (Free Discharge)
↰**1=48" Culvert** (Inlet Controls 11.69 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 0.27" for 2 YEAR event
Inflow = 12.23 cfs @ 13.91 hrs, Volume= 4.095 af
Outflow = 10.24 cfs @ 14.65 hrs, Volume= 3.779 af, Atten= 16%, Lag= 44.4 min
Primary = 10.24 cfs @ 14.65 hrs, Volume= 3.779 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 71.43' @ 14.65 hrs Surf.Area= 25,628 sf Storage= 29,187 cf

Plug-Flow detention time= 50.6 min calculated for 3.766 af (92% of inflow)
Center-of-Mass det. time= 31.7 min (969.4 - 937.7)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.24 cfs @ 14.65 hrs HW=71.43' (Free Discharge)
↑**1=Culvert** (Barrel Controls 10.24 cfs @ 5.11 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 25.75 cfs @ 12.95 hrs, Volume= 4.567 af
Outflow = 15.27 cfs @ 13.60 hrs, Volume= 4.245 af, Atten= 41%, Lag= 39.2 min
Primary = 15.27 cfs @ 13.60 hrs, Volume= 4.245 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 64.13' @ 13.60 hrs Surf.Area= 31,763 sf Storage= 194,644 cf (55,134 cf above start)

Plug-Flow detention time= 316.2 min calculated for 1.039 af (23% of inflow)
Center-of-Mass det. time= 45.6 min (909.5 - 863.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=15.28 cfs @ 13.60 hrs HW=64.13' (Free Discharge)
↑**1=Culvert** (Barrel Controls 15.28 cfs @ 5.67 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=62.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.73% Impervious, Inflow Depth > 0.05" for 2 YEAR event
Inflow = 14.17 cfs @ 13.31 hrs, Volume= 3.329 af
Outflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af, Atten= 23%, Lag= 30.1 min
Secondary = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.64' @ 13.81 hrs Surf.Area= 46,588 sf Storage= 27,999 cf

Plug-Flow detention time= 50.8 min calculated for 3.107 af (93% of inflow)
Center-of-Mass det. time= 32.9 min (928.0 - 895.1)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=10.96 cfs @ 13.81 hrs HW=76.64' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.96 cfs @ 2.15 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 0.80" for 2 YEAR event
Inflow = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af
Outflow = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af, Atten= 1%, Lag= 5.8 min
Primary = 9.93 cfs @ 13.27 hrs, Volume= 2.093 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 122.11' @ 13.27 hrs Surf.Area= 1,142 sf Storage= 1,593 cf

Plug-Flow detention time= 2.5 min calculated for 2.093 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (880.7 - 878.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.93 cfs @ 13.27 hrs HW=122.11' (Free Discharge)
└**1=Culvert** (Inlet Controls 9.93 cfs @ 5.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 0.97" for 2 YEAR event
Inflow = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af
Outflow = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af, Atten= 2%, Lag= 5.0 min
Primary = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.38' @ 12.85 hrs Surf.Area= 5,564 sf Storage= 5,483 cf

Plug-Flow detention time= 19.5 min calculated for 1.602 af (97% of inflow)
Center-of-Mass det. time= 9.5 min (859.6 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

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                          Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                          Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=10.30 cfs @ 12.85 hrs  HW=81.38'   (Free Discharge)
└─1=Culvert  (Barrel Controls 10.30 cfs @ 4.56 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=80.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 85P: 18" CULVERT

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Inflow Area =       8.230 ac,   4.74% Impervious,  Inflow Depth >   0.92"    for  2 YEAR event
Inflow      =       3.98 cfs @   12.77 hrs,  Volume=          0.629 af
Outflow     =       3.31 cfs @   13.03 hrs,  Volume=          0.625 af,  Atten= 17%,  Lag= 15.9 min
Primary     =       3.31 cfs @   13.03 hrs,  Volume=          0.625 af
Secondary   =       0.00 cfs @    5.00 hrs,  Volume=          0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.93' @ 13.03 hrs   Surf.Area= 6,258 sf   Storage= 3,475 cf

Plug-Flow detention time= 16.2 min calculated for 0.625 af (99% of inflow)
Center-of-Mass det. time= 13.7 min ( 866.2 - 852.5 )

Volume       Invert    Avail.Storage   Storage Description
  #1         90.00'       29,280 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation       Surf.Area        Inc.Store        Cum.Store
    (feet)         (sq-ft)      (cubic-feet)     (cubic-feet)
     90.00           1,196                0                0
     92.00          12,056           13,252           13,252
     93.00          20,000           16,028           29,280

Device   Routing          Invert   Outlet Devices
  #1     Primary          89.86'   18.0"  Round Culvert
                                   L= 28.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                   Inlet / Outlet Invert= 89.86' / 89.79'   S= 0.0025 '/'   Cc= 0.900
                                   n= 0.011  Concrete pipe, straight & clean,  Flow Area= 1.77 sf
  #2     Secondary        92.00'   25.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                   Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                   Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=3.31 cfs @ 13.03 hrs  HW=90.93'   (Free Discharge)
└─1=Culvert  (Barrel Controls 3.31 cfs @ 3.43 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=90.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 0.39" for 2 YEAR event
Inflow = 6.29 cfs @ 13.75 hrs, Volume= 1.842 af
Outflow = 6.17 cfs @ 13.91 hrs, Volume= 1.832 af, Atten= 2%, Lag= 9.8 min
Primary = 6.17 cfs @ 13.91 hrs, Volume= 1.832 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.86' @ 13.91 hrs Surf.Area= 5,642 sf Storage= 3,087 cf

Plug-Flow detention time= 7.7 min calculated for 1.832 af (99% of inflow)
Center-of-Mass det. time= 6.1 min (928.9 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.17 cfs @ 13.91 hrs HW=58.86' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 6.17 cfs @ 3.55 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=58.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 32.62 cfs @ 12.63 hrs, Volume= 4.606 af, Depth> 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 48.84 cfs @ 13.67 hrs, Volume= 13.109 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 47.02 cfs @ 13.17 hrs, Volume= 9.735 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 80.13 cfs @ 13.27 hrs, Volume= 18.133 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 32.62 cfs @ 12.74 hrs, Volume= 5.015 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 17.74 cfs @ 13.18 hrs, Volume= 3.899 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 20.31 cfs @ 13.55 hrs, Volume= 5.122 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.10" for 10 YEAR event
Inflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Outflow = 19.97 cfs @ 20.00 hrs, Volume= 5.325 af, Atten= 2%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 19.4 min

Peak Storage= 17,477 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

Summary for Reach 40R: Stream Route 9 to Greely Road

Inflow Area =	492.700 ac,	4.81% Impervious, Inflow Depth > 0.78"	for 10 YEAR event
Inflow =	85.67 cfs @	13.80 hrs, Volume=	31.827 af
Outflow =	83.71 cfs @	14.48 hrs, Volume=	30.222 af, Atten= 2%, Lag= 40.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 28.4 min

Peak Storage= 100,395 cf @ 14.15 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area =	184.270 ac,	5.43% Impervious, Inflow Depth > 1.60"	for 10 YEAR event
Inflow =	67.66 cfs @	14.16 hrs, Volume=	24.547 af
Outflow =	67.44 cfs @	14.36 hrs, Volume=	23.887 af, Atten= 0%, Lag= 11.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 6.9 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 10.4 min

Peak Storage= 27,730 cf @ 14.25 hrs
Average Depth at Peak Storage= 1.45'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: Stream Golf Pond to RR Culvert

```
Inflow Area =      241.160 ac,   5.13% Impervious,  Inflow Depth >   1.44"    for  10 YEAR event
Inflow      =       84.81 cfs @   14.29 hrs,  Volume=          28.983 af
Outflow     =       84.74 cfs @   14.38 hrs,  Volume=          28.645 af,  Atten= 0%,  Lag= 5.5 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 4.7 min

Peak Storage= 16,189 cf @ 14.33 hrs
Average Depth at Peak Storage= 2.24'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 55R: Wetland below Site

```
Inflow Area =       35.060 ac,   0.00% Impervious,  Inflow Depth >   1.58"    for  10 YEAR event
Inflow      =       32.62 cfs @   12.63 hrs,  Volume=            4.606 af
Outflow     =       32.50 cfs @   12.70 hrs,  Volume=            4.587 af,  Atten= 0%,  Lag= 3.7 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 4.5 min

Peak Storage= 4,074 cf @ 12.66 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow	=	32.90 cfs @	13.71 hrs, Volume=	12.716 af
Outflow	=	32.47 cfs @	14.03 hrs, Volume=	11.989 af, Atten= 1%, Lag= 19.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 16.4 min

Peak Storage= 21,227 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area =		28.670 ac,	6.91% Impervious, Inflow Depth > 1.96"	for 10 YEAR event
Inflow	=	28.07 cfs @	12.87 hrs, Volume=	4.690 af
Outflow	=	27.76 cfs @	13.04 hrs, Volume=	4.638 af, Atten= 1%, Lag= 10.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 13.5 min

Peak Storage= 10,452 cf @ 12.94 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 1.57" for 10 YEAR event
Inflow = 32.50 cfs @ 12.70 hrs, Volume= 4.587 af
Outflow = 25.22 cfs @ 12.98 hrs, Volume= 4.551 af, Atten= 22%, Lag= 17.0 min
Primary = 25.22 cfs @ 12.98 hrs, Volume= 4.551 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 57.78' @ 12.98 hrs Surf.Area= 9,668 sf Storage= 24,175 cf

Plug-Flow detention time= 12.8 min calculated for 4.536 af (99% of inflow)
Center-of-Mass det. time= 10.1 min (854.0 - 843.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=25.20 cfs @ 12.98 hrs HW=57.78' (Free Discharge)
└─**1=Culvert** (Inlet Controls 25.20 cfs @ 8.02 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 1.43" for 10 YEAR event
Inflow = 84.74 cfs @ 14.38 hrs, Volume= 28.645 af
Outflow = 83.43 cfs @ 14.57 hrs, Volume= 28.508 af, Atten= 2%, Lag= 11.3 min
Primary = 83.43 cfs @ 14.57 hrs, Volume= 28.508 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.10' @ 14.57 hrs Surf.Area= 27,754 sf Storage= 29,832 cf

Plug-Flow detention time= 4.2 min calculated for 28.508 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (967.1 - 963.9)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.55 cfs @ 14.57 hrs HW=58.10' (Free Discharge)
↰**1=Box Culvert** (Inlet Controls 83.55 cfs @ 5.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 129.01 cfs @ 14.01 hrs, Volume= 48.355 af
Outflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af, Atten= 84%, Lag= 359.5 min
Primary = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 121.86' @ 20.00 hrs Surf.Area= 1,096,574 sf Storage= 1,836,157 cf

Plug-Flow detention time= 291.0 min calculated for 6.105 af (13% of inflow)
Center-of-Mass det. time= 138.6 min (1,073.5 - 934.9)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.21 cfs @ 20.00 hrs HW=121.86' (Free Discharge)
└─**1=60" Culvert** (Inlet Controls 20.21 cfs @ 3.59 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.76" for 10 YEAR event
Inflow = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af
Outflow = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af, Atten= 46%, Lag= 65.4 min
Primary = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 163.13' @ 14.38 hrs Surf.Area= 153,871 sf Storage= 348,586 cf

Plug-Flow detention time= 98.1 min calculated for 22.091 af (86% of inflow)
Center-of-Mass det. time= 61.2 min (957.0 - 895.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.93 cfs @ 14.38 hrs HW=163.13' (Free Discharge)
└─**1=48" Culvert** (Inlet Controls 59.93 cfs @ 5.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 0.85" for 10 YEAR event
Inflow = 48.84 cfs @ 13.67 hrs, Volume= 13.109 af
Outflow = 36.22 cfs @ 14.41 hrs, Volume= 12.558 af, Atten= 26%, Lag= 44.5 min
Primary = 36.22 cfs @ 14.41 hrs, Volume= 12.558 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 73.72' @ 14.41 hrs Surf.Area= 40,958 sf Storage= 105,820 cf

Plug-Flow detention time= 44.4 min calculated for 12.517 af (95% of inflow)
Center-of-Mass det. time= 32.9 min (942.5 - 909.6)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=36.22 cfs @ 14.41 hrs HW=73.72' (Free Discharge)
⬑**1=Culvert** (Barrel Controls 36.22 cfs @ 7.38 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
⬑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.760 ac, 5.97% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 56.76 cfs @ 12.87 hrs, Volume= 9.653 af
Outflow = 28.06 cfs @ 13.66 hrs, Volume= 9.204 af, Atten= 51%, Lag= 46.9 min
Primary = 26.83 cfs @ 13.66 hrs, Volume= 9.160 af
Secondary = 1.23 cfs @ 13.66 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.15' @ 13.66 hrs Surf.Area= 48,771 sf Storage= 274,436 cf (134,926 cf above start)

Plug-Flow detention time= 184.2 min calculated for 5.981 af (62% of inflow)
Center-of-Mass det. time= 56.1 min (902.7 - 846.6)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.83 cfs @ 13.66 hrs HW=66.15' (Free Discharge)
⬑**1=Culvert** (Inlet Controls 26.83 cfs @ 8.54 fps)

Secondary OutFlow Max=1.10 cfs @ 13.66 hrs HW=66.15' (Free Discharge)
⬑**2=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 0.95 fps)

Summary for Pond 82P: Golf Course Pond

```
Inflow Area =      827.990 ac,   4.73% Impervious,  Inflow Depth >   0.20"    for  10 YEAR event
Inflow      =       38.10 cfs @  13.28 hrs,  Volume=          13.816 af
Outflow     =       32.90 cfs @  13.71 hrs,  Volume=          12.716 af,  Atten= 14%,  Lag= 25.9 min
Secondary =         32.90 cfs @  13.71 hrs,  Volume=          12.716 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.33' @ 13.71 hrs Surf.Area= 52,279 sf Storage= 62,339 cf

Plug-Flow detention time= 34.4 min calculated for 12.674 af (92% of inflow)
Center-of-Mass det. time= 14.8 min (972.6 - 957.8)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=32.88 cfs @ 13.71 hrs HW=77.33' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 32.88 cfs @ 3.09 fps)

Summary for Pond 83P: Culvert at Valhalla Road

```
Inflow Area =       31.310 ac,  11.18% Impervious,  Inflow Depth >   1.76"    for  10 YEAR event
Inflow      =       23.03 cfs @  13.14 hrs,  Volume=           4.598 af
Outflow     =       20.81 cfs @  13.41 hrs,  Volume=           4.591 af,  Atten= 10%,  Lag= 16.3 min
Primary     =       20.81 cfs @  13.41 hrs,  Volume=           4.591 af
Secondary =          0.00 cfs @   5.00 hrs,  Volume=           0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 126.73' @ 13.41 hrs Surf.Area= 2,841 sf Storage= 10,797 cf

Plug-Flow detention time= 4.6 min calculated for 4.576 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (867.2 - 863.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.81 cfs @ 13.41 hrs HW=126.73' (Free Discharge)
└**1=Culvert** (Inlet Controls 20.81 cfs @ 11.77 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.01" for 10 YEAR event
Inflow = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af
Outflow = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af, Atten= 3%, Lag= 6.1 min
Primary = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.96' @ 12.83 hrs Surf.Area= 6,905 sf Storage= 9,098 cf

Plug-Flow detention time= 13.4 min calculated for 3.372 af (98% of inflow)
Center-of-Mass det. time= 7.7 min (842.5 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.67 cfs @ 12.83 hrs HW=81.96' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 21.67 cfs @ 4.12 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

```
Inflow Area =      8.230 ac,   4.74% Impervious,  Inflow Depth >   1.94"    for  10 YEAR event
Inflow       =     8.63 cfs @   12.74 hrs,  Volume=            1.327 af
Outflow      =     6.77 cfs @   13.05 hrs,  Volume=            1.318 af,  Atten= 22%,  Lag= 18.6 min
Primary      =     6.77 cfs @   13.05 hrs,  Volume=            1.318 af
Secondary =        0.00 cfs @    5.00 hrs,  Volume=            0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.56' @ 13.05 hrs Surf.Area= 9,665 sf Storage= 8,470 cf

Plug-Flow detention time= 17.9 min calculated for 1.314 af (99% of inflow)
Center-of-Mass det. time= 15.4 min (852.2 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.77 cfs @ 13.05 hrs HW=91.56' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.77 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

```
Inflow Area =      56.890 ac,   4.15% Impervious,  Inflow Depth >   1.08"    for  10 YEAR event
Inflow      =      20.31 cfs @  13.55 hrs,  Volume=          5.122 af
Outflow     =      18.43 cfs @  13.95 hrs,  Volume=          5.097 af,  Atten= 9%,  Lag= 23.8 min
Primary     =      18.43 cfs @  13.95 hrs,  Volume=          5.097 af
Secondary =         0.00 cfs @   5.00 hrs,  Volume=          0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 60.27' @ 13.95 hrs   Surf.Area= 12,411 sf   Storage= 15,699 cf

Plug-Flow detention time= 10.4 min calculated for 5.097 af (99% of inflow)
Center-of-Mass det. time= 8.9 min ( 909.7 - 900.7 )

Volume        Invert     Avail.Storage   Storage Description
   #1         58.00'         44,762 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

  Elevation          Surf.Area          Inc.Store          Cum.Store
     (feet)              (sq-ft)       (cubic-feet)       (cubic-feet)
      58.00              1,500                  0                  0
      60.00             11,084             12,584             12,584
      62.00             21,094             32,178             44,762

Device   Routing              Invert   Outlet Devices
   #1    Primary              57.78'   24.0"  Round Culvert
                                       L= 73.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                       Inlet / Outlet Invert= 57.78' / 56.17'   S= 0.0221 '/'   Cc= 0.900
                                       n= 0.011  Concrete pipe, straight & clean,  Flow Area= 3.14 sf
   #2    Secondary            61.00'   100.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                       Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                       Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=18.43 cfs @ 13.95 hrs  HW=60.27'   (Free Discharge)
└─1=Culvert  (Inlet Controls 18.43 cfs @ 5.87 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=58.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Subcatchment 3S:

Runoff = 50.61 cfs @ 12.62 hrs, Volume= 7.052 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 89.59 cfs @ 13.56 hrs, Volume= 22.609 af, Depth> 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 75.94 cfs @ 13.13 hrs, Volume= 15.334 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 147.70 cfs @ 13.19 hrs, Volume= 31.202 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 48.09 cfs @ 12.72 hrs, Volume= 7.385 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 32.74 cfs @ 13.14 hrs, Volume= 6.707 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 34.82 cfs @ 13.51 hrs, Volume= 8.415 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.29" for 25 YEAR event
Inflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Outflow = 48.68 cfs @ 20.00 hrs, Volume= 16.519 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 10.7 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 13.5 min

Peak Storage= 31,184 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

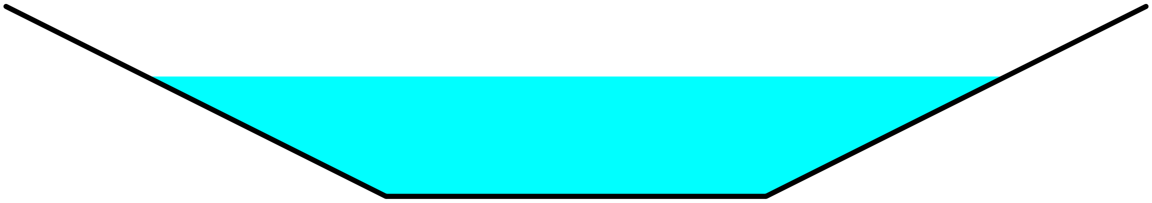
Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   1.37"    for  25 YEAR event
Inflow      =      161.60 cfs @   13.61 hrs,  Volume=          56.283 af
Outflow     =      157.75 cfs @   14.18 hrs,  Volume=          54.212 af,  Atten= 2%,  Lag= 34.2 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 16.7 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 25.5 min

Peak Storage= 157,984 cf @ 13.90 hrs
Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'



Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      184.270 ac,    5.43% Impervious,  Inflow Depth >   3.16"    for  25 YEAR event
Inflow      =      102.43 cfs @   14.10 hrs,  Volume=          48.482 af
Outflow     =      102.29 cfs @   14.28 hrs,  Volume=          47.307 af,  Atten= 0%,  Lag= 10.7 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 8.9 min

Peak Storage= 37,020 cf @ 14.18 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: Stream Golf Pond to RR Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 2.77" for 25 YEAR event
Inflow = 129.97 cfs @ 14.03 hrs, Volume= 55.683 af
Outflow = 129.92 cfs @ 14.12 hrs, Volume= 55.087 af, Atten= 0%, Lag= 5.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 4.1 min

Peak Storage= 21,954 cf @ 14.07 hrs
Average Depth at Peak Storage= 2.81'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 55R: Wetland below Site

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 2.41" for 25 YEAR event
Inflow = 50.61 cfs @ 12.62 hrs, Volume= 7.052 af
Outflow = 50.38 cfs @ 12.67 hrs, Volume= 7.029 af, Atten= 0%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.16 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 4.1 min

Peak Storage= 5,461 cf @ 12.64 hrs
Average Depth at Peak Storage= 1.30'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

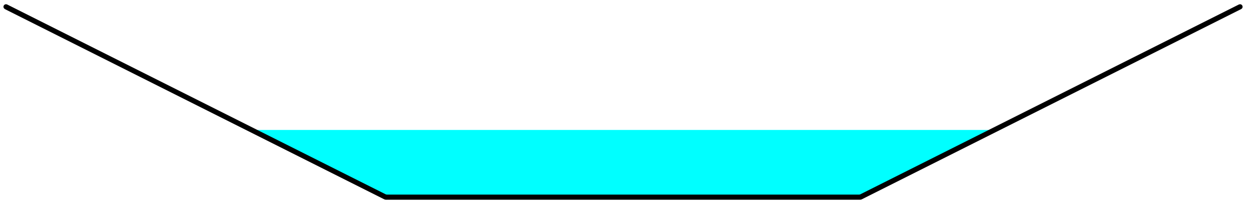
Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 53.64 cfs @ 20.00 hrs, Volume= 28.006 af
Outflow = 53.54 cfs @ 20.00 hrs, Volume= 26.636 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 13.4 min

Peak Storage= 29,848 cf @ 20.00 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 2.89" for 25 YEAR event
Inflow = 38.03 cfs @ 13.01 hrs, Volume= 6.894 af
Outflow = 37.70 cfs @ 13.16 hrs, Volume= 6.832 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 12.3 min

Peak Storage= 12,802 cf @ 13.07 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

```
Inflow Area =      35.060 ac,   0.00% Impervious,  Inflow Depth >   2.41"    for  25 YEAR event
Inflow      =      50.38 cfs @   12.67 hrs,  Volume=            7.029 af
Outflow     =      42.47 cfs @   12.90 hrs,  Volume=            6.985 af,  Atten= 16%,  Lag= 13.9 min
Primary     =      31.37 cfs @   12.90 hrs,  Volume=            6.732 af
Secondary =        11.10 cfs @   12.90 hrs,  Volume=            0.253 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.30' @ 12.90 hrs   Surf.Area= 16,501 sf   Storage= 43,570 cf

Plug-Flow detention time= 14.8 min calculated for 6.985 af (99% of inflow)
Center-of-Mass det. time= 12.6 min ( 846.9 - 834.4 )

Volume         Invert      Avail.Storage   Storage Description
   #1          54.00'         56,342 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation           Surf.Area            Inc.Store          Cum.Store
    (feet)              (sq-ft)         (cubic-feet)        (cubic-feet)
     54.00                2,362                    0                   0
     56.00                6,990                9,352               9,352
     58.00               10,000               16,990              26,342
     60.00               20,000               30,000              56,342

Device   Routing              Invert   Outlet Devices
   #1    Primary              54.00'   24.0"  Round Culvert
                                       L= 50.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                       Inlet / Outlet Invert= 54.00' / 53.00'   S= 0.0200 '/'   Cc= 0.900
                                       n= 0.011  Concrete pipe, straight & clean,  Flow Area= 3.14 sf
   #2    Secondary            59.00'   25.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                       Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                       Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=31.36 cfs @ 12.90 hrs  HW=59.30'   (Free Discharge)
└─1=Culvert  (Inlet Controls 31.36 cfs @ 9.98 fps)

Secondary OutFlow  Max=11.00 cfs @ 12.90 hrs  HW=59.30'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 11.00 cfs @ 1.47 fps)
```

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 241.160 ac, 5.13% Impervious, Inflow Depth > 2.74" for 25 YEAR event
Inflow = 129.92 cfs @ 14.12 hrs, Volume= 55.087 af
Outflow = 125.60 cfs @ 14.49 hrs, Volume= 54.586 af, Atten= 3%, Lag= 22.0 min
Primary = 125.60 cfs @ 14.49 hrs, Volume= 54.586 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.19' @ 14.49 hrs Surf.Area= 44,572 sf Storage= 69,240 cf

Plug-Flow detention time= 7.1 min calculated for 54.405 af (99% of inflow)
Center-of-Mass det. time= 5.0 min (979.3 - 974.3)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=125.59 cfs @ 14.49 hrs HW=59.19' (Free Discharge)
↳**1=Box Culvert** (Barrel Controls 125.59 cfs @ 8.18 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
↳**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 1.38" for 25 YEAR event
Inflow = 250.10 cfs @ 13.75 hrs, Volume= 85.414 af
Outflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af, Atten= 80%, Lag= 375.0 min
Primary = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 122.82' @ 20.00 hrs Surf.Area= 1,208,890 sf Storage= 2,938,188 cf

Plug-Flow detention time= 265.8 min calculated for 17.951 af (21% of inflow)
Center-of-Mass det. time= 131.9 min (1,054.7 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.75 cfs @ 20.00 hrs HW=122.82' (Free Discharge)
↑—**1=60" Culvert** (Inlet Controls 48.75 cfs @ 4.70 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 1.35" for 25 YEAR event
Inflow = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af
Outflow = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af, Atten= 46%, Lag= 58.9 min
Primary = 114.67 cfs @ 14.19 hrs, Volume= 40.949 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.65' @ 14.19 hrs Surf.Area= 195,136 sf Storage= 613,755 cf

Plug-Flow detention time= 87.6 min calculated for 40.813 af (89% of inflow)
Center-of-Mass det. time= 59.5 min (942.8 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=114.72 cfs @ 14.19 hrs HW=164.65' (Free Discharge)
⮤**1=48" Culvert** (Barrel Controls 114.72 cfs @ 8.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
⮤**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 1.47" for 25 YEAR event
Inflow = 89.59 cfs @ 13.56 hrs, Volume= 22.609 af
Outflow = 53.52 cfs @ 14.67 hrs, Volume= 21.846 af, Atten= 40%, Lag= 66.4 min
Primary = 53.52 cfs @ 14.67 hrs, Volume= 21.846 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.38' @ 14.67 hrs Surf.Area= 62,082 sf Storage= 242,793 cf

Plug-Flow detention time= 58.9 min calculated for 21.773 af (96% of inflow)
Center-of-Mass det. time= 49.2 min (948.0 - 898.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

```
Primary OutFlow  Max=53.52 cfs @ 14.67 hrs  HW=76.38'   (Free Discharge)
└─1=Culvert  (Inlet Controls 53.52 cfs @ 10.90 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=70.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 81P: OFF SITE POND

```
Inflow Area =      59.760 ac,    5.97% Impervious,  Inflow Depth >   2.85"    for  25 YEAR event
Inflow      =      79.69 cfs @   12.82 hrs,  Volume=          14.217 af
Outflow     =      52.21 cfs @   13.48 hrs,  Volume=          13.672 af,  Atten= 34%,  Lag= 39.8 min
Primary     =      30.31 cfs @   13.48 hrs,  Volume=          11.812 af
Secondary =        21.90 cfs @   13.48 hrs,  Volume=           1.860 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00'   Surf.Area= 20,254 sf   Storage= 139,510 cf
Peak Elev= 67.01' @ 13.48 hrs   Surf.Area= 63,513 sf   Storage= 323,207 cf   (183,697 cf above start)

Plug-Flow detention time= 149.9 min calculated for 10.469 af (74% of inflow)
Center-of-Mass det. time= 54.5 min ( 892.7 - 838.2 )
```

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,587 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
67.00	63,288	54,794	322,313
68.00	79,261	71,275	393,587

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

```
Primary OutFlow  Max=30.30 cfs @ 13.48 hrs  HW=67.01'   (Free Discharge)
└─1=Culvert  (Inlet Controls 30.30 cfs @ 9.65 fps)

Secondary OutFlow  Max=21.87 cfs @ 13.48 hrs  HW=67.01'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 21.87 cfs @ 2.70 fps)
```

Summary for Pond 82P: Golf Course Pond

```
Inflow Area =     827.990 ac,   4.73% Impervious,  Inflow Depth >   0.44"    for  25 YEAR event
Inflow      =      58.82 cfs @   13.22 hrs,  Volume=          30.100 af
Outflow     =      53.64 cfs @   20.00 hrs,  Volume=          28.006 af,  Atten= 9%,  Lag= 407.0 min
Secondary =        53.64 cfs @   20.00 hrs,  Volume=          28.006 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.86' @ 20.00 hrs Surf.Area= 56,623 sf Storage= 91,213 cf

Plug-Flow detention time= 28.7 min calculated for 27.913 af (93% of inflow)
Center-of-Mass det. time= 13.0 min (990.0 - 977.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=53.64 cfs @ 20.00 hrs HW=77.86' (Free Discharge)
└—**1=Broad-Crested Rectangular Weir** (Weir Controls 53.64 cfs @ 3.60 fps)

Summary for Pond 83P: Culvert at Valhalla Road

```
Inflow Area =      31.310 ac,  11.18% Impervious,  Inflow Depth >   2.64"    for  25 YEAR event
Inflow      =      34.66 cfs @   13.13 hrs,  Volume=           6.881 af
Outflow     =      27.51 cfs @   13.55 hrs,  Volume=           6.874 af,  Atten= 21%,  Lag= 25.4 min
Primary     =      27.51 cfs @   13.55 hrs,  Volume=           6.874 af
Secondary =         0.00 cfs @    5.00 hrs,  Volume=           0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 131.20' @ 13.55 hrs Surf.Area= 7,245 sf Storage= 28,832 cf

Plug-Flow detention time= 8.6 min calculated for 6.874 af (100% of inflow)
Center-of-Mass det. time= 8.2 min (863.0 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=27.51 cfs @ 13.55 hrs HW=131.20' (Free Discharge)
⮤**1=Culvert** (Inlet Controls 27.51 cfs @ 15.57 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
⮤**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.94" for 25 YEAR event
Inflow = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af
Outflow = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af, Atten= 14%, Lag= 14.0 min
Primary = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.46' @ 12.95 hrs Surf.Area= 26,457 sf Storage= 17,122 cf

Plug-Flow detention time= 12.3 min calculated for 4.952 af (99% of inflow)
Center-of-Mass det. time= 8.0 min (834.6 - 826.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

```
                              Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                              Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=28.13 cfs @ 12.95 hrs  HW=82.46'   (Free Discharge)
└─1=Culvert  (Inlet Controls 28.13 cfs @ 5.31 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=80.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 85P: 18" CULVERT

```
Inflow Area =       8.230 ac,   4.74% Impervious,  Inflow Depth >   2.85"    for  25 YEAR event
Inflow      =      12.73 cfs @  12.72 hrs,  Volume=           1.955 af
Outflow     =      10.00 cfs @  13.03 hrs,  Volume=           1.942 af,  Atten= 21%,  Lag= 18.6 min
Primary     =       9.08 cfs @  13.03 hrs,  Volume=           1.927 af
Secondary =         0.91 cfs @  13.03 hrs,  Volume=           0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.06' @ 13.03 hrs   Surf.Area= 12,502 sf   Storage= 13,941 cf

Plug-Flow detention time= 19.9 min calculated for 1.936 af (99% of inflow)
Center-of-Mass det. time= 17.5 min ( 846.0 - 828.5 )

Volume       Invert    Avail.Storage   Storage Description
   #1        90.00'        29,280 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store          Cum.Store
    (feet)            (sq-ft)       (cubic-feet)       (cubic-feet)
     90.00              1,196                  0                  0
     92.00             12,056             13,252             13,252
     93.00             20,000             16,028             29,280

Device   Routing            Invert   Outlet Devices
   #1    Primary            89.86'   18.0"  Round Culvert
                                     L= 28.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                     Inlet / Outlet Invert= 89.86' / 89.79'   S= 0.0025 '/'   Cc= 0.900
                                     n= 0.011  Concrete pipe, straight & clean,  Flow Area= 1.77 sf
   #2    Secondary          92.00'   25.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                     Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                     Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=9.08 cfs @ 13.03 hrs  HW=92.06'   (Free Discharge)
└─1=Culvert  (Barrel Controls 9.08 cfs @ 5.14 fps)

Secondary OutFlow  Max=0.87 cfs @ 13.03 hrs  HW=92.06'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 0.87 cfs @ 0.63 fps)
```

Summary for Pond 86P: 24" CULVERT

Inflow Area = 56.890 ac, 4.15% Impervious, Inflow Depth > 1.77" for 25 YEAR event
Inflow = 34.82 cfs @ 13.51 hrs, Volume= 8.415 af
Outflow = 34.73 cfs @ 13.56 hrs, Volume= 8.376 af, Atten= 0%, Lag= 3.0 min
Primary = 23.15 cfs @ 13.56 hrs, Volume= 7.731 af
Secondary = 11.58 cfs @ 13.56 hrs, Volume= 0.644 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.12' @ 13.56 hrs Surf.Area= 16,704 sf Storage= 28,186 cf

Plug-Flow detention time= 13.2 min calculated for 8.348 af (99% of inflow)
Center-of-Mass det. time= 11.7 min (902.9 - 891.2)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	44,762 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	1,500	0	0
60.00	11,084	12,584	12,584
62.00	21,094	32,178	44,762

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.15 cfs @ 13.56 hrs HW=61.12' (Free Discharge)
└─**1=Culvert** (Inlet Controls 23.15 cfs @ 7.37 fps)

Secondary OutFlow Max=11.52 cfs @ 13.56 hrs HW=61.12' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 11.52 cfs @ 0.94 fps)

Summary for Subcatchment 3S:

Runoff = 87.89 cfs @ 12.61 hrs, Volume= 12.243 af, Depth> 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	31.060	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
	35.060	70	Weighted Average
	35.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
43.8	550	Total			

Summary for Subcatchment 8:

Runoff = 184.27 cfs @ 13.47 hrs, Volume= 44.480 af, Depth> 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	48.000	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	74.270	61	EXISTING LAWNS B
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
	184.270	59	Weighted Average
	174.270		94.57% Pervious Area
	10.000		5.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 137.65 cfs @ 13.11 hrs, Volume= 27.456 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 303.09 cfs @ 13.13 hrs, Volume= 61.245 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
	20.000	70	1/2 acre lots, 25% imp, HSG B
	103.300	61	>75% Grass cover, Good, HSG B
*	5.000	98	ROADS
	250.300	59	Weighted Average
	240.300		96.00% Pervious Area
	10.000		4.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 79.28 cfs @ 12.71 hrs, Volume= 12.280 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	18.320	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	11.180	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	31.090	75	Weighted Average
	29.500		94.89% Pervious Area
	1.590		5.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 66.86 cfs @ 13.10 hrs, Volume= 13.161 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af, Depth> 4.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: OFF SITE ABOVE GREELY ROAD

Runoff = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 66.64 cfs @ 13.49 hrs, Volume= 15.754 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	54.530	61	EXISTING LAWNS B - OFF SITE
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
	56.890	63	Weighted Average
	54.530		95.85% Pervious Area
	2.360		4.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 39R: Stream Greely to Golf Pond

Inflow Area = 743.000 ac, 4.54% Impervious, Inflow Depth > 0.80" for 100 YEAR event
Inflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Outflow = 118.34 cfs @ 19.44 hrs, Volume= 46.702 af, Atten= 0%, Lag= 13.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.49 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 4.54 fps, Avg. Travel Time= 9.7 min

Peak Storage= 57,110 cf @ 19.30 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   2.74"    for  100 YEAR event
Inflow      =      290.98 cfs @   13.29 hrs,  Volume=         112.352 af
Outflow     =      284.54 cfs @   13.86 hrs,  Volume=         109.040 af,  Atten= 2%,  Lag= 33.8 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 22.3 min

Peak Storage= 242,556 cf @ 13.62 hrs
Average Depth at Peak Storage= 3.41'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      184.270 ac,    5.43% Impervious,  Inflow Depth >   7.01"    for  100 YEAR event
Inflow      =      261.29 cfs @   13.80 hrs,  Volume=         107.599 af
Outflow     =      259.22 cfs @   13.96 hrs,  Volume=         105.450 af,  Atten= 1%,  Lag= 9.2 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.36 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 3.25 fps, Avg. Travel Time= 7.6 min

Peak Storage= 71,695 cf @ 13.88 hrs
Average Depth at Peak Storage= 3.02'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: Stream Golf Pond to RR Culvert

```
Inflow Area =      241.160 ac,    5.13% Impervious,  Inflow Depth >   6.03"    for  100 YEAR event
Inflow       =     317.05 cfs @   13.92 hrs,  Volume=         121.136 af
Outflow      =     316.18 cfs @   13.99 hrs,  Volume=         120.037 af,  Atten= 0%,  Lag= 4.4 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 3.6 min

Peak Storage= 42,060 cf @ 13.96 hrs
Average Depth at Peak Storage= 4.47'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 257.28 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

Summary for Reach 55R: Wetland below Site

```
Inflow Area =       35.060 ac,    0.00% Impervious,  Inflow Depth >   4.19"    for  100 YEAR event
Inflow       =      87.89 cfs @   12.61 hrs,  Volume=          12.243 af
Outflow      =      87.50 cfs @   12.65 hrs,  Volume=          12.214 af,  Atten= 0%,  Lag= 2.7 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 3.6 min

Peak Storage= 7,963 cf @ 12.62 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af
Outflow = 127.24 cfs @ 19.52 hrs, Volume= 64.849 af, Atten= 0%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 11.2 min

Peak Storage= 54,587 cf @ 19.40 hrs
Average Depth at Peak Storage= 2.27'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 4.78" for 100 YEAR event
Inflow = 55.03 cfs @ 12.87 hrs, Volume= 11.430 af
Outflow = 54.68 cfs @ 13.02 hrs, Volume= 11.350 af, Atten= 1%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 10.8 min

Peak Storage= 16,434 cf @ 12.94 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

Inflow Area = 35.060 ac, 0.00% Impervious, Inflow Depth > 4.18" for 100 YEAR event
Inflow = 87.50 cfs @ 12.65 hrs, Volume= 12.214 af
Outflow = 85.78 cfs @ 12.72 hrs, Volume= 12.154 af, Atten= 2%, Lag= 4.5 min
Primary = 33.34 cfs @ 12.72 hrs, Volume= 9.702 af
Secondary = 52.44 cfs @ 12.72 hrs, Volume= 2.452 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.86' @ 12.72 hrs Surf.Area= 19,291 sf Storage= 53,557 cf

Plug-Flow detention time= 13.1 min calculated for 12.154 af (100% of inflow)
Center-of-Mass det. time= 11.3 min (833.2 - 821.9)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.33 cfs @ 12.72 hrs HW=59.85' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 33.33 cfs @ 10.61 fps)

Secondary OutFlow Max=52.12 cfs @ 12.72 hrs HW=59.85' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 52.12 cfs @ 2.44 fps)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

```
Inflow Area =      241.160 ac,   5.13% Impervious,  Inflow Depth >   5.97"    for  100 YEAR event
Inflow      =     316.18 cfs @  13.99 hrs,  Volume=        120.037 af
Outflow     =     242.48 cfs @  14.74 hrs,  Volume=        117.051 af,  Atten= 23%,  Lag= 44.9 min
Primary     =     242.48 cfs @  14.74 hrs,  Volume=        117.051 af
Secondary =         0.00 cfs @    5.00 hrs,  Volume=          0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.82' @ 14.74 hrs Surf.Area= 218,567 sf Storage= 361,063 cf

Plug-Flow detention time= 17.3 min calculated for 117.051 af (98% of inflow)
Center-of-Mass det. time= 11.6 min (984.3 - 972.6)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	4,415,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	2,578	1,949	1,949
57.00	10,714	6,646	8,595
60.00	57,013	101,591	110,186
62.00	234,474	291,487	401,673
66.00	504,090	1,477,128	1,878,801
70.00	764,501	2,537,182	4,415,983

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box Box Culvert** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=242.46 cfs @ 14.74 hrs HW=61.82' (Free Discharge)
↑**1=Box Culvert** (Barrel Controls 242.46 cfs @ 9.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

```
Inflow Area =      743.000 ac,   4.54% Impervious,  Inflow Depth >   2.75"    for  100 YEAR event
Inflow      =     523.45 cfs @  13.47 hrs,  Volume=        170.286 af
Outflow     =     118.36 cfs @  19.21 hrs,  Volume=         49.310 af,  Atten= 77%,  Lag= 344.6 min
Primary     =     118.36 cfs @  19.21 hrs,  Volume=         49.310 af
Secondary =         0.00 cfs @    5.00 hrs,  Volume=          0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 124.62' @ 19.21 hrs Surf.Area= 1,420,388 sf Storage= 5,304,855 cf

Plug-Flow detention time= 250.0 min calculated for 49.310 af (29% of inflow)
Center-of-Mass det. time= 121.4 min (1,039.2 - 917.7)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=118.47 cfs @ 19.21 hrs HW=124.62' (Free Discharge)
└─**1=60" Culvert** (Inlet Controls 118.47 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 2.73" for 100 YEAR event
Inflow = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af
Outflow = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af, Atten= 56%, Lag= 72.2 min
Primary = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.07' @ 14.34 hrs Surf.Area= 288,151 sf Storage= 1,441,429 cf

Plug-Flow detention time= 100.7 min calculated for 84.614 af (92% of inflow)
Center-of-Mass det. time= 78.0 min (947.2 - 869.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=197.65 cfs @ 14.34 hrs HW=168.07' (Free Discharge)
↳**1=48" Culvert** (Barrel Controls 197.65 cfs @ 10.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↳**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 184.270 ac, 5.43% Impervious, Inflow Depth > 2.90" for 100 YEAR event
Inflow = 184.27 cfs @ 13.47 hrs, Volume= 44.480 af
Outflow = 173.11 cfs @ 13.80 hrs, Volume= 42.750 af, Atten= 6%, Lag= 19.8 min
Primary = 64.23 cfs @ 13.80 hrs, Volume= 33.301 af
Secondary = 108.88 cfs @ 13.80 hrs, Volume= 9.449 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.63' @ 13.80 hrs Surf.Area= 78,033 sf Storage= 401,106 cf

Plug-Flow detention time= 63.0 min calculated for 42.608 af (96% of inflow)
Center-of-Mass det. time= 51.7 min (937.5 - 885.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

```
Primary OutFlow  Max=64.23 cfs @ 13.80 hrs  HW=78.63'   (Free Discharge)
↑1=Culvert  (Inlet Controls 64.23 cfs @ 13.08 fps)

Secondary OutFlow  Max=108.71 cfs @ 13.80 hrs  HW=78.63'   (Free Discharge)
↑2=Broad-Crested Rectangular Weir (Weir Controls 108.71 cfs @ 2.14 fps)
```

Summary for Pond 81P: OFF SITE POND

```
Inflow Area =      59.760 ac,    5.97% Impervious,  Inflow Depth >   4.74"    for  100 YEAR event
Inflow      =     126.47 cfs @   12.83 hrs,  Volume=          23.629 af
Outflow     =      92.03 cfs @   13.30 hrs,  Volume=          22.900 af,  Atten= 27%,  Lag= 28.0 min
Primary     =      33.71 cfs @   13.30 hrs,  Volume=          15.692 af
Secondary =        58.32 cfs @   13.30 hrs,  Volume=           7.208 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00'   Surf.Area= 20,254 sf   Storage= 139,510 cf
Peak Elev= 67.97' @ 13.30 hrs   Surf.Area= 78,744 sf   Storage= 391,029 cf   (251,519 cf above start)

Plug-Flow detention time= 115.2 min calculated for 19.697 af (83% of inflow)
Center-of-Mass det. time= 48.2 min ( 876.0 - 827.7 )

Volume        Invert     Avail.Storage   Storage Description
   #1         52.00'       393,587 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store          Cum.Store
     (feet)             (sq-ft)        (cubic-feet)        (cubic-feet)
     52.00               7,648                  0                  0
     62.00              20,254            139,510            139,510
     64.00              30,728             50,982            190,492
     66.00              46,299             77,027            267,519
     67.00              63,288             54,794            322,313
     68.00              79,261             71,275            393,587

Device   Routing           Invert   Outlet Devices
   #1    Primary           62.00'   24.0"  Round Culvert
                                    L= 100.0'   RCP, end-section conforming to fill,  Ke= 0.500
                                    Inlet / Outlet Invert= 62.00' / 61.50'   S= 0.0050 '/'   Cc= 0.900
                                    n= 0.010  PVC, smooth interior,  Flow Area= 3.14 sf
   #2    Secondary         66.00'   8.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                    Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Primary OutFlow  Max=33.71 cfs @ 13.30 hrs  HW=67.97'   (Free Discharge)
↑1=Culvert  (Inlet Controls 33.71 cfs @ 10.73 fps)

Secondary OutFlow  Max=58.28 cfs @ 13.30 hrs  HW=67.97'   (Free Discharge)
↑2=Broad-Crested Rectangular Weir (Weir Controls 58.28 cfs @ 3.70 fps)
```

Summary for Pond 82P: Golf Course Pond

```
Inflow Area =      827.990 ac,   4.73% Impervious,  Inflow Depth >   1.04"    for  100 YEAR event
Inflow      =     127.45 cfs @  18.93 hrs,  Volume=         71.503 af
Outflow     =     127.26 cfs @  19.31 hrs,  Volume=         67.347 af,  Atten= 0%,  Lag= 22.9 min
Secondary =       127.26 cfs @  19.31 hrs,  Volume=         67.347 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 79.31' @ 19.31 hrs Surf.Area= 68,498 sf Storage= 181,901 cf

Plug-Flow detention time= 24.1 min calculated for 67.123 af (94% of inflow)
Center-of-Mass det. time= 11.5 min (995.5 - 984.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=127.25 cfs @ 19.31 hrs HW=79.31' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 127.25 cfs @ 4.80 fps)

Summary for Pond 83P: Culvert at Valhalla Road

```
Inflow Area =       31.310 ac,  11.18% Impervious,  Inflow Depth >   4.47"    for  100 YEAR event
Inflow      =       58.33 cfs @  13.10 hrs,  Volume=         11.651 af
Outflow     =       33.38 cfs @  13.86 hrs,  Volume=         11.640 af,  Atten= 43%,  Lag= 45.3 min
Primary     =       33.38 cfs @  13.86 hrs,  Volume=         11.640 af
Secondary =          0.00 cfs @   5.00 hrs,  Volume=          0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 136.14' @ 13.86 hrs Surf.Area= 20,365 sf Storage= 96,933 cf

Plug-Flow detention time= 24.1 min calculated for 11.602 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (867.4 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.38 cfs @ 13.86 hrs HW=136.14' (Free Discharge)
↰**1=Culvert** (Inlet Controls 33.38 cfs @ 18.89 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 4.85" for 100 YEAR event
Inflow = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af
Outflow = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af, Atten= 32%, Lag= 24.7 min
Primary = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 83.23' @ 13.12 hrs Surf.Area= 58,674 sf Storage= 49,853 cf

Plug-Flow detention time= 15.4 min calculated for 8.172 af (99% of inflow)
Center-of-Mass det. time= 12.5 min (827.9 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.94 cfs @ 13.12 hrs HW=83.23' (Free Discharge)
↑**1=Culvert** (Inlet Controls 35.94 cfs @ 6.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af
Outflow = 20.43 cfs @ 12.81 hrs, Volume= 3.231 af, Atten= 3%, Lag= 6.2 min
Primary = 10.34 cfs @ 12.81 hrs, Volume= 2.768 af
Secondary = 10.09 cfs @ 12.81 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.28' @ 12.81 hrs Surf.Area= 14,299 sf Storage= 16,973 cf

Plug-Flow detention time= 18.1 min calculated for 3.220 af (99% of inflow)
Center-of-Mass det. time= 15.8 min (833.0 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.34 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↑**1=Culvert** (Barrel Controls 10.34 cfs @ 5.85 fps)

Secondary OutFlow Max=10.05 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 10.05 cfs @ 1.43 fps)

Summary for Pond 86P: 24" CULVERT

```
Inflow Area =      56.890 ac,   4.15% Impervious,  Inflow Depth >   3.32"    for  100 YEAR event
Inflow      =      66.64 cfs @   13.49 hrs,  Volume=          15.754 af
Outflow     =      66.55 cfs @   13.50 hrs,  Volume=          15.686 af,  Atten= 0%,  Lag= 0.9 min
Primary     =      23.98 cfs @   13.50 hrs,  Volume=          10.862 af
Secondary =        42.57 cfs @   13.50 hrs,  Volume=           4.824 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.29' @ 13.50 hrs   Surf.Area= 17,552 sf   Storage= 31,088 cf

Plug-Flow detention time= 11.3 min calculated for 15.634 af (99% of inflow)
Center-of-Mass det. time= 9.9 min ( 889.0 - 879.1 )

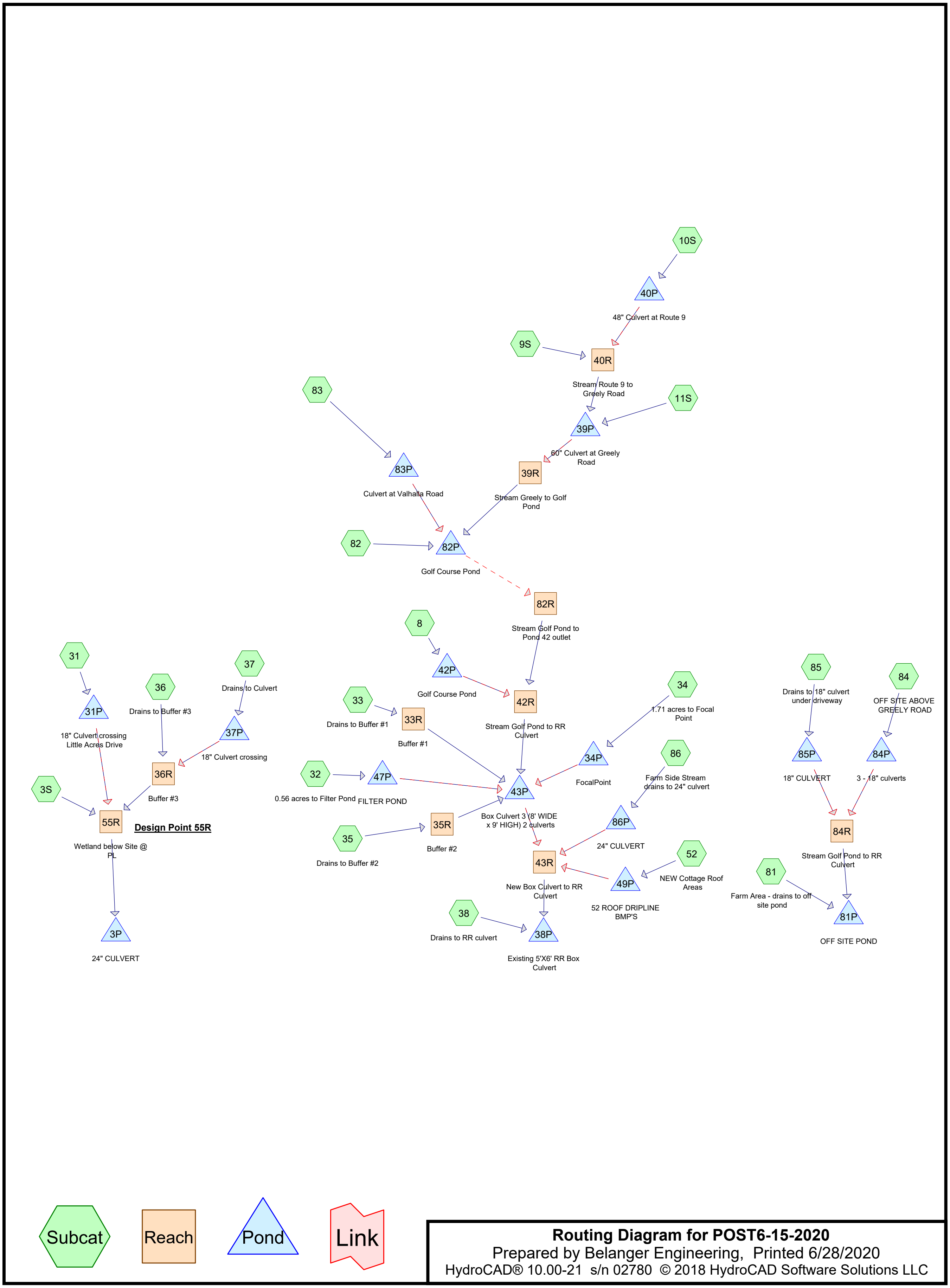
Volume        Invert     Avail.Storage   Storage Description
   #1         58.00'         44,762 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store         Cum.Store
    (feet)             (sq-ft)      (cubic-feet)      (cubic-feet)
     58.00               1,500                 0                 0
     60.00              11,084            12,584            12,584
     62.00              21,094            32,178            44,762

Device   Routing           Invert   Outlet Devices
   #1    Primary           57.78'   24.0"  Round Culvert
                                    L= 73.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                    Inlet / Outlet Invert= 57.78' / 56.17'   S= 0.0221 '/'   Cc= 0.900
                                    n= 0.011  Concrete pipe, straight & clean,  Flow Area= 3.14 sf
   #2    Secondary         61.00'   100.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                    Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=23.98 cfs @ 13.50 hrs  HW=61.29'   (Free Discharge)
└─1=Culvert  (Inlet Controls 23.98 cfs @ 7.63 fps)

Secondary OutFlow  Max=42.49 cfs @ 13.50 hrs  HW=61.29'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 42.49 cfs @ 1.45 fps)
```



Routing Diagram for POST6-15-2020
Prepared by Belanger Engineering, Printed 6/28/2020
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
15.000	75	1/4 acre lots, 38% imp, HSG B (10S)
2.860	98	52 Cottage Roofs (52)
0.620	74	Approved LAWN C phase 1 (3S)
0.100	98	Approved Trails-phase 1 (3S)
0.520	98	EXISTING BARN AND HOUSE (81, 84)
0.130	98	EXISTING GRAVEL/PAVED FARM (86)
0.260	98	EXISTING HOUSE AND BARN (86)
1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE (86)
13.000	98	EXISTING IMPERVIOUS AREA (9S)
103.300	61	EXISTING LAWN B (11S)
111.520	74	EXISTING LAWN C (3S, 9S, 10S, 81, 82, 83, 84, 85)
129.300	61	EXISTING LAWNS B (8, 86)
20.000	70	EXISTING LOTS B (11S)
1.640	98	EXISTING PAVED/GRAVEL FARM (81, 84)
26.910	98	EXISTING ROADS (8, 10S, 11S, 81, 82, 83, 84, 85)
0.870	98	EXISTING ROADS-OFF SITE (86)
0.170	98	NEW IMPERVIOUS (81)
4.080	98	NEW IMPERVIOUS PAVED AREA (32, 33, 34, 35, 36)
10.010	74	NEW LAWN C (3S, 8, 32, 33, 34, 35, 36, 37, 38)
0.430	70	NEW LAWN C (31)
0.860	74	NEW LAWNS C (86)
0.540	98	NEW PAVED - FARM (86)
0.540	98	NEW PAVEMENT - FARM (8)
24.080	70	WOODS / FIELD HSG C (3S, 31)
18.050	74	WOODS / FIELD HSG C/D (81)
205.000	30	Woods, Good, HSG A (8, 9S, 10S, 11S)
178.000	55	Woods, Good, HSG B (8, 9S, 10S, 11S, 82, 83)
231.090	70	Woods, Good, HSG C (8, 9S, 10S, 11S, 37, 38)
64.000	77	Woods, Good, HSG D (10S, 11S)
1,163.980	**61**	**TOTAL AREA**

Summary for Subcatchment 3S:

```
Runoff     =      7.19 cfs @  12.91 hrs,  Volume=        1.285 af,  Depth>  0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  2 YEAR Rainfall=3.10"

   Area (ac)   CN   Description
*     15.050   70   WOODS / FIELD HSG C
*      0.000   98   EXISTING IMPERVIOUS AREA
*      4.000   74   EXISTING LAWN C
*      0.620   74   Approved LAWN C phase 1
*      0.100   98   Approved Trails-phase 1
*      1.670   74   NEW LAWN C
*      0.000   98   NEW ROOF (1/2-11 UNITS=0.31 AC))
      21.440   71   Weighted Average
      21.340        99.53% Pervious Area
       0.100        0.47% Impervious Area

    Tc  Length   Slope  Velocity  Capacity  Description
 (min)  (feet)  (ft/ft)  (ft/sec)     (cfs)
  28.8     100  0.0400      0.06            Sheet Flow, AB
                                            Woods: Dense underbrush   n= 0.800   P2= 3.10"
  15.0     450  0.0400      0.50            Shallow Concentrated Flow, BC
                                            Forest w/Heavy Litter   Kv= 2.5 fps
  16.5      75  0.0900      0.08            Sheet Flow,
                                            Woods: Dense underbrush   n= 0.800   P2= 3.10"
  60.3     625  Total
```

Summary for Subcatchment 8:

```
Runoff     =      9.66 cfs @  13.94 hrs,  Volume=        3.346 af,  Depth>  0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  2 YEAR Rainfall=3.10"

   Area (ac)   CN   Description
      32.000   30   Woods, Good, HSG A
      20.000   55   Woods, Good, HSG B
      25.450   70   Woods, Good, HSG C
*     10.000   98   EXISTING ROADS
*      0.000   98   EXISTING PAVED / GRAVEL FARM
*      0.000   98   EXISTING HOUSE AND BARN
*     78.000   61   EXISTING LAWNS B
*      1.560   74   NEW LAWN C
*      0.000   98   NEW COTTAGES  (0.54 ac) (see sub 52) 1/2 27 units
*      0.540   98   NEW PAVEMENT - FARM
     167.550   58   Weighted Average
     157.010        93.71% Pervious Area
      10.540        6.29% Impervious Area
```

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 16.96 cfs @ 13.28 hrs, Volume= 3.916 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 23.03 cfs @ 13.52 hrs, Volume= 7.443 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 19.38 cfs @ 13.45 hrs, Volume= 5.703 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 2.93 cfs @ 12.92 hrs, Volume= 0.532 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 2.45 cfs @ 12.03 hrs, Volume= 0.150 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 5.33 cfs @ 12.03 hrs, Volume= 0.323 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.740	74	NEW LAWN C
	2.600	84	Weighted Average
	1.530		58.85% Pervious Area
	1.070		41.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 8.77 cfs @ 12.03 hrs, Volume= 0.531 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.570	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.280	84	Weighted Average
	2.570		60.05% Pervious Area
	1.710		39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 2.38 cfs @ 12.03 hrs, Volume= 0.146 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.360	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.940	89	Weighted Average
	0.360		38.30% Pervious Area
	0.580		61.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 0.78 cfs @ 12.03 hrs, Volume= 0.047 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 4.13 cfs @ 12.52 hrs, Volume= 0.544 af, Depth> 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	8.650	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.11 ac (1/2) of 2 Roofs + 2 fulll
	9.540	70	Weighted Average
	9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.1	150	0.0600	0.61		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
32.9	250	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 9.84 cfs @ 12.00 hrs, Volume= 0.639 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 14.71 cfs @ 12.77 hrs, Volume= 2.328 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 4.29 cfs @ 13.37 hrs, Volume= 1.228 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 10.04 cfs @ 13.17 hrs, Volume= 2.098 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af, Depth> 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 6.08 cfs @ 13.75 hrs, Volume= 1.783 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.600 ac, 41.15% Impervious, Inflow Depth > 1.49" for 2 YEAR event
Inflow = 5.33 cfs @ 12.03 hrs, Volume= 0.323 af
Outflow = 3.51 cfs @ 12.31 hrs, Volume= 0.315 af, Atten= 34%, Lag= 16.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 11.9 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 35.1 min

Peak Storage= 2,503 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 35R: Buffer #2

```
Inflow Area =       0.940 ac, 61.70% Impervious, Inflow Depth >  1.87"   for 2 YEAR event
Inflow      =       2.38 cfs @  12.03 hrs, Volume=         0.146 af
Outflow     =       1.49 cfs @  12.34 hrs, Volume=         0.143 af, Atten= 37%, Lag= 18.5 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.13 fps, Min. Travel Time= 13.2 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 40.2 min

Peak Storage= 1,212 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 36R: Buffer #3

```
Inflow Area =       2.090 ac,  7.66% Impervious, Inflow Depth >  0.71"   for 2 YEAR event
Inflow      =       0.78 cfs @  12.03 hrs, Volume=         0.124 af
Outflow     =       0.42 cfs @  12.46 hrs, Volume=         0.119 af, Atten= 46%, Lag= 25.6 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.09 fps, Min. Travel Time= 18.3 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 33.4 min

Peak Storage= 464 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'

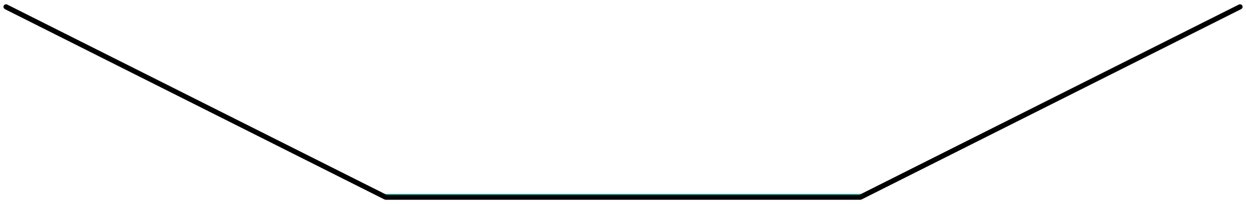
Summary for Reach 39R: Stream Greely to Golf Pond

```
Inflow Area =      743.000 ac,    3.86% Impervious,  Inflow Depth >   0.00"    for  2 YEAR event
Inflow      =         0.83 cfs @   20.00 hrs,  Volume=            0.082 af
Outflow     =         0.20 cfs @   20.00 hrs,  Volume=            0.008 af,  Atten= 76%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.82 fps, Min. Travel Time= 53.6 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 71.8 min

Peak Storage= 1,886 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'



Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   0.22"    for  2 YEAR event
Inflow      =        17.23 cfs @   15.31 hrs,  Volume=            8.944 af
Outflow     =        17.12 cfs @   16.23 hrs,  Volume=            7.939 af,  Atten= 1%,  Lag= 55.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 32.8 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 38.8 min

Peak Storage= 33,658 cf @ 15.68 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.43" for 2 YEAR event
Inflow = 18.36 cfs @ 14.43 hrs, Volume= 6.045 af
Outflow = 18.22 cfs @ 14.74 hrs, Volume= 5.848 af, Atten= 1%, Lag= 18.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 10.5 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 14.9 min

Peak Storage= 11,518 cf @ 14.57 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: New Box Culvert to RR Culvert

Inflow Area = 234.340 ac, 8.63% Impervious, Inflow Depth > 0.43" for 2 YEAR event
Inflow = 23.94 cfs @ 14.67 hrs, Volume= 8.422 af
Outflow = 23.89 cfs @ 14.83 hrs, Volume= 8.290 af, Atten= 0%, Lag= 10.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.58 fps, Min. Travel Time= 5.3 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 9.8 min

Peak Storage= 7,543 cf @ 14.75 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 4.00' Flow Area= 96.0 sf, Capacity= 364.94 cfs

16.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 32.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 55R: Wetland below Site @ PL

Inflow Area = 32.990 ac, 0.79% Impervious, Inflow Depth > 0.70" for 2 YEAR event
Inflow = 9.81 cfs @ 12.96 hrs, Volume= 1.930 af
Outflow = 9.78 cfs @ 13.04 hrs, Volume= 1.917 af, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.36 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 6.5 min

Peak Storage= 1,867 cf @ 12.99 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

Inflow = 10.97 cfs @ 13.81 hrs, Volume= 3.117 af
Outflow = 10.64 cfs @ 14.30 hrs, Volume= 2.986 af, Atten= 3%, Lag= 29.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.73 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 24.4 min

Peak Storage= 10,164 cf @ 14.03 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

```
Inflow Area =        28.670 ac,    6.91% Impervious,  Inflow Depth >   0.93"    for  2 YEAR event
Inflow      =        13.43 cfs @   12.88 hrs,  Volume=            2.227 af
Outflow     =        13.11 cfs @   13.12 hrs,  Volume=            2.190 af,  Atten= 2%,  Lag= 14.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.45 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 16.2 min

Peak Storage= 6,419 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

```
Inflow Area =        32.990 ac,    0.79% Impervious,  Inflow Depth >   0.70"    for  2 YEAR event
Inflow      =         9.78 cfs @   13.04 hrs,  Volume=            1.917 af
Outflow     =         9.39 cfs @   13.19 hrs,  Volume=            1.892 af,  Atten= 4%,  Lag= 9.0 min
Primary     =         9.39 cfs @   13.19 hrs,  Volume=            1.892 af
Secondary =           0.00 cfs @    5.00 hrs,  Volume=            0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 55.39' @ 13.19 hrs Surf.Area= 5,586 sf Storage= 5,537 cf

Plug-Flow detention time= 12.5 min calculated for 1.892 af (99% of inflow)
Center-of-Mass det. time= 8.5 min (887.0 - 878.6)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.39 cfs @ 13.19 hrs HW=55.39' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 9.39 cfs @ 4.02 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 0.67" for 2 YEAR event
Inflow = 2.93 cfs @ 12.92 hrs, Volume= 0.532 af
Outflow = 2.50 cfs @ 13.19 hrs, Volume= 0.526 af, Atten= 15%, Lag= 16.6 min
Primary = 2.50 cfs @ 13.19 hrs, Volume= 0.526 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.25' @ 13.19 hrs Surf.Area= 7,324 sf Storage= 2,505 cf

Plug-Flow detention time= 15.7 min calculated for 0.524 af (99% of inflow)
Center-of-Mass det. time= 12.3 min (882.4 - 870.1)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.50 cfs @ 13.19 hrs HW=80.25' (Free Discharge)
↑└─**1=Culvert** (Barrel Controls 2.50 cfs @ 4.15 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
↑└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.280 ac, 39.95% Impervious, Inflow Depth > 1.49" for 2 YEAR event
Inflow = 8.77 cfs @ 12.03 hrs, Volume= 0.531 af
Outflow = 8.06 cfs @ 12.04 hrs, Volume= 0.531 af, Atten= 8%, Lag= 0.4 min
Primary = 8.06 cfs @ 12.04 hrs, Volume= 0.531 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 57.35' @ 12.05 hrs Surf.Area= 3,500 sf Storage= 213 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.3 min (791.3 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	57.20'	1,400 cf	**25.00'W x 140.00'L x 1.00'H crushed stone** 3,500 cf Overall x 40.0% Voids
#2	58.21'	9,160 cf	**1.30'W x 2.30'L x 3.55'H R-tank units** x 863
#3	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#4	64.00'	2,896 cf	**Surface Storage above focal point (Prismatic)** Listed below (Recalc) -Impe
		13,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	429	0	0
64.50	600	257	257
65.00	778	345	602
65.50	919	424	1,026
66.00	1,153	518	1,544
66.50	1,350	626	2,170
67.00	1,553	726	2,896

Device	Routing	Invert	Outlet Devices
#1	Primary	57.20'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Device 4	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	58.21'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	58.21'	**18.0" Round Culvert** L= 26.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.21' / 58.00' S= 0.0081 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.10 cfs @ 12.04 hrs HW=57.34' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 8.10 cfs)
└—**4=Culvert** (Controls 0.00 cfs)
  ↑—**2=Orifice/Grate** (Controls 0.00 cfs)
  └—**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 0.79" for 2 YEAR event
Inflow = 1.77 cfs @ 12.04 hrs, Volume= 0.112 af
Outflow = 0.26 cfs @ 12.67 hrs, Volume= 0.077 af, Atten= 85%, Lag= 37.9 min
Primary = 0.26 cfs @ 12.67 hrs, Volume= 0.077 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.52' @ 12.67 hrs Surf.Area= 4,011 sf Storage= 2,089 cf

Plug-Flow detention time= 152.4 min calculated for 0.077 af (68% of inflow)
Center-of-Mass det. time= 77.1 min (898.7 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.26 cfs @ 12.67 hrs HW=80.52' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.26 cfs @ 1.60 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.880 ac, 8.29% Impervious, Inflow Depth > 0.43" for 2 YEAR event
Inflow = 24.55 cfs @ 14.83 hrs, Volume= 8.834 af
Outflow = 24.49 cfs @ 14.90 hrs, Volume= 8.794 af, Atten= 0%, Lag= 4.6 min
Primary = 24.49 cfs @ 14.90 hrs, Volume= 8.794 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.42' @ 14.90 hrs Surf.Area= 6,939 sf Storage= 5,365 cf

Plug-Flow detention time= 3.7 min calculated for 8.765 af (99% of inflow)
Center-of-Mass det. time= 2.6 min (958.4 - 955.8)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	3,745,747 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	4,539	2,930	2,930
58.00	15,848	20,387	23,317
60.00	56,417	72,265	95,582
62.00	198,504	254,921	350,503
64.00	274,621	473,125	823,628
66.00	372,832	647,453	1,471,081
70.00	764,501	2,274,666	3,745,747

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box I** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=24.46 cfs @ 14.90 hrs HW=56.42' (Free Discharge)
└─**1=I** (Inlet Controls 24.46 cfs @ 3.69 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.22" for 2 YEAR event
Inflow = 29.22 cfs @ 14.17 hrs, Volume= 13.642 af
Outflow = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af, Atten= 97%, Lag= 349.7 min
Primary = 0.83 cfs @ 20.00 hrs, Volume= 0.082 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 120.64' @ 20.00 hrs Surf.Area= 953,534 sf Storage= 588,117 cf

Plug-Flow detention time= 403.8 min calculated for 0.082 af (1% of inflow)
Center-of-Mass det. time= 188.3 min (1,155.6 - 967.3)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.55 cfs @ 20.00 hrs HW=120.64' (Free Discharge)
↑**1=60" Culvert** (Inlet Controls 0.55 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area =	405.950 ac,	2.64% Impervious,	Inflow Depth >	0.22"	for 2 YEAR event
Inflow =	23.03 cfs @	13.52 hrs,	Volume=	7.443 af	
Outflow =	11.94 cfs @	16.18 hrs,	Volume=	5.028 af,	Atten= 48%, Lag= 159.6 min
Primary =	11.94 cfs @	16.18 hrs,	Volume=	5.028 af	
Secondary =	0.00 cfs @	5.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 161.48' @ 16.18 hrs Surf.Area= 108,987 sf Storage= 131,360 cf

Plug-Flow detention time= 152.2 min calculated for 5.028 af (68% of inflow)
Center-of-Mass det. time= 82.6 min (1,012.5 - 929.9)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.69 cfs @ 16.18 hrs HW=161.48' (Free Discharge)
↑—**1=48" Culvert** (Inlet Controls 11.69 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.24" for 2 YEAR event
Inflow = 9.66 cfs @ 13.94 hrs, Volume= 3.346 af
Outflow = 8.09 cfs @ 14.77 hrs, Volume= 3.060 af, Atten= 16%, Lag= 49.9 min
Primary = 8.09 cfs @ 14.77 hrs, Volume= 3.060 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 71.24' @ 14.77 hrs Surf.Area= 24,278 sf Storage= 24,528 cf

Plug-Flow detention time= 53.6 min calculated for 3.049 af (91% of inflow)
Center-of-Mass det. time= 33.0 min (975.0 - 942.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.08 cfs @ 14.77 hrs HW=71.24' (Free Discharge)
↰**1=Culvert** (Barrel Controls 8.08 cfs @ 4.87 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (8' WIDE x 9' HIGH) 2 culverts

Inflow Area = 176.420 ac, 8.20% Impervious, Inflow Depth > 0.47" for 2 YEAR event
Inflow = 19.21 cfs @ 14.73 hrs, Volume= 6.920 af
Outflow = 19.22 cfs @ 14.74 hrs, Volume= 6.920 af, Atten= 0%, Lag= 0.8 min
Primary = 19.22 cfs @ 14.74 hrs, Volume= 6.920 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.03' @ 14.74 hrs Surf.Area= 1,420 sf Storage= 43 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (952.6 - 952.5)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	2,789,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
58.00	7,722	9,042	9,042
60.00	9,674	17,396	26,438
62.00	63,671	73,345	99,783
64.00	169,090	232,761	332,544
66.00	252,914	422,004	754,548
70.00	764,501	2,034,830	2,789,378

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**96.0" W x 108.0" H Box 2- 8' wide Box Culverts X 2.00** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 72.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=77.33 cfs @ 14.74 hrs HW=56.03' (Free Discharge)
↰**1=2- 8' wide Box Culverts** (Barrel Controls 77.33 cfs @ 4.84 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

```
Inflow Area =       1.050 ac, 53.33% Impervious,  Inflow Depth >   1.71"    for  2 YEAR event
Inflow      =       2.45 cfs @  12.03 hrs,  Volume=          0.150 af
Outflow     =       0.39 cfs @  12.50 hrs,  Volume=          0.084 af,  Atten= 84%,  Lag= 28.1 min
Primary     =       0.39 cfs @  12.50 hrs,  Volume=          0.084 af
Secondary =         0.00 cfs @    5.00 hrs,  Volume=         0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.92' @ 12.50 hrs   Surf.Area= 2,413 sf   Storage= 3,580 cf

Plug-Flow detention time= 173.5 min calculated for 0.084 af (56% of inflow)
Center-of-Mass det. time= 95.0 min ( 877.2 - 782.2 )

Volume        Invert     Avail.Storage   Storage Description
   #1         79.00'         10,009 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area         Inc.Store        Cum.Store
    (feet)            (sq-ft)      (cubic-feet)     (cubic-feet)
     79.00              1,343                 0                0
     80.00              1,873             1,608            1,608
     81.00              2,460             2,167            3,775
     82.00              3,103             2,782            6,556
     83.00              3,803             3,453           10,009

Device  Routing            Invert   Outlet Devices
   #1   Primary            75.87'   18.0"  Round Culvert
                                    L= 31.0'   RCP, square edge headwall,  Ke= 0.500
                                    Inlet / Outlet Invert= 75.87' / 75.00'   S= 0.0281 '/'   Cc= 0.900
                                    n= 0.010  PVC, smooth interior,  Flow Area= 1.77 sf
   #2   Device 1           80.50'   6.0" Vert. Orifice/Grate   C= 0.600
   #3   Device 1           82.00'   48.0" Horiz. Orifice/Grate   C= 0.600
                                    Limited to weir flow at low heads
   #4   Secondary          82.50'   10.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                    Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                    Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Primary OutFlow  Max=0.39 cfs @ 12.50 hrs  HW=80.92'   (Free Discharge)
└─1=Culvert  (Passes 0.39 cfs of 17.64 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 0.39 cfs @ 2.21 fps)
   └─3=Orifice/Grate  ( Controls 0.00 cfs)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=79.00'   (Free Discharge)
└─4=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

```
Inflow Area =       2.860 ac,100.00% Impervious,  Inflow Depth >   2.68"    for  2 YEAR event
Inflow      =       9.84 cfs @  12.00 hrs,  Volume=          0.639 af
Outflow     =       0.00 cfs @    5.00 hrs,  Volume=         0.000 af,  Atten= 100%,  Lag= 0.0 min
Primary     =       0.00 cfs @    5.00 hrs,  Volume=         0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.08' @ 20.00 hrs Surf.Area= 851,760 sf Storage= 27,843 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	12,675 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 52 32,760 cf Overall - 1,072 cf Embedded = 31,688 cf x 40.0% Voids
#2	100.00'	1,072 cf	**6.0" Round Pipe Storage** x 52 Inside #1 L= 105.0' S= 0.0050 '/'
		13,747 cf	x 52.00 = 714,857 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 52.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area =	59.120 ac,	6.33% Impervious, Inflow Depth > 0.92"	for 2 YEAR event
Inflow =	25.47 cfs @	12.95 hrs, Volume=	4.518 af
Outflow =	15.11 cfs @	13.61 hrs, Volume=	4.198 af, Atten= 41%, Lag= 39.2 min
Primary =	15.11 cfs @	13.61 hrs, Volume=	4.198 af
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 64.12' @ 13.61 hrs Surf.Area= 31,625 sf Storage= 194,083 cf (54,573 cf above start)

Plug-Flow detention time= 320.2 min calculated for 0.992 af (22% of inflow)
Center-of-Mass det. time= 45.6 min (909.7 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900

```
                                n= 0.010  PVC, smooth interior,  Flow Area= 3.14 sf
   #2     Secondary     66.00'  8.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Primary OutFlow  Max=15.12 cfs @ 13.61 hrs  HW=64.11'   (Free Discharge)
└─1=Culvert  (Barrel Controls 15.12 cfs @ 5.66 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=62.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 82P: Golf Course Pond

```
Inflow Area =      827.990 ac,    4.13% Impervious,  Inflow Depth >   0.05"    for  2 YEAR event
Inflow      =       14.17 cfs @   13.31 hrs,  Volume=           3.329 af
Outflow     =       10.97 cfs @   13.81 hrs,  Volume=           3.117 af,  Atten= 23%,  Lag= 30.1 min
Secondary =         10.97 cfs @   13.81 hrs,  Volume=           3.117 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 76.64' @ 13.81 hrs   Surf.Area= 46,588 sf   Storage= 27,999 cf

Plug-Flow detention time= 50.8 min calculated for 3.107 af (93% of inflow)
Center-of-Mass det. time= 32.9 min ( 928.0 - 895.1 )

Volume        Invert    Avail.Storage   Storage Description
   #1         76.00'       395,691 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation         Surf.Area          Inc.Store         Cum.Store
    (feet)            (sq-ft)       (cubic-feet)      (cubic-feet)
     76.00             41,373                  0                 0
     82.00             90,524            395,691           395,691

Device   Routing          Invert   Outlet Devices
   #1     Secondary       76.00'   8.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                   Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                   Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Secondary OutFlow  Max=10.96 cfs @ 13.81 hrs  HW=76.64'   (Free Discharge)
└─1=Broad-Crested Rectangular Weir (Weir Controls 10.96 cfs @ 2.15 fps)
```

Summary for Pond 83P: Culvert at Valhalla Road

```
Inflow Area =       31.310 ac,  11.18% Impervious,  Inflow Depth >   0.80"    for  2 YEAR event
Inflow      =       10.04 cfs @   13.17 hrs,  Volume=           2.098 af
Outflow     =        9.93 cfs @   13.27 hrs,  Volume=           2.093 af,  Atten= 1%,  Lag= 5.8 min
Primary     =        9.93 cfs @   13.27 hrs,  Volume=           2.093 af
Secondary =          0.00 cfs @    5.00 hrs,  Volume=           0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
```

Peak Elev= 122.11' @ 13.27 hrs Surf.Area= 1,142 sf Storage= 1,593 cf

Plug-Flow detention time= 2.5 min calculated for 2.093 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (880.7 - 878.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.93 cfs @ 13.27 hrs HW=122.11' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 9.93 cfs @ 5.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 0.97" for 2 YEAR event
Inflow = 10.52 cfs @ 12.76 hrs, Volume= 1.653 af
Outflow = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af, Atten= 2%, Lag= 5.0 min
Primary = 10.31 cfs @ 12.85 hrs, Volume= 1.602 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.38' @ 12.85 hrs Surf.Area= 5,564 sf Storage= 5,483 cf

Plug-Flow detention time= 19.5 min calculated for 1.602 af (97% of inflow)
Center-of-Mass det. time= 9.5 min (859.6 - 850.2)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.30 cfs @ 12.85 hrs HW=81.38' (Free Discharge)
↑**1=Culvert** (Barrel Controls 10.30 cfs @ 4.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 0.92" for 2 YEAR event
Inflow = 3.98 cfs @ 12.77 hrs, Volume= 0.629 af
Outflow = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af, Atten= 17%, Lag= 15.9 min
Primary = 3.31 cfs @ 13.03 hrs, Volume= 0.625 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 90.93' @ 13.03 hrs Surf.Area= 6,258 sf Storage= 3,475 cf

Plug-Flow detention time= 16.2 min calculated for 0.625 af (99% of inflow)
Center-of-Mass det. time= 13.7 min (866.2 - 852.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.31 cfs @ 13.03 hrs HW=90.93' (Free Discharge)
└─**1=Culvert** (Barrel Controls 3.31 cfs @ 3.43 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

Inflow Area =	55.060 ac,	5.27% Impervious, Inflow Depth > 0.39"	for 2 YEAR event	
Inflow =	6.08 cfs @	13.75 hrs, Volume=	1.783 af	
Outflow =	4.85 cfs @	14.43 hrs, Volume=	1.503 af,	Atten= 20%, Lag= 41.1 min
Primary =	4.85 cfs @	14.43 hrs, Volume=	1.503 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.73' @ 14.43 hrs Surf.Area= 14,824 sf Storage= 18,559 cf

Plug-Flow detention time= 79.1 min calculated for 1.498 af (84% of inflow)
Center-of-Mass det. time= 42.0 min (964.8 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	401,091 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	758	0	0
58.00	9,115	9,873	9,873
60.00	24,850	33,965	43,838
62.00	43,236	68,086	111,924
64.00	72,382	115,618	227,542
66.00	101,167	173,549	401,091

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.84 cfs @ 14.43 hrs HW=58.73' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.84 cfs @ 3.31 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 17.40 cfs @ 12.85 hrs, Volume= 2.921 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	15.050	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.31 AC))
	21.440	71	Weighted Average
	21.340		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 41.06 cfs @ 13.68 hrs, Volume= 11.178 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 47.02 cfs @ 13.17 hrs, Volume= 9.735 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af, Depth> 0.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 80.13 cfs @ 13.27 hrs, Volume= 18.133 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 7.32 cfs @ 12.85 hrs, Volume= 1.233 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 4.22 cfs @ 12.03 hrs, Volume= 0.263 af, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 9.62 cfs @ 12.03 hrs, Volume= 0.591 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.740	74	NEW LAWN C
	2.600	84	Weighted Average
	1.530		58.85% Pervious Area
	1.070		41.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 15.83 cfs @ 12.03 hrs, Volume= 0.973 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.570	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.280	84	Weighted Average
	2.570		60.05% Pervious Area
	1.710		39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

```
Runoff      =        3.96 cfs @   12.03 hrs,  Volume=          0.251 af,  Depth>  3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  10 YEAR Rainfall=4.60"

    Area (ac)    CN    Description
*       0.580    98    NEW IMPERVIOUS PAVED AREA
*       0.360    74    NEW LAWN C
*       0.000    98    0.14 ac (1/2) of 5 Roofs
*       0.000    74    NEW LAWN C
        0.940    89    Weighted Average
        0.360          38.30% Pervious Area
        0.580          61.70% Impervious Area

    Tc   Length    Slope   Velocity   Capacity   Description
 (min)   (feet)   (ft/ft)  (ft/sec)      (cfs)
   0.2       11   0.0300      1.02               Sheet Flow, AB
                                                 Smooth surfaces   n= 0.011   P2= 3.10"
   1.4      300   0.0300      3.52               Shallow Concentrated Flow, BC
                                                 Paved   Kv= 20.3 fps
   1.6      311   Total
```

Summary for Subcatchment 36: Drains to Buffer #3

```
Runoff      =        1.41 cfs @   12.03 hrs,  Volume=          0.086 af,  Depth>  2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr  10 YEAR Rainfall=4.60"

    Area (ac)    CN    Description
*       0.160    98    NEW IMPERVIOUS PAVED AREA
*       0.220    74    NEW LAWN C
*       0.000    98    0.055 ac (1/2) of 2 Roofs
*       0.000    74    NEW LAWN C
        0.380    84    Weighted Average
        0.220          57.89% Pervious Area
        0.160          42.11% Impervious Area

    Tc   Length    Slope   Velocity   Capacity   Description
 (min)   (feet)   (ft/ft)  (ft/sec)      (cfs)
   0.2       11   0.0300      1.02               Sheet Flow, AB
                                                 Smooth surfaces   n= 0.011   P2= 3.10"
   1.4      300   0.0300      3.52               Shallow Concentrated Flow, BC
                                                 Paved   Kv= 20.3 fps
   1.6      311   Total
```

Summary for Subcatchment 37: Drains to Culvert

Runoff = 4.11 cfs @ 12.03 hrs, Volume= 0.249 af, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 10.24 cfs @ 12.49 hrs, Volume= 1.259 af, Depth> 1.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	8.650	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.11 ac (1/2) of 2 Roofs + 2 fulll
	9.540	70	Weighted Average
	9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.1	150	0.0600	0.61		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
32.9	250	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 14.71 cfs @ 12.00 hrs, Volume= 0.966 af, Depth> 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 31.95 cfs @ 12.74 hrs, Volume= 4.911 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 17.74 cfs @ 13.18 hrs, Volume= 3.899 af, Depth> 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af, Depth> 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 19.65 cfs @ 13.55 hrs, Volume= 4.958 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.600 ac, 41.15% Impervious, Inflow Depth > 2.73" for 10 YEAR event
Inflow = 9.62 cfs @ 12.03 hrs, Volume= 0.591 af
Outflow = 7.06 cfs @ 12.25 hrs, Volume= 0.581 af, Atten= 27%, Lag= 13.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 30.2 min

Peak Storage= 3,805 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 35R: Buffer #2

Inflow Area = 0.940 ac, 61.70% Impervious, Inflow Depth > 3.20" for 10 YEAR event
Inflow = 3.96 cfs @ 12.03 hrs, Volume= 0.251 af
Outflow = 2.75 cfs @ 12.27 hrs, Volume= 0.246 af, Atten= 31%, Lag= 14.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 10.4 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 34.9 min

Peak Storage= 1,745 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 1.70" for 10 YEAR event
Inflow = 2.28 cfs @ 12.07 hrs, Volume= 0.297 af
Outflow = 2.02 cfs @ 12.48 hrs, Volume= 0.291 af, Atten= 11%, Lag= 24.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.17 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 27.3 min

Peak Storage= 1,193 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'

Summary for Reach 39R: Stream Greely to Golf Pond

```
Inflow Area =      743.000 ac,    3.86% Impervious,  Inflow Depth >   0.10"    for  10 YEAR event
Inflow      =       20.44 cfs @   20.00 hrs,  Volume=            6.126 af
Outflow     =       19.97 cfs @   20.00 hrs,  Volume=            5.325 af,  Atten= 2%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 14.4 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 19.4 min

Peak Storage= 17,477 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   0.78"    for  10 YEAR event
Inflow      =       85.67 cfs @   13.80 hrs,  Volume=           31.827 af
Outflow     =       83.71 cfs @   14.48 hrs,  Volume=           30.222 af,  Atten= 2%,  Lag= 40.6 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 20.0 min
Avg. Velocity = 2.82 fps, Avg. Travel Time= 28.4 min

Peak Storage= 100,395 cf @ 14.15 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

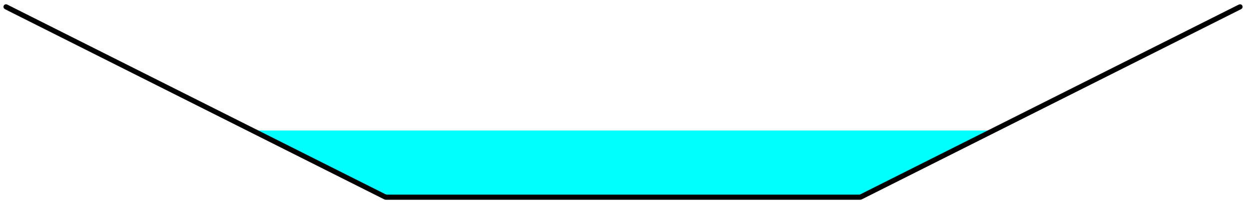
Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      167.550 ac,    6.29% Impervious,  Inflow Depth >   1.62"    for  10 YEAR event
Inflow       =      63.53 cfs @   14.11 hrs,  Volume=          22.665 af
Outflow      =      63.29 cfs @   14.32 hrs,  Volume=          22.017 af,  Atten= 0%,  Lag= 12.5 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 10.6 min

Peak Storage= 26,548 cf @ 14.20 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'



Summary for Reach 43R: New Box Culvert to RR Culvert

```
Inflow Area =      234.340 ac,    8.63% Impervious,  Inflow Depth >   1.47"    for  10 YEAR event
Inflow       =      80.86 cfs @   14.27 hrs,  Volume=          28.630 af
Outflow      =      80.78 cfs @   14.39 hrs,  Volume=          28.261 af,  Atten= 0%,  Lag= 6.6 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.40 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 7.1 min

Peak Storage= 16,846 cf @ 14.33 hrs
Average Depth at Peak Storage= 1.73'
Bank-Full Depth= 4.00' Flow Area= 96.0 sf, Capacity= 364.94 cfs

16.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 32.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 55R: Wetland below Site @ PL

```
Inflow Area =        32.990 ac,    0.79% Impervious,  Inflow Depth >   1.61"    for  10 YEAR event
Inflow       =       23.53 cfs @   12.89 hrs,  Volume=            4.435 af
Outflow      =       23.49 cfs @   12.95 hrs,  Volume=            4.416 af,  Atten= 0%,  Lag= 3.8 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.22 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 5.4 min

Peak Storage= 3,286 cf @ 12.91 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

```
Inflow       =       32.90 cfs @   13.71 hrs,  Volume=           12.716 af
Outflow      =       32.47 cfs @   14.03 hrs,  Volume=           11.989 af,  Atten= 1%,  Lag= 19.1 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 10.9 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 16.4 min

Peak Storage= 21,227 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

```
Inflow Area =        28.670 ac,    6.91% Impervious,  Inflow Depth >   1.96"    for  10 YEAR event
Inflow       =       28.07 cfs @   12.87 hrs,  Volume=            4.690 af
Outflow      =       27.76 cfs @   13.04 hrs,  Volume=            4.638 af,  Atten= 1%,  Lag= 10.4 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 13.5 min

Peak Storage= 10,452 cf @ 12.94 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

```
Inflow Area =        32.990 ac,    0.79% Impervious,  Inflow Depth >   1.61"    for  10 YEAR event
Inflow       =       23.49 cfs @   12.95 hrs,  Volume=            4.416 af
Outflow      =       20.78 cfs @   13.23 hrs,  Volume=            4.380 af,  Atten= 12%,  Lag= 16.7 min
Primary      =       20.78 cfs @   13.23 hrs,  Volume=            4.380 af
Secondary =           0.00 cfs @    5.00 hrs,  Volume=            0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.89' @ 13.23 hrs Surf.Area= 8,324 sf Storage= 16,141 cf

Plug-Flow detention time= 11.7 min calculated for 4.366 af (99% of inflow)
Center-of-Mass det. time= 9.0 min (868.4 - 859.3)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.77 cfs @ 13.23 hrs HW=56.88' (Free Discharge)
⮤**1=Culvert** (Inlet Controls 20.77 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
⮤**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 1.56" for 10 YEAR event
Inflow = 7.32 cfs @ 12.85 hrs, Volume= 1.233 af
Outflow = 5.66 cfs @ 13.22 hrs, Volume= 1.224 af, Atten= 23%, Lag= 22.0 min
Primary = 5.66 cfs @ 13.22 hrs, Volume= 1.224 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.75' @ 13.22 hrs Surf.Area= 13,973 sf Storage= 7,829 cf

Plug-Flow detention time= 18.6 min calculated for 1.224 af (99% of inflow)
Center-of-Mass det. time= 15.9 min (868.3 - 852.4)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

```
Primary OutFlow  Max=5.66 cfs @ 13.22 hrs  HW=80.75'   (Free Discharge)
└─1=Culvert  (Barrel Controls 5.66 cfs @ 4.89 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=79.50'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 34P: FocalPoint

```
Inflow Area =        4.280 ac,  39.95% Impervious,  Inflow Depth >   2.73"    for  10 YEAR event
Inflow      =       15.83 cfs @   12.03 hrs,  Volume=           0.973 af
Outflow     =       14.87 cfs @   12.07 hrs,  Volume=           0.973 af,  Atten= 6%,  Lag= 2.7 min
Primary     =       14.87 cfs @   12.07 hrs,  Volume=           0.973 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.34' @ 12.07 hrs   Surf.Area= 6,080 sf   Storage= 1,745 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.6 min ( 777.6 - 777.0 )

Volume        Invert    Avail.Storage   Storage Description
   #1         57.20'        1,400 cf    25.00'W x 140.00'L x 1.00'H crushed stone
                                        3,500 cf Overall  x 40.0% Voids
   #2         58.21'        9,160 cf    1.30'W x 2.30'L x 3.55'H R-tank units x 863
   #3         61.00'          192 cf    20.00'W x 15.00'L x 3.20'H FocalPoint
                                        960 cf Overall  x 20.0% Voids
   #4         64.00'        2,896 cf    Surface Storage above focal point (Prismatic)Listed below (Recalc) -Impe
                           13,648 cf    Total Available Storage

 Elevation         Surf.Area        Inc.Store        Cum.Store
   (feet)            (sq-ft)     (cubic-feet)     (cubic-feet)
     64.00               429                0                0
     64.50               600              257              257
     65.00               778              345              602
     65.50               919              424            1,026
     66.00             1,153              518            1,544
     66.50             1,350              626            2,170
     67.00             1,553              726            2,896

Device   Routing          Invert   Outlet Devices
   #1    Primary          57.20'   100.000 in/hr Exfiltration over Surface area   Phase-In= 0.10'
   #2    Device 4         65.50'   48.0" Horiz. Orifice/Grate   C= 0.600
                                   Limited to weir flow at low heads
   #3    Device 4         58.21'   12.0" Vert. Orifice/Grate   C= 0.600
   #4    Primary          58.21'   18.0"  Round Culvert
                                   L= 26.0'   RCP, square edge headwall,  Ke= 0.500
                                   Inlet / Outlet Invert= 58.21' / 58.00'   S= 0.0081 '/'   Cc= 0.900
                                   n= 0.010  PVC, smooth interior,  Flow Area= 1.77 sf
```

Primary OutFlow Max=14.09 cfs @ 12.07 hrs HW=58.27' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 14.07 cfs)
- **4=Culvert** (Passes 0.02 cfs of 0.02 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.84 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area =	1.710 ac,	0.00% Impervious, Inflow Depth >	1.75"	for 10 YEAR event
Inflow =	4.11 cfs @	12.03 hrs, Volume=	0.249 af	
Outflow =	1.61 cfs @	12.27 hrs, Volume=	0.210 af,	Atten= 61%, Lag= 14.1 min
Primary =	1.61 cfs @	12.27 hrs, Volume=	0.210 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 80.89' @ 12.27 hrs Surf.Area= 4,018 sf Storage= 3,568 cf

Plug-Flow detention time= 86.6 min calculated for 0.210 af (84% of inflow)
Center-of-Mass det. time= 41.1 min (844.5 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.60 cfs @ 12.27 hrs HW=80.89' (Free Discharge)
- **1=Culvert** (Barrel Controls 1.60 cfs @ 3.68 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.880 ac, 8.29% Impervious, Inflow Depth > 1.45" for 10 YEAR event
Inflow = 82.26 cfs @ 14.38 hrs, Volume= 29.520 af
Outflow = 81.71 cfs @ 14.51 hrs, Volume= 29.344 af, Atten= 1%, Lag= 7.8 min
Primary = 81.71 cfs @ 14.51 hrs, Volume= 29.344 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.06' @ 14.51 hrs Surf.Area= 17,091 sf Storage= 24,326 cf

Plug-Flow detention time= 4.3 min calculated for 29.246 af (99% of inflow)
Center-of-Mass det. time= 2.8 min (955.0 - 952.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	3,745,747 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	4,539	2,930	2,930
58.00	15,848	20,387	23,317
60.00	56,417	72,265	95,582
62.00	198,504	254,921	350,503
64.00	274,621	473,125	823,628
66.00	372,832	647,453	1,471,081
70.00	764,501	2,274,666	3,745,747

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box I** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=81.78 cfs @ 14.51 hrs HW=58.06' (Free Discharge)
1=I (Inlet Controls 81.78 cfs @ 5.52 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 0.78" for 10 YEAR event
Inflow = 129.01 cfs @ 14.01 hrs, Volume= 48.355 af
Outflow = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af, Atten= 84%, Lag= 359.5 min
Primary = 20.44 cfs @ 20.00 hrs, Volume= 6.126 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 121.86' @ 20.00 hrs Surf.Area= 1,096,574 sf Storage= 1,836,157 cf

Plug-Flow detention time= 291.0 min calculated for 6.105 af (13% of inflow)
Center-of-Mass det. time= 138.6 min (1,073.5 - 934.9)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.21 cfs @ 20.00 hrs HW=121.86' (Free Discharge)
└─**1=60" Culvert** (Inlet Controls 20.21 cfs @ 3.59 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 0.76" for 10 YEAR event
Inflow = 110.28 cfs @ 13.29 hrs, Volume= 25.827 af
Outflow = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af, Atten= 46%, Lag= 65.4 min
Primary = 60.02 cfs @ 14.38 hrs, Volume= 22.091 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 163.13' @ 14.38 hrs Surf.Area= 153,871 sf Storage= 348,586 cf

Plug-Flow detention time= 98.1 min calculated for 22.091 af (86% of inflow)
Center-of-Mass det. time= 61.2 min (957.0 - 895.8)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=59.93 cfs @ 14.38 hrs HW=163.13' (Free Discharge)
⬑**1=48" Culvert** (Inlet Controls 59.93 cfs @ 5.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
⬑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 0.80" for 10 YEAR event
Inflow = 41.06 cfs @ 13.68 hrs, Volume= 11.178 af
Outflow = 31.62 cfs @ 14.37 hrs, Volume= 10.677 af, Atten= 23%, Lag= 41.1 min
Primary = 31.62 cfs @ 14.37 hrs, Volume= 10.677 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 73.18' @ 14.37 hrs Surf.Area= 37,485 sf Storage= 84,903 cf

Plug-Flow detention time= 43.0 min calculated for 10.641 af (95% of inflow)
Center-of-Mass det. time= 30.8 min (942.6 - 911.8)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=31.63 cfs @ 14.37 hrs HW=73.18' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 31.63 cfs @ 6.55 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (8' WIDE x 9' HIGH) 2 culverts

```
Inflow Area =      176.420 ac,    8.20% Impervious,  Inflow Depth >   1.63"    for  10 YEAR event
Inflow      =       65.19 cfs @   14.30 hrs,  Volume=          24.013 af
Outflow     =       65.17 cfs @   14.31 hrs,  Volume=          24.012 af,  Atten= 0%,  Lag= 0.3 min
Primary     =       65.17 cfs @   14.31 hrs,  Volume=          24.012 af
Secondary =          0.00 cfs @    5.00 hrs,  Volume=           0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.11' @ 14.31 hrs Surf.Area= 1,658 sf Storage= 157 cf

Plug-Flow detention time= 0.0 min calculated for 23.932 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (957.2 - 957.2)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	2,789,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
58.00	7,722	9,042	9,042
60.00	9,674	17,396	26,438
62.00	63,671	73,345	99,783
64.00	169,090	232,761	332,544
66.00	252,914	422,004	754,548
70.00	764,501	2,034,830	2,789,378

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**96.0" W x 108.0" H Box 2- 8' wide Box Culverts X 2.00** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 72.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=83.50 cfs @ 14.31 hrs HW=56.11' (Free Discharge)
↑—**1=2- 8' wide Box Culverts** (Barrel Controls 83.50 cfs @ 4.95 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 3.01" for 10 YEAR event
Inflow = 4.22 cfs @ 12.03 hrs, Volume= 0.263 af
Outflow = 0.93 cfs @ 12.41 hrs, Volume= 0.196 af, Atten= 78%, Lag= 23.1 min
Primary = 0.93 cfs @ 12.41 hrs, Volume= 0.196 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.73' @ 12.41 hrs Surf.Area= 2,927 sf Storage= 5,732 cf

Plug-Flow detention time= 134.6 min calculated for 0.195 af (74% of inflow)
Center-of-Mass det. time= 74.2 min (843.1 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.87'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.87' / 75.00' S= 0.0281 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.93 cfs @ 12.41 hrs HW=81.73' (Free Discharge)
↑—**1=Culvert** (Passes 0.93 cfs of 19.23 cfs potential flow)
  ↑—**2=Orifice/Grate** (Orifice Controls 0.93 cfs @ 4.76 fps)
  └—**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.00' (Free Discharge)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 4.05" for 10 YEAR event
Inflow = 14.71 cfs @ 12.00 hrs, Volume= 0.966 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.12' @ 20.00 hrs Surf.Area= 851,760 sf Storage= 42,079 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	12,675 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 52 32,760 cf Overall - 1,072 cf Embedded = 31,688 cf x 40.0% Voids
#2	100.00'	1,072 cf	**6.0" Round Pipe Storage** x 52 Inside #1 L= 105.0' S= 0.0050 '/'
		13,747 cf	x 52.00 = 714,857 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 52.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

```
Inflow Area =      59.120 ac,   6.33% Impervious,  Inflow Depth >   1.94"    for  10 YEAR event
Inflow      =      56.13 cfs @   12.88 hrs,  Volume=          9.550 af
Outflow     =      27.57 cfs @   13.66 hrs,  Volume=          9.103 af,  Atten= 51%,  Lag= 47.3 min
Primary     =      26.70 cfs @   13.66 hrs,  Volume=          9.075 af
Secondary =         0.87 cfs @   13.66 hrs,  Volume=          0.028 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.12' @ 13.66 hrs Surf.Area= 48,200 sf Storage= 272,968 cf (133,458 cf above start)

Plug-Flow detention time= 185.6 min calculated for 5.900 af (62% of inflow)
Center-of-Mass det. time= 56.0 min (902.7 - 846.7)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900

			n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.70 cfs @ 13.66 hrs HW=66.11' (Free Discharge)
↑└─**1=Culvert** (Inlet Controls 26.70 cfs @ 8.50 fps)

Secondary OutFlow Max=0.77 cfs @ 13.66 hrs HW=66.11' (Free Discharge)
↑└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.77 cfs @ 0.84 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 0.20" for 10 YEAR event
Inflow = 38.10 cfs @ 13.28 hrs, Volume= 13.816 af
Outflow = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af, Atten= 14%, Lag= 25.9 min
Secondary = 32.90 cfs @ 13.71 hrs, Volume= 12.716 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.33' @ 13.71 hrs Surf.Area= 52,279 sf Storage= 62,339 cf

Plug-Flow detention time= 34.4 min calculated for 12.674 af (92% of inflow)
Center-of-Mass det. time= 14.8 min (972.6 - 957.8)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=32.88 cfs @ 13.71 hrs HW=77.33' (Free Discharge)
↑└─**1=Broad-Crested Rectangular Weir** (Weir Controls 32.88 cfs @ 3.09 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 1.76" for 10 YEAR event
Inflow = 23.03 cfs @ 13.14 hrs, Volume= 4.598 af
Outflow = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af, Atten= 10%, Lag= 16.3 min
Primary = 20.81 cfs @ 13.41 hrs, Volume= 4.591 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 126.73' @ 13.41 hrs Surf.Area= 2,841 sf Storage= 10,797 cf

Plug-Flow detention time= 4.6 min calculated for 4.576 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (867.2 - 863.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.81 cfs @ 13.41 hrs HW=126.73' (Free Discharge)
└─**1=Culvert** (Inlet Controls 20.81 cfs @ 11.77 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.01" for 10 YEAR event
Inflow = 22.32 cfs @ 12.73 hrs, Volume= 3.428 af
Outflow = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af, Atten= 3%, Lag= 6.1 min
Primary = 21.66 cfs @ 12.83 hrs, Volume= 3.372 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.96' @ 12.83 hrs Surf.Area= 6,905 sf Storage= 9,098 cf

Plug-Flow detention time= 13.4 min calculated for 3.372 af (98% of inflow)
Center-of-Mass det. time= 7.7 min (842.5 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.67 cfs @ 12.83 hrs HW=81.96' (Free Discharge)
└─**1=Culvert** (Inlet Controls 21.67 cfs @ 4.12 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 1.94" for 10 YEAR event
Inflow = 8.63 cfs @ 12.74 hrs, Volume= 1.327 af
Outflow = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af, Atten= 22%, Lag= 18.6 min
Primary = 6.77 cfs @ 13.05 hrs, Volume= 1.318 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.56' @ 13.05 hrs Surf.Area= 9,665 sf Storage= 8,470 cf

Plug-Flow detention time= 17.9 min calculated for 1.314 af (99% of inflow)
Center-of-Mass det. time= 15.4 min (852.2 - 836.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.77 cfs @ 13.05 hrs HW=91.56' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 6.77 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 86P: 24" CULVERT

```
Inflow Area =       55.060 ac,   5.27% Impervious,  Inflow Depth >   1.08"    for  10 YEAR event
Inflow      =       19.65 cfs @   13.55 hrs,  Volume=          4.958 af
Outflow     =       15.75 cfs @   14.16 hrs,  Volume=          4.618 af,  Atten= 20%,  Lag= 36.6 min
Primary     =       15.75 cfs @   14.16 hrs,  Volume=          4.618 af
Secondary =          0.00 cfs @    5.00 hrs,  Volume=          0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.86' @ 14.16 hrs Surf.Area= 23,785 sf Storage= 40,546 cf

Plug-Flow detention time= 48.3 min calculated for 4.603 af (93% of inflow)
Center-of-Mass det. time= 30.0 min (930.7 - 900.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	401,091 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	758	0	0
58.00	9,115	9,873	9,873
60.00	24,850	33,965	43,838
62.00	43,236	68,086	111,924
64.00	72,382	115,618	227,542
66.00	101,167	173,549	401,091

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.75 cfs @ 14.16 hrs HW=59.86' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 15.75 cfs @ 5.01 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment 3S:

Runoff = 26.77 cfs @ 12.82 hrs, Volume= 4.438 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	15.050	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.31 AC))
	21.440	71	Weighted Average
	21.340		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 76.77 cfs @ 13.58 hrs, Volume= 19.547 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 75.94 cfs @ 13.13 hrs, Volume= 15.334 af, Depth> 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 212.15 cfs @ 13.21 hrs, Volume= 45.706 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 147.70 cfs @ 13.19 hrs, Volume= 31.202 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 11.37 cfs @ 12.83 hrs, Volume= 1.890 af, Depth> 2.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 5.63 cfs @ 12.03 hrs, Volume= 0.358 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 13.12 cfs @ 12.03 hrs, Volume= 0.819 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.740	74	NEW LAWN C
	2.600	84	Weighted Average
	1.530		58.85% Pervious Area
	1.070		41.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 21.60 cfs @ 12.03 hrs, Volume= 1.347 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.570	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.280	84	Weighted Average
	2.570		60.05% Pervious Area
	1.710		39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 5.23 cfs @ 12.03 hrs, Volume= 0.337 af, Depth> 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.360	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.940	89	Weighted Average
	0.360		38.30% Pervious Area
	0.580		61.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 1.92 cfs @ 12.03 hrs, Volume= 0.120 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 6.20 cfs @ 12.03 hrs, Volume= 0.375 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 15.88 cfs @ 12.47 hrs, Volume= 1.927 af, Depth> 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	8.650	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.11 ac (1/2) of 2 Roofs + 2 fulll
	9.540	70	Weighted Average
	9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.1	150	0.0600	0.61		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
32.9	250	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 18.59 cfs @ 12.00 hrs, Volume= 1.227 af, Depth> 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 47.10 cfs @ 12.72 hrs, Volume= 7.233 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 32.74 cfs @ 13.14 hrs, Volume= 6.707 af, Depth> 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 34.66 cfs @ 13.13 hrs, Volume= 6.881 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 33.70 cfs @ 13.51 hrs, Volume= 8.144 af, Depth> 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.600 ac, 41.15% Impervious, Inflow Depth > 3.78" for 25 YEAR event
Inflow = 13.12 cfs @ 12.03 hrs, Volume= 0.819 af
Outflow = 9.86 cfs @ 12.22 hrs, Volume= 0.806 af, Atten= 25%, Lag= 11.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.21 fps, Min. Travel Time= 7.8 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 27.7 min

Peak Storage= 4,707 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 35R: Buffer #2

Inflow Area = 0.940 ac, 61.70% Impervious, Inflow Depth > 4.30" for 25 YEAR event
Inflow = 5.23 cfs @ 12.03 hrs, Volume= 0.337 af
Outflow = 3.85 cfs @ 12.24 hrs, Volume= 0.331 af, Atten= 26%, Lag= 13.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.18 fps, Min. Travel Time= 9.1 min
Avg. Velocity = 0.05 fps, Avg. Travel Time= 31.4 min

Peak Storage= 2,113 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 36R: Buffer #3

Inflow Area = 2.090 ac, 7.66% Impervious, Inflow Depth > 2.61" for 25 YEAR event
Inflow = 4.42 cfs @ 12.07 hrs, Volume= 0.454 af
Outflow = 3.82 cfs @ 12.34 hrs, Volume= 0.447 af, Atten= 14%, Lag= 16.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 24.8 min

Peak Storage= 1,753 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'

Summary for Reach 39R: Stream Greely to Golf Pond

```
Inflow Area =      743.000 ac,    3.86% Impervious,  Inflow Depth >   0.29"    for  25 YEAR event
Inflow      =       48.78 cfs @   20.00 hrs,  Volume=          17.951 af
Outflow     =       48.68 cfs @   20.00 hrs,  Volume=          16.519 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 10.7 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 13.5 min

Peak Storage= 31,184 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,    4.81% Impervious,  Inflow Depth >   1.37"    for  25 YEAR event
Inflow      =      161.60 cfs @   13.61 hrs,  Volume=          56.283 af
Outflow     =      157.75 cfs @   14.18 hrs,  Volume=          54.212 af,  Atten= 2%,  Lag= 34.2 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 16.7 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 25.5 min

Peak Storage= 157,984 cf @ 13.90 hrs
Average Depth at Peak Storage= 2.52'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      167.550 ac,    6.29% Impervious,  Inflow Depth >   3.26"    for  25 YEAR event
Inflow       =      98.34 cfs @   14.08 hrs,  Volume=          45.498 af
Outflow      =      98.19 cfs @   14.27 hrs,  Volume=          44.342 af,  Atten= 0%,  Lag= 10.9 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 6.1 min
Avg. Velocity = 2.73 fps, Avg. Travel Time= 9.1 min

Peak Storage= 35,977 cf @ 14.16 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: New Box Culvert to RR Culvert

```
Inflow Area =      234.340 ac,    8.63% Impervious,  Inflow Depth >   2.81"    for  25 YEAR event
Inflow       =     126.90 cfs @   14.17 hrs,  Volume=          54.871 af
Outflow      =     126.77 cfs @   14.26 hrs,  Volume=          54.238 af,  Atten= 0%,  Lag= 5.4 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 5.8 min

Peak Storage= 22,893 cf @ 14.21 hrs
Average Depth at Peak Storage= 2.24'
Bank-Full Depth= 4.00' Flow Area= 96.0 sf, Capacity= 364.94 cfs

16.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 32.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 55R: Wetland below Site @ PL

```
Inflow Area =        32.990 ac,    0.79% Impervious,  Inflow Depth >   2.46"    for  25 YEAR event
Inflow       =       35.35 cfs @   12.86 hrs,  Volume=            6.761 af
Outflow      =       35.30 cfs @   12.91 hrs,  Volume=            6.738 af,  Atten= 0%,  Lag= 3.5 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 4.9 min

Peak Storage= 4,299 cf @ 12.88 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

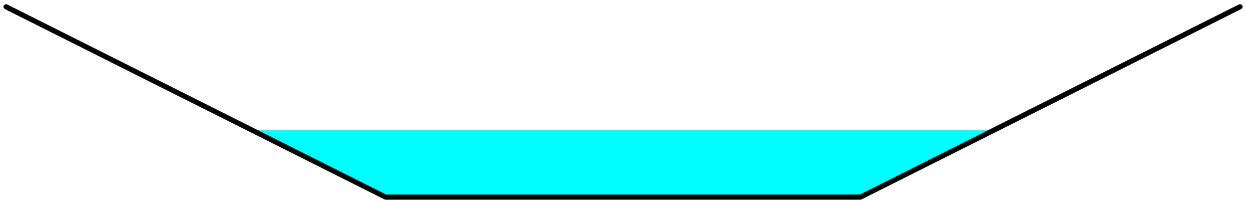
Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

```
Inflow       =       53.64 cfs @   20.00 hrs,  Volume=           28.006 af
Outflow      =       53.54 cfs @   20.00 hrs,  Volume=           26.636 af,  Atten= 0%,  Lag= 0.0 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.96 fps, Min. Travel Time= 9.3 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 13.4 min

Peak Storage= 29,848 cf @ 20.00 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'



Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 2.89" for 25 YEAR event
Inflow = 38.03 cfs @ 13.01 hrs, Volume= 6.894 af
Outflow = 37.70 cfs @ 13.16 hrs, Volume= 6.832 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 12.3 min

Peak Storage= 12,802 cf @ 13.07 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.990 ac, 0.79% Impervious, Inflow Depth > 2.45" for 25 YEAR event
Inflow = 35.30 cfs @ 12.91 hrs, Volume= 6.738 af
Outflow = 28.36 cfs @ 13.31 hrs, Volume= 6.694 af, Atten= 20%, Lag= 23.5 min
Primary = 28.36 cfs @ 13.31 hrs, Volume= 6.694 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.52' @ 13.31 hrs Surf.Area= 12,579 sf Storage= 32,166 cf

Plug-Flow detention time= 13.9 min calculated for 6.694 af (99% of inflow)
Center-of-Mass det. time= 11.6 min (862.3 - 850.6)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=28.36 cfs @ 13.31 hrs HW=58.51' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 28.36 cfs @ 9.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=54.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 2.40" for 25 YEAR event
Inflow = 11.37 cfs @ 12.83 hrs, Volume= 1.890 af
Outflow = 7.99 cfs @ 13.28 hrs, Volume= 1.877 af, Atten= 30%, Lag= 26.8 min
Primary = 7.99 cfs @ 13.28 hrs, Volume= 1.877 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.13' @ 13.28 hrs Surf.Area= 19,087 sf Storage= 14,185 cf

Plug-Flow detention time= 21.8 min calculated for 1.877 af (99% of inflow)
Center-of-Mass det. time= 19.3 min (862.9 - 843.5)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.99 cfs @ 13.28 hrs HW=81.13' (Free Discharge)
↑└─**1=Culvert** (Inlet Controls 7.99 cfs @ 4.52 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
↑└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

Inflow Area = 4.280 ac, 39.95% Impervious, Inflow Depth > 3.78" for 25 YEAR event
Inflow = 21.60 cfs @ 12.03 hrs, Volume= 1.347 af
Outflow = 15.63 cfs @ 12.09 hrs, Volume= 1.347 af, Atten= 28%, Lag= 4.0 min
Primary = 15.63 cfs @ 12.09 hrs, Volume= 1.347 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 58.88' @ 12.09 hrs Surf.Area= 6,080 sf Storage= 3,129 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.9 min (770.1 - 769.2)

Volume	Invert	Avail.Storage	Storage Description
#1	57.20'	1,400 cf	**25.00'W x 140.00'L x 1.00'H crushed stone** 3,500 cf Overall x 40.0% Voids
#2	58.21'	9,160 cf	**1.30'W x 2.30'L x 3.55'H R-tank units** x 863
#3	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#4	64.00'	2,896 cf	**Surface Storage above focal point (Prismatic)**Listed below (Recalc) -Impe
		13,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	429	0	0
64.50	600	257	257
65.00	778	345	602
65.50	919	424	1,026
66.00	1,153	518	1,544
66.50	1,350	626	2,170
67.00	1,553	726	2,896

Device	Routing	Invert	Outlet Devices
#1	Primary	57.20'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Device 4	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	58.21'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	58.21'	**18.0" Round Culvert** L= 26.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.21' / 58.00' S= 0.0081 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=15.56 cfs @ 12.09 hrs HW=58.86' (Free Discharge)
- **1=Exfiltration** (Exfiltration Controls 14.07 cfs)
- **4=Culvert** (Passes 1.48 cfs of 1.76 cfs potential flow)
  - **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Orifice Controls 1.48 cfs @ 2.74 fps)

Summary for Pond 37P: 18" Culvert crossing

Inflow Area = 1.710 ac, 0.00% Impervious, Inflow Depth > 2.63" for 25 YEAR event
Inflow = 6.20 cfs @ 12.03 hrs, Volume= 0.375 af
Outflow = 3.16 cfs @ 12.15 hrs, Volume= 0.334 af, Atten= 49%, Lag= 7.3 min
Primary = 3.16 cfs @ 12.15 hrs, Volume= 0.334 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.18' @ 12.15 hrs Surf.Area= 4,024 sf Storage= 4,754 cf

Plug-Flow detention time= 67.6 min calculated for 0.333 af (89% of inflow)
Center-of-Mass det. time= 33.5 min (827.8 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	133,356 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	4,000	0	0
82.00	4,041	8,041	8,041
84.00	30,637	34,678	42,719
86.00	60,000	90,637	133,356

Device	Routing	Invert	Outlet Devices
#1	Primary	80.30'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.30' / 80.00' S= 0.0107 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	85.50'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.16 cfs @ 12.15 hrs HW=81.18' (Free Discharge)
- **1=Culvert** (Barrel Controls 3.16 cfs @ 4.19 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.880 ac, 8.29% Impervious, Inflow Depth > 2.76" for 25 YEAR event
Inflow = 128.98 cfs @ 14.25 hrs, Volume= 56.165 af
Outflow = 124.83 cfs @ 14.54 hrs, Volume= 55.711 af, Atten= 3%, Lag= 17.1 min
Primary = 124.83 cfs @ 14.54 hrs, Volume= 55.711 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.17' @ 14.54 hrs Surf.Area= 39,677 sf Storage= 55,930 cf

Plug-Flow detention time= 5.7 min calculated for 55.711 af (99% of inflow)
Center-of-Mass det. time= 3.8 min (967.3 - 963.5)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	3,745,747 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	4,539	2,930	2,930
58.00	15,848	20,387	23,317
60.00	56,417	72,265	95,582
62.00	198,504	254,921	350,503
64.00	274,621	473,125	823,628
66.00	372,832	647,453	1,471,081
70.00	764,501	2,274,666	3,745,747

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box I** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=124.81 cfs @ 14.54 hrs HW=59.17' (Free Discharge)
└─**1=I** (Barrel Controls 124.81 cfs @ 8.17 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 1.38" for 25 YEAR event
Inflow = 250.10 cfs @ 13.75 hrs, Volume= 85.414 af
Outflow = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af, Atten= 80%, Lag= 375.0 min
Primary = 48.78 cfs @ 20.00 hrs, Volume= 17.951 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 122.82' @ 20.00 hrs Surf.Area= 1,208,890 sf Storage= 2,938,188 cf

Plug-Flow detention time= 265.8 min calculated for 17.951 af (21% of inflow)
Center-of-Mass det. time= 131.9 min (1,054.7 - 922.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.75 cfs @ 20.00 hrs HW=122.82' (Free Discharge)
└**1=60" Culvert** (Inlet Controls 48.75 cfs @ 4.70 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area =	405.950 ac,	2.64% Impervious, Inflow Depth > 1.35" for 25 YEAR event		
Inflow =	212.15 cfs @	13.21 hrs, Volume=	45.706 af	
Outflow =	114.67 cfs @	14.19 hrs, Volume=	40.949 af,	Atten= 46%, Lag= 58.9 min
Primary =	114.67 cfs @	14.19 hrs, Volume=	40.949 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 164.65' @ 14.19 hrs Surf.Area= 195,136 sf Storage= 613,755 cf

Plug-Flow detention time= 87.6 min calculated for 40.813 af (89% of inflow)
Center-of-Mass det. time= 59.5 min (942.8 - 883.3)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=114.72 cfs @ 14.19 hrs HW=164.65' (Free Discharge)
↑—**1=48" Culvert** (Barrel Controls 114.72 cfs @ 8.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 1.40" for 25 YEAR event
Inflow = 76.77 cfs @ 13.58 hrs, Volume= 19.547 af
Outflow = 48.97 cfs @ 14.57 hrs, Volume= 18.863 af, Atten= 36%, Lag= 59.8 min
Primary = 48.97 cfs @ 14.57 hrs, Volume= 18.863 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 75.54' @ 14.57 hrs Surf.Area= 55,585 sf Storage= 193,591 cf

Plug-Flow detention time= 52.9 min calculated for 18.800 af (96% of inflow)
Center-of-Mass det. time= 43.0 min (943.5 - 900.5)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.97 cfs @ 14.57 hrs HW=75.54' (Free Discharge)
⮤**1=Culvert** (Inlet Controls 48.97 cfs @ 9.98 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=70.00' (Free Discharge)
⮤**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 43P: Box Culvert 3 (8' WIDE x 9' HIGH) 2 culverts

Inflow Area =	176.420 ac,	8.20% Impervious,	Inflow Depth > 3.20"	for 25 YEAR event
Inflow =	100.77 cfs @	14.25 hrs, Volume=	47.116 af	
Outflow =	100.77 cfs @	14.26 hrs, Volume=	47.112 af,	Atten= 0%, Lag= 0.5 min
Primary =	100.77 cfs @	14.26 hrs, Volume=	47.112 af	
Secondary =	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 56.31' @ 14.26 hrs Surf.Area= 2,302 sf Storage= 555 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (971.1 - 971.0)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	2,789,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,320	0	0
58.00	7,722	9,042	9,042
60.00	9,674	17,396	26,438
62.00	63,671	73,345	99,783
64.00	169,090	232,761	332,544
66.00	252,914	422,004	754,548
70.00	764,501	2,034,830	2,789,378

Device	Routing	Invert	Outlet Devices
#1	Primary	54.70'	**96.0" W x 108.0" H Box 2- 8' wide Box Culverts X 2.00** L= 70.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 54.70' / 54.00' S= 0.0100 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 72.00 sf
#2	Secondary	68.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=100.74 cfs @ 14.26 hrs HW=56.31' (Free Discharge)
⮤**1=2- 8' wide Box Culverts** (Barrel Controls 100.74 cfs @ 5.22 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=56.00' (Free Discharge)
⮤**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47P: FILTER POND

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Inflow Area =      1.050 ac, 53.33% Impervious,  Inflow Depth >   4.09"   for  25 YEAR event
Inflow      =      5.63 cfs @  12.03 hrs,  Volume=          0.358 af
Outflow     =      2.39 cfs @  12.18 hrs,  Volume=          0.289 af,  Atten= 58%,  Lag= 9.0 min
Primary     =      2.39 cfs @  12.18 hrs,  Volume=          0.289 af
Secondary   =      0.00 cfs @   5.00 hrs,  Volume=          0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.10' @ 12.18 hrs   Surf.Area= 3,172 sf   Storage= 6,865 cf

Plug-Flow detention time= 122.1 min calculated for 0.289 af (81% of inflow)
Center-of-Mass det. time= 69.7 min ( 831.3 - 761.5 )

Volume      Invert    Avail.Storage  Storage Description
  #1        79.00'       10,009 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation       Surf.Area        Inc.Store        Cum.Store
    (feet)         (sq-ft)    (cubic-feet)     (cubic-feet)
     79.00           1,343               0                0
     80.00           1,873           1,608            1,608
     81.00           2,460           2,167            3,775
     82.00           3,103           2,782            6,556
     83.00           3,803           3,453           10,009

Device  Routing        Invert   Outlet Devices
  #1    Primary        75.87'   18.0"  Round Culvert
                                L= 31.0'   RCP, square edge headwall,  Ke= 0.500
                                Inlet / Outlet Invert= 75.87' / 75.00'   S= 0.0281 '/'   Cc= 0.900
                                n= 0.010  PVC, smooth interior,  Flow Area= 1.77 sf
  #2    Device 1       80.50'   6.0" Vert. Orifice/Grate   C= 0.600
  #3    Device 1       82.00'   48.0" Horiz. Orifice/Grate   C= 0.600
                                Limited to weir flow at low heads
  #4    Secondary      82.50'   10.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Primary OutFlow  Max=2.35 cfs @ 12.18 hrs  HW=82.10'   (Free Discharge)
└─1=Culvert  (Passes 2.35 cfs of 19.91 cfs potential flow)
   ├─2=Orifice/Grate  (Orifice Controls 1.10 cfs @ 5.59 fps)
   └─3=Orifice/Grate  (Weir Controls 1.25 cfs @ 1.02 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=79.00'   (Free Discharge)
└─4=Broad-Crested Rectangular Weir( Controls 0.00 cfs)
```

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

```
Inflow Area =      2.860 ac,100.00% Impervious,  Inflow Depth >   5.15"   for  25 YEAR event
Inflow      =     18.59 cfs @  12.00 hrs,  Volume=          1.227 af
Outflow     =      0.00 cfs @   5.00 hrs,  Volume=          0.000 af,  Atten= 100%,  Lag= 0.0 min
Primary     =      0.00 cfs @   5.00 hrs,  Volume=          0.000 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.15' @ 20.00 hrs Surf.Area= 851,760 sf Storage= 53,417 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	12,675 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 52 32,760 cf Overall - 1,072 cf Embedded = 31,688 cf x 40.0% Voids
#2	100.00'	1,072 cf	**6.0" Round Pipe Storage** x 52 Inside #1 L= 105.0' S= 0.0050 '/'
		13,747 cf	x 52.00 = 714,857 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 52.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
↳**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 78.72 cfs @ 12.82 hrs, Volume= 14.065 af
Outflow = 51.54 cfs @ 13.49 hrs, Volume= 13.523 af, Atten= 35%, Lag= 40.0 min
Primary = 30.23 cfs @ 13.49 hrs, Volume= 11.738 af
Secondary = 21.31 cfs @ 13.49 hrs, Volume= 1.785 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 66.99' @ 13.49 hrs Surf.Area= 62,678 sf Storage= 321,669 cf (182,159 cf above start)

Plug-Flow detention time= 150.8 min calculated for 10.321 af (73% of inflow)
Center-of-Mass det. time= 54.6 min (892.9 - 838.3)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900

```
                                  n= 0.010  PVC, smooth interior,  Flow Area= 3.14 sf
  #2     Secondary         66.00'  8.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                  Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                  Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Primary OutFlow  Max=30.23 cfs @ 13.49 hrs  HW=66.99'   (Free Discharge)
└─1=Culvert  (Inlet Controls 30.23 cfs @ 9.62 fps)

Secondary OutFlow  Max=21.21 cfs @ 13.49 hrs  HW=66.99'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 21.21 cfs @ 2.67 fps)
```

Summary for Pond 82P: Golf Course Pond

```
Inflow Area =      827.990 ac,    4.13% Impervious,  Inflow Depth >   0.44"    for  25 YEAR event
Inflow      =       58.82 cfs @   13.22 hrs,  Volume=          30.100 af
Outflow     =       53.64 cfs @   20.00 hrs,  Volume=          28.006 af,  Atten= 9%,  Lag= 407.0 min
Secondary =         53.64 cfs @   20.00 hrs,  Volume=          28.006 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 77.86' @ 20.00 hrs   Surf.Area= 56,623 sf   Storage= 91,213 cf

Plug-Flow detention time= 28.7 min calculated for 27.913 af (93% of inflow)
Center-of-Mass det. time= 13.0 min ( 990.0 - 977.0 )

Volume          Invert     Avail.Storage   Storage Description
   #1           76.00'       395,691 cf    Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store        Cum.Store
     (feet)             (sq-ft)       (cubic-feet)     (cubic-feet)
     76.00             41,373                 0                0
     82.00             90,524           395,691          395,691

Device   Routing              Invert   Outlet Devices
  #1     Secondary            76.00'   8.0' long  x 10.0' breadth Broad-Crested Rectangular Weir
                                       Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                       Coef. (English)  2.49  2.56  2.70  2.69  2.68  2.69  2.67  2.64

Secondary OutFlow  Max=53.64 cfs @ 20.00 hrs  HW=77.86'   (Free Discharge)
└─1=Broad-Crested Rectangular Weir (Weir Controls 53.64 cfs @ 3.60 fps)
```

Summary for Pond 83P: Culvert at Valhalla Road

```
Inflow Area =        31.310 ac,  11.18% Impervious,  Inflow Depth >   2.64"    for  25 YEAR event
Inflow      =       34.66 cfs @   13.13 hrs,  Volume=             6.881 af
Outflow     =       27.51 cfs @   13.55 hrs,  Volume=             6.874 af,  Atten= 21%,  Lag= 25.4 min
Primary     =       27.51 cfs @   13.55 hrs,  Volume=             6.874 af
Secondary =          0.00 cfs @    5.00 hrs,  Volume=             0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
```

Peak Elev= 131.20' @ 13.55 hrs Surf.Area= 7,245 sf Storage= 28,832 cf

Plug-Flow detention time= 8.6 min calculated for 6.874 af (100% of inflow)
Center-of-Mass det. time= 8.2 min (863.0 - 854.8)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=27.51 cfs @ 13.55 hrs HW=131.20' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 27.51 cfs @ 15.57 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 2.94" for 25 YEAR event
Inflow = 32.62 cfs @ 12.72 hrs, Volume= 5.013 af
Outflow = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af, Atten= 14%, Lag= 14.0 min
Primary = 28.13 cfs @ 12.95 hrs, Volume= 4.952 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.46' @ 12.95 hrs Surf.Area= 26,457 sf Storage= 17,122 cf

Plug-Flow detention time= 12.3 min calculated for 4.952 af (99% of inflow)
Center-of-Mass det. time= 8.0 min (834.6 - 826.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=28.13 cfs @ 12.95 hrs HW=82.46' (Free Discharge)
└**1=Culvert** (Inlet Controls 28.13 cfs @ 5.31 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 2.85" for 25 YEAR event
Inflow = 12.73 cfs @ 12.72 hrs, Volume= 1.955 af
Outflow = 10.00 cfs @ 13.03 hrs, Volume= 1.942 af, Atten= 21%, Lag= 18.6 min
Primary = 9.08 cfs @ 13.03 hrs, Volume= 1.927 af
Secondary = 0.91 cfs @ 13.03 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.06' @ 13.03 hrs Surf.Area= 12,502 sf Storage= 13,941 cf

Plug-Flow detention time= 19.9 min calculated for 1.936 af (99% of inflow)
Center-of-Mass det. time= 17.5 min (846.0 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

```
                                  Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=9.08 cfs @ 13.03 hrs  HW=92.06'   (Free Discharge)
└─1=Culvert  (Barrel Controls 9.08 cfs @ 5.14 fps)

Secondary OutFlow  Max=0.87 cfs @ 13.03 hrs  HW=92.06'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 0.87 cfs @ 0.63 fps)
```

Summary for Pond 86P: 24" CULVERT

```
Inflow Area =      55.060 ac,    5.27% Impervious,  Inflow Depth >   1.77"    for  25 YEAR event
Inflow      =      33.70 cfs @   13.51 hrs,  Volume=            8.144 af
Outflow     =      26.53 cfs @   14.12 hrs,  Volume=            7.759 af,  Atten= 21%,  Lag= 36.8 min
Primary     =      22.76 cfs @   14.12 hrs,  Volume=            7.661 af
Secondary =         3.76 cfs @   14.12 hrs,  Volume=            0.098 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.04' @ 14.12 hrs   Surf.Area= 34,451 sf   Storage= 74,806 cf

Plug-Flow detention time= 48.7 min calculated for 7.759 af (95% of inflow)
Center-of-Mass det. time= 35.2 min ( 926.4 - 891.2 )

Volume         Invert     Avail.Storage   Storage Description
   #1          56.00'         401,091 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation           Surf.Area            Inc.Store            Cum.Store
    (feet)             (sq-ft)          (cubic-feet)         (cubic-feet)
     56.00                 758                    0                    0
     58.00               9,115                9,873                9,873
     60.00              24,850               33,965               43,838
     62.00              43,236               68,086              111,924
     64.00              72,382              115,618              227,542
     66.00             101,167              173,549              401,091

Device   Routing            Invert   Outlet Devices
   #1    Primary            57.78'   24.0"  Round Culvert
                                     L= 73.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                     Inlet / Outlet Invert= 57.78' / 56.17'   S= 0.0221 '/'   Cc= 0.900
                                     n= 0.011  Concrete pipe, straight & clean,  Flow Area= 3.14 sf
   #2    Secondary          61.00'   100.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                     Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                     Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=22.76 cfs @ 14.12 hrs  HW=61.04'   (Free Discharge)
└─1=Culvert  (Inlet Controls 22.76 cfs @ 7.24 fps)

Secondary OutFlow  Max=2.45 cfs @ 14.12 hrs  HW=61.04'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 2.45 cfs @ 0.56 fps)
```

Summary for Subcatchment 3S:

Runoff = 46.09 cfs @ 12.81 hrs, Volume= 7.641 af, Depth> 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	15.050	70	WOODS / FIELD HSG C
*	0.000	98	EXISTING IMPERVIOUS AREA
*	4.000	74	EXISTING LAWN C
*	0.620	74	Approved LAWN C phase 1
*	0.100	98	Approved Trails-phase 1
*	1.670	74	NEW LAWN C
*	0.000	98	NEW ROOF (1/2-11 UNITS=0.31 AC))
	21.440	71	Weighted Average
	21.340		99.53% Pervious Area
	0.100		0.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 8:

Runoff = 160.95 cfs @ 13.47 hrs, Volume= 38.986 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	32.000	30	Woods, Good, HSG A
	20.000	55	Woods, Good, HSG B
	25.450	70	Woods, Good, HSG C
*	10.000	98	EXISTING ROADS
*	0.000	98	EXISTING PAVED / GRAVEL FARM
*	0.000	98	EXISTING HOUSE AND BARN
*	78.000	61	EXISTING LAWNS B
*	1.560	74	NEW LAWN C
*	0.000	98	NEW COTTAGES (0.54 ac) (see sub 52) 1/2 27 units
*	0.540	98	NEW PAVEMENT - FARM
	167.550	58	Weighted Average
	157.010		93.71% Pervious Area
	10.540		6.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
9.7	3,700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
109.0	4,750	Total			

Summary for Subcatchment 9S:

Runoff = 137.65 cfs @ 13.11 hrs, Volume= 27.456 af, Depth> 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	15.000	30	Woods, Good, HSG A
	10.000	55	Woods, Good, HSG B
	25.000	70	Woods, Good, HSG C
*	13.000	98	EXISTING IMPERVIOUS AREA
*	23.750	74	EXISTING LAWN C
	86.750	67	Weighted Average
	73.750		85.01% Pervious Area
	13.000		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 10S:

Runoff = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	118.000	30	Woods, Good, HSG A
	74.000	55	Woods, Good, HSG B
	129.000	70	Woods, Good, HSG C
	48.000	77	Woods, Good, HSG D
	15.000	75	1/4 acre lots, 38% imp, HSG B
*	16.950	74	EXISTING LAWN C
*	5.000	98	EXISTING ROADS
	405.950	57	Weighted Average
	395.250		97.36% Pervious Area
	10.700		2.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 11S:

Runoff = 303.09 cfs @ 13.13 hrs, Volume= 61.245 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	40.000	30	Woods, Good, HSG A
	24.000	55	Woods, Good, HSG B
	42.000	70	Woods, Good, HSG C
	16.000	77	Woods, Good, HSG D
*	20.000	70	EXISTING LOTS B
*	103.300	61	EXISTING LAWN B
*	5.000	98	EXISTING ROADS
	250.300	59	Weighted Average
	245.300		98.00% Pervious Area
	5.000		2.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	150	0.0200	0.05		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
82.5	1,050	Total			

Summary for Subcatchment 31:

Runoff = 19.82 cfs @ 12.81 hrs, Volume= 3.283 af, Depth> 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	9.030	70	WOODS / FIELD HSG C
*	0.430	70	NEW LAWN C
	9.460	70	Weighted Average
	9.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
15.0	450	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
16.5	75	0.0900	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.10"
60.3	625	Total			

Summary for Subcatchment 32: 0.56 acres to Filter Pond

Runoff = 8.33 cfs @ 12.03 hrs, Volume= 0.542 af, Depth> 6.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.560	98	NEW IMPERVIOUS PAVED AREA
*	0.490	74	NEW LAWN C
	1.050	87	Weighted Average
	0.490		46.67% Pervious Area
	0.560		53.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 33: Drains to Buffer #1

Runoff = 19.85 cfs @ 12.03 hrs, Volume= 1.268 af, Depth> 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	1.070	98	NEW IMPERVIOUS PAVED AREA
*	0.790	74	NEW LAWN C
*	0.000	98	0.52 ac (1/2) of 19 Roofs
*	0.740	74	NEW LAWN C
	2.600	84	Weighted Average
	1.530		58.85% Pervious Area
	1.070		41.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 32.67 cfs @ 12.03 hrs, Volume= 2.088 af, Depth> 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.570	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.280	84	Weighted Average
	2.570		60.05% Pervious Area
	1.710		39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 35: Drains to Buffer #2

Runoff = 7.63 cfs @ 12.03 hrs, Volume= 0.502 af, Depth> 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.580	98	NEW IMPERVIOUS PAVED AREA
*	0.360	74	NEW LAWN C
*	0.000	98	0.14 ac (1/2) of 5 Roofs
*	0.000	74	NEW LAWN C
	0.940	89	Weighted Average
	0.360		38.30% Pervious Area
	0.580		61.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 36: Drains to Buffer #3

Runoff = 2.90 cfs @ 12.03 hrs, Volume= 0.185 af, Depth> 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.160	98	NEW IMPERVIOUS PAVED AREA
*	0.220	74	NEW LAWN C
*	0.000	98	0.055 ac (1/2) of 2 Roofs
*	0.000	74	NEW LAWN C
	0.380	84	Weighted Average
	0.220		57.89% Pervious Area
	0.160		42.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 37: Drains to Culvert

Runoff = 10.46 cfs @ 12.03 hrs, Volume= 0.638 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	0.990	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.720	74	NEW LAWN C
*	0.000	98	0.25 ac (1/2) of 9 Roofs
*	0.000	74	NEW LAWN C
	1.710	72	Weighted Average
	1.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Subcatchment 38: Drains to RR culvert

Runoff = 27.55 cfs @ 12.46 hrs, Volume= 3.344 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	8.650	70	Woods, Good, HSG C
*	0.000	98	NEW IMPERVIOUS PAVED AREA
*	0.890	74	NEW LAWN C
*	0.000	98	0.11 ac (1/2) of 2 Roofs + 2 fulll
	9.540	70	Weighted Average
	9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0400	0.06		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
4.1	150	0.0600	0.61		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
32.9	250	Total			

Summary for Subcatchment 52: NEW Cottage Roof Areas

Runoff = 26.02 cfs @ 12.00 hrs, Volume= 1.725 af, Depth> 7.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	2.860	98	52 Cottage Roofs
	2.860		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	20	0.4000	3.25		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"

Summary for Subcatchment 81: Farm Area - drains to off site pond

Runoff = 77.65 cfs @ 12.71 hrs, Volume= 12.027 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	18.050	74	WOODS / FIELD HSG C/D
*	0.510	98	EXISTING ROADS
*	10.640	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
*	0.170	98	NEW IMPERVIOUS
	30.450	75	Weighted Average
	28.690		94.22% Pervious Area
	1.760		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 82:

Runoff = 66.86 cfs @ 13.10 hrs, Volume= 13.161 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	44.000	55	Woods, Good, HSG B
*	2.000	98	EXISTING ROADS
*	7.680	74	EXISTING LAWN C
	53.680	59	Weighted Average
	51.680		96.27% Pervious Area
	2.000		3.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
7.3	220	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
1.8	700	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
78.4	1,070	Total			

Summary for Subcatchment 83:

Runoff = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
	6.000	55	Woods, Good, HSG B
*	3.500	98	EXISTING ROADS
*	21.810	74	EXISTING LAWN C
	31.310	73	Weighted Average
	27.810		88.82% Pervious Area
	3.500		11.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
12.3	370	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
81.6	520	Total			

Summary for Subcatchment 84: OFF SITE ABOVE GREELY ROAD

Runoff = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af, Depth> 4.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.510	98	EXISTING ROADS
*	18.850	74	EXISTING LAWN C
*	0.820	98	EXISTING PAVED/GRAVEL FARM
*	0.260	98	EXISTING BARN AND HOUSE
	20.440	76	Weighted Average
	18.850		92.22% Pervious Area
	1.590		7.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 85: Drains to 18" culvert under driveway

Runoff = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.390	98	EXISTING ROADS
*	7.840	74	EXISTING LAWN C
	8.230	75	Weighted Average
	7.840		95.26% Pervious Area
	0.390		4.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.1	100	0.0100	0.03		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
2.4	100	0.0800	0.71		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
52.5	200	Total			

Summary for Subcatchment 86: Farm Side Stream drains to 24" culvert

Runoff = 64.50 cfs @ 13.49 hrs, Volume= 15.247 af, Depth> 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YEAR Rainfall=8.10"

	Area (ac)	CN	Description
*	0.870	98	EXISTING ROADS-OFF SITE
*	51.300	61	EXISTING LAWNS B
*	1.100	98	EXISTING HOUSE LOTS 11 - OFF SITE
*	0.260	98	EXISTING HOUSE AND BARN
*	0.130	98	EXISTING GRAVEL/PAVED FARM
*	0.540	98	NEW PAVED - FARM
*	0.000	98	COTTAGE ROOFS - 0.22 (see 52s)
*	0.860	74	NEW LAWNS C
	55.060	63	Weighted Average
	52.160		94.73% Pervious Area
	2.900		5.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
69.3	150	0.0100	0.04		**Sheet Flow, AB** Woods: Dense underbrush n= 0.800 P2= 3.10"
30.0	900	0.0400	0.50		**Shallow Concentrated Flow, BC** Forest w/Heavy Litter Kv= 2.5 fps
8.2	3,100	0.0100	6.33	253.05	**Trap/Vee/Rect Channel Flow, CD** Bot.W=10.00' D=4.00' n= 0.040 Winding stream, pools & shoals
107.5	4,150	Total			

Summary for Reach 33R: Buffer #1

Inflow Area = 2.600 ac, 41.15% Impervious, Inflow Depth > 5.85" for 100 YEAR event
Inflow = 19.85 cfs @ 12.03 hrs, Volume= 1.268 af
Outflow = 15.73 cfs @ 12.19 hrs, Volume= 1.254 af, Atten= 21%, Lag= 9.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.26 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 23.8 min

Peak Storage= 6,213 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 222.0 sf, Capacity= 132.82 cfs

222.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 35R: Buffer #2

```
Inflow Area =        0.940 ac, 61.70% Impervious,  Inflow Depth >   6.41"    for  100 YEAR event
Inflow      =        7.63 cfs @   12.03 hrs,  Volume=          0.502 af
Outflow     =        5.80 cfs @   12.21 hrs,  Volume=          0.496 af,  Atten= 24%,  Lag= 11.3 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.22 fps, Min. Travel Time= 7.7 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 26.9 min

Peak Storage= 2,730 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 126.0 sf, Capacity= 75.05 cfs

126.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.1050 '/'
Inlet Invert= 72.50', Outlet Invert= 62.00'

Summary for Reach 36R: Buffer #3

```
Inflow Area =        2.090 ac,   7.66% Impervious,  Inflow Depth >   4.48"    for  100 YEAR event
Inflow      =        8.38 cfs @   12.07 hrs,  Volume=          0.780 af
Outflow     =        7.52 cfs @   12.25 hrs,  Volume=          0.771 af,  Atten= 10%,  Lag= 10.9 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.29 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 20.8 min

Peak Storage= 2,636 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.00' Flow Area= 45.0 sf, Capacity= 18.16 cfs

45.00' x 1.00' deep channel, n= 0.800 Sheet flow: Woods+dense brush
Length= 100.0' Slope= 0.0500 '/'
Inlet Invert= 78.00', Outlet Invert= 73.00'

Summary for Reach 39R: Stream Greely to Golf Pond

```
Inflow Area =      743.000 ac,   3.86% Impervious,  Inflow Depth >   0.80"    for  100 YEAR event
Inflow      =      118.36 cfs @   19.21 hrs,  Volume=          49.310 af
Outflow     =      118.34 cfs @   19.44 hrs,  Volume=          46.702 af,  Atten= 0%,  Lag= 13.8 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.49 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 4.54 fps, Avg. Travel Time= 9.7 min

Peak Storage= 57,110 cf @ 19.30 hrs
Average Depth at Peak Storage= 1.63'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 641.98 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 2,650.0' Slope= 0.0125 '/'
Inlet Invert= 115.00', Outlet Invert= 82.00'

Summary for Reach 40R: Stream Route 9 to Greely Road

```
Inflow Area =      492.700 ac,   4.81% Impervious,  Inflow Depth >   2.74"    for  100 YEAR event
Inflow      =      290.98 cfs @   13.29 hrs,  Volume=         112.352 af
Outflow     =      284.54 cfs @   13.86 hrs,  Volume=         109.040 af,  Atten= 2%,  Lag= 33.8 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 22.3 min

Peak Storage= 242,556 cf @ 13.62 hrs
Average Depth at Peak Storage= 3.41'
Bank-Full Depth= 4.00' Flow Area= 64.0 sf, Capacity= 392.75 cfs

8.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 4,800.0' Slope= 0.0063 '/'
Inlet Invert= 150.00', Outlet Invert= 120.00'

Summary for Reach 42R: Stream Golf Pond to RR Culvert

```
Inflow Area =      167.550 ac,    6.29% Impervious,  Inflow Depth >   7.34"    for  100 YEAR event
Inflow       =     230.92 cfs @   13.93 hrs,  Volume=          102.455 af
Outflow      =     228.72 cfs @   14.09 hrs,  Volume=          100.331 af,  Atten= 1%,  Lag= 9.5 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.17 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 3.20 fps, Avg. Travel Time= 7.7 min

Peak Storage= 65,551 cf @ 14.01 hrs
Average Depth at Peak Storage= 2.83'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 448.47 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,481.0' Slope= 0.0061 '/'
Inlet Invert= 65.00', Outlet Invert= 56.00'

Summary for Reach 43R: New Box Culvert to RR Culvert

```
Inflow Area =      234.340 ac,    8.63% Impervious,  Inflow Depth >   6.11"    for  100 YEAR event
Inflow       =     284.29 cfs @   14.07 hrs,  Volume=          119.359 af
Outflow      =     283.51 cfs @   14.14 hrs,  Volume=          118.217 af,  Atten= 0%,  Lag= 4.3 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 4.5 min

Peak Storage= 40,147 cf @ 14.10 hrs
Average Depth at Peak Storage= 3.49'
Bank-Full Depth= 4.00' Flow Area= 96.0 sf, Capacity= 364.94 cfs

16.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 32.00'
Length= 500.0' Slope= 0.0020 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

‡

Summary for Reach 55R: Wetland below Site @ PL

```
Inflow Area =        32.990 ac,    0.79% Impervious,  Inflow Depth >   4.25"    for  100 YEAR event
Inflow      =       58.05 cfs @   12.81 hrs,  Volume=          11.675 af
Outflow     =       57.88 cfs @   12.86 hrs,  Volume=          11.645 af,  Atten= 0%,  Lag= 3.2 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.35 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 4.1 min

Peak Storage= 5,994 cf @ 12.83 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 5.00' Flow Area= 65.0 sf, Capacity= 540.76 cfs

8.00' x 5.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 1.0 '/' Top Width= 18.00'
Length= 450.0' Slope= 0.0067 '/'
Inlet Invert= 63.02', Outlet Invert= 60.00'

Summary for Reach 82R: Stream Golf Pond to Pond 42 outlet

```
Inflow      =      127.26 cfs @   19.31 hrs,  Volume=          67.347 af
Outflow     =      127.24 cfs @   19.52 hrs,  Volume=          64.849 af,  Atten= 0%,  Lag= 12.4 min
```

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 11.2 min

Peak Storage= 54,587 cf @ 19.40 hrs
Average Depth at Peak Storage= 2.27'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 374.71 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,650.0' Slope= 0.0042 '/'
Inlet Invert= 72.00', Outlet Invert= 65.00'

Summary for Reach 84R: Stream Golf Pond to RR Culvert

Inflow Area = 28.670 ac, 6.91% Impervious, Inflow Depth > 4.78" for 100 YEAR event
Inflow = 55.03 cfs @ 12.87 hrs, Volume= 11.430 af
Outflow = 54.68 cfs @ 13.02 hrs, Volume= 11.350 af, Atten= 1%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.99 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 10.8 min

Peak Storage= 16,434 cf @ 12.94 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 4.00' Flow Area= 72.0 sf, Capacity= 575.29 cfs

10.00' x 4.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.0 '/' Top Width= 26.00'
Length= 1,200.0' Slope= 0.0100 '/'
Inlet Invert= 78.00', Outlet Invert= 66.00'

Summary for Pond 3P: 24" CULVERT

Inflow Area = 32.990 ac, 0.79% Impervious, Inflow Depth > 4.24" for 100 YEAR event
Inflow = 57.88 cfs @ 12.86 hrs, Volume= 11.645 af
Outflow = 56.55 cfs @ 12.98 hrs, Volume= 11.586 af, Atten= 2%, Lag= 7.2 min
Primary = 32.12 cfs @ 12.98 hrs, Volume= 10.344 af
Secondary = 24.43 cfs @ 12.98 hrs, Volume= 1.243 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 59.51' @ 12.98 hrs Surf.Area= 17,538 sf Storage= 47,100 cf

Plug-Flow detention time= 14.8 min calculated for 11.548 af (99% of inflow)
Center-of-Mass det. time= 13.0 min (854.1 - 841.1)

Volume	Invert	Avail.Storage	Storage Description
#1	54.00'	56,342 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
54.00	2,362	0	0
56.00	6,990	9,352	9,352
58.00	10,000	16,990	26,342
60.00	20,000	30,000	56,342

Device	Routing	Invert	Outlet Devices
#1	Primary	54.00'	**24.0" Round Culvert** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 54.00' / 53.00' S= 0.0200 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	59.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=32.11 cfs @ 12.98 hrs HW=59.51' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 32.11 cfs @ 10.22 fps)

Secondary OutFlow Max=24.33 cfs @ 12.98 hrs HW=59.51' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 24.33 cfs @ 1.92 fps)

Summary for Pond 31P: 18" Culvert crossing Little Acres Drive

Inflow Area = 9.460 ac, 0.00% Impervious, Inflow Depth > 4.17" for 100 YEAR event
Inflow = 19.82 cfs @ 12.81 hrs, Volume= 3.283 af
Outflow = 10.97 cfs @ 13.43 hrs, Volume= 3.263 af, Atten= 45%, Lag= 37.2 min
Primary = 10.97 cfs @ 13.43 hrs, Volume= 3.263 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.91' @ 13.43 hrs Surf.Area= 29,458 sf Storage= 33,117 cf

Plug-Flow detention time= 32.2 min calculated for 3.263 af (99% of inflow)
Center-of-Mass det. time= 30.0 min (861.8 - 831.7)

Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	262,372 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	366	0	0
80.00	4,041	1,102	1,102
82.00	30,637	34,678	35,780
87.00	60,000	226,593	262,372

Device	Routing	Invert	Outlet Devices
#1	Primary	79.50'	**18.0" Round Culvert** L= 62.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 79.50' / 79.00' S= 0.0081 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	86.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.97 cfs @ 13.43 hrs HW=81.91' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 10.97 cfs @ 6.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.50' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 34P: FocalPoint

```
Inflow Area =         4.280 ac,  39.95% Impervious,  Inflow Depth >   5.85"    for  100 YEAR event
Inflow      =       32.67 cfs @   12.03 hrs,  Volume=            2.088 af
Outflow     =       19.30 cfs @   12.12 hrs,  Volume=            2.088 af,  Atten= 41%,  Lag= 5.4 min
Primary     =       19.30 cfs @   12.12 hrs,  Volume=            2.088 af
```

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 60.62' @ 12.12 hrs Surf.Area= 6,080 sf Storage= 7,614 cf

Plug-Flow detention time= 1.9 min calculated for 2.088 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (760.7 - 758.9)

Volume	Invert	Avail.Storage	Storage Description
#1	57.20'	1,400 cf	**25.00'W x 140.00'L x 1.00'H crushed stone** 3,500 cf Overall x 40.0% Voids
#2	58.21'	9,160 cf	**1.30'W x 2.30'L x 3.55'H R-tank units** x 863
#3	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#4	64.00'	2,896 cf	**Surface Storage above focal point (Prismatic)** Listed below (Recalc) -Impe
		13,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	429	0	0
64.50	600	257	257
65.00	778	345	602
65.50	919	424	1,026
66.00	1,153	518	1,544
66.50	1,350	626	2,170
67.00	1,553	726	2,896

Device	Routing	Invert	Outlet Devices
#1	Primary	57.20'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Device 4	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	58.21'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	58.21'	**18.0" Round Culvert** L= 26.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.21' / 58.00' S= 0.0081 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf

```
Primary OutFlow  Max=19.21 cfs @ 12.12 hrs  HW=60.55'   (Free Discharge)
 ├─1=Exfiltration  (Exfiltration Controls 14.07 cfs)
 └─4=Culvert  (Passes 5.13 cfs of 10.73 cfs potential flow)
     ├─2=Orifice/Grate  ( Controls 0.00 cfs)
     └─3=Orifice/Grate  (Orifice Controls 5.13 cfs @ 6.53 fps)
```

Summary for Pond 37P: 18" Culvert crossing

```
Inflow Area =        1.710 ac,   0.00% Impervious,  Inflow Depth >   4.48"    for  100 YEAR event
Inflow      =      10.46 cfs @  12.03 hrs,  Volume=             0.638 af
Outflow     =       6.28 cfs @  12.12 hrs,  Volume=             0.594 af,  Atten= 40%,  Lag= 5.4 min
Primary     =       6.28 cfs @  12.12 hrs,  Volume=             0.594 af
Secondary =         0.00 cfs @   5.00 hrs,  Volume=             0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 81.68' @ 12.12 hrs   Surf.Area= 4,035 sf   Storage= 6,764 cf

Plug-Flow detention time= 51.8 min calculated for 0.594 af (93% of inflow)
Center-of-Mass det. time= 27.8 min ( 809.9 - 782.1 )

Volume         Invert     Avail.Storage   Storage Description
    #1         80.00'        133,356 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area          Inc.Store        Cum.Store
    (feet)            (sq-ft)       (cubic-feet)     (cubic-feet)
     80.00              4,000                  0                0
     82.00              4,041              8,041            8,041
     84.00             30,637             34,678           42,719
     86.00             60,000             90,637          133,356

Device   Routing            Invert   Outlet Devices
   #1    Primary            80.30'   18.0"  Round Culvert
                                     L= 28.0'   RCP, sq.cut end projecting,  Ke= 0.500
                                     Inlet / Outlet Invert= 80.30' / 80.00'   S= 0.0107 '/'   Cc= 0.900
                                     n= 0.011  Concrete pipe, straight & clean,  Flow Area= 1.77 sf
   #2    Secondary          85.50'   20.0' long  x 20.0' breadth Broad-Crested Rectangular Weir
                                     Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                     Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=6.18 cfs @ 12.12 hrs  HW=81.67'   (Free Discharge)
 └─1=Culvert  (Barrel Controls 6.18 cfs @ 4.80 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=80.00'   (Free Discharge)
 └─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 38P: Existing 5'X6' RR Box Culvert

Inflow Area = 243.880 ac, 8.29% Impervious, Inflow Depth > 5.98" for 100 YEAR event
Inflow = 287.18 cfs @ 14.14 hrs, Volume= 121.561 af
Outflow = 234.44 cfs @ 14.76 hrs, Volume= 119.026 af, Atten= 18%, Lag= 37.6 min
Primary = 234.44 cfs @ 14.76 hrs, Volume= 119.026 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.65' @ 14.76 hrs Surf.Area= 173,897 sf Storage= 286,010 cf

Plug-Flow detention time= 14.3 min calculated for 119.026 af (98% of inflow)
Center-of-Mass det. time= 9.4 min (976.9 - 967.4)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	3,745,747 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	1,320	0	0
56.00	4,539	2,930	2,930
58.00	15,848	20,387	23,317
60.00	56,417	72,265	95,582
62.00	198,504	254,921	350,503
64.00	274,621	473,125	823,628
66.00	372,832	647,453	1,471,081
70.00	764,501	2,274,666	3,745,747

Device	Routing	Invert	Outlet Devices
#1	Primary	55.10'	**60.0" W x 74.0" H Box I** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 55.10' / 53.70' S= 0.0156 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 30.83 sf
#2	Secondary	69.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=234.42 cfs @ 14.76 hrs HW=61.65' (Free Discharge)
└─**1=I** (Barrel Controls 234.42 cfs @ 9.54 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=55.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 39P: 60" Culvert at Greely Road

Inflow Area = 743.000 ac, 3.86% Impervious, Inflow Depth > 2.75" for 100 YEAR event
Inflow = 523.45 cfs @ 13.47 hrs, Volume= 170.286 af
Outflow = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af, Atten= 77%, Lag= 344.6 min
Primary = 118.36 cfs @ 19.21 hrs, Volume= 49.310 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 124.62' @ 19.21 hrs Surf.Area= 1,420,388 sf Storage= 5,304,855 cf

Plug-Flow detention time= 250.0 min calculated for 49.310 af (29% of inflow)
Center-of-Mass det. time= 121.4 min (1,039.2 - 917.7)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	149,235,760 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) x 2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	439,044	0	0
140.00	1,613,877	20,529,210	20,529,210
160.00	3,794,990	54,088,670	74,617,880

Device	Routing	Invert	Outlet Devices
#1	Primary	120.50'	**60.0" Round 60" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 118.20' S= 0.0200 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	131.50'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=118.47 cfs @ 19.21 hrs HW=124.62' (Free Discharge)
└─**1=60" Culvert** (Inlet Controls 118.47 cfs @ 6.61 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 40P: 48" Culvert at Route 9

Inflow Area = 405.950 ac, 2.64% Impervious, Inflow Depth > 2.73" for 100 YEAR event
Inflow = 453.25 cfs @ 13.14 hrs, Volume= 92.235 af
Outflow = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af, Atten= 56%, Lag= 72.2 min
Primary = 197.63 cfs @ 14.34 hrs, Volume= 84.896 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 168.07' @ 14.34 hrs Surf.Area= 288,151 sf Storage= 1,441,429 cf

Plug-Flow detention time= 100.7 min calculated for 84.614 af (92% of inflow)
Center-of-Mass det. time= 78.0 min (947.2 - 869.2)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	22,928,710 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	68,874	0	0
180.00	611,999	6,808,730	6,808,730
200.00	999,999	16,119,980	22,928,710

Device	Routing	Invert	Outlet Devices
#1	Primary	160.50'	**60.0" Round 48" Culvert w/ 6.0" inside fill** L= 90.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.70' S= 0.0144 '/' Cc= 0.900 n= 0.022 Earth, clean & straight, Flow Area= 18.61 sf
#2	Secondary	180.00'	**25.0' long x 100.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=197.65 cfs @ 14.34 hrs HW=168.07' (Free Discharge)
└─**1=48" Culvert** (Barrel Controls 197.65 cfs @ 10.62 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=160.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 42P: Golf Course Pond

Inflow Area = 167.550 ac, 6.29% Impervious, Inflow Depth > 2.79" for 100 YEAR event
Inflow = 160.95 cfs @ 13.47 hrs, Volume= 38.986 af
Outflow = 142.68 cfs @ 13.93 hrs, Volume= 37.606 af, Atten= 11%, Lag= 27.5 min
Primary = 63.69 cfs @ 13.93 hrs, Volume= 31.749 af
Secondary = 78.99 cfs @ 13.93 hrs, Volume= 5.857 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 78.51' @ 13.93 hrs Surf.Area= 77,195 sf Storage= 391,523 cf

Plug-Flow detention time= 66.6 min calculated for 37.481 af (96% of inflow)
Center-of-Mass det. time= 56.2 min (943.5 - 887.3)

Volume	Invert	Avail.Storage	Storage Description
#1	70.00'	514,000 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.00	15,328	0	0
72.00	29,781	45,109	45,109
74.00	42,804	72,585	117,694
76.00	59,373	102,177	219,871
78.00	73,726	133,099	352,970
80.00	87,304	161,030	514,000

Device	Routing	Invert	Outlet Devices
#1	Primary	70.00'	**30.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 70.00' / 69.50' S= 0.0063 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 4.91 sf
#2	Secondary	78.00'	**80.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

```
Primary OutFlow  Max=63.68 cfs @ 13.93 hrs  HW=78.51'   (Free Discharge)
└─1=Culvert  (Inlet Controls 63.68 cfs @ 12.97 fps)

Secondary OutFlow  Max=78.66 cfs @ 13.93 hrs  HW=78.51'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir (Weir Controls 78.66 cfs @ 1.93 fps)
```

Summary for Pond 43P: Box Culvert 3 (8' WIDE x 9' HIGH) 2 culverts

```
Inflow Area =      176.420 ac,   8.20% Impervious,  Inflow Depth >   7.12"    for  100 YEAR event
Inflow      =      232.57 cfs @   14.09 hrs,  Volume=        104.640 af
Outflow     =      232.52 cfs @   14.10 hrs,  Volume=        104.585 af,  Atten= 0%,  Lag= 1.1 min
Primary     =      232.52 cfs @   14.10 hrs,  Volume=        104.585 af
Secondary =          0.00 cfs @    5.00 hrs,  Volume=          0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 57.64' @ 14.10 hrs   Surf.Area= 6,558 sf   Storage= 6,445 cf

Plug-Flow detention time= 0.3 min calculated for 104.585 af (100% of inflow)
Center-of-Mass det. time= 0.2 min ( 977.7 - 977.5 )

Volume        Invert     Avail.Storage   Storage Description
   #1         56.00'      2,789,378 cf   Custom Stage Data (Prismatic)Listed below (Recalc)

 Elevation          Surf.Area           Inc.Store          Cum.Store
    (feet)              (sq-ft)       (cubic-feet)        (cubic-feet)
     56.00                1,320                  0                  0
     58.00                7,722              9,042              9,042
     60.00                9,674             17,396             26,438
     62.00               63,671             73,345             99,783
     64.00              169,090            232,761            332,544
     66.00              252,914            422,004            754,548
     70.00              764,501          2,034,830          2,789,378

Device   Routing          Invert   Outlet Devices
   #1    Primary          54.70'   96.0" W x 108.0" H  Box 2- 8' wide Box Culverts X 2.00
                                   L= 70.0'   RCP, end-section conforming to fill,  Ke= 0.500
                                   Inlet / Outlet Invert= 54.70' / 54.00'   S= 0.0100 '/'   Cc= 0.900
                                   n= 0.022  Earth, clean & straight,  Flow Area= 72.00 sf
   #2    Secondary        68.00'   25.0' long  x 25.0' breadth Broad-Crested Rectangular Weir
                                   Head (feet)  0.20  0.40  0.60  0.80  1.00  1.20  1.40  1.60
                                   Coef. (English)  2.68  2.70  2.70  2.64  2.63  2.64  2.64  2.63

Primary OutFlow  Max=232.40 cfs @ 14.10 hrs  HW=57.64'   (Free Discharge)
└─1=2- 8' wide Box Culverts (Barrel Controls 232.40 cfs @ 6.60 fps)

Secondary OutFlow  Max=0.00 cfs @ 5.00 hrs  HW=56.00'   (Free Discharge)
└─2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)
```

Summary for Pond 47P: FILTER POND

Inflow Area = 1.050 ac, 53.33% Impervious, Inflow Depth > 6.19" for 100 YEAR event
Inflow = 8.33 cfs @ 12.03 hrs, Volume= 0.542 af
Outflow = 7.79 cfs @ 12.07 hrs, Volume= 0.471 af, Atten= 7%, Lag= 2.4 min
Primary = 7.79 cfs @ 12.07 hrs, Volume= 0.471 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 82.30' @ 12.07 hrs Surf.Area= 3,311 sf Storage= 7,509 cf

Plug-Flow detention time= 98.4 min calculated for 0.470 af (87% of inflow)
Center-of-Mass det. time= 58.3 min (810.9 - 752.6)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	10,009 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.00	1,343	0	0
80.00	1,873	1,608	1,608
81.00	2,460	2,167	3,775
82.00	3,103	2,782	6,556
83.00	3,803	3,453	10,009

Device	Routing	Invert	Outlet Devices
#1	Primary	75.87'	**18.0" Round Culvert** L= 31.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 75.87' / 75.00' S= 0.0281 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	80.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	82.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	82.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.29 cfs @ 12.07 hrs HW=82.28' (Free Discharge)
- **1=Culvert** (Passes 7.29 cfs of 20.24 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.17 cfs @ 5.96 fps)
  - **3=Orifice/Grate** (Weir Controls 6.12 cfs @ 1.73 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=79.00' (Free Discharge)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 49P: 52 ROOF DRIPLINE BMP'S

Inflow Area = 2.860 ac,100.00% Impervious, Inflow Depth > 7.24" for 100 YEAR event
Inflow = 26.02 cfs @ 12.00 hrs, Volume= 1.725 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.21' @ 20.00 hrs Surf.Area= 851,760 sf Storage= 75,085 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	12,675 cf	**3.00'W x 105.00'L x 2.00'H Prismatoid** x 52 32,760 cf Overall - 1,072 cf Embedded = 31,688 cf x 40.0% Voids
#2	100.00'	1,072 cf	**6.0" Round Pipe Storage** x 52 Inside #1 L= 105.0' S= 0.0050 '/'
		13,747 cf	x 52.00 = 714,857 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir X 52.00** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=100.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 81P: OFF SITE POND

Inflow Area = 59.120 ac, 6.33% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 124.91 cfs @ 12.83 hrs, Volume= 23.377 af
Outflow = 90.88 cfs @ 13.30 hrs, Volume= 22.653 af, Atten= 27%, Lag= 28.1 min
Primary = 33.63 cfs @ 13.30 hrs, Volume= 15.604 af
Secondary = 57.25 cfs @ 13.30 hrs, Volume= 7.050 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 62.00' Surf.Area= 20,254 sf Storage= 139,510 cf
Peak Elev= 67.94' @ 13.30 hrs Surf.Area= 78,326 sf Storage= 388,610 cf (249,100 cf above start)

Plug-Flow detention time= 115.3 min calculated for 19.386 af (83% of inflow)
Center-of-Mass det. time= 48.3 min (876.2 - 827.9)

Volume	Invert	Avail.Storage	Storage Description
#1	52.00'	393,079 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
52.00	7,648	0	0
62.00	20,254	139,510	139,510
64.00	30,728	50,982	190,492
66.00	46,299	77,027	267,519
68.00	79,261	125,560	393,079

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 62.00' / 61.50' S= 0.0050 '/' Cc= 0.900

			n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Secondary	66.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=33.63 cfs @ 13.30 hrs HW=67.94' (Free Discharge)
└─**1=Culvert** (Inlet Controls 33.63 cfs @ 10.71 fps)

Secondary OutFlow Max=57.21 cfs @ 13.30 hrs HW=67.94' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 57.21 cfs @ 3.68 fps)

Summary for Pond 82P: Golf Course Pond

Inflow Area = 827.990 ac, 4.13% Impervious, Inflow Depth > 1.04" for 100 YEAR event
Inflow = 127.45 cfs @ 18.93 hrs, Volume= 71.503 af
Outflow = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af, Atten= 0%, Lag= 22.9 min
Secondary = 127.26 cfs @ 19.31 hrs, Volume= 67.347 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 79.31' @ 19.31 hrs Surf.Area= 68,498 sf Storage= 181,901 cf

Plug-Flow detention time= 24.1 min calculated for 67.123 af (94% of inflow)
Center-of-Mass det. time= 11.5 min (995.5 - 984.0)

Volume	Invert	Avail.Storage	Storage Description
#1	76.00'	395,691 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
76.00	41,373	0	0
82.00	90,524	395,691	395,691

Device	Routing	Invert	Outlet Devices
#1	Secondary	76.00'	**8.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Secondary OutFlow Max=127.25 cfs @ 19.31 hrs HW=79.31' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 127.25 cfs @ 4.80 fps)

Summary for Pond 83P: Culvert at Valhalla Road

Inflow Area = 31.310 ac, 11.18% Impervious, Inflow Depth > 4.47" for 100 YEAR event
Inflow = 58.33 cfs @ 13.10 hrs, Volume= 11.651 af
Outflow = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af, Atten= 43%, Lag= 45.3 min
Primary = 33.38 cfs @ 13.86 hrs, Volume= 11.640 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 136.14' @ 13.86 hrs Surf.Area= 20,365 sf Storage= 96,933 cf

Plug-Flow detention time= 24.1 min calculated for 11.602 af (100% of inflow)
Center-of-Mass det. time= 23.7 min (867.4 - 843.6)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	648,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	366	0	0
130.00	4,041	22,035	22,035
140.00	30,637	173,390	195,425
150.00	60,000	453,185	648,610

Device	Routing	Invert	Outlet Devices
#1	Primary	120.00'	**18.0" Round Culvert** L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 120.00' / 119.00' S= 0.0125 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	148.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=33.38 cfs @ 13.86 hrs HW=136.14' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 33.38 cfs @ 18.89 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=120.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 84P: 3 - 18" culverts

Inflow Area = 20.440 ac, 7.78% Impervious, Inflow Depth > 4.85" for 100 YEAR event
Inflow = 53.26 cfs @ 12.70 hrs, Volume= 8.267 af
Outflow = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af, Atten= 32%, Lag= 24.7 min
Primary = 35.95 cfs @ 13.12 hrs, Volume= 8.199 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 83.23' @ 13.12 hrs Surf.Area= 58,674 sf Storage= 49,853 cf

Plug-Flow detention time= 15.4 min calculated for 8.172 af (99% of inflow)
Center-of-Mass det. time= 12.5 min (827.9 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	297,916 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,362	0	0
82.00	6,990	9,352	9,352
84.00	90,787	97,777	107,129
86.00	100,000	190,787	297,916

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**18.0" Round Culvert X 3.00** L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 80.50' / 80.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	84.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=35.94 cfs @ 13.12 hrs HW=83.23' (Free Discharge)
↳**1=Culvert** (Inlet Controls 35.94 cfs @ 6.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=80.00' (Free Discharge)
↳**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 85P: 18" CULVERT

Inflow Area = 8.230 ac, 4.74% Impervious, Inflow Depth > 4.74" for 100 YEAR event
Inflow = 20.99 cfs @ 12.71 hrs, Volume= 3.251 af
Outflow = 20.43 cfs @ 12.81 hrs, Volume= 3.231 af, Atten= 3%, Lag= 6.2 min
Primary = 10.34 cfs @ 12.81 hrs, Volume= 2.768 af
Secondary = 10.09 cfs @ 12.81 hrs, Volume= 0.463 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 92.28' @ 12.81 hrs Surf.Area= 14,299 sf Storage= 16,973 cf

Plug-Flow detention time= 18.1 min calculated for 3.220 af (99% of inflow)
Center-of-Mass det. time= 15.8 min (833.0 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	29,280 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	1,196	0	0
92.00	12,056	13,252	13,252
93.00	20,000	16,028	29,280

Device	Routing	Invert	Outlet Devices
#1	Primary	89.86'	**18.0" Round Culvert** L= 28.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 89.86' / 89.79' S= 0.0025 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf
#2	Secondary	92.00'	**25.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.34 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↰**1=Culvert** (Barrel Controls 10.34 cfs @ 5.85 fps)

Secondary OutFlow Max=10.05 cfs @ 12.81 hrs HW=92.28' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Weir Controls 10.05 cfs @ 1.43 fps)

Summary for Pond 86P: 24" CULVERT

Inflow Area =	55.060 ac,	5.27% Impervious,	Inflow Depth > 3.32"	for 100 YEAR event	
Inflow =	64.50 cfs @	13.49 hrs,	Volume=	15.247 af	
Outflow =	64.27 cfs @	13.53 hrs,	Volume=	14.774 af,	Atten= 0%, Lag= 2.4 min
Primary =	23.92 cfs @	13.53 hrs,	Volume=	10.780 af	
Secondary =	40.35 cfs @	13.53 hrs,	Volume=	3.994 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.28' @ 13.53 hrs Surf.Area= 36,626 sf Storage= 83,212 cf

Plug-Flow detention time= 37.4 min calculated for 14.774 af (97% of inflow)
Center-of-Mass det. time= 28.1 min (907.2 - 879.1)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	401,091 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	758	0	0
58.00	9,115	9,873	9,873
60.00	24,850	33,965	43,838
62.00	43,236	68,086	111,924
64.00	72,382	115,618	227,542
66.00	101,167	173,549	401,091

Device	Routing	Invert	Outlet Devices
#1	Primary	57.78'	**24.0" Round Culvert** L= 73.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 57.78' / 56.17' S= 0.0221 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 3.14 sf
#2	Secondary	61.00'	**100.0' long x 25.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.92 cfs @ 13.53 hrs HW=61.28' (Free Discharge)
↰**1=Culvert** (Inlet Controls 23.92 cfs @ 7.61 fps)

Secondary OutFlow Max=39.98 cfs @ 13.53 hrs HW=61.28' (Free Discharge)
↰**2=Broad-Crested Rectangular Weir** (Weir Controls 39.98 cfs @ 1.42 fps)

FOCALPOINT

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM

CUMBERLAND CROSSING PHASE 2 – JAN 7, 2020

MAINE – CHAPTER 500 DESIGN WORKSHEET/CHECKLIST

1. FocalPoint Bed Area (min 174 square feet per acre of impervious area (e.g. 0.2 acres = 35 sf))

- Tributary Impervious area = 1.71 ac. (A)
- Tributary Pervious area = 2.41 ac. (B)
- Min FocalPoint bed area req'd = (((A) x 1.0) + ((B) x 0.4)) * 174 = 465 sf.
- FocalPoint Bed Area provided * = 465 sf.
- Dimensions of Proposed FocalPoint = 18 ft x 25.83 ft

* see criteria 2. to determine if minimum size is appropriate.

2. A 0.95 inch Type III 24hr rainfall event shall be modelled to demonstrate the entire storm volume is treated prior to activation of the overflow (typically set at 6-12" above the mulch)

- Temporary storage depth provided = 12 inches (typ 6" to 12")
- Temporary storage volume provided at above depth = 607 cubic feet.
- Peak ponding depth from 0.95" 24hr storm event = 8 inches

3. Ratio of the surface area of the filter media (sf) to the temporary ponding volume (cf) shall be no less that 1:5

- Ratio of FocalPoint Bed Area : Temporary Storage Vol = 1 : 1.31

4. Subsurface R-Tank or Chamber Treatment Row must be sized to treat the peak flow from a 1 yr-24hr storm event.

- 1yr 24hr Peak Flowrate = 6.29 cfs
- Chamber model selected
  - Cultec 330 XLHD (1 chamber per 0.227 cfs) ☐
  - Cultec 150XLHD (1 chamber per 0.185 cfs) ☐
  - R-Tank modules (1 module per 0.02 cfs) ☒

- Number of Chambers/modules required = 315 (320 provided)

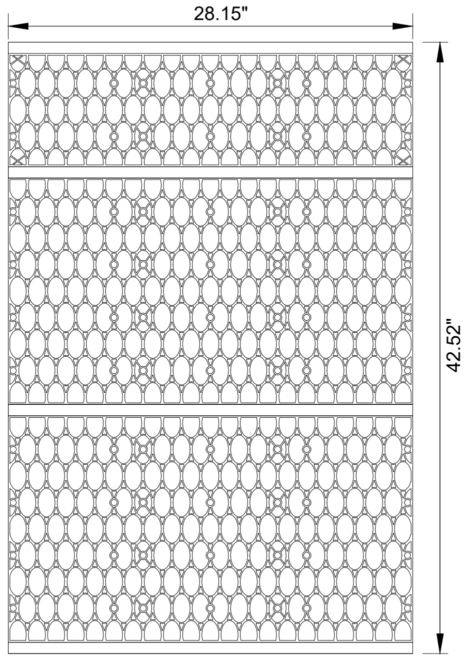
5. Controlled release of the Channel Protection over 24-48 hrs

- Controlled release of the channel protection volume is being achieved by:
  - Expanded subsurface storage basin with OCS ☒ **(320 maintenance modules + 620 standard modules (total of 940 Double+Mini modules)**
  - Surface detention basin with OCS ☐

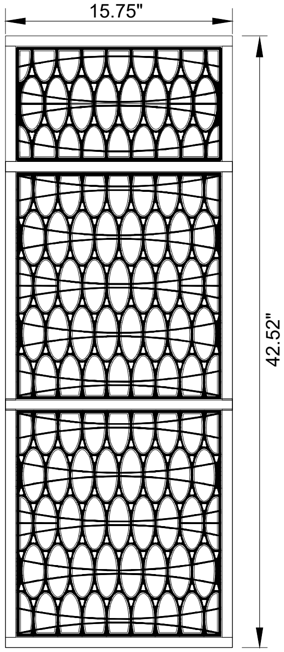
6. A landscape plan for the FocalPoint bed area has been prepared ☐

7. The Design shall be reviewed by the manufacturer's representative prior to submission and installation will be overseen by the manufacturer's representative.

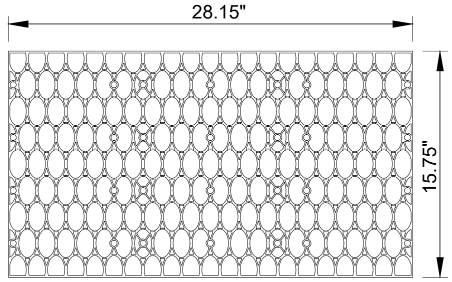
  - The Design has been reviewed by ACF Environmental ☒
  - Engineer will coordinate installation inspection with ACF ☒



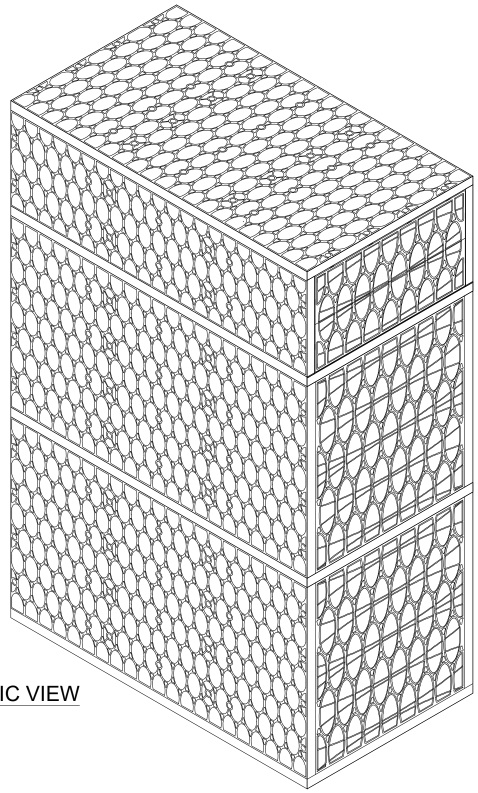
SECTION VIEW



FRONT VIEW



PLAN VIEW



ISOMETRIC VIEW

MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 42.52 IN. (1080 MM)
TANK VOLUME = 10.91 CF
STORAGE VOLUME = 10.36 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS25, (WITH ACF COVER SYSTEM)

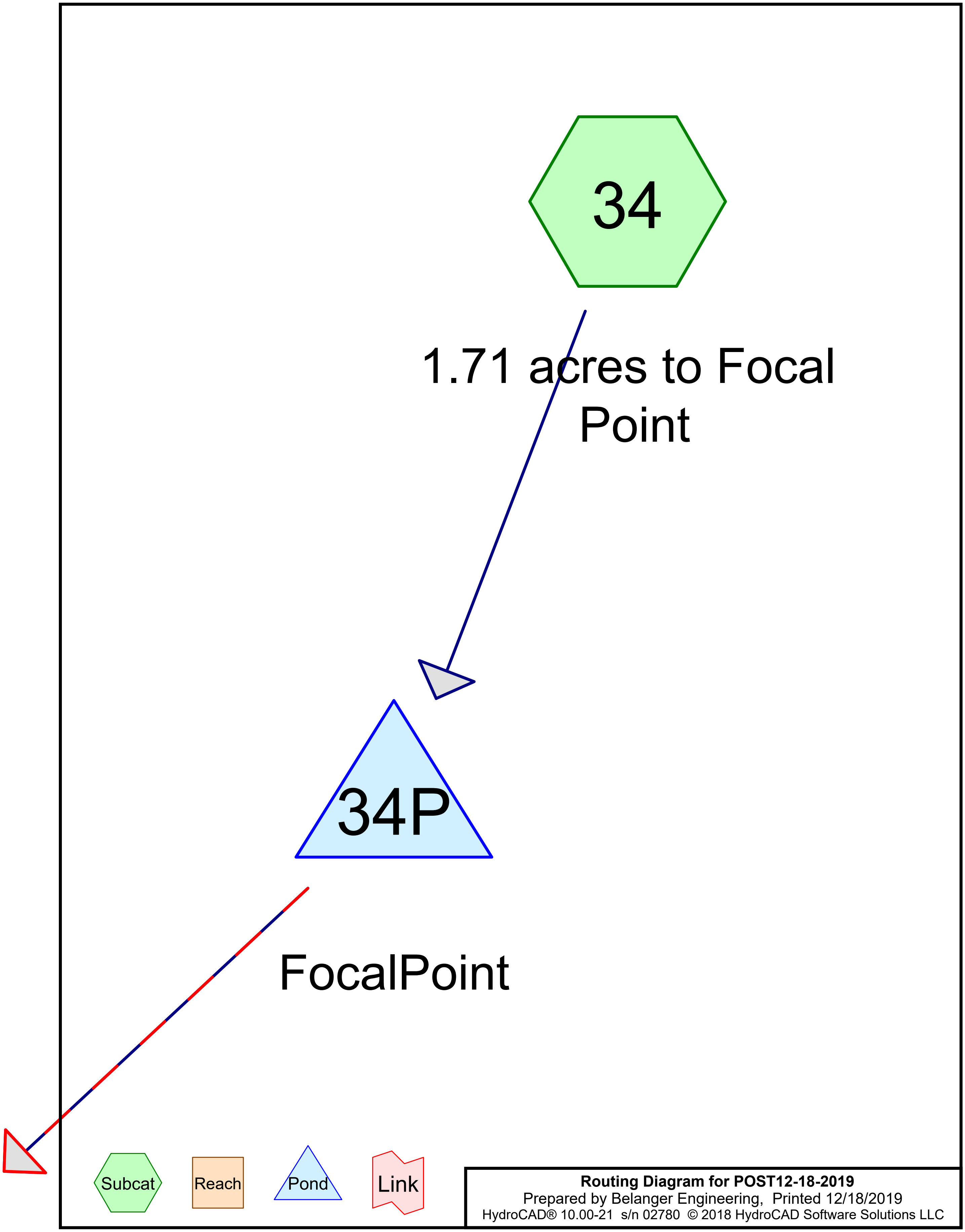
MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES PER SEGMENT/TOTAL: 5/15

ACF ENVIRONMENTAL

R-TANK^{HD} - DOUBLE + MINI MODULES

FOR ADDITIONAL INFORMATION PLEASE CONTACT: ACF ENVIRONMENTAL, 1-800-448-3636, www.acfenvironmental.com



Routing Diagram for POST12-18-2019
Prepared by Belanger Engineering, Printed 12/18/2019
HydroCAD® 10.00-21 s/n 02780 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.710	98	NEW IMPERVIOUS PAVED AREA (34)
2.660	74	NEW LAWN C (34)
4.370	**83**	**TOTAL AREA**

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 0.47 cfs @ 12.06 hrs, Volume= 0.042 af, Depth> 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 INCH Rainfall=1.00"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 0.12" for 1 INCH event
Inflow = 0.47 cfs @ 12.06 hrs, Volume= 0.042 af
Outflow = 0.47 cfs @ 12.07 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.2 min
Primary = 0.47 cfs @ 12.07 hrs, Volume= 0.042 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 61.07' @ 12.06 hrs Surf.Area= 300 sf Storage= 4 cf

Plug-Flow detention time= 0.1 min calculated for 0.042 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (856.3 - 856.2)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.45 cfs @ 12.07 hrs HW=61.07' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.45 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=61.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment 34: 1.71 acres to Focal Point

Runoff = 6.30 cfs @ 12.03 hrs, Volume= 0.381 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YEAR Rainfall=2.60"

	Area (ac)	CN	Description
*	1.710	98	NEW IMPERVIOUS PAVED AREA
*	2.660	74	NEW LAWN C
*	0.000	98	0.66 ac (1/2) of 24 Roofs
	4.370	83	Weighted Average
	2.660		60.87% Pervious Area
	1.710		39.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	11	0.0300	1.02		**Sheet Flow, AB** Smooth surfaces n= 0.011 P2= 3.10"
1.4	300	0.0300	3.52		**Shallow Concentrated Flow, BC** Paved Kv= 20.3 fps
1.6	311	Total			

Summary for Pond 34P: FocalPoint

Inflow Area = 4.370 ac, 39.13% Impervious, Inflow Depth > 1.05" for 1 YEAR event
Inflow = 6.30 cfs @ 12.03 hrs, Volume= 0.381 af
Outflow = 6.42 cfs @ 12.05 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.8 min
Primary = 0.69 cfs @ 11.65 hrs, Volume= 0.271 af
Secondary = 5.73 cfs @ 12.05 hrs, Volume= 0.110 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 65.77' @ 12.05 hrs Surf.Area= 300 sf Storage= 1,432 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 8.3 min (808.9 - 800.6)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	192 cf	**20.00'W x 15.00'L x 3.20'H FocalPoint** 960 cf Overall x 20.0% Voids
#2	64.00'	2,785 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc) -Impervious
		2,977 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
64.00	300	0	0
64.50	600	225	225
65.00	751	338	563
65.50	919	418	980
66.00	1,100	505	1,485
66.50	1,296	599	2,084
67.00	1,506	701	2,785

Device	Routing	Invert	Outlet Devices
#1	Primary	61.00'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#2	Secondary	65.50'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 11.65 hrs HW=61.32' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.69 cfs)

Secondary OutFlow Max=5.62 cfs @ 12.05 hrs HW=65.77' (Free Discharge)
└─**2=Orifice/Grate** (Weir Controls 5.62 cfs @ 1.68 fps)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
GOVERNOR

PAUL MERCER
COMMISSIONER

February 2, 2017

Stormwater Systems ACF-Convergent Water Technologies Alliance
23 Faith Drive
Gorham, ME 04038
ATTN: Robert Woodman and Scott Gorneau

Dear Mr. Woodman and Mr. Gorneau:

This letter replaces the May 16, 2016 approval from the Department of Environmental Protection (Department) that authorized the use of the FocalPoint system. The FocalPoint system (a high performance modular biofiltration system), when installed in series with a subsurface chamber-based treatment row, meets the requirements of the General Standards (Section 4.C.) of the Stormwater Management Rules (Chapter 500), provided that the system is filled with the FocalPoint engineered filter media; it is sized to meet the requirements of the General Standards (Section 4.B.); and it is installed, operated and maintained in accordance with the following provisions:

1. The FocalPoint system must be sized in accordance with the manufacturer's latest field test results with the goal of treating 90% of the annual runoff volume. To accomplish this, the system must be modelled in HydroCAD (or similar TR-55 modelling software) to demonstrate that the entire volume of a 0.95 inch Type III 24-hr storm is treated prior to activation of the bypass/overflow (typically set at 6" to 12" above the mulch surface). When sizing the FocalPoint system to meet Chapter 500, note that runoff from the entire contributing drainage area, including pervious areas, must be included in the modeled runoff values.

2. The surface area of the media within the FocalPoint must be a minimum of 174 square feet per 1 acre of impervious area treated (26 sq. ft. per 0.15 acres). The thickness of the media is to be no less than 1.5 ft. (18 inches) and the ratio of the surface area of the filter media bed in square feet to the ponding volume in cubic feet must be no less than 1 to 5.

3. The FocalPoint system consists of five components that include: 1) an open cell underdrain; 2) a wide aperture separation mesh wrap around the underdrain; 3) a layer of clean washed, 3/8" diameter bridging stone; 4) advanced high flow rate engineered media with an infiltration rate of 100 inches per hour; and 5) double shredded hardwood mulch. These components are built from the bottom up to create a mostly permeable profile that measures 3 feet from bottom of underdrain to top of mulch. The ponding

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

depth above the mulch surface is typically 6 to 12 inches and varies based on site conditions. An overflow outlet should be placed above the ponding depth.

4. The FocalPoint system requires the establishment of vegetation that is tolerant of wet and dry conditions. Plants that are not performing as desired should be replaced as needed. A list of appropriate plants for use in the FocalPoint system is provided at: http://www.acfenvironmental.com/products/stormwater-management/filtration/focal-point/.

5. The FocalPoint biofiltration system must be placed in-line with a subsurface chamber-based treatment row that is approved by the Department such that both the treated discharge and the bypass discharge from the FocalPoint system drain to the treatment row. The treatment row must be sized to treat the peak flow from a 1-year, 24-hour storm event. The treatment row structure must be continuous and without obstacle for cleaning, and must have access at both ends for the removal of accumulated sediment and debris. The treatment row must be underlain with a bottom surface consisting of 2 layers of woven geotextile (e.g., ACF S300) that extends 18 to 24 inches beyond all sides of the bottom of the structure.

6. Additional storage downstream of the FocalPoint and treatment row will be required to store at least the sum of 1.0 inch of runoff from the impervious areas and 0.4 inches of runoff from the lawn and landscaped areas that drain to the system unless attenuation of the channel protection volume is not required (i.e. direct discharge to a lake, tidal waters, or a major river). An external outlet control structure must control the flow out of a downstream storage system, sized for the entire channel protection volume, and drain in no less than 24 hours or more than 48 hours.

7. If required for flooding control, the storage system can be sized to provide for the storage and release of the peak flow with a regulated flow rate from 24-hour storms of the 2, 10, and 25-year frequencies such that the peak flows from the project site do not exceed the peak flow prior to undertaking the project.

8. The applicant must demonstrate that the design meets all the manufacturer's specifications and shall be reviewed by the manufacturer prior to submission to the Department for approval. Review and approval of the design by the manufacturer will be sufficient to demonstrate conformance with the manufacturer's specifications. The FocalPoint system must be installed by a manufacturer's certified installer or under the supervision of a manufacturer's representative.

9. Components of the system that are delivered in bulk (i.e., mulch, high flow media and clean washed bridging stone), should be contained in nylon super sacks to promote ease of storage and protection during on-site construction activities.

10. The FocalPoint and treatment row system should be inspected and maintained if necessary at least once every six months to maintain the established efficiency for pollutant removal. Prior to construction, a five-year binding inspection and maintenance contract must be provided prior to the Department for review and approval, and must be renewed before contract expiration. The contract will be with a professional with knowledge of erosion and stormwater control, including experience with the proposed system.

11. The overall stormwater management design must meet all Department criteria and sizing specifications and will be reviewed and approved by the Department prior to use.

12. This approval is conditional on full-scale, cold climate field testing results, performed in accordance with the Department’s protocols, confirming that the pollutant removal efficiency and sizing of the FocalPoint system are appropriate. The “permit shield” provision (Section 14) of the Chapter 500 rules will apply, and the Department will not require the replacement of the system if, with proper maintenance, pollutant removals do not satisfy the General Standard Best Management Practices.

Questions concerning this decision should be directed to David Waddell at (207) 215-6932 or Jeff Dennis at (207) 215-6376.

Sincerely,

Mark R Bergeron

Mark Bergeron, P.E.
Director
Bureau of Land Resources

cc: Don Witherill, Maine DEP

ACF Environmental
2831 Cardwell Rd
Richmond, VA 23234

Christopher S. Belanger, P.E.
Belanger Engineering
63 Second Avenue,
Augusta, Maine 04330

January 7, 2020,

SUBJECT: Cumberland Crossing Phase 2, Cumberland, Maine
Plan Review and Construction Oversight Commitment

Dear Chris,

Thank you for forwarding the permit plans for the proposed Cumberland Crossing Phase 2 project in Cumberland, Maine project to ACF environmental for review of the proposed FocalPoint biofiltration system with expanded R-Tank storage system.

Our team has reviewed the plans (with latest revision date of January 2020) and made the following observations:

- There is one FocalPoint system proposed on the plans – 464 sf (18 ft x 25.77 ft)
- The FocalPoint is set in a recessed vegetated 'bowl' area downgradient from the adjacent roadway.
- Runoff enters the system via a stabilized pipe outfall which conveys developed upstream area to the system.
- Based on the modelling and the elevations shown on the grading plan and details, the system has the approved FocalPoint section (3" mulch, 18" media, 6" bridging stone and modular underdrain.
- Based on the computation sheets. The system has a peak elevation of less than 12 inches of temporary ponding volume for the 0.95" storm – which is within the recommended temporary ponding range for the system.
- The volume associated with the 0.95" 24hr storm is treated prior to activation of the overflow device (WQ goal met).
- A 24" domed overflow drain is being provided for the system as the bypass for the system to convey larger storms to the expanded R-Tank "Double+Mini" system.
- The expanded R-Tank Double+Mini system has been provided channel protection, but also have been sized to meet the "Separator Row/treatment row" design

component required by the MeDEP FocalPoint design guidance and is sized per the State guidance.

Overall, ACF takes no exceptions to the location and application of the FocalPoint system for this project.

It appears that the system has been designed in accordance with the design criteria set forth by Maine DEP in the FocalPoint system approval letter and meet the system specifications etc.

With regard to the installation, ACF Environmental will host a preconstruction meeting with the site contractor and will be on-site during the entire installation to ensure that the installation is being conducted in accordance with our standard installation procedures.

ACF Environmental will also provide the first year's maintenance on the FocalPoint bed area.

Please review and contact me with any questions from your office.

We look forward to working with you on this project.

Sincerely,

Robert J Woodman,
Senior Stormwater Engineer
ACF Environmental

Cc: Loren Joyce, ACF Environmental

Northeast
Stormwater Services
Inspection, Maintenance, Compliance

January 6, 2020

Christopher L. Wasileski
Director of Development
Sea Coast Management Company
20 Blueberry Ln. Falmouth, ME 04105

Christopher,

Northeast Stormwater Services (NESS) is pleased to provide a proposal to perform biannual inspections and annual maintenance of the FocalPoint stormwater management system at the proposed Cumberland Crossing Phase 2 project in Cumberland, Maine. NESS serves several commercial landowners in Maine with professional inspection of stormwater systems. The NESS team is well versed in all stormwater management "best management practices" from wetponds and bioretention to proprietary treatment devices and subsurface stormwater detention systems and looks forward to serving you at this site. NESS staff are approved SWM BMP inspectors by MeDEP.

Site Overview and Understanding

In accordance with the Maine Department of Environmental Protection (MEDEP) permit requirements, every 5 years, the property owner is required to submit certification that the stormwater management system has been inspected and maintained per the approved Operations and Maintenance Manual submitted as part of the permit application. A draft contract is typically required as part of the permit application for proposed projects. This letter can be used for this purpose.

It is the understanding of NESS, based on construction plans with latest revision date of Jan 2020, that the proposed FocalPoint stormwater system with expanded R-Tank system comprises of the following

- 465 sf FocalPoint Biofiltration systems with a riprap inlet apron, and overflow riser.
- An expanded R-Tank storage system consisting of 940 R-Tank Double+Mini modules (including an R-Tank Maintenance row system)

*** NOTE: there are additional stormwater features on the site. These are not covered by the scope of this proposal. It is the understanding of NESS that these features are being inspected and maintained by other parties. Please contact our office if you would like a proposal for the rest of the BMPs on the site.**

Inspection Recommendations

In order to meet the certification requirements, NESS recommends biannual inspections of the FocalPoint system. Usually early spring (May) and late fall (Oct) are ideal times to inspect the site.

Note: NESS will provide the inspection, reporting and assist you with the completion of the recertification forms. NESS will perform the annual maintenance needed for the FocalPoint system bed mulch area – essentially annual removal and replacement of the mulch layer. Beyond the FocalPoint bed area, i.e. the R-Tank system, NESS **will not** conduct the maintenance work as recommended in the inspection reports.

Seacoast Management Company will need to contract a local maintenance company to complete the recommended maintenance activities. Our office can provide recommendations for qualified contractors who are experienced in maintaining similar stormwater systems.

Deliverables

Following each site inspection, NESS will prepare a detailed professional inspection report complete with maintenance recommendations and representative photos. All documents will be provided in electronic copy only (PDF format). Hard copies are available upon request.

These reports can be included with the 5yr recertification documentation.

Fee

The annual cost for the inspection of the FocalPoint system at the Cumberland Crossing Phase 2 project in Cumberland, Maine managed by Seacoast Management Company will be **$600.00 **** Payment will be due upon invoice of completed work. (i.e. $300 per visit). ** *note: this price assumes that NESS will continue to inspect the system installed in Phase 1 (i.e. the above price is the added cost to add Phase 2 to the existing contract).*

The annual cost for the maintenance of the Phase 2 FocalPoint system at the site will be **$4,000.00.** This will include removal and replacement of the surface mulch layer one time per year.

Should you wish to accept this proposal, please sign at the bottom of this page and scan and email to northeastsws@gmail.com. At the end of each calendar year, Seacoast Management Company can select to continue this agreement or work with another party.

The first maintenance visit is included with the price of the FocalPoint system as provided by ACF Environmental.

Please note: while the fee will be charged on an annual basis, the "inspection and reporting" portion of this contract is for the first 5 years after the BMPs are completed and brought "on line". The "maintenance" portion of this contract (for the FocalPoints only) is for the four year period after the initial maintenance visit (provided by ACF) is completed.

NESS shall maintain general liability insurance in amounts reasonably satisfactory to the landowner, provide the landowner with evidence of same upon request, and indemnify and hold harmless the landowner from any and all claims of injury or property damage relating to the services provided under this agreement by NESS or any employee, contractor, subcontractor, agent, or representative.

Closure

Thank you for the opportunity to provide this proposal for stormwater inspection services. NESS looks forward to partnering with you on this.

Sincerely,

Robert J Woodman,
Senior Stormwater Engineer/Certified SWM Inspector
Northeast Stormwater Services

cc Rick Fotino, Northeast Stormwater Services

Signed and Approved:

____
Christopher L. Wasileski, Seacoast Management Company

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

4674

January 8, 2020

Mr. Rick Licht
Licht Environmental Design LLC
35 Fran Circle
Gray, ME 04039

Re: Soil Evaluation, Proposed Stormwater Devices, Cumberland Crossing, Phase 2, Cumberland, ME

Dear Rick,

I completed a soil evaluation for the proposed stormwater treatment program for development activities for the proposed phase 2 of Cumberland Crossing, Cumberland, ME. The soil evaluation was conducted in accordance with Section 7.D.4 of the Stormwater Management Rules. I evaluated a backhoe excavated soil test pit in proposed stormwater treatment pond. And four hand dug test pits at the four buffer locations. The soils found on the parcel are moderately well drained marine lacustrine soils. There is a seasonal high watertable ranging from 14 and 28 inches. There was no observed groundwater table in any of the soil test pits. The soil test pit log descriptions are attached.

If you have any questions or require additional information, please contact me.

Sincerely,

Mark J. Hampton L.S.E., C.S.S.
Licensed Site Evaluator #263
Certified Soil Scientist #216

P.O. BOX 1931 • PORTLAND, ME 04104-1931 • 207-756-2900 • mhampto1@maine.rr.com

Quality services that meet your deadline

PAGE ____ OF ____

4674

FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: Cumberland Crossing Phase 2

Applicant Name: Oceanview at Cumberland LLC

Project Location (municipality): Cumberland

Exploration Symbol # STW-1 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Texture	Consistency	Color	Redox Features
fine sandy loam	Friable	Dark Brown	
fine sandy loam	Friable	Brown	
Silty Clay loam	Firm	olive gray	Common & Distinct

no water in hole

Depth below mineral soil surface (inches): 0, 10, 20, 30, 40, 50, 60; 100

Soil Details by S.E. ▸▸

Soil Classification		Slope	Limiting Factor	
8 Profile	C Condition	2 Percent	16 " Depth	☐ Groundwater ☒ Restrictive Layer ☐ Bedrock

S.S. ▸▸ Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic _____ Soil Group

---

Exploration Symbol # B-1 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Texture	Consistency	Color	Redox Features
fine sandy loam	Friable	Dark Brown	
fine sandy loam	Friable	Brown	
Silty Clay loam	Firm	olive gray	Common & Distinct

Depth of Excavation to 36"

Depth below mineral soil surface (inches): 0, 10, 20, 30, 40, 50, 60

Soil Details by S.E. ▸▸

Soil Classification		Slope	Limiting Factor	
8 Profile	D Condition	4 Percent	14 " Depth	☐ Groundwater ☒ Restrictive Layer ☐ Bedrock

S.S. ▸▸ Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic _____ Soil Group

---

Exploration Symbol # B-2 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Texture	Consistency	Color	Redox Features
fine sandy loam	Friable	Dark Brown	
fine sandy loam	Friable	Brown	
Silty Clay loam	Firm	olive gray	Common & Distinct

Depth of Excavation to 36"

Depth below mineral soil surface (inches): 0, 10, 20, 30, 40, 50, 60

Soil Details by S.E. ▸▸

Soil Classification		Slope	Limiting Factor	
8 Profile	C Condition	12 Percent	16 " Depth	☐ Groundwater ☒ Restrictive Layer ☐ Bedrock

S.S. ▸▸ Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic _____ Soil Group

---

Exploration Symbol # B-3 ☒ Test Pit ☐ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth of exploration or to refusal

Texture	Consistency	Color	Redox Features
loamy sand	Friable	Dark Brown	
loamy sand	Friable	Brown	
Silty clay loam	Firm	olive gray	Common & distinct

Depth of Excavation to 36"

Depth below mineral soil surface (inches): 0, 10, 20, 30, 40, 50, 60

Soil Details by S.E. ▸▸

Soil Classification		Slope	Limiting Factor	
7 Profile	C Condition	4 Percent	18 " Depth	☐ Groundwater ☒ Restrictive Layer ☐ Bedrock

S.S. ▸▸ Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic _____ Soil Group

---

INVESTIGATOR INFORMATION AND SIGNATURE

Signature

Date 1/8/20

Name Printed Mark J. Hampton

Cert/Lic/Reg. # 263/216

Title ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

affix professional seal

PAGE ____ OF ____

#674

FORM F Rev. 07/11

SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
Cumberland Crossing Phase 2	Oceanview at Cumberland LLC	Cumberland

Exploration Symbol # B-4 ☒ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth of exploration or to refusal

Depth below mineral soil surface (*inches*)

Depth	Texture	Consistency	Color	Redox Features
0	fine sandy loam	Friable	Dark Brown	
10	fine sandy loam	Friable	Brown	
20	Silty clay loam	Firm	Olive Gray	Common & Distinct
30				
40	Depth of Excavation - 38"			
50				
60				

Soil Details by S.E.

Soil Classification		Slope	Limiting Factor	
8 Profile	C Condition	10 Percent	15 " Depth	☐ Groundwater ☒ Restrictive Layer ☐ Bedrock

S.S. Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic ____ Soil Group

---

Exploration Symbol # ____ ☐ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth of exploration or to refusal

Depth below mineral soil surface (*inches*)

Depth	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E.

Soil Classification		Slope	Limiting Factor	
____ Profile	____ Condition	____ Percent	____ " Depth	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

S.S. Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic ____ Soil Group

---

Exploration Symbol # ____ ☐ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth of exploration or to refusal

Depth below mineral soil surface (*inches*)

Depth	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E.

Soil Classification		Slope	Limiting Factor	
____ Profile	____ Condition	____ Percent	____ " Depth	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

S.S. Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic ____ Soil Group

---

Exploration Symbol # ____ ☐ Test Pit ☐ Boring ☐ Probe

____ " Organic horizon thickness Ground surface elev. ____

____ " Depth of exploration or to refusal

Depth below mineral soil surface (*inches*)

Depth	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E.

Soil Classification		Slope	Limiting Factor	
____ Profile	____ Condition	____ Percent	____ " Depth	☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

S.S. Soil Series/Phase Name: ☐ Hydric ☐ Non-hydric Hydrologic ____ Soil Group

---

INVESTIGATOR INFORMATION AND SIGNATURE

Signature Mark J. Hampton

Date 1/8/20

Name Printed Mark J. Hampton

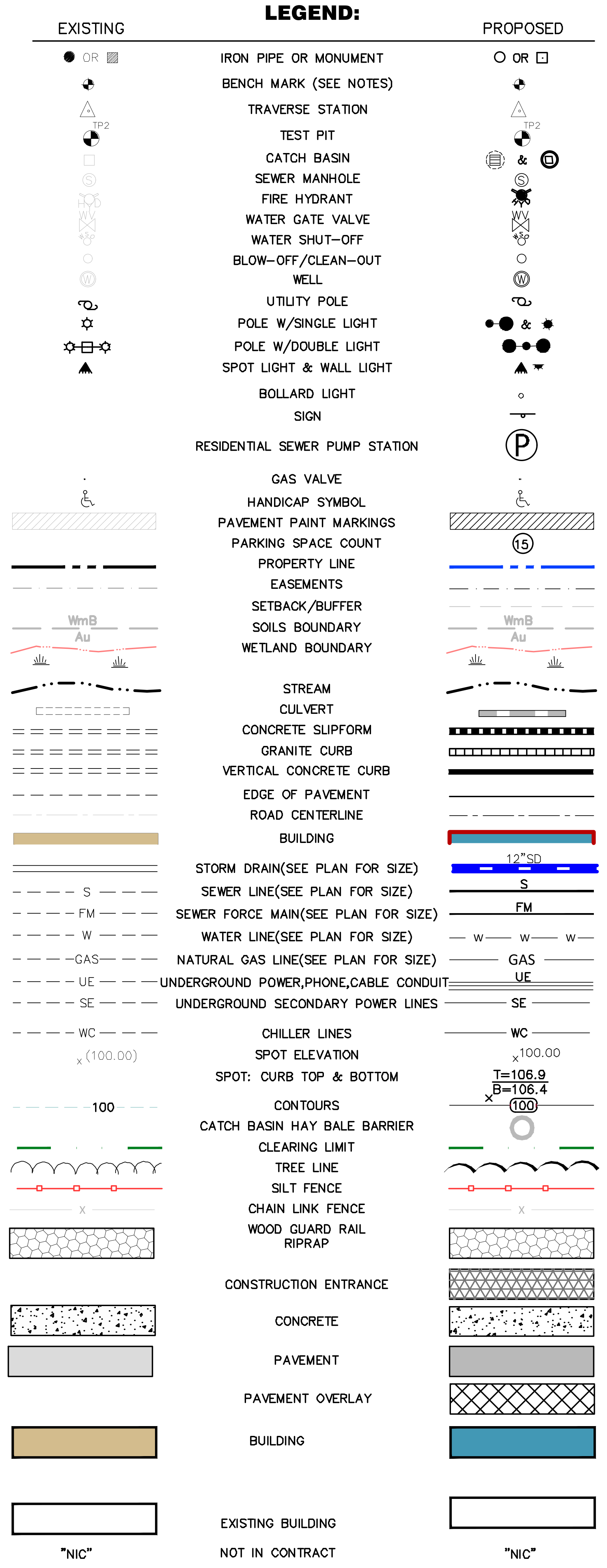
Cert/Lic/Reg. # 263/216

Title ☒ Licensed Site Evaluator ☒ Certified Soil Scientist ☐ Certified Geologist ☐ Professional Engineer

affix professional seal

CUMBERLAND CROSSING - PHASE 2
Tuttle & Greely Roads, Cumberland, Maine
June 15, 2020
DEP and Town Re-Submission

LEGEND:



PROJECT SCALES

GRAPHIC SCALE

(IN FEET)
1 inch = 20 ft.

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

GENERAL NOTES:

1. TOPOGRAPHIC DATA IS BASED ON COMPILATIONS OF INFORMATION INCLUDING AERIAL INFORMATION, ON THE GROUND SURVEY, APPROVED DESIGN PLANS, AND FIELD OBSERVATIONS. ON THE GROUND SURVEYS HAVE BEEN COMPLETED BY TITCOMB ASSOCIATES IN 2017

2. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR THE ELEVATION OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION HAS NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVES AND IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE (1-800-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

3. UNIT FOOTPRINTS AS SHOWN ARE FOR PLANNING PURPOSES ONLY. FINAL FOOTPRINTS MAY VARY. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS ETC.

4. LAYOUT DIMENSIONS ARE FROM FACE OF BUILDING, RETAINING WALLS, CURBS OR BERMS.

5. RIM ELEVATIONS OF PROPOSED DRAINAGE AND SANITARY SEWER MANHOLES AND ASSOCIATED STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH AND CONSISTENT WITH THE GRADING PLANS. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE WITHIN LIMITS OF WORK.

6. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC AND FIRE ALARM). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.

7. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, INVERTS AND TYPES OF EXISTING PIPES AT ALL PROPOSED POINTS OF CONNECTION PRIOR TO ORDERING MATERIALS. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATIONS, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT.

8. ALL AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. ALL AREAS DISTURBED DURING CONSTRUCTION NOT COVERED WITH BUILDINGS, STRUCTURES, OR PAVEMENT SHALL RECEIVE 6 INCHES OF LOAM AND SEED.

9. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND SHALL BE RESPONSIBLE FOR PAYING ANY FEES FOR ANY POLE RELOCATION AND FOR THE ALTERATION OR ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

10. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY PERMITS, PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS.

11. ALL PROPERTY MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE RESET TO THEIR ORIGINAL LOCATION BY A MAINE REGISTERED PROFESSIONAL LAND SURVEYOR (PLS) AT THE CONTRACTOR'S EXPENSE.

12. THE CONTRACTOR SHALL PREPARE/PROVIDE AN AS-BUILT SURVEY SHOWING LOCATIONS OF ALL CONSTRUCTED SURFACE FEATURES AND SUBSURFACE UTILITY SYSTEMS INCLUDING THE GPS POINT LOCATION, TYPE, SIZE AND INVERTS. THE CONTRACTOR SHALL PROVIDE SURVEY POINTS AND DATA TO THE ENGINEER.

13. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL MEASURES PRIOR TO EARTHWORK OPERATION AND MAINTAIN ALL EROSION CONTROL MEASURES AND SEEDED EMBANKMENTS DURING CONSTRUCTION. EROSION CONTROL SHALL BE REMOVED ONLY UPON THE ESTABLISHMENT OF ALL LANDSCAPED AREAS. AL WORK SHALL BE IN COMPLIANCE WITH THE ENVIRONMENTAL QUALITY HANDBOOK FOR EROSION AND SEDIMENT CONTROL, LATEST EDITION, AS ADOPTED BY THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

14. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.

15. ALL MATERIALS AND CONSTRUCTION METHODS USED WITHIN THE PUBLIC RIGHT-OF-WAY SHALL CONFORM TO ALL LOCAL MUNICIPAL STANDARDS AND MAINE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

16. ALL HANDICAP ACCESSIBLE PARKING SPACES, RAMPS AND SIDEWALKS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA).

17. ALL SITE SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

LAYOUT NOTES:

1. ALL DIMENSIONING, UNLESS NOTED OTHERWISE, IS TO THE FACE OF CURB OR BUILDING.

2. OFFSETS TO CATCH BASINS AND MANHOLES ARE TO THE CENTER OF THE FRAME.

3. PIPE LENGTH EQUALS THE CENTER TO CENTER DISTANCES BETWEEN CATCH BASINS AND/OR MANHOLES MINUS ONE HALF THE DIAMETER OF EACH CATCH BASIN OR MANHOLE.

4. BOUNDARY INFORMATION ON LAYOUT PLAN IS FOR REFERENCE ONLY, REFER TO SUBDIVISION PLAT AND ACTUAL SURVEY AND BOUNDARY SURVEY REFERENCES BY TITCOMB ASSOCIATES.

GRADING AND DRAINAGE NOTES:

1. UNLESS OTHERWISE NOTED, ALL STORM DRAIN PIPE SHALL BE IN ACCORDANCE WITH MDOT SPECIFICATIONS SECTION 603. PIPE CULVERTS AND STORM DRAINS, LATEST REVISION WITH THE EXCEPTION THAT THE ONLY ACCEPTABLE TYPES OF PIPE ARE AS FOLLOWS:
   REINFORCED CONCRETE PIPE
   POLYVINYL CHLORIDE PIPE (PVC)
   SMOOTH BORE HDPE POLYETHYLENE PIPE

2. TOPSOIL STRIPPED IN AREAS OF CONSTRUCTION THAT IS SUITABLE FOR REUSE AS LOAM SHALL BE STOCKPILED ON SITE AT A LOCATION TO BE DESIGNATED BY OWNER. UNSUITABLE SOIL SHALL BE SEPARATED, REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFF SITE.

3. THE CONTRACTOR SHALL ANTICIPATE THAT GROUNDWATER WILL BE ENCOUNTERED DURING CONSTRUCTION AND SHALL INCLUDE SUFFICIENT COSTS WITHIN THEIR BID TO PROVIDE DEWATERING AS NECESSARY. NO SEPARATE PAYMENT SHALL BE MADE TO THE CONTRACTOR FOR DEWATERING.

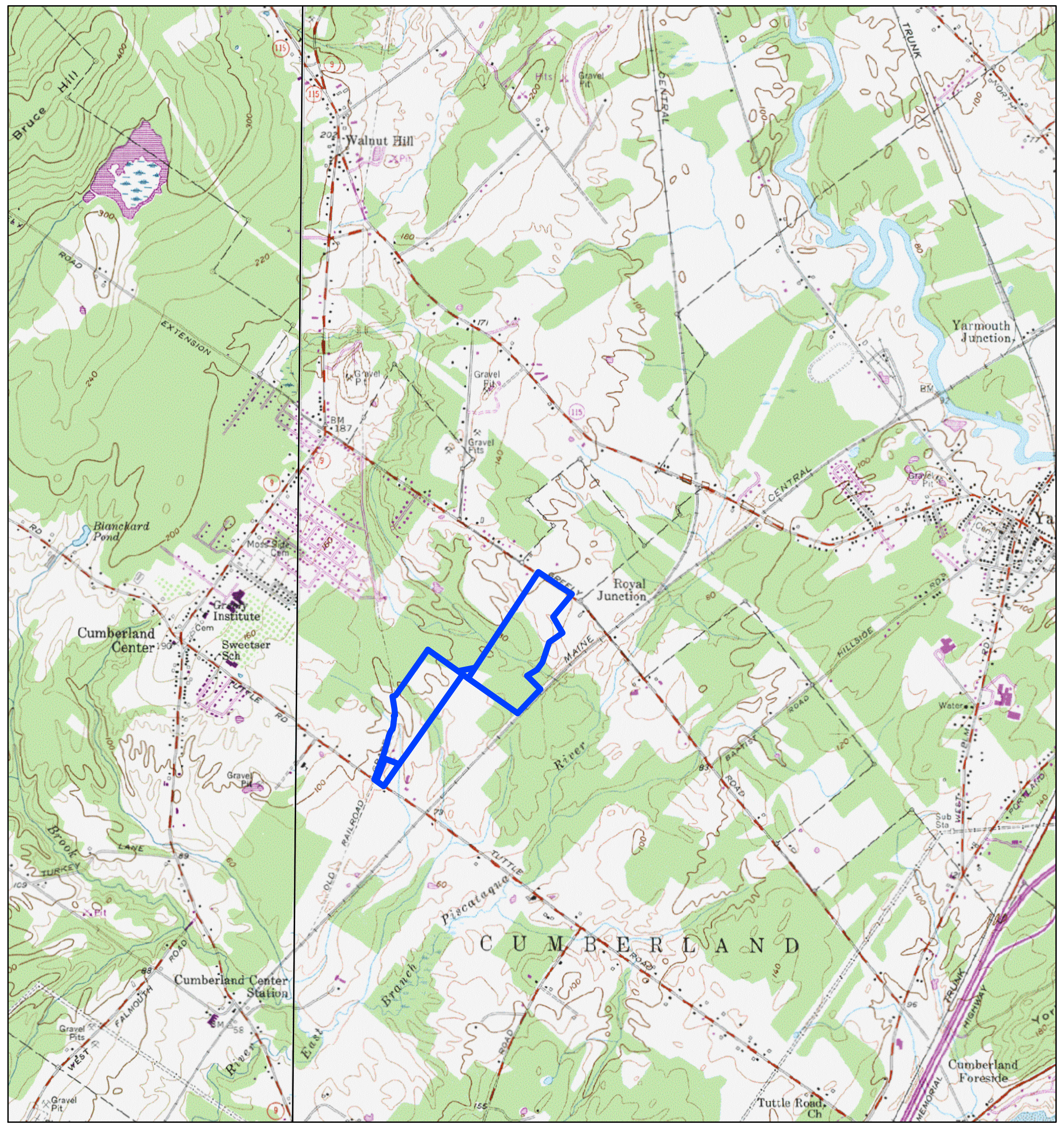
EROSION CONTROL NOTES:

1. LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED IN A MANNER AND SEQUENCE THAT CAUSES THE LEAST PRACTICAL DISTURBANCE OF THE SITE. SEE EROSION CONTROL PLAN FOR EROSION CONTROL SEQUENCING.

2. ALL EROSION CONTROL METHODS IMPLEMENTED SHALL CONFORM TO THE "MAINE EROSION AND SEDIMENT CONTROL EST MANAGEMENT PRACTICES (BMP's) MANUAL" DATED OCTOBER 2016 BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION. http://www.maine.gov/dep/land/erosion/escbmps/esc_bmp_engineers.pdf

3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PLACE THE EROSION CONTROL BMPS INCLUDING SILT FENCE, BERMS, EROSION CONTROL MIX, ETC.. THE CONTRACTOR SHALL INSPECT THE BARRIER AND OTHER PREVENTATIVE MEASURES BI-WEEKLY, BEFORE ANY PREDICTED RAIN EVENT, AND AFTER ANY RAIN EVENT. THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SILT AND/OR MAKE REPAIRS AS NECESSARY.

4. THE CONTRACTOR IS CAUTIONED THAT FAILURE TO COMPLY WITH THE SEQUENCE OF CONSTRUCTION, EROSION/SEDIMENT CONTROL PLAN, AND OTHER PERMIT REQUIREMENTS MAY RESULT IN MONETARY PENALTIES. THE CONTRACTOR SHALL BE ASSESSED ALL SUCH PENALTIES AT NO COST TO THE OWNER OR PERMITTEE.



LOCATION MAP
1"=2000'

UTILITY INFO & CONTACTS:

SUMMIT NATURAL GAS: 12 INCH MAIN, W. SIDE TUTTLE RD.
CONTACT: MICHAEL STINCHFIELD, PROJECT MANAGER 207.620.8000

WATER: PORTLAND WATER DISTRICT: 12 C.I.INCH MAIN, E. SIDE TUTTLE RD.& N. SIDE GREELY ROAD.
CONTACT: ROBERT BARTELS, MEANS DEPT. 207.774.5961 X3199

SANITARY SEWER: PORTLAND WATER DISTRICT - 8 INCH GRAVITY SS, W. SIDE TUTTLE RD.
CONTACT: ROBERT BARTELS, MEANS DEPT. 207.774.5961 X3199

ELECTRIC CENTRAL MAINE POWER: 3 PHASE OVERHEAD, W. SIDE TUTTLE RD. & N. SIDE GREELY ROAD.
CONTACT: HERB STEVENS, 800.750.4000

COMMUNICATIONS/CTV: SPECTRUM COMMUNICATIONS, OVERHEAD, W. SIDE TUTTLE ROAD
CONTACT: PETER DETESO, 207.318.6542

TELE; FAIRPOINT & CONSOLIDATED, OVERHEAD, W. SIDE TUTTLE ROAD
CONTACT MATT FREE (CONSOLIDATED), 207.626.2007

STREET OPENING: TOWN OF CUMBERLAND URBAN COMPACT& (MDOT)
CONTACT: MDOT SCARBOROGH, REGION 1, 207.885.7000
CONTACT: CUMBERLAND DPW: CHRIS BOLDUC, 207.829.2220

APPROVALS OBTAINED AND REQUIRED:

1. TOWN OF CUMBERLAND PLANNING BOARD. THE PLANNING BOARD CONDITIONALLY APPROVED PHASE 1 OF THE PROJECT ON AUGUST 21, 2018. TAX MAP R4 LOTS 4B, 4D, 4E, & 5. SEE NOTICE OF DECISION DATED AUGUST 22, 2018. PHASE 2 IS BEING SUBMITTED FOR APPROVAL.

2. MAINE DEP SITE LOCATION OF DEVELOPMENT PERMIT. MAINE DEP APPROVED PHASE 1 OF THE PROJECT ON SEPTEMBER 8, 2018. SEE DEP # L-27834-26-A-N & L-27834-TC-B-N. PHASE 2 HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.

3. MAINE DEP NRPA TIER 1 PERMIT. MAINE DEP APPROVED PHASE 1 OF THE PROJECT ON SEPTEMBER 8, 2018. SEE DEP # L-27834-26-A-N & L-27834-TC-B-N. A DEP TIER 2 PERMIT HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.

4. MAINE DOT ENTRANCE PERMIT. SEE PERMIT NUMBER 25667 - ENTRANCE ID: 1 DATED MARCH 16, 2018.

5. U.S. ARMY CORPS OF ENGINEERS PERMIT. ACOE APPROVED PHASE 1 OF THE PROJECT ON AUGUST 14, 2018. SEE CORPS PERMIT # NAE-2018-00545. PHASE 2 HAS BEEN SUBMITTED FOR REVIEW AND APPROVAL.

DESIGN CONSULTANTS:

BELANGER ENGINEERING
63 SECOND AVENUE
AUGUSTA, ME 04330
(207) 622-0543

LICHT ENVIRONMENTAL DESIGN
35 FRAN CIRCLE
GRAY, ME 04330
(207) 749-4924

J. D. HAYNES
MAINE REGISTERED
LANDSCAPE ARCHITECT
OCEAN VIEW RETIREMENT
COMMUNITY
207-653-9427

TITCOMB ASSOCIATES
39 COURT STREET
BATH, ME 04530
(207) 443-9199

ANTHONY MANCINI, INC.
179 SHERIDAN STREET
PORTLAND, MAINE 04101
(207) 774-5829

GAWRON / TURGEON ARCHITECTS
29 BLACK PT. ROAD
SCARBOROUGH, MAINE 04074
207-883-6307

SHEET INDEX:

4.	6-15-2020	Re-submit to Town and DEP	CSB
3.	2-24-2020	Re-submit to Town	CSB
2.	1-15-2019	Submit to Maine DEP	CSB
1.	12-18-2019	Submit to Town	CSB

Cover Page

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
2-24-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET: C0
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

CUMBERLAND CROSSING -PHASE 2

SUMMARY OF PLAN CHANGES FROM 02-24-20 TO 06-15-20 SUBDIVISION PLANS

PLAN SHEETS	TITLE	CHANGES
NOTE:	PLANS NOT LISTED HAVE NO OR INCONSEQUENTIAL CHANGES	
S1-S4	SUBDIVISION PLANS	ADDED ROAD/UTILITY EASEMENT, ADJUSTED DEP BUFFER LINES
		ADJUSTED 50 FOOT UTIL. EASEMENT TO GREELY ROAD
C2	OVERALL PLAN	CORRECTED ROAD NAMES SKIPPER/HORTHWOND FARM ROAD
		MISC LABELLING
		REV. PATH TO BARNS FROM LITTLE ACRES DRIVE
C3A-C6A	GRADING & DRAINAGE PLANS	MISC MINOR GRADING & DRAINAGE ADJUSTMENTS
		ADDED 50 FOOT PERIMETER BUFFER
		REVISED TRAILS -NO CONNECTION TO EXTERNAL TRAIL
		ADJUSTED UNIT 80 BUFFER TO 50 FEET
		ADJUSTED GRASSHOPPPER LANE TO AVOID WETLAND FILL
		MINOR EDITS TO DEP 100 FOOT BUFFERS TO WETLANDS
		MINOR TREELINE ADJUSTMENTS
		SHEET C5A - REVISED LAYOUT FOCAL POINT SYSTEM
		SHEET C5A - INCREASED BOX CULVERT WIDTH TO 16 FT PER CORPS COMMENT
		SHEET C5A - REVISED LOCATION OF SIDEWALK TO PATH CROSSING L.A. DRIVE
C3B-C6B	UTILITY PLANS	UTILITY UPDATES AND LABELLING
		ADDED INFORMATION TO WATER SYSTEM
		SHT C6B -ADDED FM AND 2 INCH WATER SERVICE/EASEMENT TO VALHALLA
		ADDED ADDITIONAL WATER MAIN DETAILING AT GREELY ROAD
C6C	FARMHOUSE AREA SITE PLAN	MISC. MINOR SPOT GRADES, UTILITY ADJUSTMENTS PER PEER REVIEW
		ADJUSTED 50 FOOT UTIL. EASEMENT TO GREELY ROAD
C7A-C10B	PROFILES	REVISIONS TO DRAINAGE AND UTILITIES PER PEER COMMENTS
C11A -C11B	LANSCAPING PLANS	ADJUSTMENT TO NETLAND BUFFER "B"TREATMENT PER SITE MEETING WITH
		MR. NETLAND AND ADDED NOTE RE: INSTALLATION OF PLANTINGS.
		TREELINE ADJUSTMENTS
C11C	FARMHOUSE AREA LS PLAN	ADDED AS PLACEHOLDER FOR FUTURE LANDSCAPING. NOT APPLICABLE
C12	TRAIL & WALKWAY MASTERPLAN	ADJUSTED PATH FROM L.A.D TO BARNS AND PARKING IN FIELD
		REVISED VALHALLA BOUNDARY TRAIL - NO CONNECTION TO INTERNAL TRAILS
		REVISED VALHALLA BOUNDARY TRAIL TO NW SIDE FENCE TO GREELY ROAD
		INTERNAL TRAILS - DISCONNECT FROM ACCESS TO VALHALLA TRAIL
C26	BOX CULVERT DETAILS	WIDENED BOX CULVERT TO 16 FEET
C26A	CULVERT & WALL SITE PLAN	ADJUSTED CONNECTION TO EXISTING 2 INCH SD AT LEONARD LANE/L.A.D
		FOCAL POINT ADJUSTMENTS TO PROVIDE 25 FOOT BUFFER TO STREAM
		WIDENED BOX CULVERT TO 16 FEET
		ADJUSTEMENTS TO WALLS PER GRADING REVISIONS
C27 - C29	FOCAL POINT PLANS	ADJUSTEMENTS TO FOCAL POINT SYSTEM DESIGN AND GRADING
		PROVIDE 25 FOOT SETBACK TO STREAM
CMP 905	CMP ELECTRIC PLAN	ADDED ELECTRIC PLAN FROM CMP
	PRE AND POST SW PLANS	REVISIONS PER UPDATES TO SW MODELLING
		REVISION TO FEMA 100 YR FLOOD PLAIN AND LABELLING

State of Maine, Cumberland ss
Registry of Deeds

Received ____________ 20____

at ___h___m___M and recorded in

Plan Book ________ Page ____

Attest: ______________________
Register

CERTIFICATION

This is not a boundary survey. The boundary lines shown for this property rely solely upon the information depicted on plan reference 2, no representations are made or implied regarding the accuracy of the information provided.

Rex J. Croteau, P.L.S. #2273

Approved by the Town of Cumberland Planning Board dated ____________

______________________ ______________________
______________________ ______________________
______________________ ______________________
______________________ ______________________

SEE SHEET 3 FOR NOTES, CHARTS AND LEGEND

PLAN OF

Subdivision Plat Cumberland Crossing Phase II

228 Greely Road
Cumberland, Maine

MADE FOR

Ocean View at Cumberland, LLC

20 Blueberry Lane
Falmouth, Maine

JOB #89076.1	DATE: June 25, 2020	SCALE: 1" = 50'
BOOK #898,904		
89076_Subdivision Plat.dwg		
Sheet 1 of 4		

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

State of Maine, Cumberland ss
Registry of Deeds

Received ________________ 20 ____

at ___h___m___M and recorded in

Plan Book ________ Page ____

Attest: ________________________
Register

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Rex J. Croteau, P.L.S. #2273

SEE SHEET 3 FOR NOTES, CHARTS AND LEGEND

PLAN OF
Subdivision Plat Cumberland Crossing Phase II
228 Greely Road
Cumberland, Maine

MADE FOR
Ocean View at Cumberland, LLC
20 Blueberry Lane
Falmouth, Maine

JOB #89076.1
DATE: June 25, 2020
SCALE: 1" = 50'
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89076_Subdivision Plat.dwg
Sheet 2 of 4

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

ZONING

RR1 and Senior Housing Community Overlay District
Shoreland–Stream Protection Overlay

State of Maine, Cumberland ss
Registry of Deeds

Received ______________ 20____

at___h___m___M and recorded in

Plan Book ________ Page ____

Attest: ______________________
Register

Approved by the Town of Cumberland Planning Board dated ____________

LEGEND

⊡	Monument – found
◎	Iron marker – found
━━━	Property line (locus)
───	Property line (abutter)
─o─o─	Fence
— — —	Edge of pavement
— — —	Edge of gravel
═══	Curb
─o─	Sign
	Utility pole
	Guy wire
	Water shutoff
	Fire hydrant
Ⓢ	Sewer manhole
	Catch basin (round)
── OH ──	Overhead utility line
── SS ──	Sewer line
── SD ──	Storm drain
── W ──	Underground water line
── G ──	Underground gas line
── E ──	Underground electrical line
64	Contours (1ft Topographic)
65	Contours (5ft Topographic)
70	Contours (2ft LIDAR; see note 6))
N/F	Now or formerly of
1234/567	Deed reference (Book/Page)
	Tree line
	Wetlands
	Deciduous tree
	Coniferous tree
▨	Existing building

NOTES

1) Book and Page references are to the Cumberland County Registry of Deeds.

2) Bearings are referenced to grid north, Maine State Plane Coordinate System, NAD83, West Zone.

3) Elevations are based on the NAVD88 datum as derived by GPS observations.

4) Utility information on this plan is approximate, based on location of visible features. DigSafe and/or the appropriate utilities should be contacted prior to any construction.

5) Property lies within Zone C based on FIRM Community #230162 Panel #0015 B, dated May 19, 1981. A portion of the property lies within Zone A (approximate location shown). The The Elevation 62.0 FEMA line is proposed from a hydrologic flood study of watershed by Belanger Engineering dated December, 2019, a LOMA will be pursued with FEMA to adjust Zone A line.

6) Offsite abutter information obtained from a combination of field survey, aerial photography, and Maine GIS data.

7) Wetland delineation by Hampton Assoc. dated October, 2017 as mapped by GPS equipment.

8) Stream assessment in marsh west of the farm per DEP site–walk on December 11, 2018.

9) Borings B–1 through B–6 performed by Summit Geoengineering Services, June 6, 2019.

SITE DATA TABLE

ZONING	RR1 AND SENIOR HOUSING COMMUNITY (SHC) OVERLAY DISTRICT AND S.Z. STREAM PROTECTION DISTRICT	
STANDARD	REQUIRED SHC	PROVIDED
MIN. LOT AREA (AC)	5 AC	59.59 (1)
MIN. FRONTAGE (FT)	0	797.5
SETBACKS:		
A. EDGE PAVED ROAD	25	25+
B. BETWEEN STRUCTURES	20	20+
C. DEVELOPMENT PROPERTY LINE	30	50 MIN.(2)
MAXIMUM DENSITY (LAND AREA/UNIT)	10,000	49,893
MAX. ALLOWABLE UNITS	259	52
OPEN SPACE	20% (11.9 AC.)	68% (41 AC.)
MAX. STRUCTURE HEIGHT (FT.)	40	40 (3.)
PERIMETER BUFFER (FT.)	50	50 (2.)

NOTES:
1. TOWN/GOLF COURSE ACCESS/UTIL. EASEMENT = 0.72 ACRES.
TOTAL PHASE 2 AREA = 60.31 ACRES.
PHASE 1 (37.09 AC.) + PHASE 2 = 97.40 ACRES.
2. BUFFER < 50 FEET AT STREAM CROSSING AREA BELOW FARM PER SHC ORDINANCE WITH PLANNING BOARD APPROVAL.
3. TYPICAL COTTAGE HEIGHTS ARE 23 FEET+/-. NO BUILDING SHALL EXCEED 40 FT.

SUBDIVISION NOTES

1) This project is being proposed as Phase 2 of the 2018 approved Cumberland Crossing (f.k.a. Oceanview at Cumberland) Phase 1 Senior Housing Community permitted under the Town of Cumberland Land Uuse Ordinance Section 315–28.4.– Senior Housing Community (SHC) Overlay District. This Phase 2 project includes 52 cottage units, a community center at the former Godsoe Farmstead and associated infrastructure. This plan is being reviewed and approved as a separate subdivision from the Phase 1 development.

2) Project lies within the RR1 Zoning District, Senior Housing Community (SHC) Overlay District and Shoreland Zoning Stream Protection District.

3) Wetlands mapping by Hampton Associates, Spring, 2017 and located by GPS survey (Hampton Assoc. and Titcomb Assoc, surveyors.)

4) Site topography and existing conditions from a field survey by Titcomb Associates, surveyors with information supplemented from the State of Maine GIS digital ortho and lidar mapping as noted.

5) Project to be serviced by public water, private on–site low pressure sewer system discharging to the Portland Water District public sewerage system in Tuttle Road, natural gas and underground cable utilities.

6) All internal roadways shall remain private.

7) Cottage units and footprint styles and driveway locations are shown in the general locations intended to be constructed. However approval final locations and building types may vary slightly to fit field conditions.

8) There shall be no less than one parking space per unit per Ordinance Section 315–28.4.f.

9) Refer to site data table for setbacks and dimensional requirements.

10) This plat shall be recorded within 90 days of final subdivision approval and signing of the plat by the Town of Cumberland Planning Board, subject to the establishment of any performance guarantee.

11) Access & utility widths proposed over main roads:
a. little Acres Drive (LAD) Extension – 50 feet.
b. Cross Country Extension from LAD to Greely Road –50 feet.
c. Grasshopper Lane (Loop Road) – 50 feet
d. Leonard Lane (Culdesac) – 50 feet
e. Northwind Farm Road – 40 feet
f. On remaining five (5) side roads – 40 feet
Note PWD easements not required on the 5 additional side roads.
All water services to be from the main road to individual units.

12) DEP Meadow and Forested Buffers as shown shall be monumented or marked in the field using iron rods and plastic "buffer caps"or similar markings. Locations of Forested Buffer monuments shall be field determined at reasonable locations due to the irregular and large size of these buffers.

13) 100–foot Maine Department of Inland Fisheries & Wildlife (MDIFW) Buffers are shown along stream associated wetlands excepting permitted areas of encroachment for roads and infrastructure as shown on this plan and the accompanying engineering plans.
Some buffer areas are existing farmland and meadows and shall continue to be managed as meadows subject to any overlapping DEP Stormwater Meadow Easements as shown on the plans.

14) Street names to be submitted to and approved by the town assessor prior to final plan approval. Street signs to be provided by the developer in accordance with Town of Cumberland Street Standards for private streets.

15) Clearing limits shall be as shown on the plans as proposed treelines or as otherwise noted. All clearing limits shall be flagged in the field for review prior to cutting operations.
16)

PLAN REFERENCES

1) Property Plan made for Robert E. Brown by Howard F. Babbidge, RLS dated November 22, 1983.

2) Boundary Survey made for Legacy Properties by Owen Haskell, Inc. dated July 24, 2017.

3) Right–of–Way and Track Map, Maine Central R.R., Station 307+80 to Station 360+60, June 30, 1916. MCCR File Mo. V2/S1 and V2/S2.

4) Subdivision Plan Oceanview at Cumberland made for Ocean View at Cumberland LLC dated December 26, 2017 and revised through July 31, 2018 as recorded in Plan Book 218, Page 411.

AREA

2,595,768 square feet / 59.59 acres

OWNERS OF RECORD

Ocean View at Cumberland, LLC
Book 35246, Page 97

SCALE IN FEET
50 0 50 100
1" = 50'

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Rex J. Croteau, P.L.S. #2273

PLAN OF
Subdivision Plat Cumberland Crossing Phase II
228 Greely Road Cumberland, Maine

MADE FOR
Ocean View at Cumberland, LLC
20 Blueberry Lane Falmouth, Maine

JOB #89076.1
DATE: June 25, 2020
SCALE: 1" = 50'
BOOK #898,904
89076_Subdivision Plat.dwg
Sheet 3 of 4

Titcomb Associates
133 Gray Road, Falmouth, Maine 04105
(207)797-9199 www.titcombsurvey.com

State of Maine, Cumberland ss
Registry of Deeds

Received _____________ 20____

at___h___m___M and recorded in

Plan Book ________ Page ____

Attest: ____________________

Register

SEE SHEET 3 FOR NOTES, CHARTS AND LEGEND

PLAN OF

Subdivision Plat Cumberland Crossing Phase II

228 Greely Road
Cumberland, Maine

MADE FOR

Ocean View at Cumberland, LLC

20 Blueberry Lane
Falmouth, Maine

JOB #89076.1	DATE: June 25, 2020	SCALE: 1" = 50'
BOOK #898,904	Titcomb Associates 133 Gray Road, Falmouth, Maine 04105 (207)797-9199 www.titcombsurvey.com	
89076_Subdivision Plat.dwg		
Sheet 4 of 4		

Approved by the Town of Cumberland Planning Board dated ______________

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Rex J. Croteau, P.L.S. #2273

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── OH ──	Overhead utility line
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Ocean view at Cumberland, LLC
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1" = 100'

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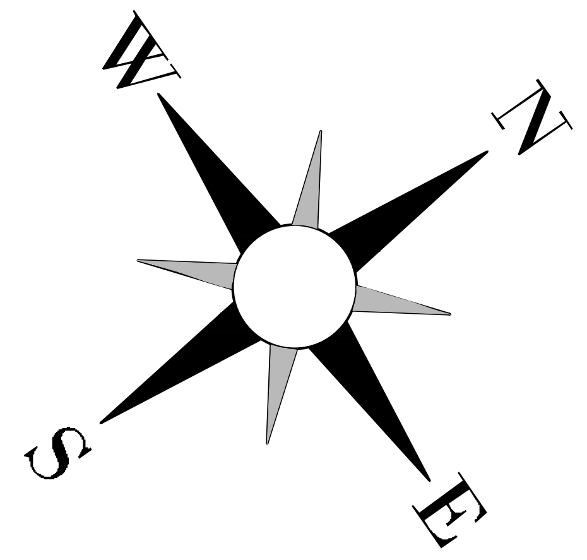
Rex J. Croteau, P.L.S. #2273

PLAN OF
Existing Conditions and Removals
228 Greely Road Cumberland, Maine

MADE FOR
Ocean View at Cumberland, LLC
20 Blueberry Lane Falmouth, Maine

JOB #89076.1	DATE: December 13, 2019	SCALE: 1" = 100'
BOOK #898,904	Titcomb Associates 133 Gray Road, Falmouth, Maine 04105 (207)797-9199 www.titcombsurvey.com	
89076_2019.dwg		



PROGRESS PLAN
NOT FOR CONSTRUCTION
THIS DOCUMENT IS ISSUED FOR INFORMATIONAL PURPOSES ONLY. THE DATA SHOWN HEREON IS SUBJECT TO REVISION.

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)
1 inch = 200 ft.

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

3. 6–15–2020 Re–submit to Town and DEP CSB
2. 2–24–2020 Re–submit to Town CSB
1. 12–18–2019 Submit to Town and Maine DEP CSB

Cumberland Crossing - Phases 1 and 2
Overall Context Plan

Tax Map R04 Parcel 34 A
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
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- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=200'	SHEET: C1
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN

NOT FOR CONSTRUCTION

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STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER

6-15-2020

2.	6-15-2020	Re-submit to Town and DEP	CSB
1.	12-18-2019	Submit to Town and DEP	CSB

Cumberland Crossing - Phase 2 Overall Plan

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET: C2
DRN BY:	JOB #: 109	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

AERIAL OVERLAY

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Augusta, Maine 04330

SCALE: 1"=100'
JOB #: 134
DATE: 6-15-2020
SHEET: C2A

Prepared in association with:
LICHT ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN

NOT FOR CONSTRUCTION

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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

1.	6-15-2020	Respond to SME memo dated 3-4-2020 Re-submit to Town and DEP	CSB

Cumberland Crossing - Phase 2
Grading and Drainage Plan

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

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20 Blueberry Lane, Falmouth, Maine 04105

CHRISTOPHER S. BELANGER 9098
6-15-2020

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FIELD WK:	SCALE: 1"=40'	SHEET:
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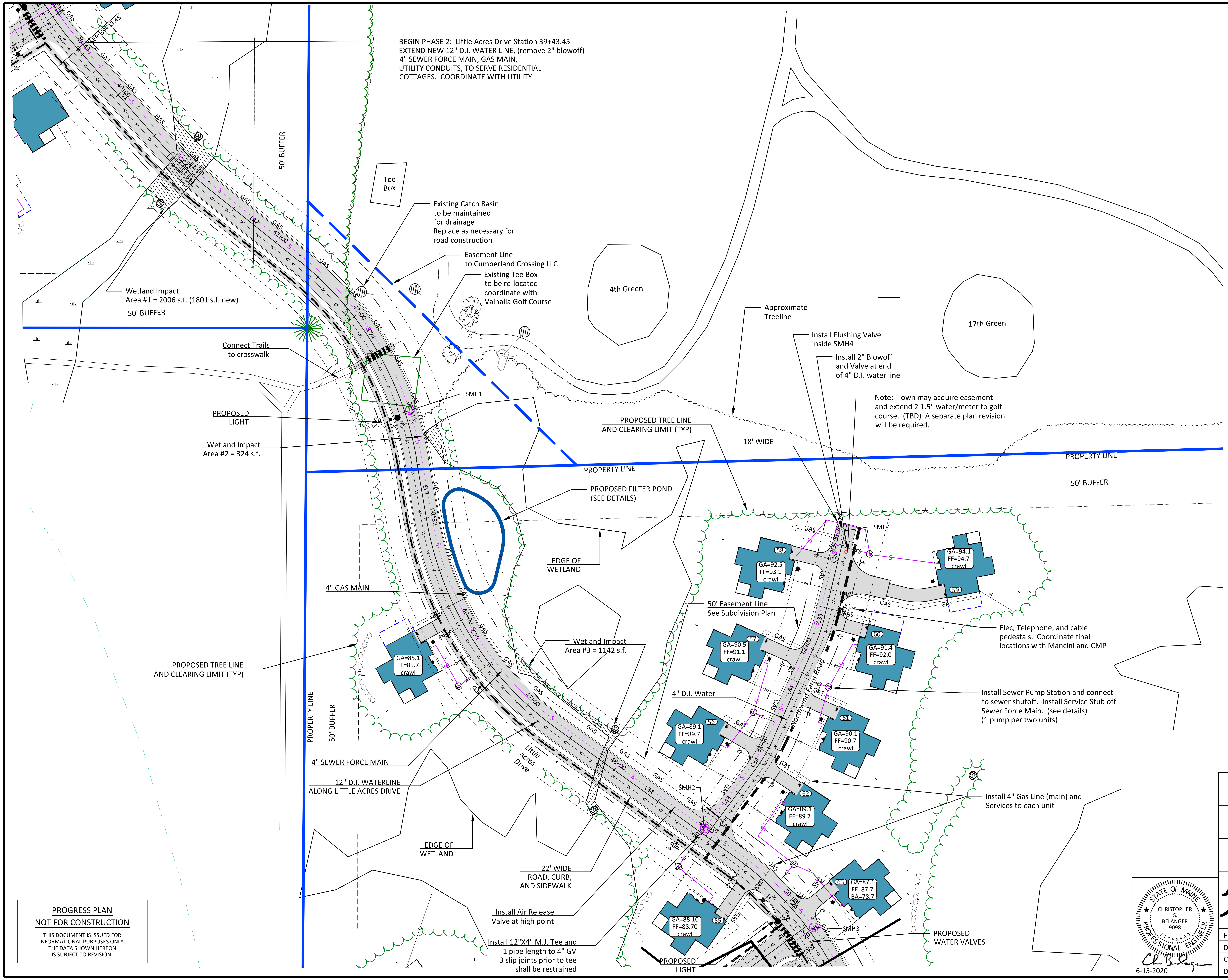
DATE: 6-15-2020	FILE:	



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W N E S

Note: Refer to Sheet C0 for additional utility notes and Subdivision plats S1-S4 for easement information.

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LICHT
ENVIRONMENTAL DESIGN, LLC

1. 6-15-2020 SME response to comments dated 3-4-2020 CSB

Cumberland Crossing - Phase 2
Utilities Plan

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STATE OF MAINE
CHRISTOPHER S. BELANGER
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LICHT ENVIRONMENTAL DESIGN, LLC

3.	6-15-2020	Respond to SME memo dated 3-4-2020 Re-submit to Town and DEP	CSB
2.	2.-24-2020	Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and DEP	CSB

PROGRESS PLAN

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S.
BELANGER
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First three (3) pipe slip joints before tee shall be restrained

Proposed Fire Hydrant install 12"X6" Swivel Tee and 6" G.V.
3' off face of curb (typ)
Install 12"X8" Swivel Tee and 12" G.V. 1 pipe length from tee install 3 slip joints before Tee @ L.A.D. shall be restrained install 2" blowoff (temporary) set @ 5' from end pavement (Ph 2B)

EDGE OF WETLAND

8" D.I. Valve one pipe length from Tee

Elec, Telephone, and cable pedestals. Coordinate final locations with Mancini and CMP

Phase 2B Remove Blowoff
Extend 8" D.I. Water Main

Phase 2C Remove Blowoff
Extend 12" D.I. Water Main

MAINE DEP JURISDICTIONAL STREAM

8" D.I. Water Line

SMH 3
4" force main Little Acres Drive (LAD) and 2" FM on Monarch
Install isolation valve and Flushing valve

Install Sewer Pump Station and connect to sewer shutoff. Install Service Stub off Sewer Force Main. (see details)
(1 pump per two units)

SMH 6
2" FM on Firefly Lane
Install Flushing valve

4" SEWER FORCE MAIN

4" GAS MAIN

12" D.I. WATERLINE ALONG LITTLE ACRES DRIVE (LAD)

Install 4" Gas Line (main) and Services to each unit

SMH 5
2" force main Monarch
Install isolation valve and Flushing valve

EDGE OF WETLAND

SMH 10
4" force main Little Acres Drive (LAD) and 2" FM on Monarch
Install isolation valve and Flushing valve

Install 12"X8" SWIVEL TEE
12" G.V. 2 pipe lengths from tee
Install 2" temporary blowoff Phase 2B/2C min. 5' to edge of pavement phase 2B.

PROPOSED FIRE HYDRANT
Install 12"X6" Swivel Tee and 6" G.V. 3' off face curb.

Install 2" blowoff and 12" G.V. at end of phase 2C
Install valve 1 pipe lenth from tee
Install blowoff 2 pipe lengths from tee
Start of Phase 2D
Remove Blowoff and extend 12" main

SMH 7
2" force main Monarch
Install isolation valve and Flushing valve
Proposed Fire Hydrant install 8"X6" Swivel Tee and 6" G.V.
3' off face of curb (typ)

Air Release Valve

EXTEND NEW 8" D.I. WATER LINE
2" SEWER FORCE MAIN, GAS MAIN, UTILITY CONDUITS, TO SERVE RESIDENTIAL COTTAGES. COORDINATE WITH UTILITY

SMH 8
2" force main Monarch
2" FM on Grasshopper Lane
Install isolation valve and Flushing valve

PWD easement does not need to include Grasshopper lane. Service shutoffs are located in the Monarch drive easement

18' WIDE

22' WIDE ROAD, CURB, AND SIDEWALK

EDGE OF WETLAND

EXTEND NEW 8" D.I. WATER LINE
2" SEWER FORCE MAIN, GAS MAIN, UTILITY CONDUITS, TO SERVE RESIDENTIAL COTTAGES. COORDINATE WITH UTILITY

18' WIDE

SMH 9
2" FM on Grasshopper Lane
Install Flushing valve

40' Easement

BUFFER
50' Buffer

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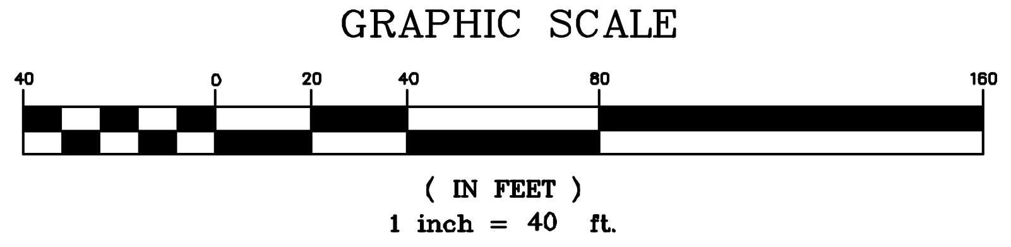

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Elec, Telephone, and cable pedestals. Coordinate final locations with Mancini and CMP

4" SEWER FORCE MAIN

4" GAS MAIN

12" D.I. WATERLINE ALONG LITTLE ACRES DRIVE (LAD)

Maine DEP Jurisdictional Stream

Install 4" Gas Line (main) and Services to each unit

See sheet 4B for Monarch Drive Notes and information

Install Sewer Pump Station and connect to sewer shutoff. Install Service Stub off Sewer Force Main. (see details) (1 pump per two units)

SMH's 11 and 12
4" force main Little Acres Drive (LAD) and 2" FM on Leonard Lane
Install isolation valve and Flushing valve

PWD Phase 2D

2" SEWER FORCE MAIN

2" GAS MAIN (verify size)

8" D.I. WATERLINE

50' Utility / PWD Easement (typ)

End Maine DEP Jurisdictional Stream

Existing Vinyl Fencing

Field

4' Stone Dust Pedestrian Path

EXTEND NEW 8" D.I. WATER LINE 2" SEWER FORCE MAIN, GAS MAIN, UTILITY CONDUITS, TO SERVE RESIDENTIAL COTTAGES. COORDINATE WITH UTILITY

Gravel Pedestrian path to Farm House Beginning at crosswalk at sta 62+50

FOCAL POINT DRAINAGE SYSTEM (SEE DETAILS)

STONE STRONG RETAINING WALL (SEE DETAILS)

Start of Small Stream Segment at Existing Culvert inlet

Taper Road from 22' wide to 20' from Sta 63+00 to Sta 63+75 (Both Sides)

Install 2" blowoff and 12" G.V. at end of phase 2D
Install valve 1 pipe lenth from tee
Install blowoff 2 pipe lengths from tee
Start of Phase 2E
Remove Blowoff and extend 12" main

Install 12"X8" SWIVEL TEE

Install walkway tipdown 5'X5' landing and crosswalk (both ends of crosswalk)

INSTALL STONE STRONG RETAINING WALLS COORDINATE FINAL DESIGN WITH SUMMIT GEOENGINEERING (SEE DETAILS)

First three (3) water pipe slip joints before 12"X8" tee shall be restrained

Proposed Electrical, cable, and phone pedestals and conduits coordinate with Mancini Electrict

Proposed light

Proposed Fire Hydrant install 8"X6" Swivel Tee and 6" G.V. 3' off sidewalk (typ)

Existing pedestrian bridge to remain

Install walkway tipdown 5'X5' landing and crosswalk (both ends of crosswalk)

PROPOSED TREE LINE AND CLEARING LIMIT (TYP)

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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Utility Plan

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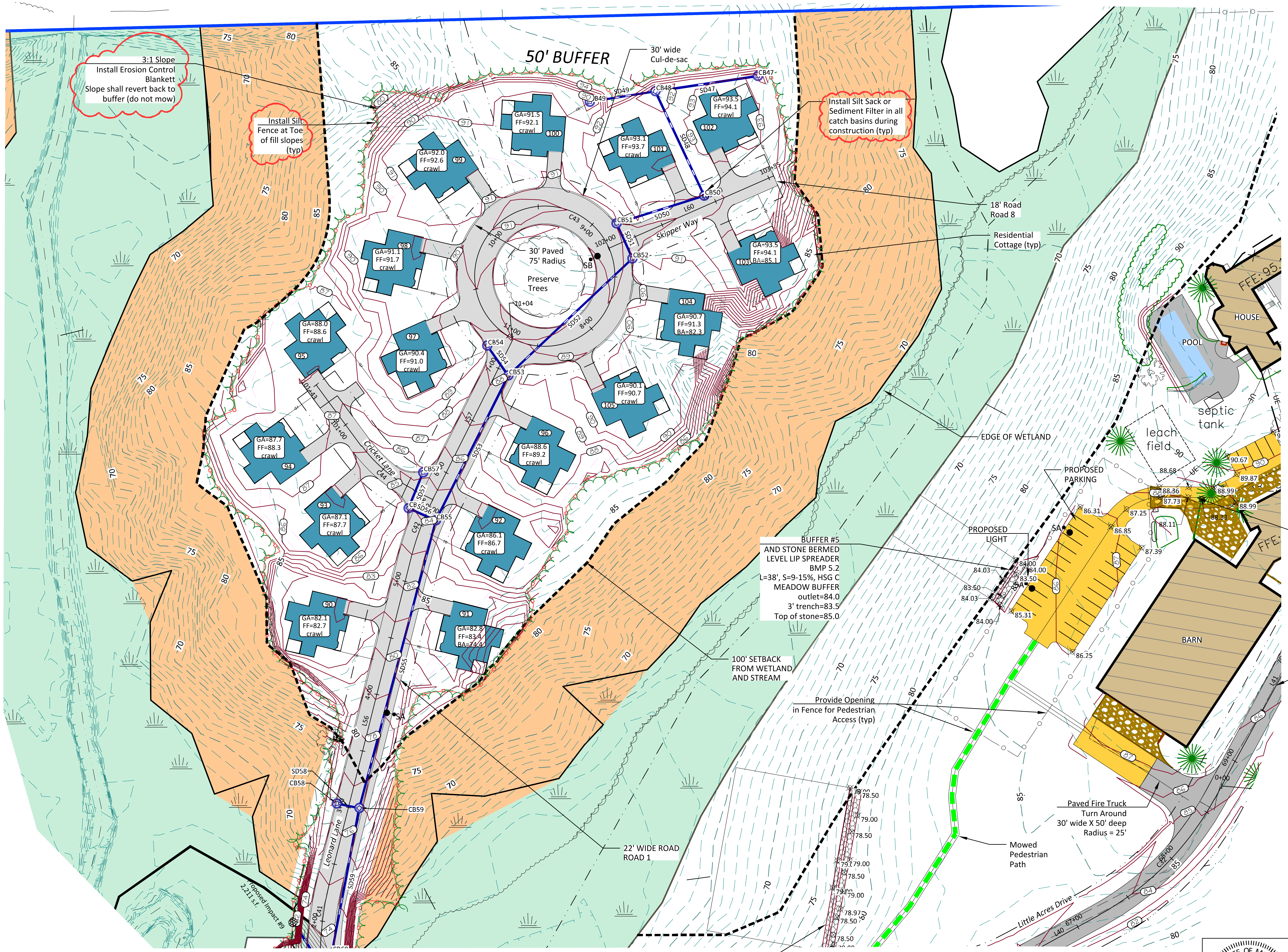

Note: Refer to trail and walkway master plan Sheet C12 for trail locations

BUFFER #4
AND STONE BERMED
LEVEL LIP SPREADER
BMP 5.2
L=142', S=9-15%, HSG C
MEADOW BUFFER
culv7 outlet=79.0
3' trench=78.5
Top of stone=80.0

GRAPHIC SCALE

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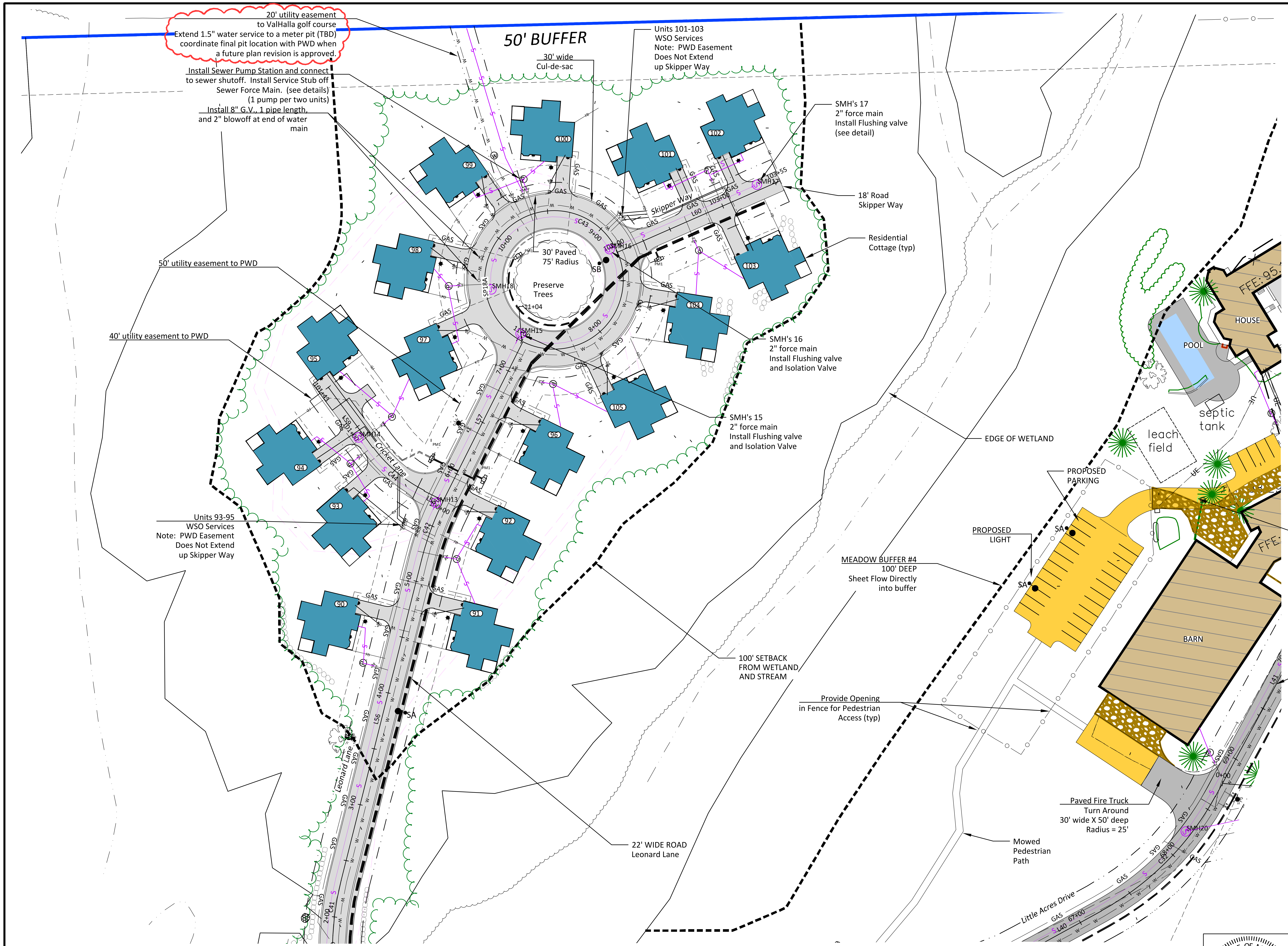
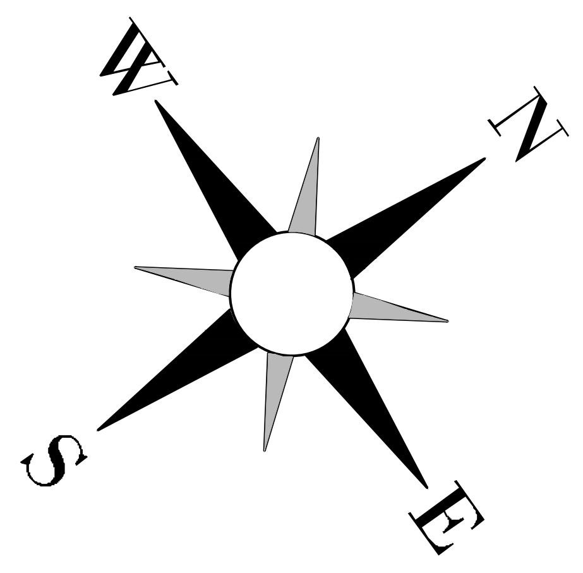
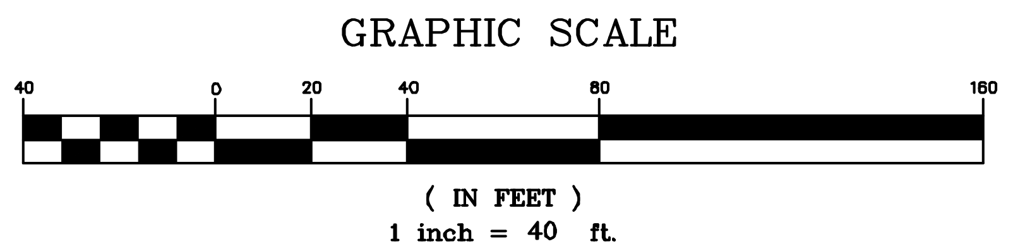




Note: Refer to trail and walkway master plan Sheet C12 for trail locations



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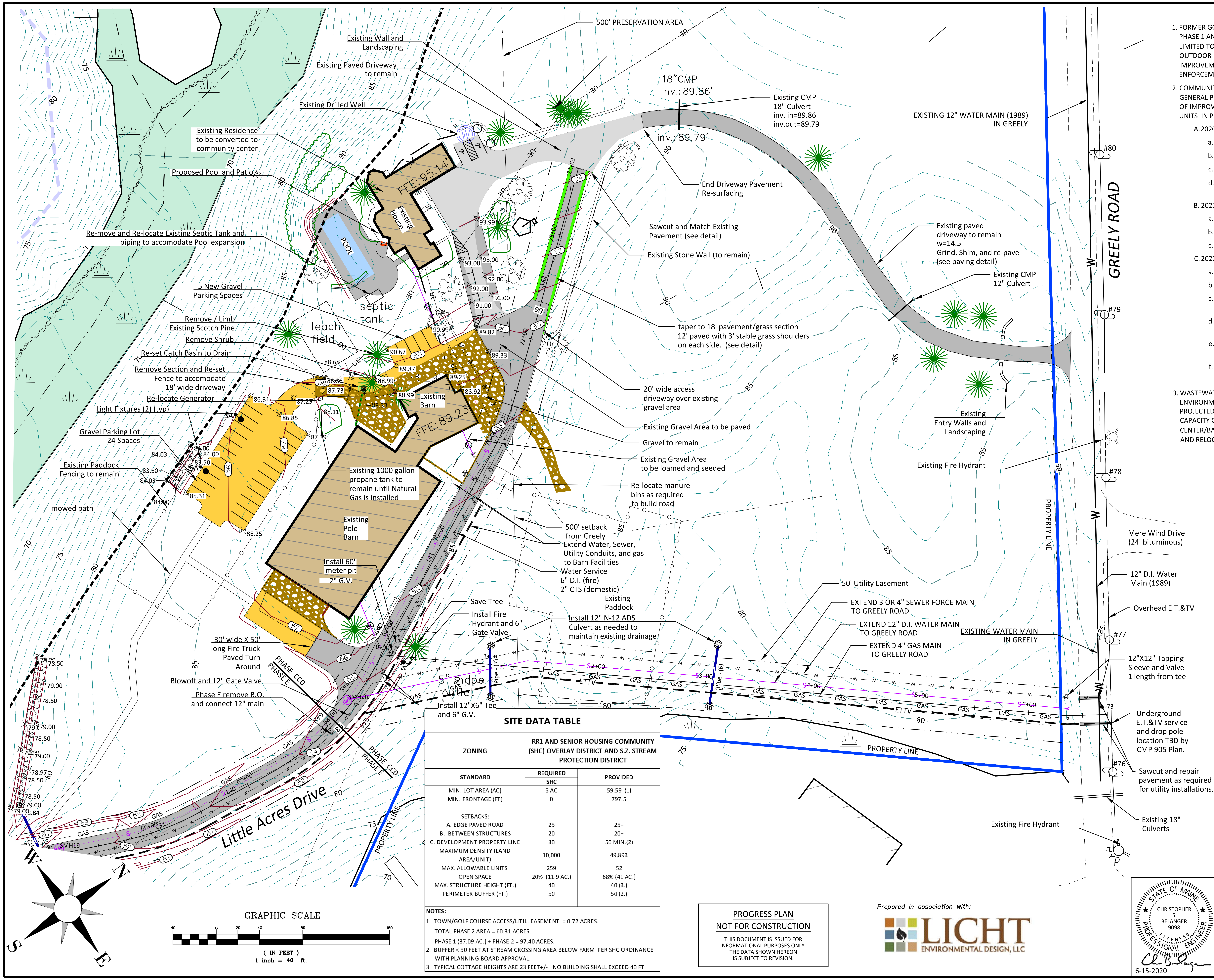

1. FORMER GODSOE RESIDENCE TO BE CONVERTED INTO A COMMUNITY CENTER FOR THE PHASE 1 AND 2 CUMBERLAND CROSSING PROJECT. USES TO INCLUDE BUT NOT BE LIMITED TO MEETING/GAME ROOMS, SALES OFFICES, ACTIVITY AREAS, LOCKER ROOMS, OUTDOOR POOL FACILITY AND ADA IMPROVEMENTS. DETAILS OF INTERNAL BUILDING IMPROVEMENTS & ADA ACCESS TO BE FILED UNDER A BUILDING PERMIT TO THE CODE ENFORCEMENT OFFICER AND ARE NOT A PART OFF THIS SITE PLAN REVIEW.
2. COMMUNITY CENTER USE/IMPROVEMENTS TO BE PHASED. THE FOLLOWING PROVIDES A GENERAL PHASING APPROACH AS A GUIDELINE. ACTUAL TIMING AND IMPLEMENTATION OF IMPROVEMENTS MAY VARY DEPENDING ON FINAL PERMITS, MARKET ABSORPTION OF UNITS IN PHASES 1 AND 2 AND OTHER FACTORS:
   A. 2020-21:
      a. INSTALL POOL, PATIO, ADA & LOCKER ROOM IMPROVEMENTS.
      b. LIFE SAFETY CODE REVIEW.
      c. INSTALL NEW 2 INCH WATER SERVICE. USE WELL FOR IRRIGATION.
      d. MAINTAIN EX. WASTEWATER LEACHFIELD. REPLACE/MOVE SEPTIC TANK AND PIPING.
   B. 2021-22:
      a. CREATE CC AREA PARKING-10 SPACES.
      b. INTERNAL BUILDING IMPROVEMENTS, UTILITY UPGRADES.
      c. MAINTAIN EX. WASTEWATER LEACHFIELD.
   C. 2022-25:
      a. CONSTRUCT REAR GRAVEL PARKING AREA.
      b. RELOCATE GENERATOR.
      c. EXTEND LITTLE ACRES DRIVE FROM PHASE 2 AND CONNECT TO EXISTING 14.5 FOOT DRIVE.
      d. EXTEND UTILITIES FROM LITTLE ACRES DRIVE TO GREELY ROAD. CONNECT SERVICES TO BARNS AND COMMUNITY CENTER.
      e. ABANDON WASTEWATER SYSTEM & CONNECT CC TO NEW SANITARY SEWER FORCEMAIN.
      f. GRIND AND RE-PAVE EXISTING DRIVEWAY.
3. WASTEWATER SYSTEM - THE CURRENT SYSTEM HAS A DESIGN FLOW OF 303 GPD. LICHT ENVIRONMENTAL DESIGN, LLC HAS INCLUDED IN THE SUBDIVISION APPLICATION, A PROJECTED USE AND PHASING OF FLOWS TO THE SYSTEM TO DEMONSTRATE THE CAPACITY OF THE SYSTEM UNTIL SEWER IS EXTENDED TO THE COMMUNITY CENTER/BARNS. THE 1000 GALLON SEPTIC TANK SHALL AND D-BOX SHALL BE REPLACED AND RELOCATED COMMENSURATE WITH THE 2020-21 POOL IMPROVEMENTS.

COMMUNITY CENTER PARKING REQUIRED

BASIS (ZONING C. 315-57 PARKING & LOADING)	STANDARD	UNITS	REQUIRED
SALES OFFICES (PROF. OFFICES/BUSINESS)	1 SP/250 SF. GROSS AREA	948 SF (2ND STORY SALES OFFICE)	4
PRIVATE CLUB/LODGE (CLOSEST COMPARABLE USE)	1 SP/ 4 MEMBERS (UNITS)	105 COTTAGE UNITS	27
TOTAL REQUIRED			31

NOTES:
1. USES BASED ON BEST COMPARISON OF "COMMUNITY CENTER' ACTIVITIES WITH ORDINANCE PRESCRIBED USES.

PARKING PROVIDED

LOCATION	REGULAR	ADA	TOTAL
FRONT OF CC BUILDING (PAVED)	3	2	5
SIDE OF CC BUILDING (GRAVEL)	5	0	5
BEHIND BARN (GRAVEL)	24	0	24
TOTAL PROPOSED	**32**	**2**	**34**

NOTES:
1. PARKING COUNT DOES NOT INCLUDE THE 2 GARAGE SPACES AT THE CC.
2. PARKING COUNTS DO NOT INCLUDE EXISTING GRAVEL FARM/AGRICULURAL AREAS USED FOR DAILY PARKING, TRAILERS AND FARM EQUIPMENT ACCESS. ETC.

SITE DATA TABLE

ZONING	RR1 AND SENIOR HOUSING COMMUNITY (SHC) OVERLAY DISTRICT AND S.Z. STREAM PROTECTION DISTRICT	
STANDARD	REQUIRED SHC	PROVIDED
MIN. LOT AREA (AC)	5 AC	59.59 (1)
MIN. FRONTAGE (FT)	0	797.5
SETBACKS:		
A. EDGE PAVED ROAD	25	25+
B. BETWEEN STRUCTURES	20	20+
C. DEVELOPMENT PROPERTY LINE	30	50 MIN.(2)
MAXIMUM DENSITY (LAND AREA/UNIT)	10,000	49,893
MAX. ALLOWABLE UNITS	259	52
OPEN SPACE	20% (11.9 AC.)	68% (41 AC.)
MAX. STRUCTURE HEIGHT (FT.)	40	40 (3.)
PERIMETER BUFFER (FT.)	50	50 (2.)

NOTES:
1. TOWN/GOLF COURSE ACCESS/UTIL. EASEMENT = 0.72 ACRES.
   TOTAL PHASE 2 AREA = 60.31 ACRES.
   PHASE 1 (37.09 AC.) + PHASE 2 = 97.40 ACRES.
2. BUFFER < 50 FEET AT STREAM CROSSING AREA BELOW FARM PER SHC ORDINANCE WITH PLANNING BOARD APPROVAL.
3. TYPICAL COTTAGE HEIGHTS ARE 23 FEET+/-. NO BUILDING SHALL EXCEED 40 FT.

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Farm Area Site Plan

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Little Acres Drive Extension PROFILE

GRAPHIC SCALE

(IN FEET)
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Profile Sta 39+43.35 - Sta 52+50
Little Acres Drive - ph 2

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Augusta, Maine 04330

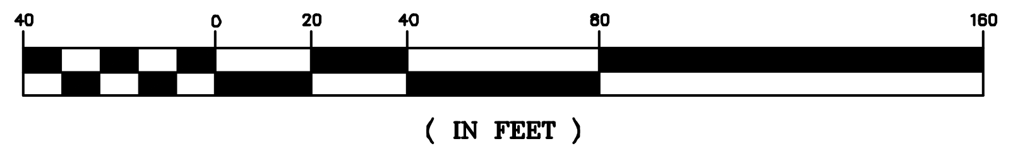
SCALE: 1"=40' H, 4' V	SHEET:
JOB #: 134	C7A
DATE: 6-15-2020	

Little Acres Drive Extension PROFILE

Drop water line to avoid utility crossing provide 1' clearance from utility install 2 pieces of 2" blue board between pipes for insulation install 45 degree bends before and after the crossing

Drop water line to avoid utility crossing provide 1' clearance from utility install 2 pieces of 2" blue board between pipes for insulation install 45 degree bends before and after the crossing

GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
NOT FOR CONSTRUCTION

THIS DOCUMENT IS ISSUED FOR INFORMATIONAL PURPOSES ONLY. THE DATA SHOWN HEREON IS SUBJECT TO REVISION.

CHRISTOPHER S. BELANGER 9098
6-15-2020

1. 6–15–2020 Re–submit to Town and DEP

Profile Sta 52+50 - Sta 63+50
Little Acres Drive Extension

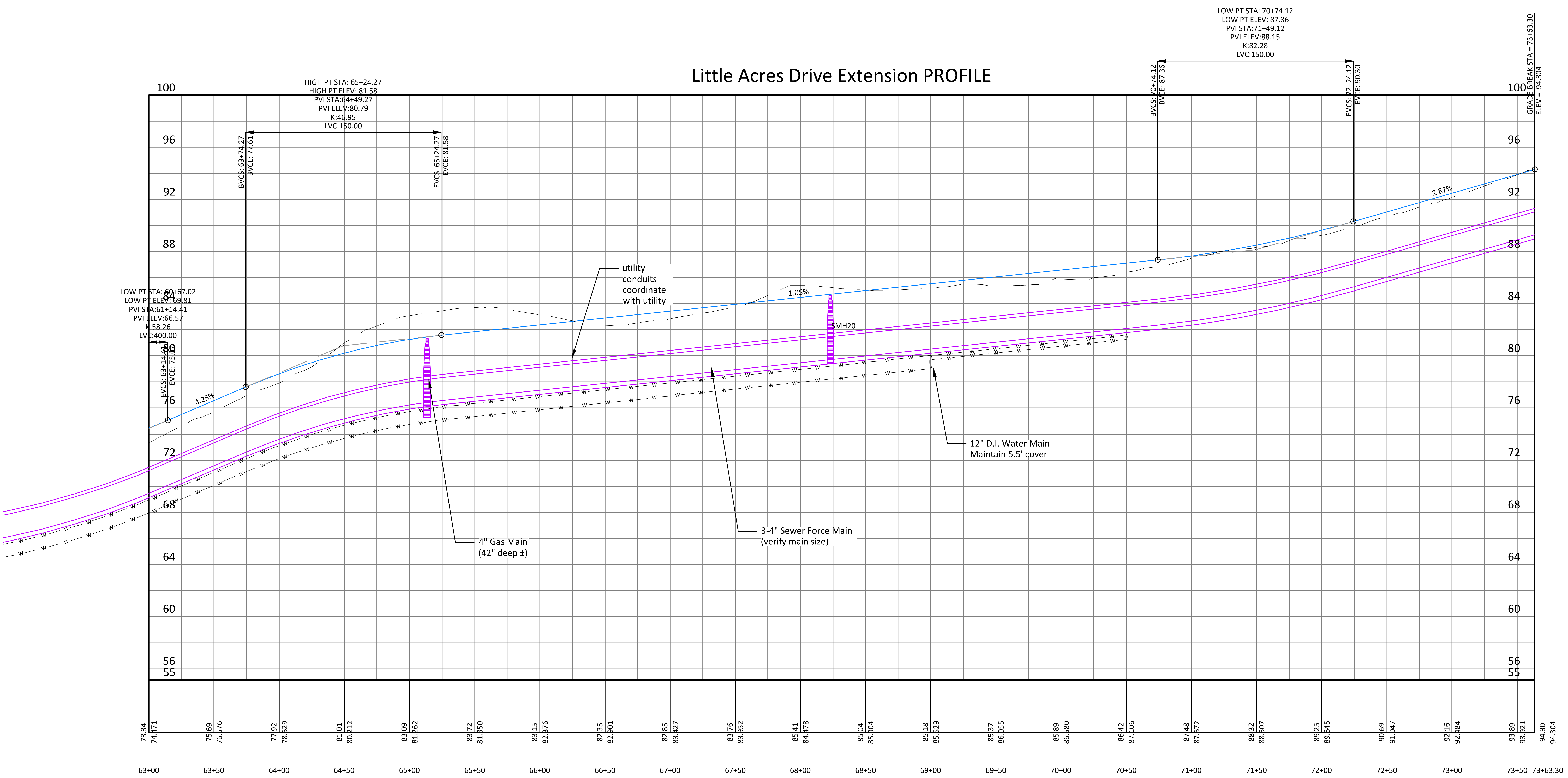
Cumberland Crossing – Phase 2

BELANGER
ENGINEERING
CONSULTING ENGINEERS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET: C7B

Little Acres Drive Extension PROFILE



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

Prepared in association with:

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ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
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CHRISTOPHER
S.
BELANGER
9098
6-15-2020

1. 6-15-2020 Re-submit to Town and DEP

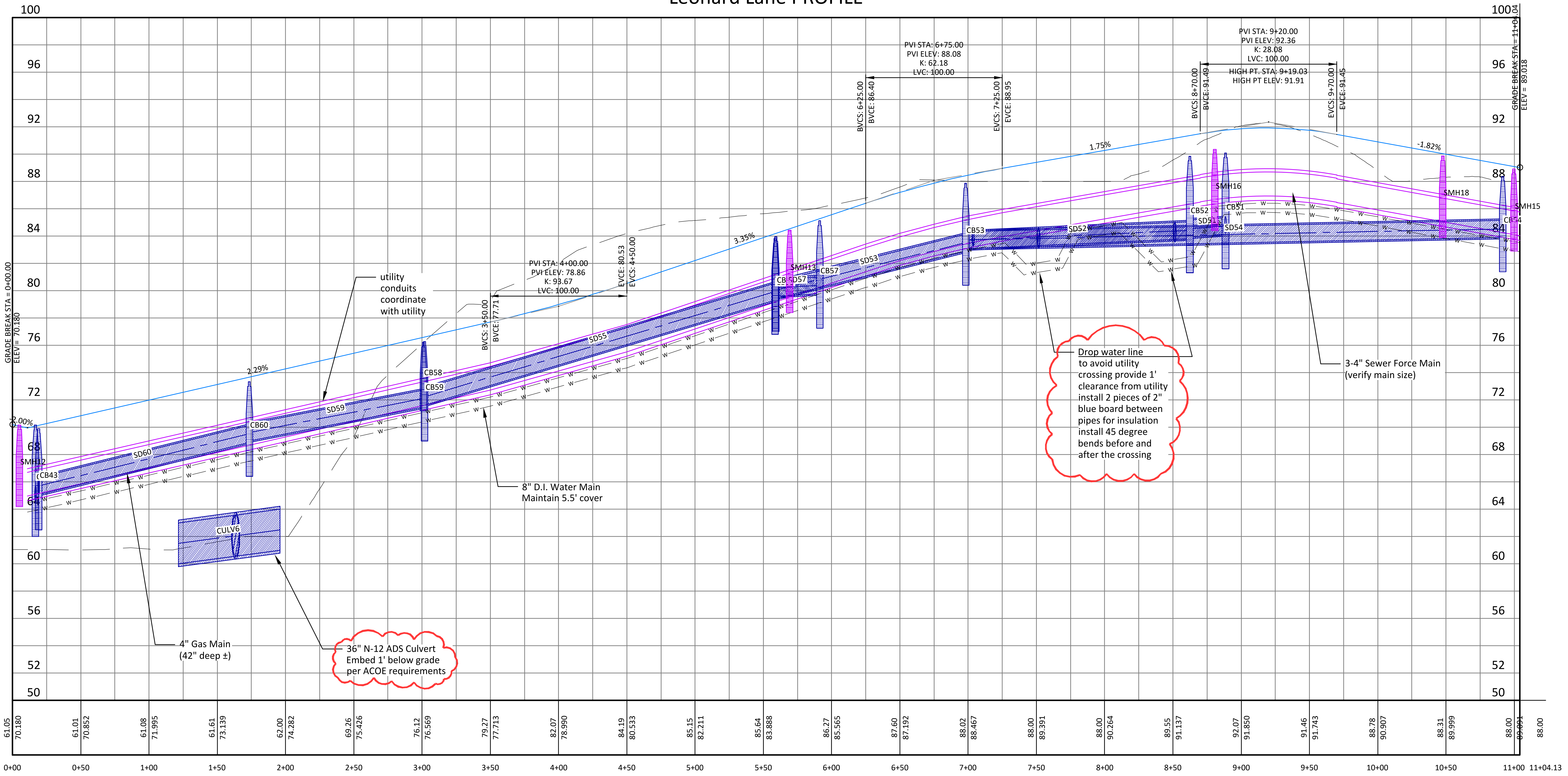
Profile Sta 63+50 - End
Little Acres Drive

Cumberland Crossing – Phase 2

BELANGER ENGINEERING
CONSULTING ENGINEERS
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET:
C7C

Leonard Lane PROFILE



utility conduits coordinate with utility

8" D.I. Water Main
Maintain 5.5' cover

Drop water line to avoid utility crossing provide 1' clearance from utility install 2 pieces of 2" blue board between pipes for insulation install 45 degree bends before and after the crossing

3-4" Sewer Force Main
(verify main size)

4" Gas Main
(42" deep ±)

36" N-12 ADS Culvert
Embed 1' below grade
per ACOE requirements

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

PROGRESS PLAN
NOT FOR CONSTRUCTION

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Prepared in association with:

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ENVIRONMENTAL DESIGN, LLC

CHRISTOPHER
S.
BELANGER
9098
6-15-2020

1. 6-15-2020 Re-submit to Town and DEP

Profile
Leonard Lane

Cumberland Crossing – Phase 2

BELANGER
ENGINEERING
CONSULTING ENGINEERS

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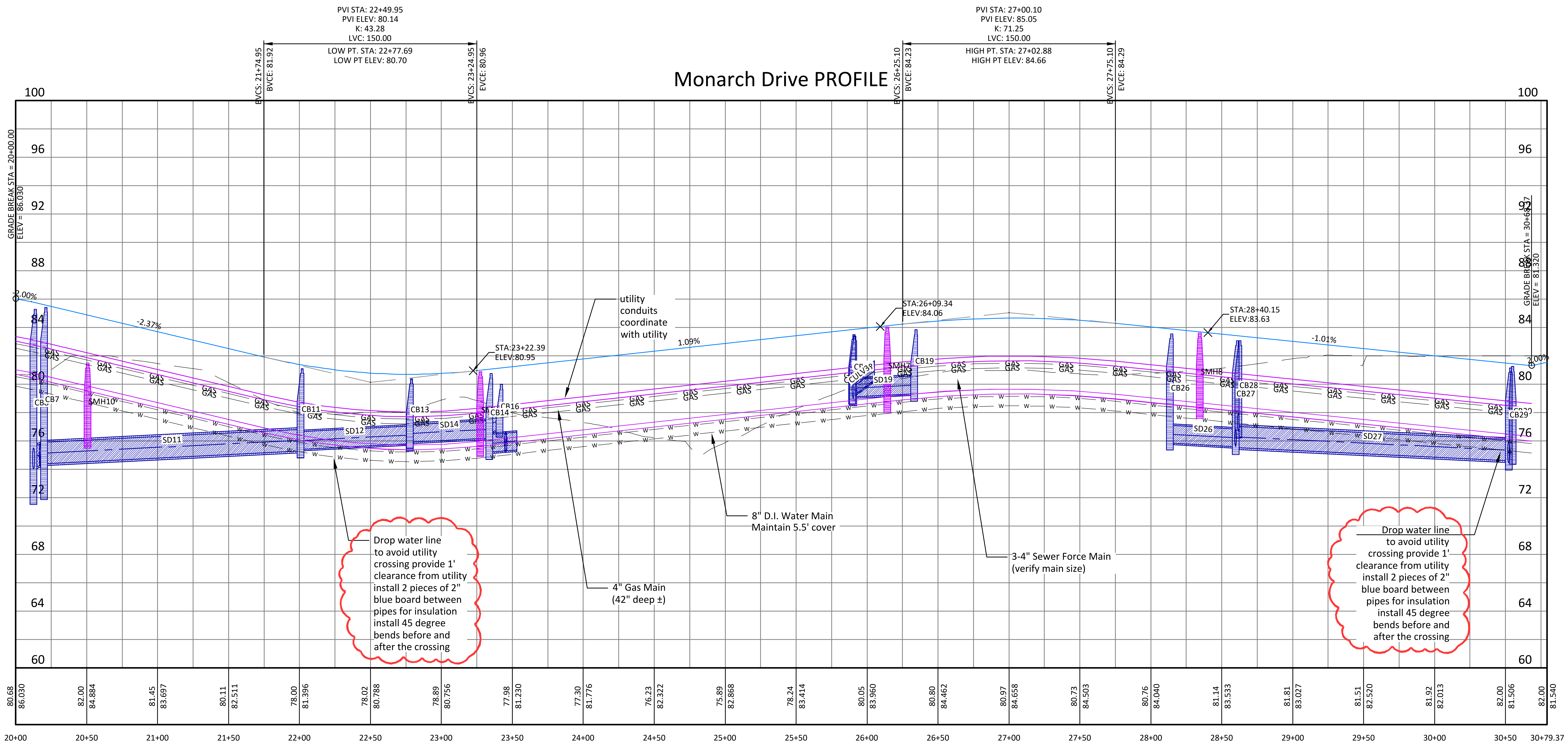
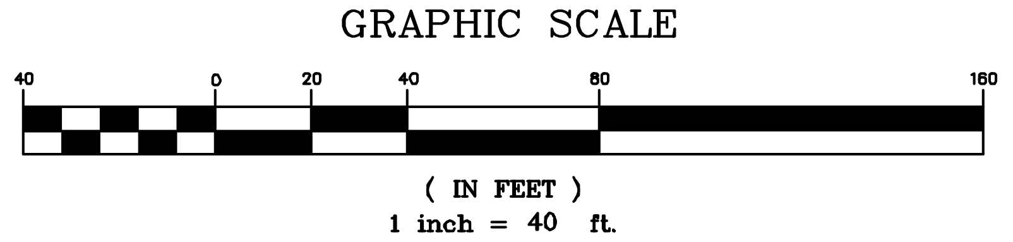
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V	SHEET:
JOB #: 134	C8
DATE: 6-15-2020	

Monarch Drive PROFILE





PROGRESS PLAN
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ENVIRONMENTAL DESIGN, LLC

1. 6-15-2020 Respond to SME memo dated 3-4-2020
Re-submit to Town and DEP

Profile
Monarch Drive

Cumberland Crossing – Phase 2

CHRISTOPHER S. BELANGER 9098

6-15-2020

BELANGER
ENGINEERING
CONSULTING ENGINEERS

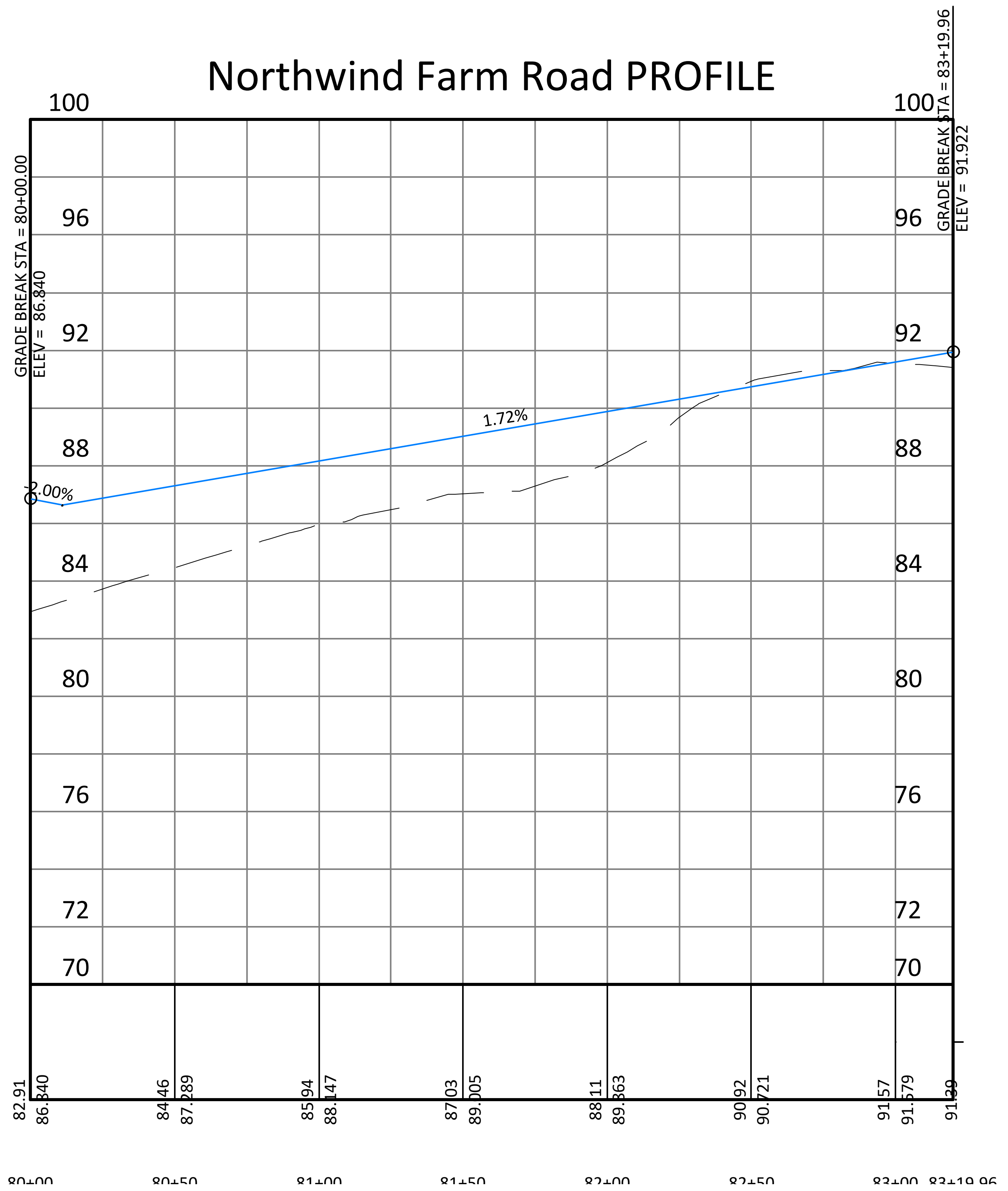
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

63 Second Avenue
Augusta, Maine 04330

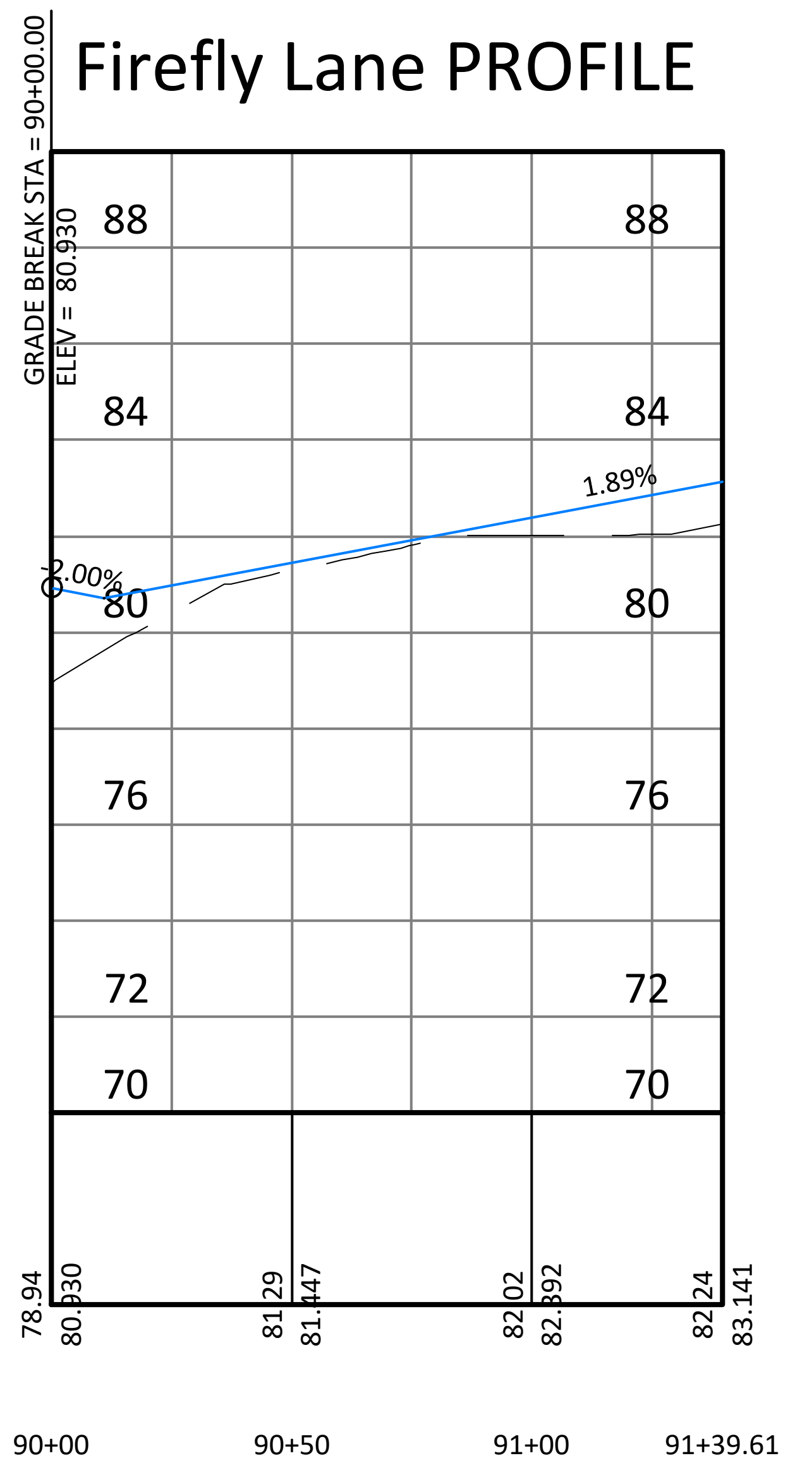
SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020

SHEET:
C9

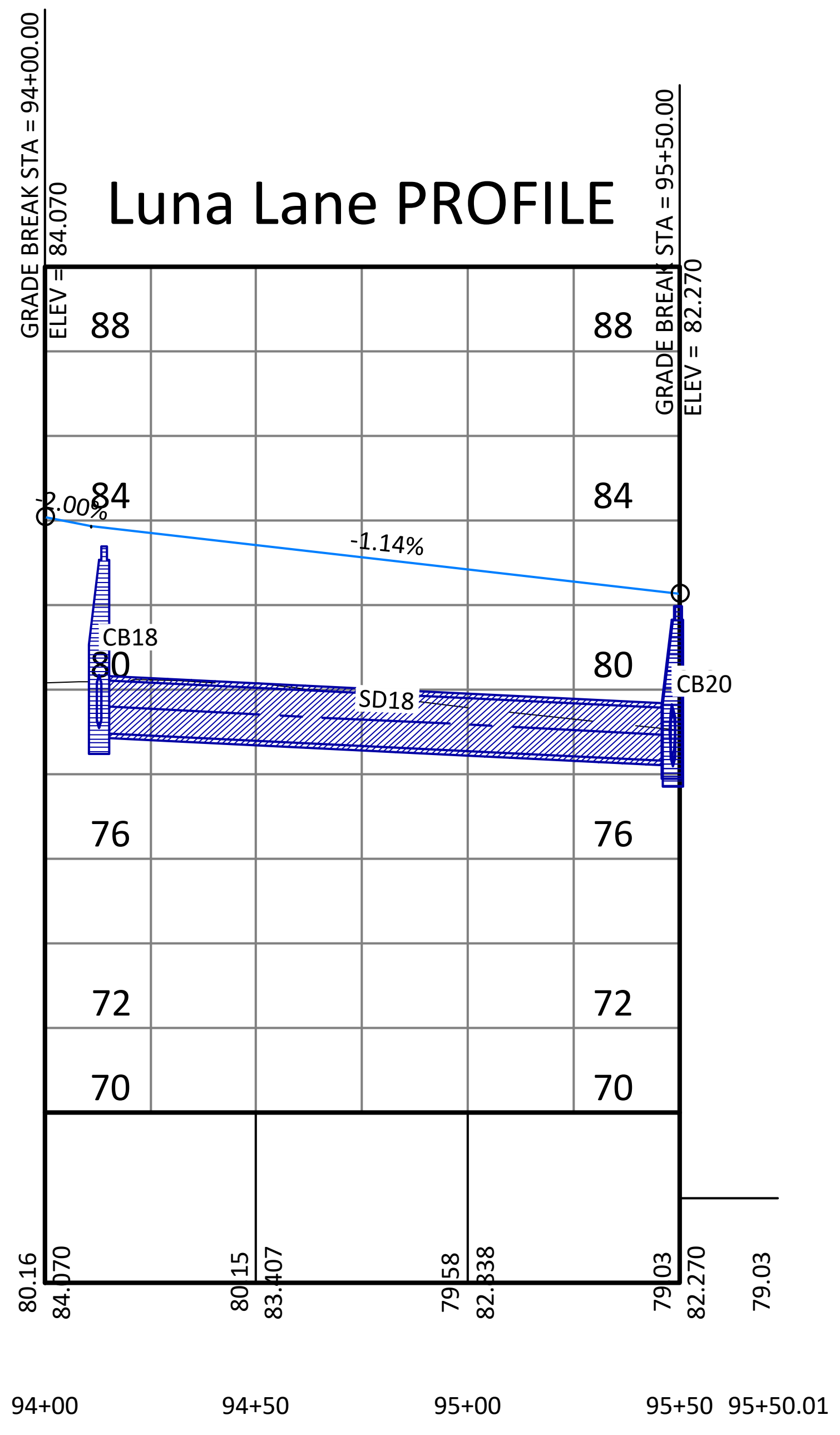
Northwind Farm Road PROFILE



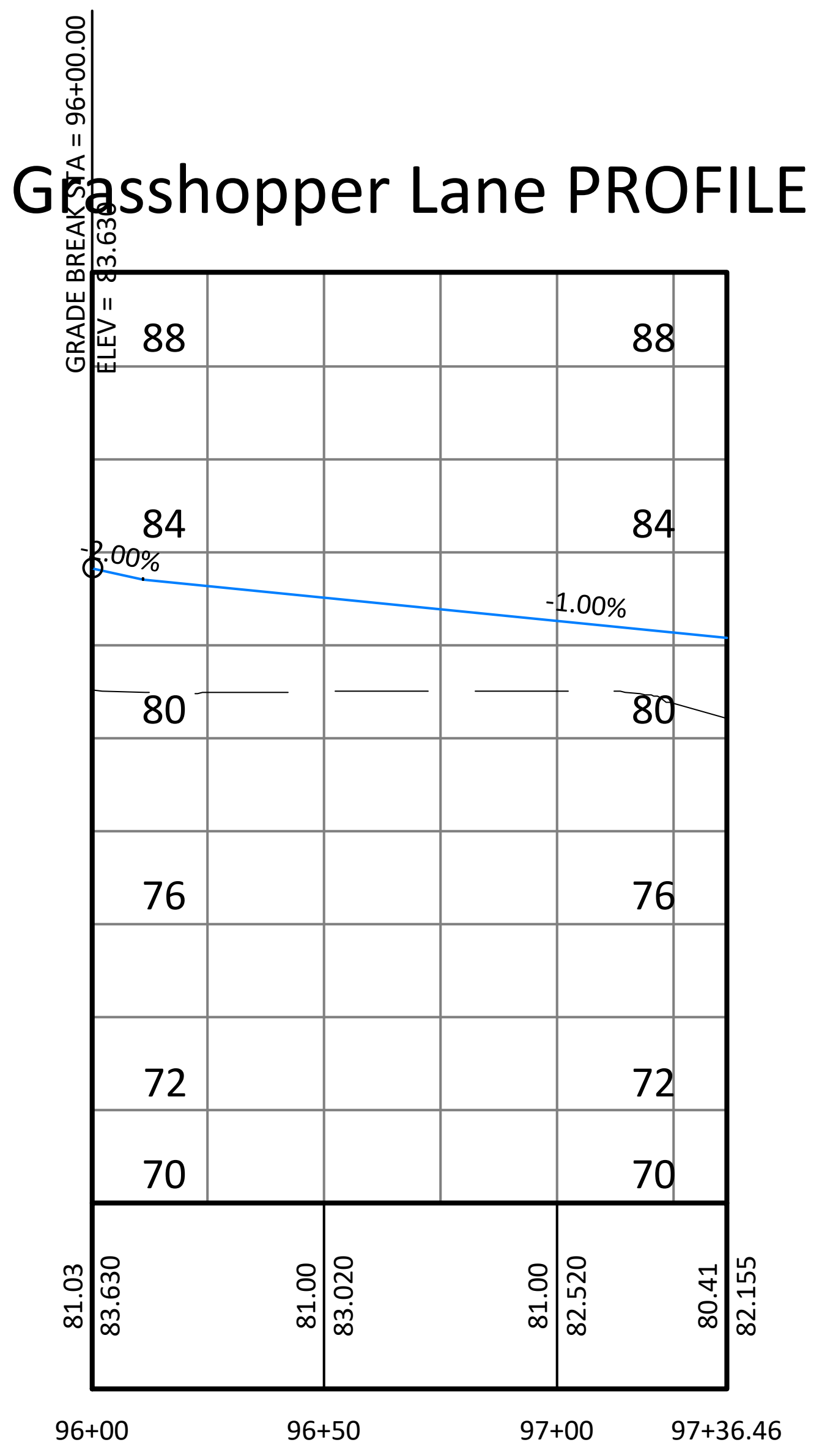
Firefly Lane PROFILE



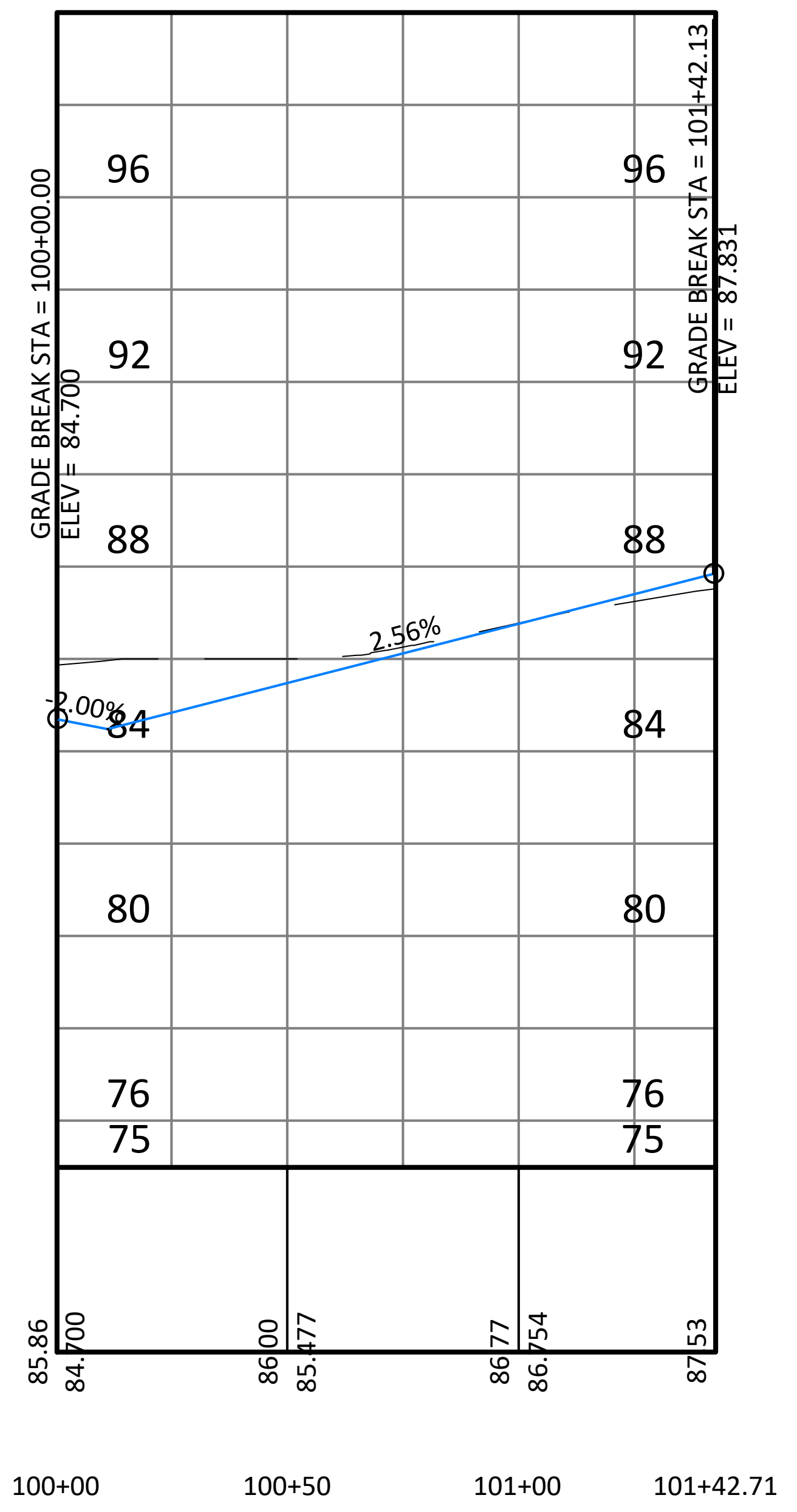
Luna Lane PROFILE



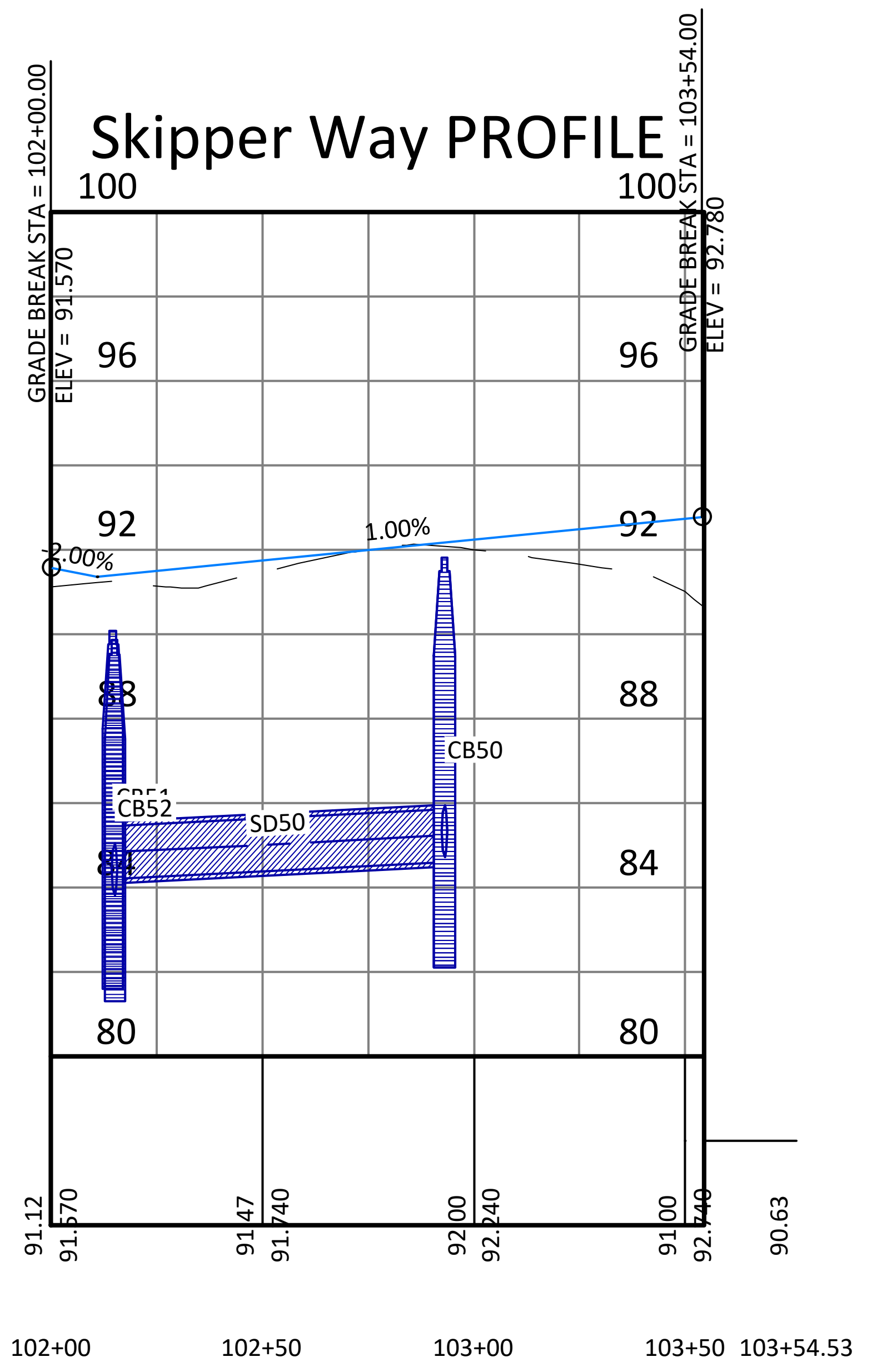
Grasshopper Lane PROFILE



Cricket Lane PROFILE



Skipper Way PROFILE



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
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CHRISTOPHER S. BELANGER 9098
6-15-2020

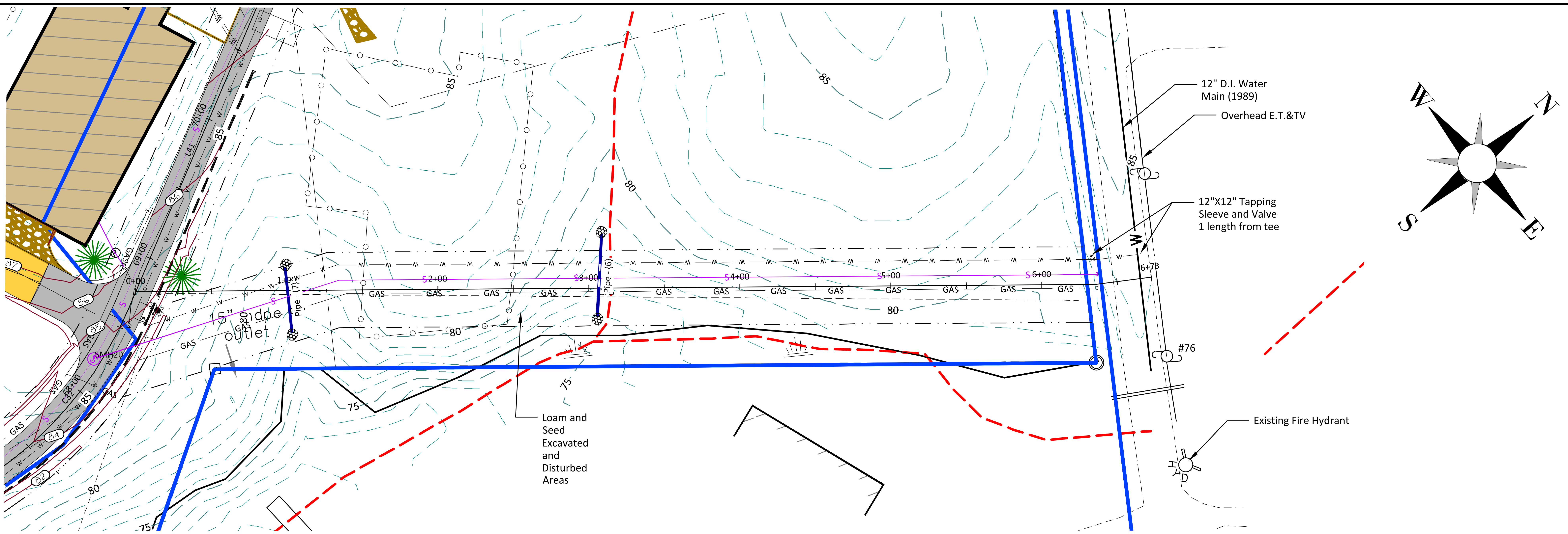
1. 6-15-2020 Re-submit to Town and DEP

Road Profiles

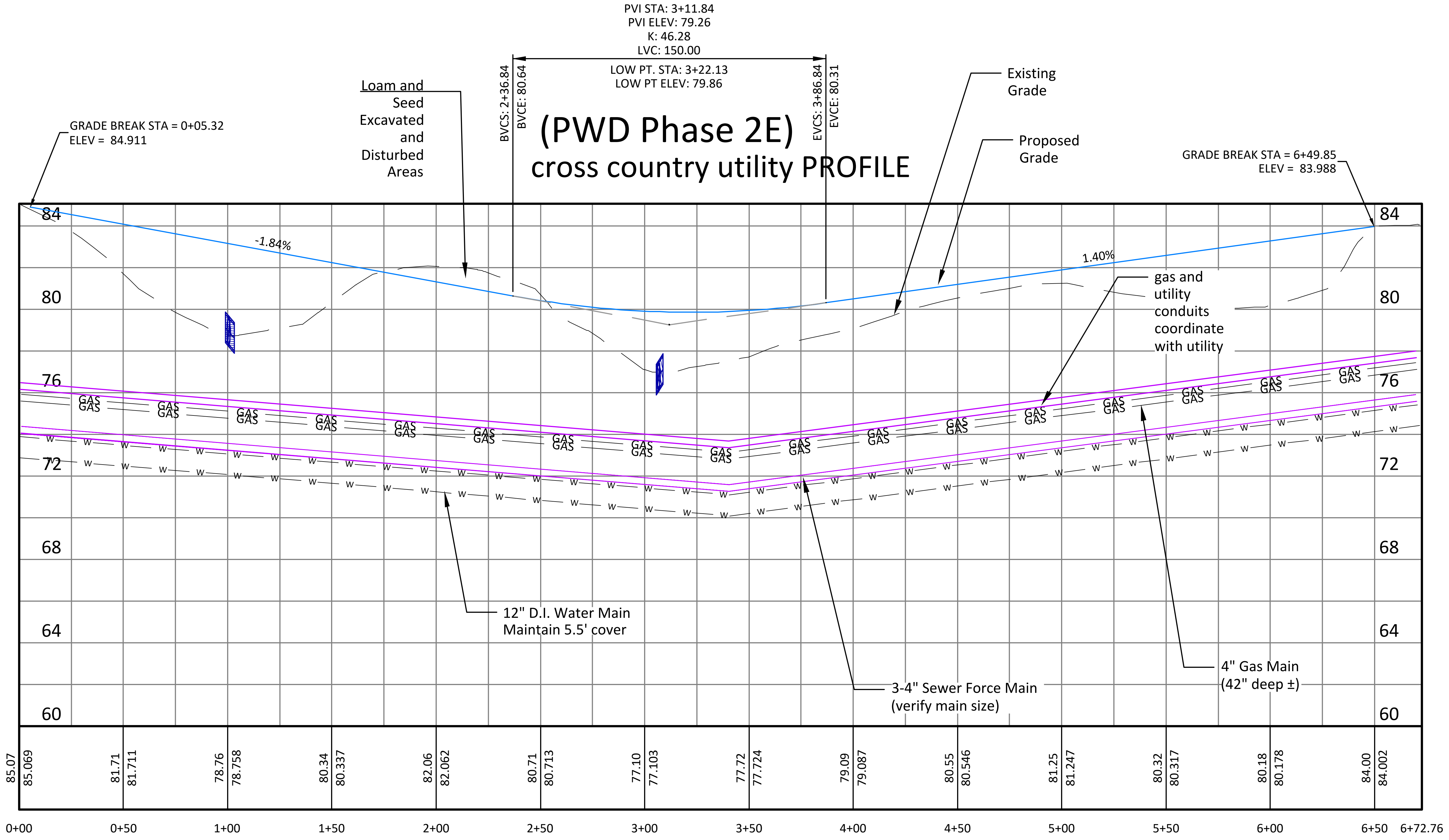
Cumberland Crossing – Phase 2

BELANGER ENGINEERING
CONSULTING ENGINEERS
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET: C10



(PWD Phase 2E)
cross country utility PROFILE



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

PROGRESS PLAN
NOT FOR CONSTRUCTION

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CHRISTOPHER S. BELANGER 9098
6-15-2020

1. 6–15–2020 Respond to SME memo dated 3–4–2020
Re–submit to Town and DEP

Plan and Profile
Cross Country Utility

Cumberland Crossing – Phase 2

BELANGER ENGINEERING
CONSULTING ENGINEERS
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET: C10B

Area "A" Landscape Buffer
(See Sheet 11B)

Area "B" Landscape Buffer
(See Sheet 11B)

Street Tree Plant Schedule

Key	Quan.	Botanical and Common Name	Ht.
A	31	Acer rubrum "Red Sunset" Red Sunset Maple	2-2.5" cal.
W	7	Quercus alba White Oak	2-2.5" cal.
S	18	Quercus bicolor Swamp White Oak	2-2.5" cal.
R	20	Quercus rubra Red Oak	2-2.5" cal.
B	13	Tilia americana Basswood	2-2.5" cal.
Z	14	Zelkova serrata "Green Vase" Green Vase Zelkova	2-2.5" cal.
V	17	Ulmus "Valley Forge" Valley Forge Elm	2-2.5" cal.

1. 6-15-2020 Re-submit to Town and DEP CSB

Landscape Overall Plan and Street Tree Layout

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

J. DAVID HAYNES
No. 5

CHRISTOPHER S. BELANGER
9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

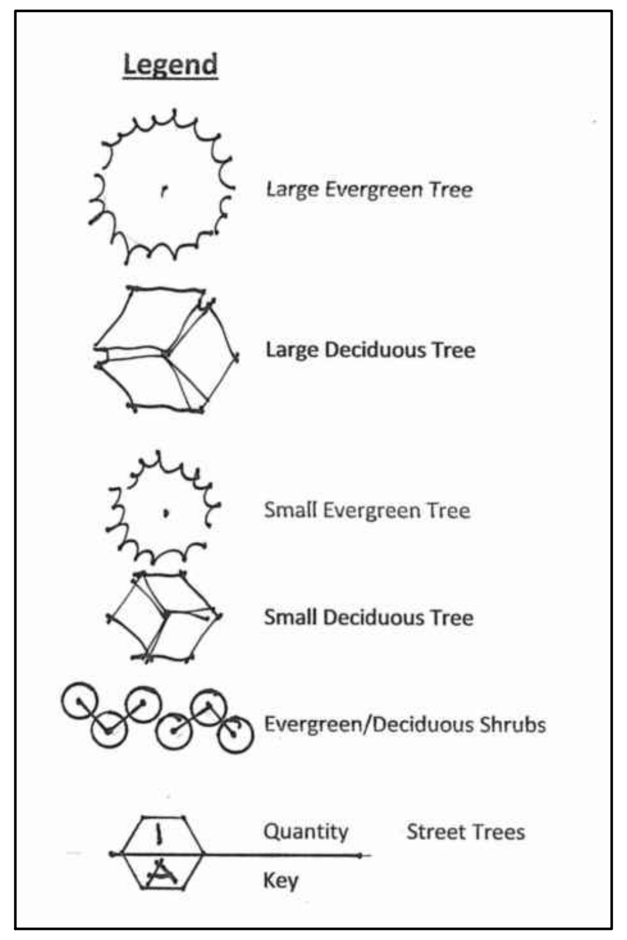
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

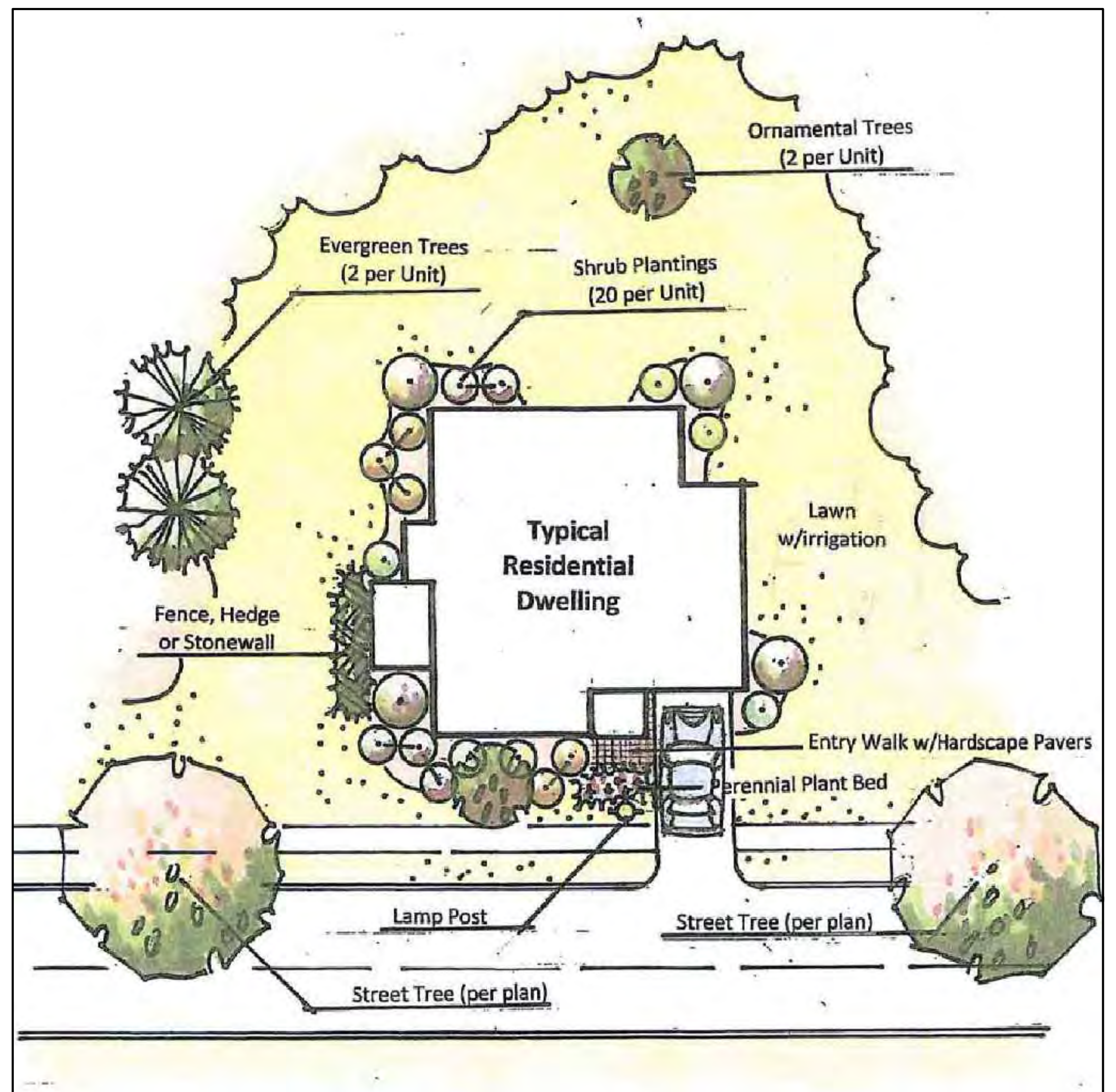
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #:	C11A
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

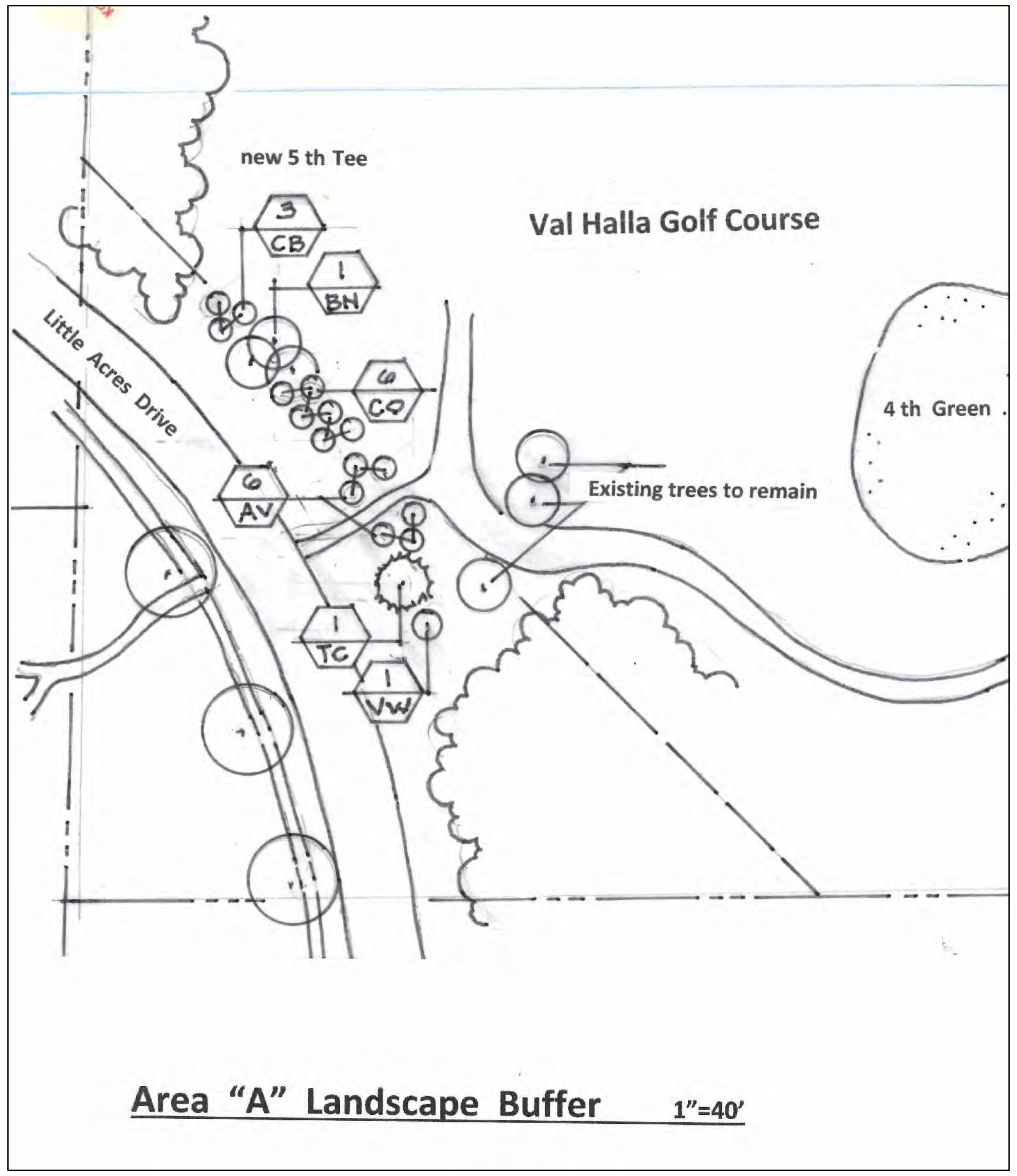
Landscape Notes:

1. All disturbed construction areas to be re-vegetated with grass shall receive a minimum of 4 in. topsoil loam with hydro-seed or sod as indicated on plans.
2. Prior to plant installation the contractor shall meet with the landscape architect on site for a pre-construction meeting.
3. Plant beds shall receive 10-12 in. of prepared topsoil loam.
4. The landscape architect shall approve plant spacing and layout prior to planting.
5. Contractor shall verify plant schedule with planting plans. If conflicts exist, the contractor shall provide higher number of plants.
6. Installation of plant materials; materials and plantings shall meet requirements as specified by "American standard for nursery stock, may 2004 and as shown on construction detail drawings.
7. Landscape contractor shall construct curvilinear plant beds around and under all shrub plantings to outside limit of branching. plant beds shall be mulched with 3 in. deep dark decomposed mulch.
8. All tags, labels or other foreign material shall be removed from plant material limbs and stems.
9. All plant material substitutions shall be applied for in writing for approval by the landscape architect. Approval of plant variety substitutions shall be based on similar characteristics of the specified plant – mature size, color, bloom times, branching habit, shape, solar and soil preferences.
10. Final spacing of street trees to be field determined based upon driveway curb cuts, utility service stops, view sheds, preserved woodland edges and landscape buffers.
11. Tree and shrub understory buffers around property perimeter and disturbed common areas such as specified and around storm water management basins to be supplemented in various locations with indigenous plant material as selected from, but not limited to, the following "Buffer Tree and Shrub Specifications" list. Precise location of buffer plant materials to be field selected based upon view sheds, existing plant materials and field conditions.





Typical Residential Landscape Plan



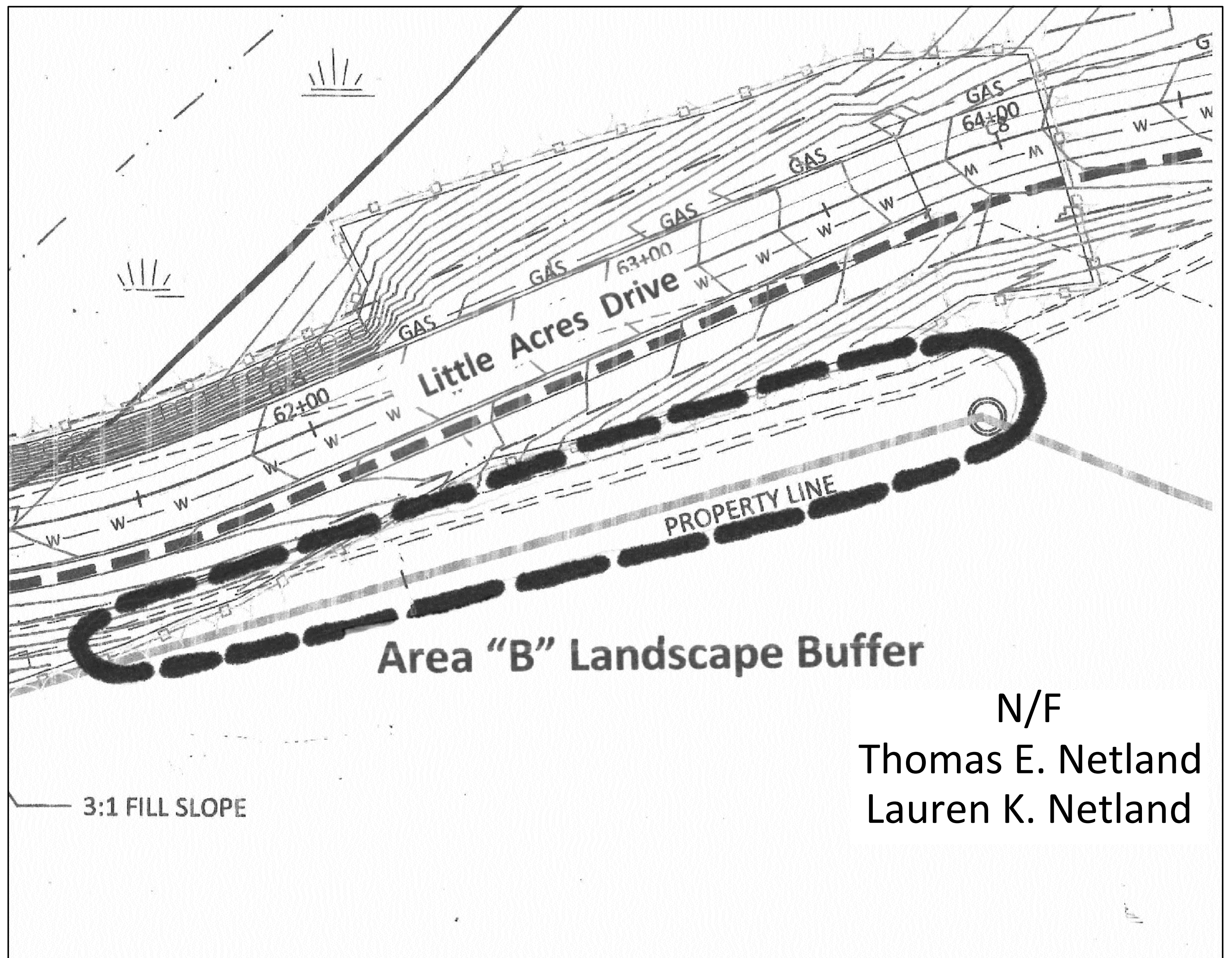
Area "A" Landscape Buffer 1"=40'

Area "A" Plant Schedule

Key	Quan	Plant Name	Ht.	Spr.	Notes
Trees:					
BN	1	Betula nigra "Heritage" Heritage River Birch	10-12 ft.		clump
TC	1	Tsuga Canadensis Canadian Hemlock	6-7 ft.		
Shrubs:					
AV	6	Azalea viscosum (var.) Swamp Azalea		#3 cont.	
CO	6	Cephalanthus occidentalis "Sugar Shack" Sugar Shack Buttonbush		#3 cont.	
CB	3	Cornus sericea "Baileyii" Red Twig Dogwood		#5 cont.	
VW	1	Viburnum nudum "Winterthur" Winterthur Viburnum		#5 cont.	

Area "B" Plant Schedule

Key	Quan	Plant Name	Ht.	Spr.	Notes
		Trees:			
	2	Tsuga canadensis Canadian Hemlock	5-6 ft.		
	2	Amelanchier laevis grandiflora "A. Brillance Autumn Brillance Serviceberry	6-7 ft.		clump
		Shrubs:			
	5	Azalea viscosum Swamp azalea		#2 cont.	
	3	Aronia arbutifolia "Brilliantissima" Red Chokeberry		#3 cont.	
	5	Cephalanthus occidentalis "Sugar Shack" Sugar Shack Buttonbush		#3 cont.	
	3	Clethra alnifolia Sweet Pepperbush		#3 cont.	
	5	Cornus sericea "Baileyii" Red Twig Dogwood		#3 cont.	
	2	Corylus americana American Hazelnut		#5 cont.	
	2	Corylus americana "Bailey's Redleaf" Redleaf Hazelnut		#5 cont.	
	3	Hamamelis intermedia "Pallida" Pallida Witchhazel		#3 cont.	
	5	Ilex verticillata Winterberry		#3 cont	M&F
	2	Picea abies "Pumila" Globe Spruce		#3 cont.	
	7	Juniperus chinensis "Sea Green" Sea Green Juniper		#5 cont.	
	2	Lindera benzoin Spicebush		#2 cont.	
	2	Salix discolor Pussy Willow		#3 cont.	
	2	Sambucus canadensis Elderberry		#2-3 cont.	var.
	5	Vaccinium corymbosum Highbush Blueberry		#3 cont.	var.
	2	Viburnum cassinoides Withrod Viburnum		#3 cont.	
	1	Viburnum dentatum "christom" Blue Muffin Arrowwood		#5 cont.	
	2	Viburnum lentago Nannyberry Viburnum		#5 cont.	
	2	Viburnum nudum "Winterthur" Winterthur Viburnum		#3 cont.	



Area "B" Landscape Buffer 1"=40'

Note: Landscape contractor to notify abutter and Landscape Architect prior to installation of plant material so that abutter and Landscape Architect can assist with siting plants before installation.

1. 6-15-2020 Re-submit to Town and DEP CSB

Landscape Plan Details

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

J. DAVID HAYNES
No. 5

CHRISTOPHER S. BELANGER
9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #:	C11B
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

Landscape Legend

⊙	Small/Medium Shrub
○	Large Shrub
○	Ornamental & EvergreenTrees
○	Street Tree
3 FP	Quantity Plant Key
+ + +	Ground Cover & Perennial Flower Beds

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Landscape Notes:

1. All disturbed construction areas to be re–vegetated with grass shall receive a minimum of 4 in. topsoil loam with hydro–seed or sod as indicated on plans.
2. Prior to plant installation the contractor shall meet with the landscape architect on site for a pre–construction meeting.
3. Plant beds shall receive 10–12 in. of prepared topsoil loam.
4. The landscape architect shall approve plant spacing and layout prior to planting.
5. Contractor shall verify plant schedule with planting plans. If conflicts exist, the contractor shall provide higher number of plants.
6. Installation of plant materials; materials and plantings shall meet requirements as specified by "American standard for nursery stock, may 2004 and as shown on construction detail drawings.
7. Landscape contractor shall construct curvilinear plant beds around and under all shrub plantings to outside limit of branching. plant beds shall be mulched with 3 in. deep dark decomposed mulch.
8. All tags, labels or other foreign material shall be removed from plant material limbs and stems.
9. All plant material substitutions shall be applied for in writing for approval by the landscape architect. Approval of plant variety substitutions shall be based on similar characteristics of the specified plant – mature size, color, bloom times, branching habit, shape, solar and soil preferences.
10. Trees and understory buffers around property perimeter and disturbed common areas such as around storm water management basins are to be augmented in various locations with indigenous plan materials as listed in plant schedule. Placement of trees and shrubs to be field adjusted for "best fit" to supplement existing vegetation.

J. DAVID HAYNES No. 5

CHRISTOPHER S. BELANGER 9098

6-15-2020

1.	6-15-2020	Re-submit to Town and DEP	CSB

Cumberland Crossing - Phase 2
Farmhouse Area Landscaping

Oceanview at Cumberland LLC
277 Tuttle Road, Cumberland, Maine

Oceanview at Cumberland LLC
20 Blueberry Lane, Falmouth, Maine 04105

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
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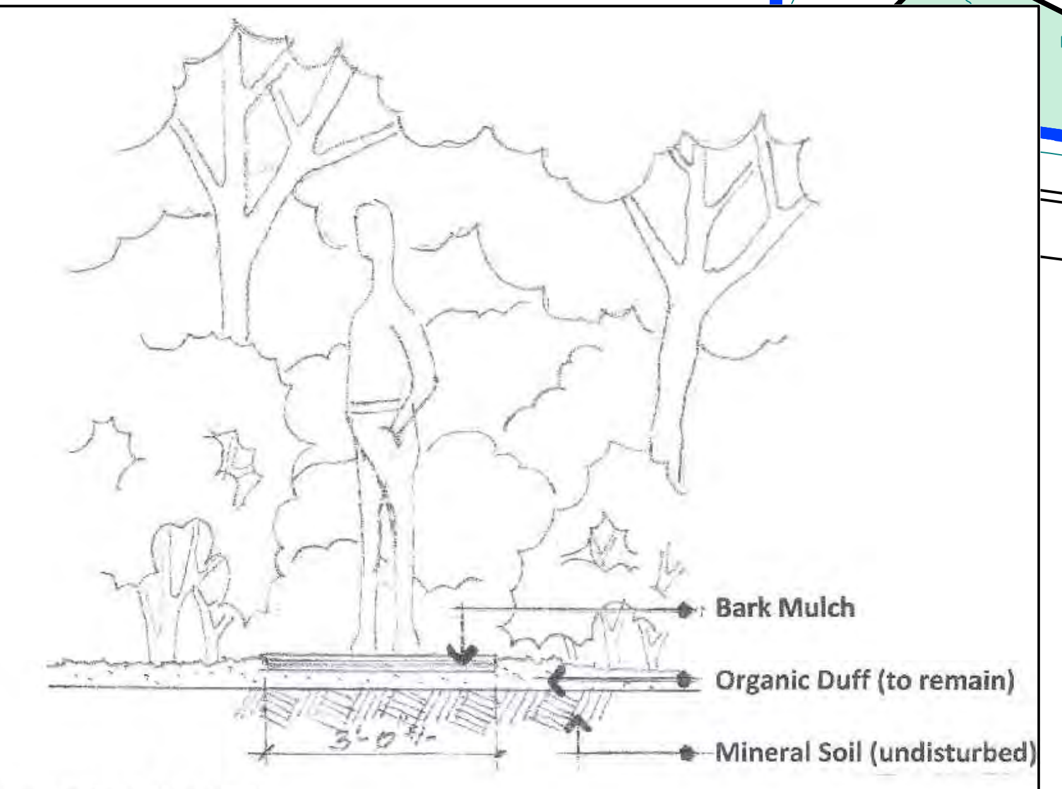
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=100'	SHEET:
DRN BY:	JOB #: 109	C11C
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

Note:

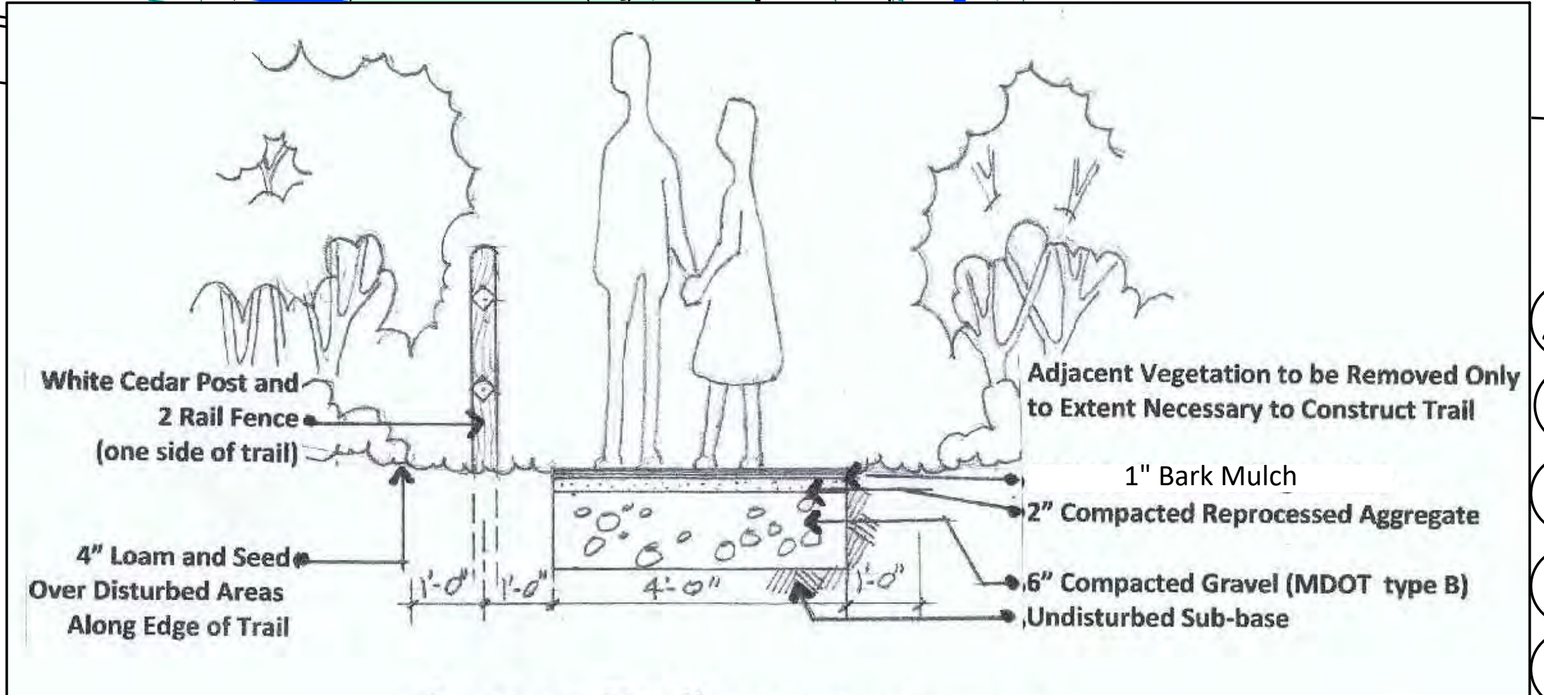
Proposed Trails are preliminary only and subject to review with the land and trails committee.



Construction Notes:

1. Alignment of trail to meander through woods along "path of least resistance".
2. Trail to be 3 ft. +/- wide.
3. Path of trail to be cleared of small trees and brush and grubbed to remove small stumps and roots.
4. Meandering trail surfacing to be 2-3 in. depth of wood chips and/or well rotted bark mulch.

Woodland Buffer Trail
Typical Section



Access Trail - Typical Section

Trail & Pedestrian Ways Key

Ⓐ Existing Snowmobile and Pedestrian Trails
Ⓑ Proposed Sidewalk and Pedestrian Access
Ⓒ 6-8' Wide Grass/Gravel Trail (Not in Contract)
Ⓓ 4' Bark Mulch / Access Trail (Not in Contract)
Ⓔ 3' Hand Cut/Woodland Buffer Trail
Ⓕ Proposed 4' Stonedust Path
Proposed Boardwalk or Culvert
Crosswalk

1. 6-15-2020 Re-submit to Town and DEP CSB

Trail and Walkway Master Plan

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
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63 Second Avenue , Augusta, Maine 04330

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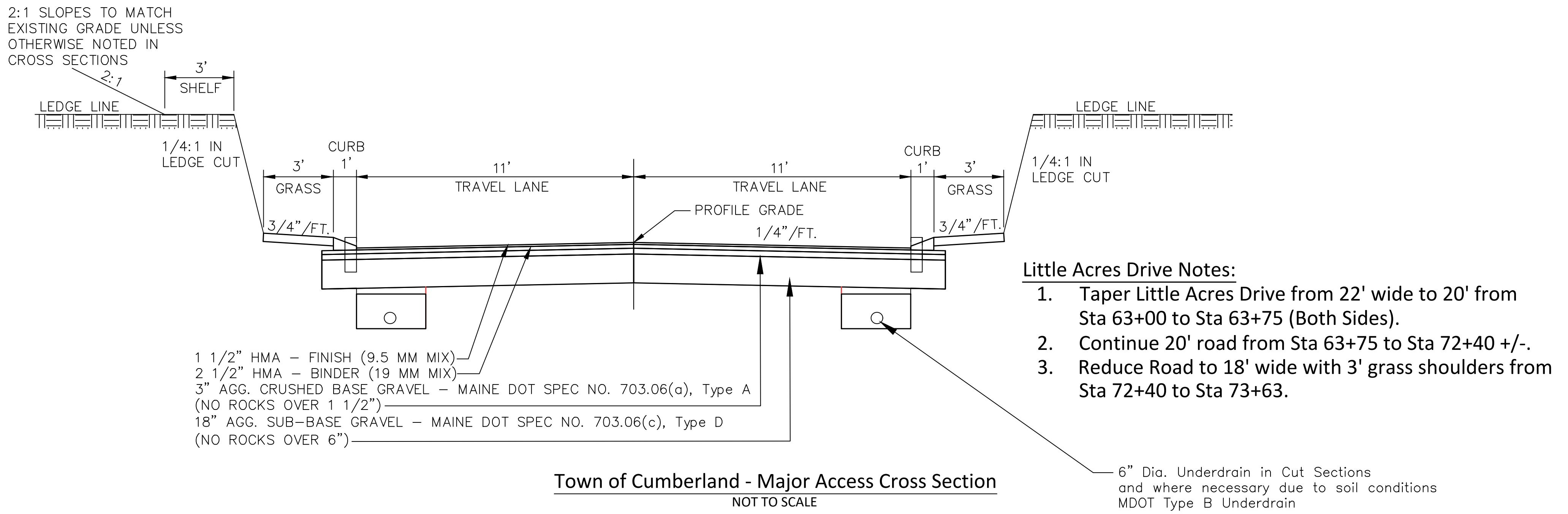
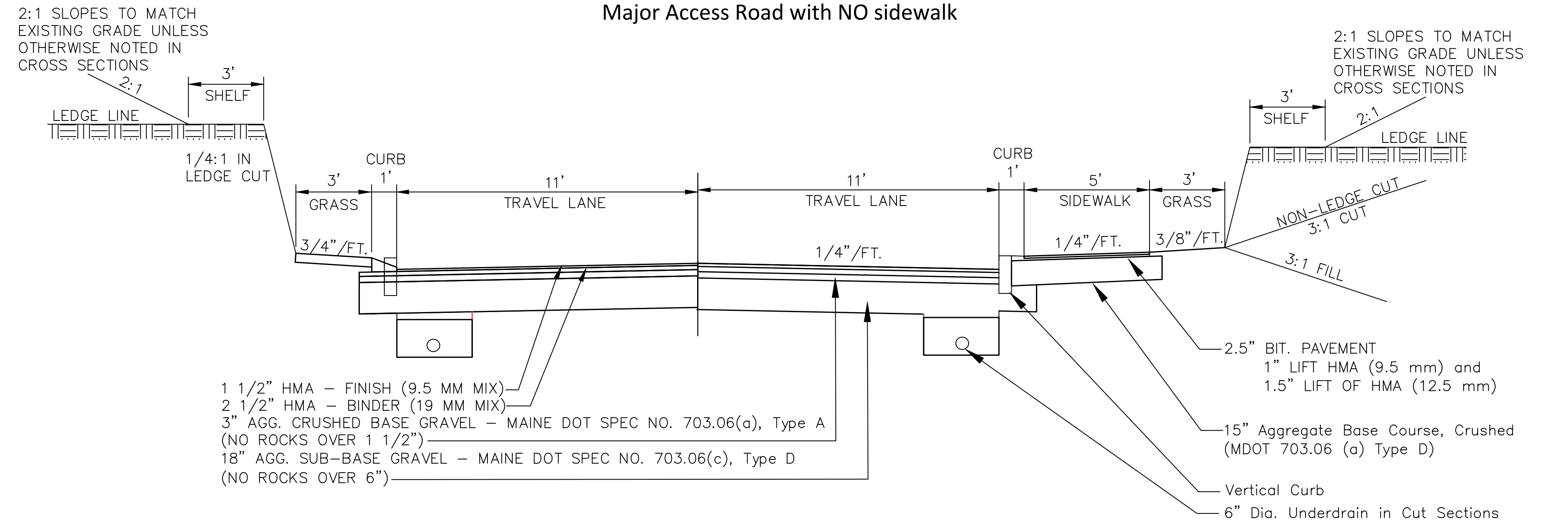
FIELD WK:
SCALE:
DRN BY:
JOB #:
CH'D BY:
SS:
DATE: 6-15-2020
FILE:
SHEET: C12



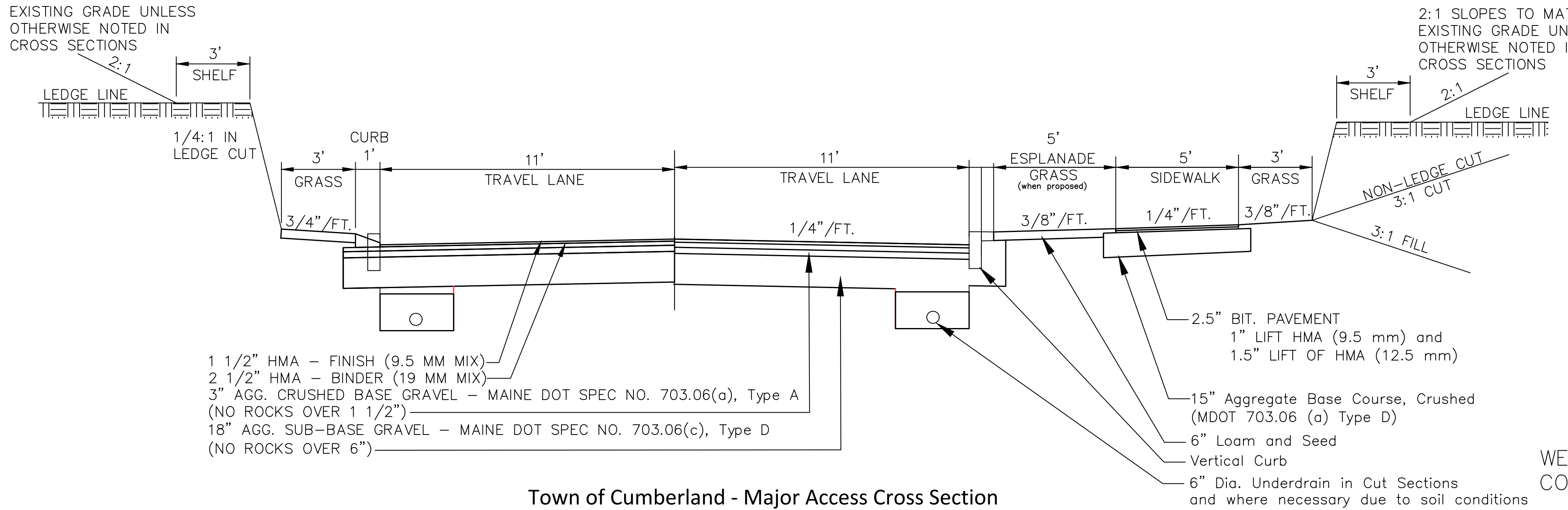
Little Acres Drive Notes:

1. Taper Little Acres Drive from 22' wide to 20' from Sta 63+00 to Sta 63+75 (Both Sides).
2. Continue 20' road from Sta 63+75 to Sta 72+40 +/-.
3. Reduce Road to 18' wide with 3' grass shoulders from Sta 72+40 to Sta 73+63.

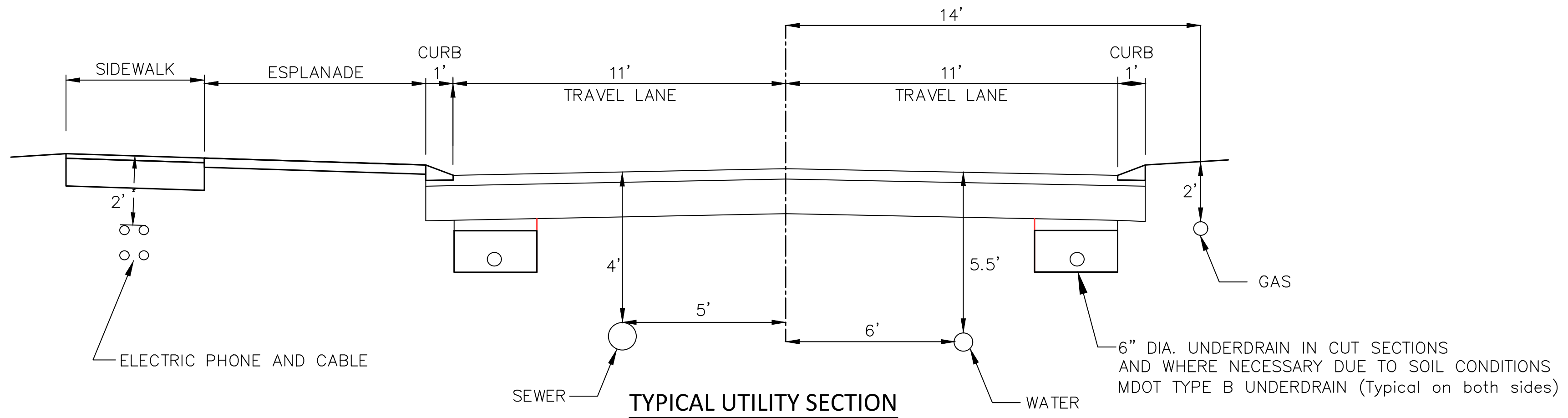
Town of Cumberland - Major Access Cross Section
NOT TO SCALE
Major Access Road with NO sidewalk



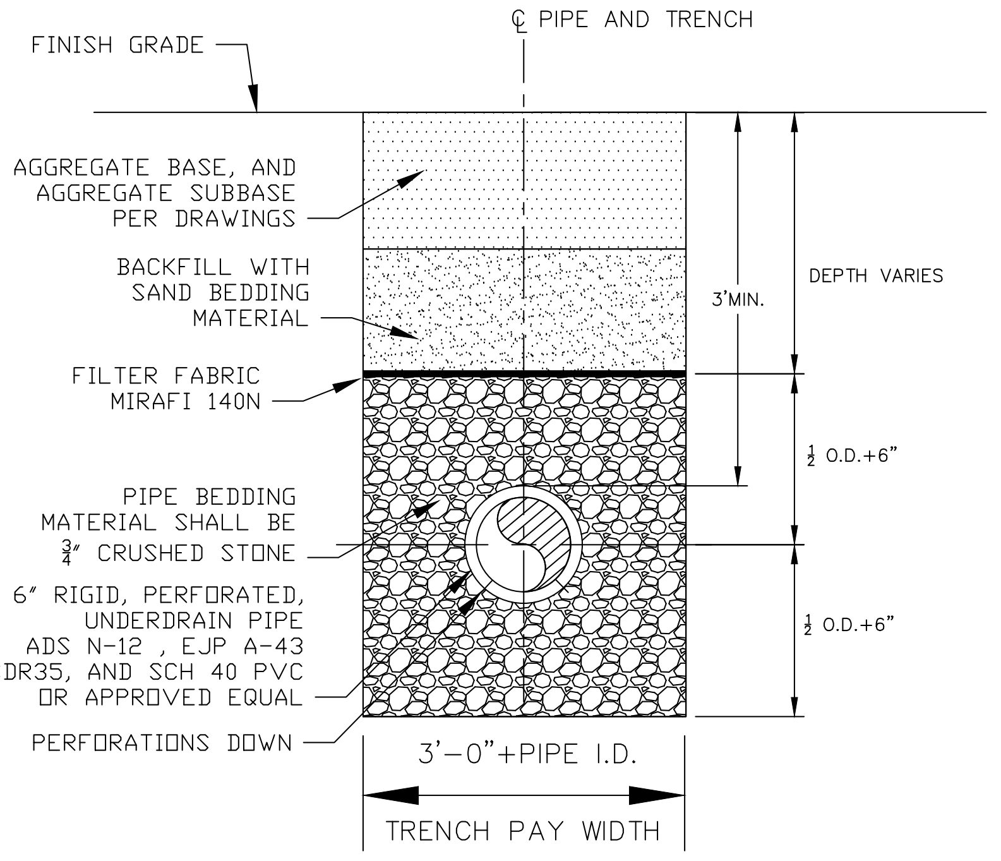
Town of Cumberland - Major Access Cross Section
NOT TO SCALE
Major Access Road with 5' walk and NO esplanade on Right



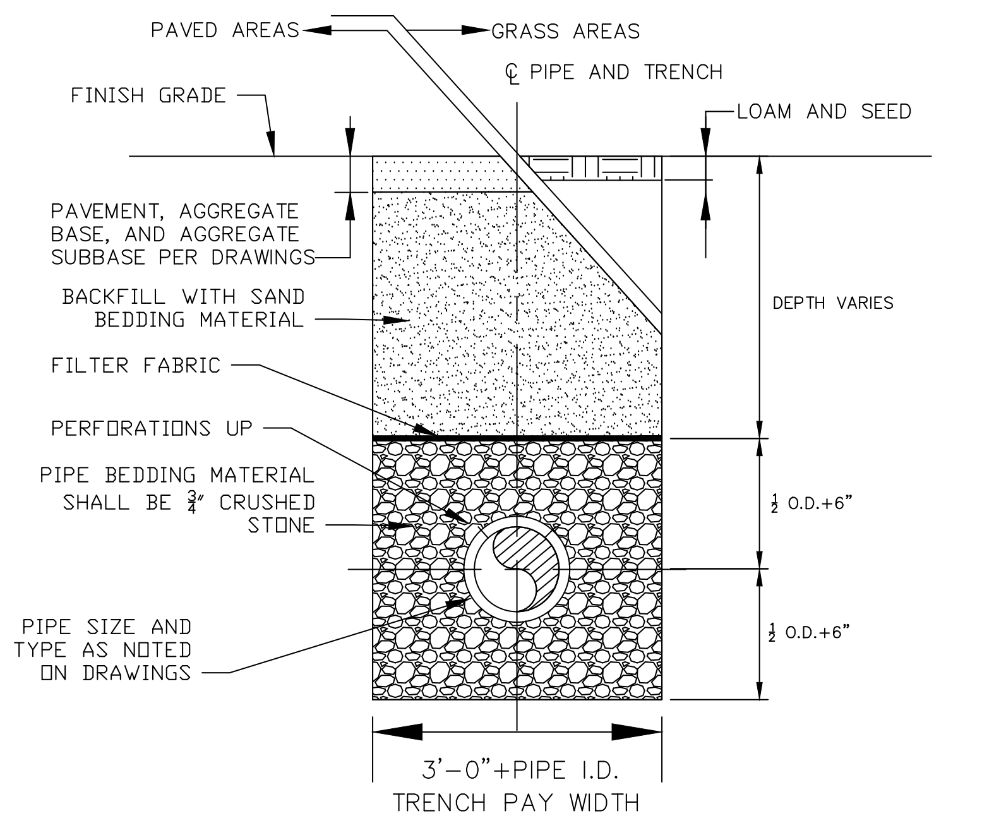
Town of Cumberland - Major Access Cross Section
NOT TO SCALE
Major Access Road with 5' walk and esplanade on Right



TYPICAL UTILITY SECTION
NOT TO SCALE



MDOT TYPE "B" UNDERDRAIN TRENCH DETAIL
NOT TO SCALE



MDOT TYPE "C" UNDERDRAIN TRENCH DETAIL
NOT TO SCALE

ROAD CONSTRUCTION NOTES:

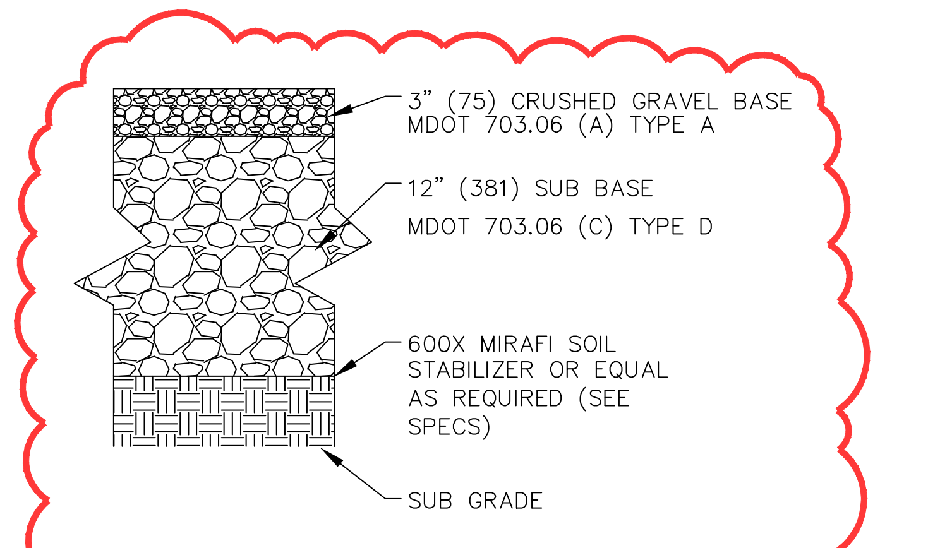
1. IN FILL AREAS 3:1 SLOPES ARE TO BE USED UNLESS ENOUGH USEABLE WASTE MATERIAL HAS BEEN STOCKPILED TO USE 4:1 FILL SLOPES.

2. IN FILL AREAS THE GRANULAR MATERIAL TO BE USED SHALL CONFORM TO SECTION 703.19 OF THE STATE OF MAINE STANDARDS SPECIFICATIONS FOR GRANULAR BORROW.

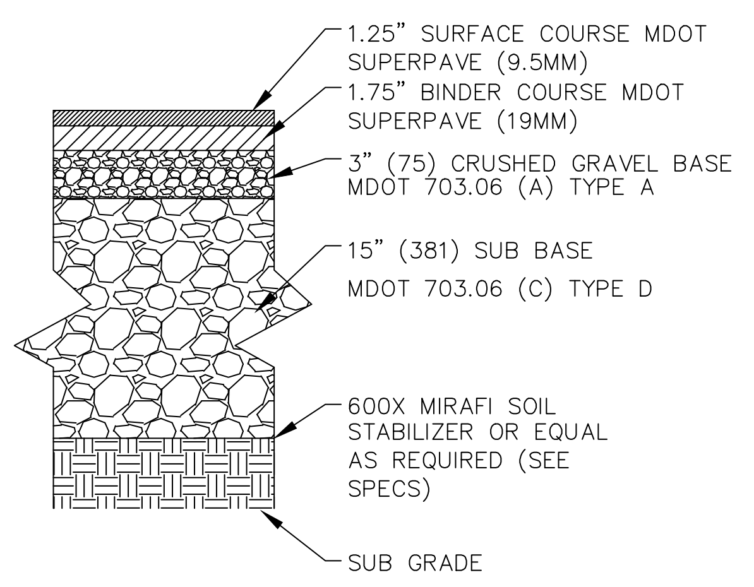
3. UNDERDRAIN SHALL BE INSTALLED IN ALL AREAS WHERE LEDGE IS ENCOUNTERED. CONTRACTOR SHALL ASSUME UNDERDRAIN IS REQUIRED IN CUT AND LEDGE CONDITIONS AND SHALL BE PART OF THE BASE BID.

4. INSTALL FABRIC (Mirafi 500X) UNDER ROAD BASE WHEN SOFT CLAY IS ENCOUNTERED DURING CONSTRUCTION. WHEN FOUND CONTRACTOR SHALL CONTACT ENGINEER FOR SPECIFIC RECOMMENDATION BASED ON FIELD CONDITIONS.

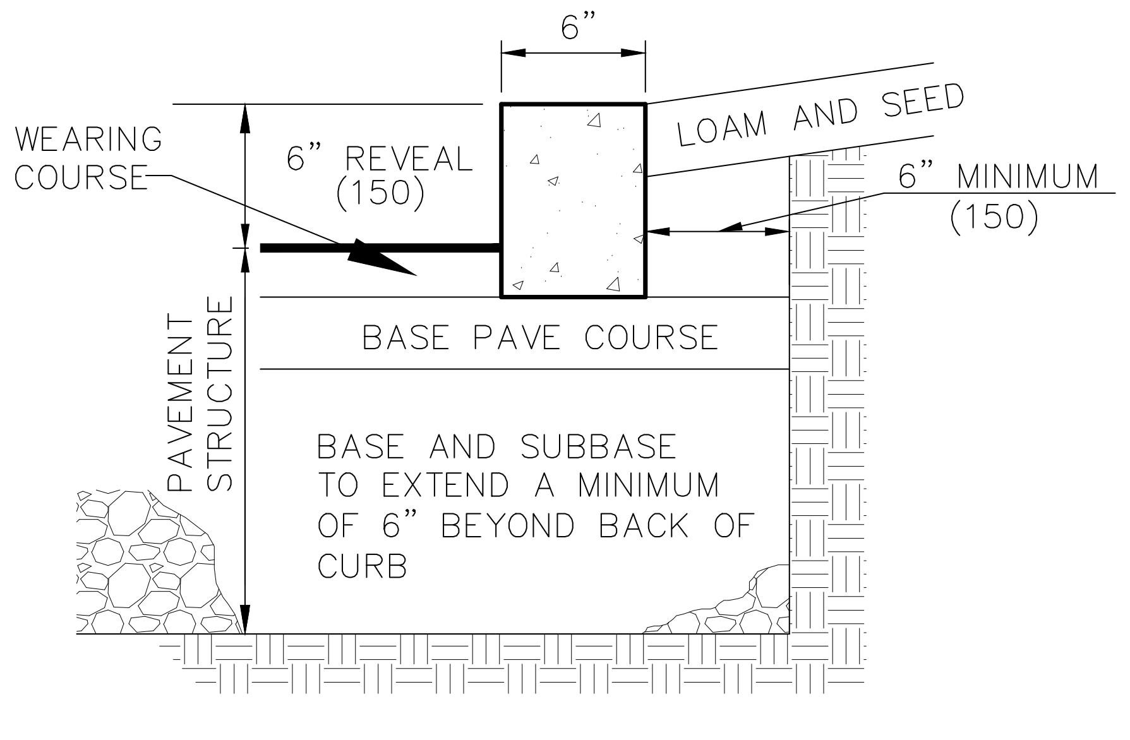
5. CONTRACTOR MAY PERFORATE STORM DRAIN IF AVAILABLE TO SUBSTITUTE UNDERDRAIN ON THAT SIDE OF ROAD. UNDERDRAIN IS STILL REQUIRED ON OTHER SIDE OF ROAD TO MEET TOWN SPECIFICATION. INSTALL TYPE C UNDERDRAIN WITH PERFORATED STORM DRAIN (HOLES UP). INSTALL TYPE B UNDERDRAIN FOR 6" UNDERDRAIN IS USED (HOLES DOWN). TIE UNDERDRAIN INTO CATCH BASINS AS AVAILABLE OR OUTLET TO DITCH OR SWALE.



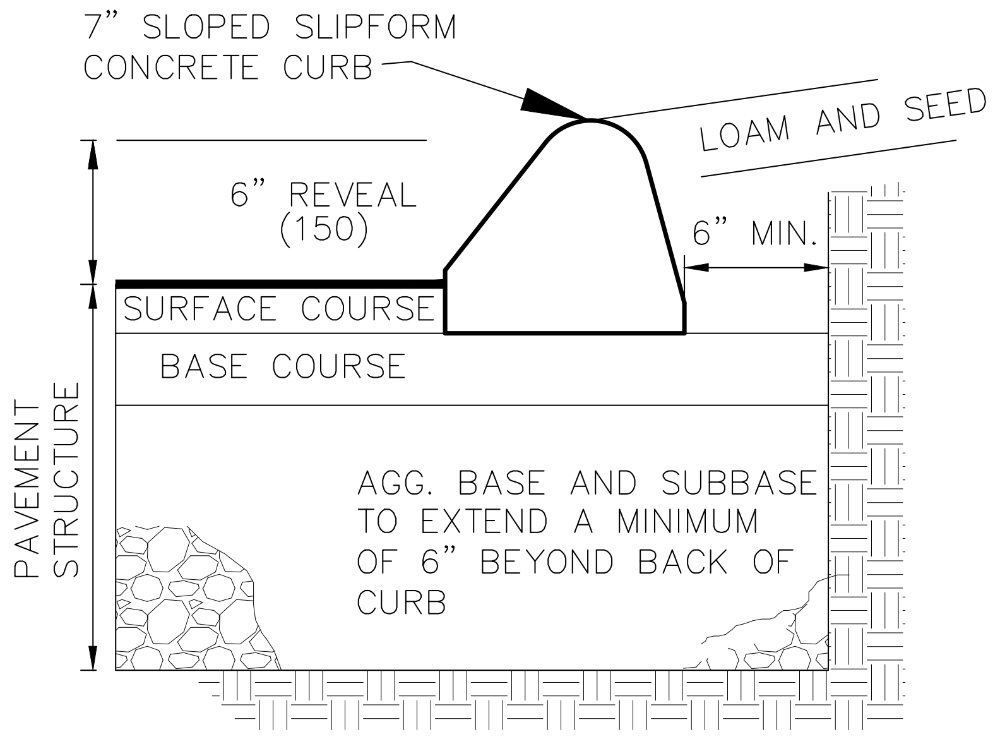
GRAVEL DRIVE @ FARM
NOT TO SCALE



BIUMINOUS CONCRETE DRIVE
NOT TO SCALE



VERTICAL SLIPFORM CONCRETE CURB
NOT TO SCALE – ONLY WHEN SIDEWALK ABUTS ROAD (NO ESPLANADE)



7" SLOPED SLIPFORM CONCRETE CURB
NOT TO SCALE – NON-SIDEWALK AREAS

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL METHODS SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION BEST MANAGEMENT PRACTICES BY THE CUMBERLAND COUNTY SOIL WATER CONSERVATION DISTRICT, AND THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

2. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PLACE THE SILT FENCE. THE CONTRACTOR SHALL INSPECT THE BARRIER AND OTHER PREVENTATIVE MEASURES BI-WEEKLY, BEFORE ANY PREDICTED RAIN EVENT, AND AFTER ANY RAIN EVENT. THE CONTRACTOR SHALL REMOVE ANY ACCUMULATED SILT AND/OR MAKE REPAIRS AS NECESSARY.

3. ALL TOPSOIL SHALL BE SAVED TO LOAM LANDSCAPED AREAS TO A DEPTH OF 4". LOAM SHALL BE STOCKPILED ON SITE IN A LOCATION CONVENIENT TO THE CONTRACTOR. THE STOCKPILE WILL BE TEMPORARILY SEEDED WITH RYE GRASS AND MULCHED AT 75 90 LBS/1000SF. ALL SOIL STOCKPILES ARE TO BE ENCLOSED WITH SILT FENCE. STOCKPILES SHALL NOT BE LOCATED IN WETLAND STEEP SLOPES, OR AREAS OF CONCERTRATING FLOW.

4. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE PERMANENTLY SEEDED. SEEDING SHALL BE PERFORMED IN ACCORDANCE WITH MDOT SPECIFICATION: LIME AT 3 TONS/ACRE: FERTILIZER 10-10-10 AT 13.8LBS/1000 SF: SEED MDOT PARK MIX AT 3 LBS/1000 SF. - SEEDING SHALL BE PERFORMED BETWEEN APRIL 15 - JUNE 15 OR AUGUST 15 - SEPTEMBER 15, WINTER RYE SHALL BE USED AS TEMPORARY SEED BETWEEN SEPTEMBER 15 - OCTOBER 15. ALL FINISHED SLOPES EXCEEDING 15% SHALL ALSO HAVE MULCH NETTING INSTALLED AND PINNED DOWN. AFTER SEPTEMBER 15, THE SAME APPLIES TO ALL SLOPES EXCEEDING 8%.

5. ALL AREAS TO BE SEEDED SHALL BE MULCHED. MULCH SHALL BE LONG FIBERED HAY OR STRAW AND SPREAD UNIFORMLY. 1.5 TO 2.0 TONS PER ACRE. TO BE MAINTAINED MOIST TO MINIMIZE BLOWING AS NECESSARY. IN WINTER CONDITIONS, NO MULCH IS TO BE APPLIED OVER SNOW. THE SNOW MUST FIRST BE REMOVED AND THEN MULCH APPLIED ACCORDING TO SPECIFICATIONS STATED PRIOR. IN ALL CASES MULCH SHALL BE APPLIED SUCH THAT THE SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. DURING NOVEMBER 1 THROUGH APRIL 1 MULCHING SHALL BE COMPLETED DAILY BY THE END OF THE WORK DAY.

6. PLACE SILT SACKS IN CATCH BASIN INLET DURING CONSTRUCTION. CONTACT AH HARRIS IN PORTLAND (207) 775-5764 OR AUGUSTA (207) 622-0821 SILT SACKS SHALL BE REMOVED AFTER FINAL PAVEMENT OVERLAY.

7. ALL SEDIMENT CONTROL FENCING AND SILT SACKS BARRIERS WILL REMAIN IN PLACE UNTIL SEEDLINGS HAVE BEEN ESTABLISHED.

8. ALL EARTH CHANGES WILL BE CONSTRUCTED AND COMPLETED IN SUCH A MANNER SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND WILL BE LIMITED TO THE SHORTEST PERIOD OF TIME POSSIBLE. THE CONTRACTOR SHALL COMPLETE FINAL GRADING, SEEDING, AND MULCHING IN CONJUNCTION WITH THE COMPLETION OF THE CORRESPONDING BUILDINGS WHENEVER POSSIBLE. IF FINAL GRADING CANNOT BE COMPLETED THEN THE CONTRACTOR IS TO MULCH ANY DISTURBED LAND AND WORK ON TOP OF THE MULCH. AREAS OF DISTURBED SOIL WILL BE TEMPORARILY MULCHED OR SEEDED WITHIN 30 DAYS OF INITIAL DISTURBANCE.

9. SEDIMENT CAUSED BY ACCELERATED SOIL EROSION WILL BE REMOVED FROM RUNOFF WATER BEFORE IT LEAVES THE DEVELOPMENT SITE.

10. ALL TEMPORARY OR PERMANENT FACILITY CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR FROM THE DEVELOPMENT SITE WILL BE CONSTRUCTED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.

11. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA WILL BE COMPLETED WITHIN 15 DAYS AFTER FINAL GRADING HAS BEEN COMPLETED.

12. IN THE EVENT THAT TEMPORARY OR PERMANENT SEEDLINGS HAVE NOT BEEN ESTABLISHED (90% SURFACE COVERAGE) BY SEPTEMBER 15, TEMPORARY MULCHING SHALL BE APPLIED FOR PROTECTION OVER WINTER (PAST THE GROWING SEASON) IN ACCORDANCE WITH THE TEMPORARY MULCHING BMP OF THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK.
A. MULCHING FOR OVER WINTER PROTECTION WILL BE COMPLETED BY NOVEMBER 15.
B. WINTER MULCH ON SLOPES 8% OR GREATER WILL BE ANCHORED WITH NETTING.
C. ALL SOILS DISTURBED PRIOR TO NOVEMBER 1 AND NOT HAVING THE REQUIRED COVER OF VEGETATION WILL BE STABILIZED WITH ANCHORED MULCH BY NOVEMBER 15.

13. PROVIDE TWO TEMPORARY CMP RISERS AT EXISTING CATCH BASIN AND WRAP WITH EROSION CONTROL FABRIC TO CONTROL POTENTIAL SEDIMENTATION. INSTALL STONE BERM OR HAY BALES AROUND CATCH DURING CONSTRUCTION..

14. NO EARTH MOVING OR CONSTRUCTION OPERATIONS ARE ANTICIPATED ON THE EXISTING STEEP SLOPE EXCEPT FOR RIP-RAP SLOPE PROTECTION. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED IN ACCORDANCE WITH OTHER EROSION CONTROL NOTES.

15. DURING WINTER CONSTRUCTION THE CONTRACTOR SHALL INSTALL AN EROSION CONTROL FILTER BERM. THE CONTRACTOR SHALL INSTALL THE BERMS AS SEDIMENT BARRIERS DURING FROZEN GROUND CONDITIONS.

PAVING, GRADING & DRAINAGE NOTES:

1. VERTICAL DATUM IS NATIONAL GEODETIC DATUM 1929 DEFINITION. BENCHMARK LOCATIONS ARE SPECIFIED ON TITCOMB SURVEY.

2. CLEARING LIMITS WILL BE FLAGGED BY THE ENGINEER AND THE OWNER. THE CONTRACTOR SHALL NOT CUT BEYOND THE LIMITS OR REMOVE A TREE DESIGNATED TO BE SAVED WITHOUT THE OWNER'S AND ENGINEER'S CONSENT.

3. ALL CURBS AND WALKS SHALL BE STAKED OUT BY THE CONTRACTOR AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. SIDEWALKS TO BE 4' WIDE FROM DRIVEWAY TO THE FRONT DOOR AND SET BACK 4' FROM THE HOUSE.

4. DRIVEWAYS TO BE 24' WIDE AT THE GARAGE DOOR AND MAY TRANSITION TO 20' WIDTH AS APPROPRIATE TO MEET SITE CONDITIONS.

TRAIL SYSTEM NOTES:

1. A TRAIL SYSTEM SHALL BE INSTALLED THROUGH OCEANVIEW AT CUMBERLAND PROPERTY TO PROVIDE PEDESTRIAN ACCESS. THE TRAIL SYSTEM WILL FORM LINKS TO ABUTTING PARCELS AND CONNECTION TO TOWN TRAIL SYSTEMS. THE TRAIL SYSTEM WILL BE AVAILABLE FOR PUBLIC & PRIVATE USE. THE DETAILED DESIGN WILL BE COORDINATED WITH THE TOWN PLANNER, PLANNING BOARD, AND THE OWNER.

FAIRPOINT NOTES:

1. ALL CONSTRUCTION TO BE IN COMPLIANCE WITH FAIRPOINT CONSTRUCTION STANDARDS.

2. ALL TRENCHING, CONDUIT AND BACK FILLING IS THE CONTRACTOR'S RESPONSIBILITY.

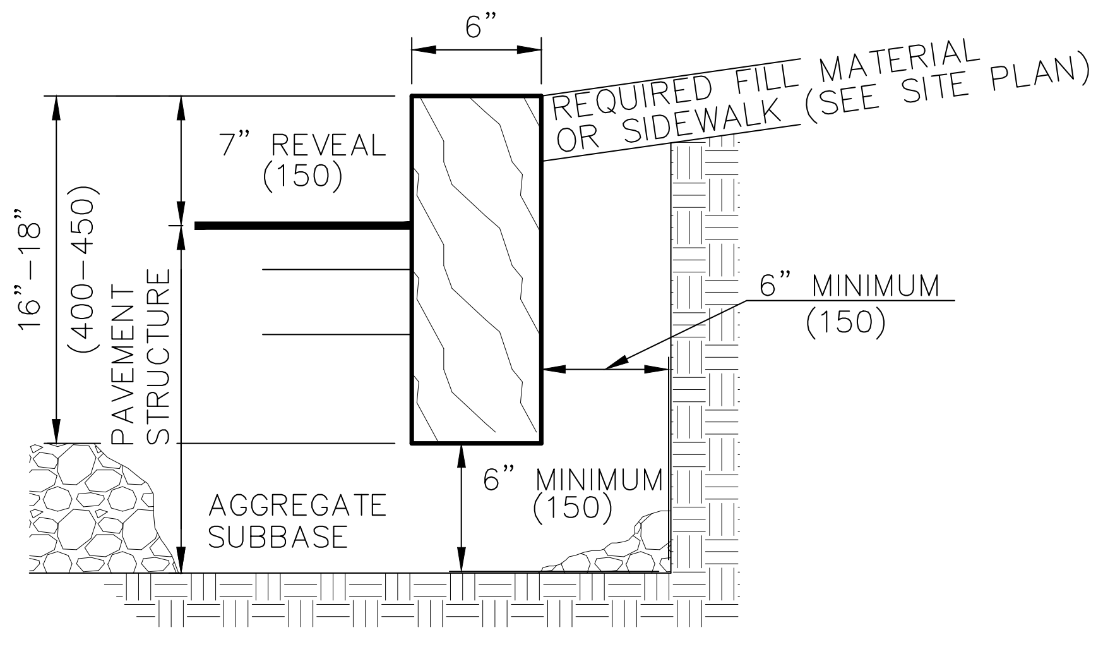
3. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED ROADS, DRIVEWAYS AND WALKWAYS. 4" FOR THE MAIN CABLE AND 2" FOR SERVICE WIRES.

4. CONDUITS FOR SERVICE WIRES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INITIAL INSTALLATION OF THE MAIN CABLE.

5. THE TRENCH MUST BE FILLED WITH "SUITABLE" BACK FILL, I.E. , SAND BACK FILL WITH NO STONE LARGER THAN 1/4" IN DIAMETER.

6. FAIRPOINT WILL SUPPLY THE CABLE AND LABOR TO INSTALL SAME.

7. A SEPARATION OF 12" HORIZONTAL OR VERTICAL MUST BE MAINTAINED BETWEEN FAIRPOINT AND ALL OTHER UTILITIES SUCH AS ELECTRIC, CABLE TV, OR OTHERS.



VERTICAL GRANITE CURB
NOT TO SCALE AT ALL ROAD ENTRANCE RADII AT INTERSECTIONS

UTILITIES GENERAL NOTES:

1. ALL UTILITIES TO BE LOCATED UNDERGROUND.

2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES WITH THE RESPECTIVE OWNERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF UTILITY AN STRUCTURE OWNERS REGARDING NOTIFICATION OF WORK AND PROTECTION OF EXISTING FACILITIES.

3. CONTRACTOR SHALL VERIFY ALL CRITICAL DIMENSIONS AND GRADES TO HIS SATISFACTION BEFORE WORK BEGINS. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.

4. ALL UTILITIES ARE TO BE CONSTRUCTED TO THE STANDARDS SET BY THE RESPECTIVE UTILITY. PRE- CONSTRUCTION CONFERENCE MUST BE HELD WITH ALL UTILITY REPRESENTATIVES.

5. A MINIMUM OF 12" HORIZONTAL SPACING IS NECESSARY BETWEEN CABLES.

6. 4" CABLE & TELEPHONE SERVICE WILL BE CONSTRUCTED IN THE SAME TRENCH AS ELECTRIC.

7. THE ROAD CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ELECTRIC, TELEPHONE, & CABLE UP TO AND INCLUDING THE INSTALLATION OF JUNCTION BOXES AND TRANSFORMER PADS. THE ROAD CONTRACTOR SHALL INSTALL ANY ADDITIONAL CONDUIT NEEDED WHERE INDIVIDUAL UNIT SERVICES CROSS THE ROADWAY. THE SITE CONTRACTOR SHALL BE RESPONSIBLE TO EXTEND INDIVIDUAL SERVICE FROM THE TRANSFORMER PAD TO THE BUILDING. THE SITE CONTRACTOR IS REQUIRED TO INSTALL CONDUIT AT ALL PAVEMENT CROSSINGS OTHER THAN THE ROADWAY.

8. THE ROADWAY CONTRACTOR SHALL SET UP A SCOPING MEETING WITH THE SITE CONTRACTOR TO CONFIRM LIMITS OF WORK, SCHEDULING, AND CONSTRUCTION SEQUENCE BEFORE CONSTRUCTION.

CMP NOTES:

1. THE PROPOSED DISTRIBUTION SYSTEM PLAN SHALL BE COORDINATED WITH CENTRAL MAINE POWER COMPANY.

2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CMP'S CONSTRUCTION STANDARDS AND THE LATEST REVISION OF THE NATIONAL ELECTRICAL SAFTEY CODE.

3. ALL TRENCHING, CONDUIT AND BACK FILLING IS THE CONTRACTOR'S RESPONSIBILITY.

4. CONDUITS SHALL BE A MINIMUM OF SCHEDULE 40 PVC OR EQUIVALENT.

5. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED AREAS, ROADWAYS, AND DRIVEWAYS. PRIMARY CABLES ARE TO BE INSTALLED IN CONDUIT IF DRIVEWAYS ARE NOT ROUGH GRADED.

6. CONDUITS FOR SECONDARY CABLES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INITIAL INSTALLATION OF THE PRIMARY CABLE.

7. PRIMARY CABLE TO BE #2 AL 15 KV.

8. SEE CMP'S CONTRACTOR HANDBOOK, SECTION IX, PARAGRAPHS 910, 911, AND 912 FOR SPECIFICATIONS ON BACK-FILL MATERIALS AND DEPTHS, ETC.

9. ALL TRANSFORMER PADS MUST BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. PAD DESIGNS MUST CONFORM TO CMP SPECIFICATIONS. SEE ILLUSTRATIONS NO. 19, NO. 20, NO. 21 IN SECTION XII OF THE CONTRACTOR'S HANDBOOK.

10. ALL JUNCTION BOXES WILL BE PURCHASED AND INSTALLED BY THE CONTRACTOR. CMP WILL PROVIDE THE JUNCTION BOX, HOWEVER, THE EXCESS COST WILL BE BILLED TO THE OWNER.FIBERGLASS OR CONCRETE PADS REQUIRED FOR STELL CABINETS AND JUNCTION BOXES.

11. CMP WILL SUPPLY THE CABLE, TRANSFORMERS AND LABOR TO INSTALL SAME.

12. ALL METERING ENCLOSURES WILL BE PUNCHED AND INSTALLED BY THE CONTRACTOR.

13. A SEPARATION OF 12" MUST BE MAINTAINED BETWEEN CMP AND ALL OTHER UTILITIES AND/OR TELEPHONE, CABLE ETC.

CABLE TV NOTES:

1. ALL TRENCHING, CONDUIT & BACK FILLING IS THE CONTRACTORS RESPONSIBILITY.

2. CONDUITS SHALL BE SCHEDULE 40 PVC AND WILL BE ROPED WITH 1/4" ROPE.

3. ALL CABLES SHALL BE IN CONDUIT UNDER ALL PAVED ROADS, DRIVEWAYS AND WALKWAYS AS NOTED OR SHOWN ON THE PLAN; 4" FOR THE MAIN CABLE AND 2" FOR THE SERVICE WIRES.

4. CONDUITS FOR SERVICE WIRES SHOULD BE INSTALLED AT ALL LOCATIONS WHERE REQUIRED DURING THE INSTALLATION OF THE MAIN CABLE.

5. THE CABLE COMPANY WILL SUPPLY THE MAIN CABLE AND PEDESTALS AND THE LABOR TO INSTALL SAME.

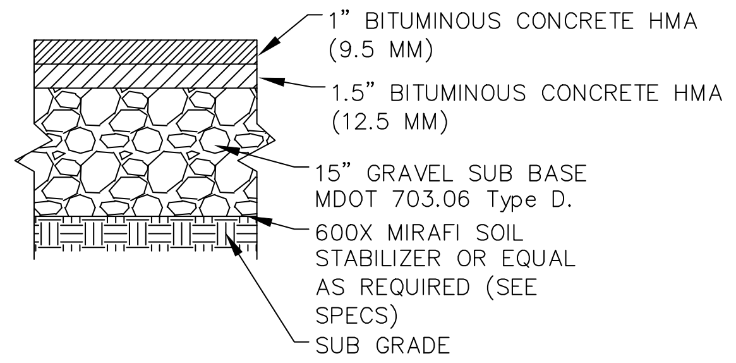
6. THE CABLE COMPANY WILL SUPPLY THE SERVICE WIRES.

7. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE CABLE COMPANY FOR INTERNAL WIRING SPECIFICATIONS AND SERVICE WIRE INSTALLATIONS.

8. ALL SERVICE WIRE INSTALLATIONS AND INTERIOR WIRING SHALL CONFORM TO THE CABLE COMPANY SPECIFICATIONS.

9. A SEPARATION OF 12" HORIZONTAL OR VERTICAL MUST BE MAINTAINED BETWEEN THE CABLE COMPANY AND ALL OTHER UTILITIES SUCH AS ELECTRIC, TELEPHONE OR OTHERS.

10. CONTRACTOR SHALL EXPOSE GROUND ROD AT ALL PAD LOCATIONS TO INSURE PROPER GROUNDING FOR THE CABLE COMPANY.



BIUMINOUS CONCRETE WALK

SEWER CONSTRUCTION NOTES:

1. SEWER LINE CONSTRUCTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CUMBERLAND STANDARD SPECIFICATIONS.

2. MINIMUM DIAMETER FOR MAINLINE SEWER IS EIGHT INCH (8") WITH A MINIMUM SLOPE OF 0.005.

3. SANITARY SEWER SERVICE STUBS TO BE SIX INCH (6") DIAMETER MINIMUM AND TO BE INSTALLED BEYOND THE EDGE OF PAVEMENT, AND UTILITY TRENCH AS SHOWN ON PLAN.

4. SANITARY SEWER SERVICE STUBS TO BE CONNECTED TO THE MAIN LINE BY USE OF 8X8X6 WYES. TEE STUBS WILL NOT BE ALLOWED.

5. SANITARY SEWER MANHOLES TO BE PER ASTM SPECIFICATIONS, WITH TWO (2) COATS OF BITUMINOUS COATING, WITH SMOOTH CHANNELED INVERTS, AND PROPERLY SIZED AND ORIENTED PRECAST PIPE OPENINGS WITH FLEXIBLE PIPE BOOTS. STEPS TO BE INSTALLED PARALLEL TO INVERT CHANNEL. SERVICE CONNECTIONS TO BE INCORPORATED IN INVERT CHANNEL.

6. MANHOLE FRAMES AND COVERS TO BE SUITABLE FOR HIGHWAY LOADING AND TO BE TO DISTRICT STANDARDS.

7. DESIGN AND CONSTRUCTION OF PROJECT SANITARY SEWER UTILITY WILL BE CARRIED OUT TO SPECIFICALLY EXCLUDE THE INTRODUCTION OF NON-SANITARY GROUND AND / OR SURFACE WATER INTO THE SANITARY SEWER SYSTEM.

8. ALL GRAVITY SEWER TO BE LOW PRESSURE AIR AND DEFLECTION TESTED AFTER BACK FILLING AND COMPACTION AND PRIOR TO CONNECTION OF BUILDING SEWER.

9. PRIOR TO THE START OF CONSTRUCTION, DEVELOPER TO PROVIDE TO DISTRICT TWO (2) COPIES OF UTILITY PLAN.

10. MINIMUM HORIZONTAL CLEARANCES TO BE MAINTAINED BETWEEN UTILITIES, TO PERMIT FUTURE MAINTENANCE OPERATIONS WITHOUT DISTURBING ADJACENT UTILITIES,

WATER CONSTRUCTION NOTES:

1. TEST PITS SHALL BE EXCAVATED AT CROSSINGS OF UTILITIES TO DETERMINE LOCATION AND DEPTH SUFFICIENTLY IN ADVANCE OF WATER MAIN CONSTRUCTION TO PERMIT ADJUSTMENT OF WATER MAIN LOCATION BY DEFLECTION OF THE PIPE.

2. MINIMUM DEPTH OF COVER FOR ALL WATER LINES SHALL BE 5.5' FROM FINISHED GRADE UNLESS OTHERWISE DIRECTED.

3. PROPOSED PIPELINE, VALVE, AND HYDRANT LOCATIONS ARE APPROXIMATE. FINAL LOCATION MAY BE ADJUSTED AS REQUIRED TO AVOID CONFLICTS WITH OTHER UTILITIES AND STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR EXCAVATION AND BACK FILL BEYOND THE TRENCH LIMITS SHOWN.

4. ANY EXISTING PIPELINE , UTILITY OR STRUCTURE, INCLUDING EXISTING WATER MAINS, DAMAGED BY CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER.

5. ALL PROPERTY REMOVED, DAMAGED OR ALTERED IN THE COURSE OF THE WORK SHALL BE REPLACED OR RESTORED TO EQUAL OR BETTER CONDITION TO THAT WHICH EXISTED BEFORE THE WORK COMMENCED.

6. ALL FITTINGS, VALVES, AND HYDRANTS SHALL HAVE MECHANICAL JOINTS RESTRAINED WITH GRIP-RING RETAINER GLANDS.

7. CONSTRUCTION SHALL FOLLOW PORTLAND WATER DISTRICT STANDARDS. ALL MATERIALS FOR THE PROJECT INCLUDING PIPE, COUPLINGS, VALVES, FITTINGS, HYDRANTS, TAPPING SLEEVES AND VALVES, VALVE BOXES, CORPORATION STOPS, CURB STOPS, SERVICE PIPING, CURB BOXES, RETAINER GLANDS, AND ACCESSORIES SUCH AS GASKETS, BOLTS, NUTS, AND GLANDS AS REQUIRED TO MAKE THE PIPING SYSTEMS COMPLETE SHALL MEET PWD SPECIFICATIONS. ALL CONCRETE AND EARTH MATERIALS INCLUDING CRUSHED STONE, GRAVEL, SAND, AND BORROW SHALL BE FURNISHED BY THE CONTRACTOR.

8. A SEPARATION OF 12" VERTICAL CLEARANCE MUST BE MAINTAINED BETWEEN THE WATER MAIN AND ALL OTHER UTILITIES.

9. ALL WATER MAIN SIZES ARE AS INDICATED ON THE PLAN/PROFILES. EACH UNIT SHALL BE SERVICED BY A 1 1/2" LINE OFF THE MAIN, SPLIT AT THE UNIT TO PROVIDE A 1"CTS DOMESTIC SUPPLY AND A 1 1/2" SPRINKLER SUPPLY INSTALLED IN ACCORDANCE WITH THE STANDARDS OF THE PORTLAND WATER DISTRICT. SIZES SHALL BE CONFIRMED BY THE SPRINKLER INSTALLER PRIOR TO CONSTRUCTION.

10. THE COMPLETE PIPING SYSTEM SHALL BE FLUSHED, CHLORINATED, AND PRESSURE TESTED BY THE CONTRACTOR PRIOR TO ACCEPTANCE BY THE OWNER. SERVICES SHALL BE INSTALLED UNDER LINE PRESSURE AFTER THE MAIN HAS BEEN SUCCESSFULLY PRESSURE TESTED.

2.	6-15-2020	Respond to SME Memo 3-4-2020 Re-submit to Maine DEP	CSB
1.	2-24-2020	clarify veritical slipform curb locations Re-submit to Town	CSB

Roadway Sections and Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

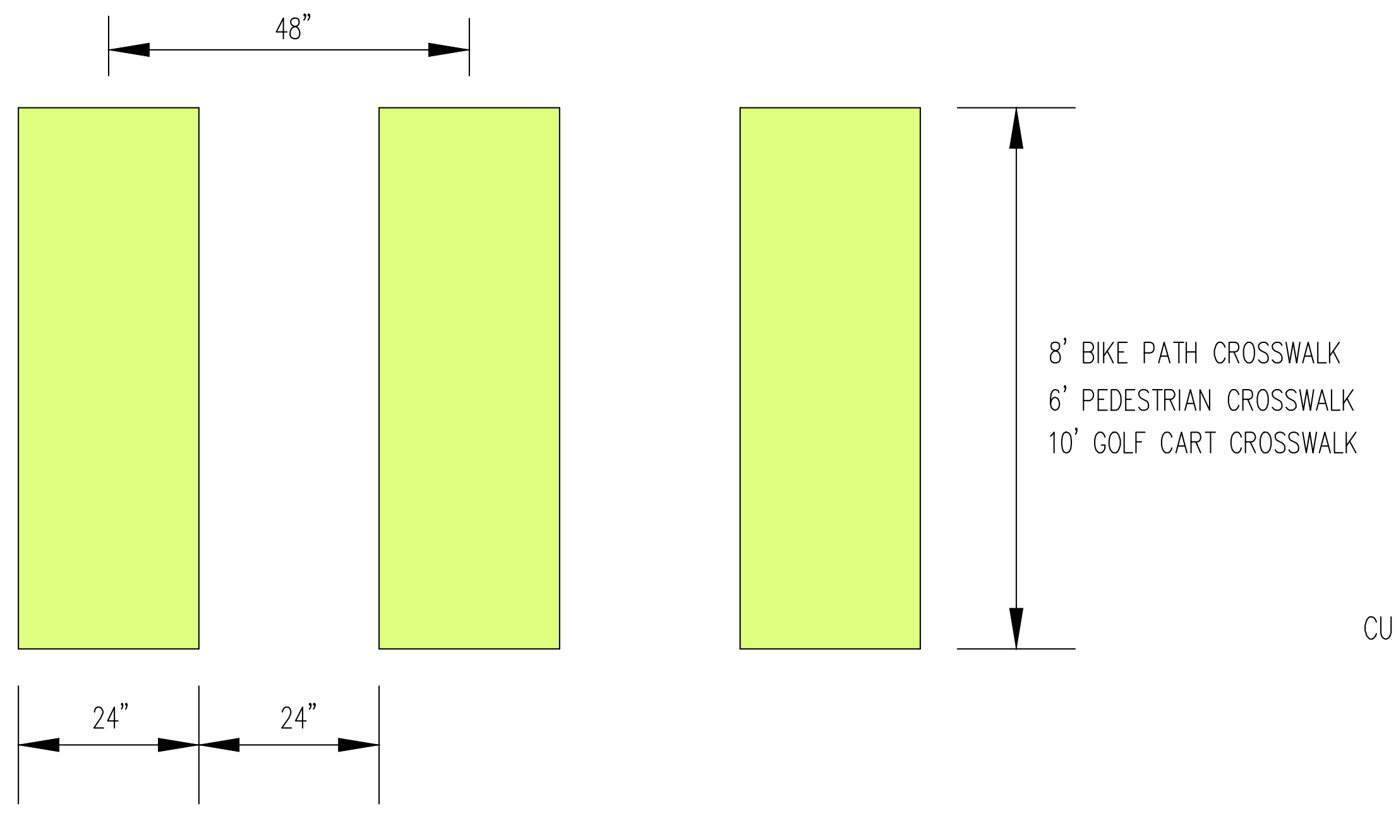
CHRISTOPHER S. BELANGER 9098
Ch Belanger
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

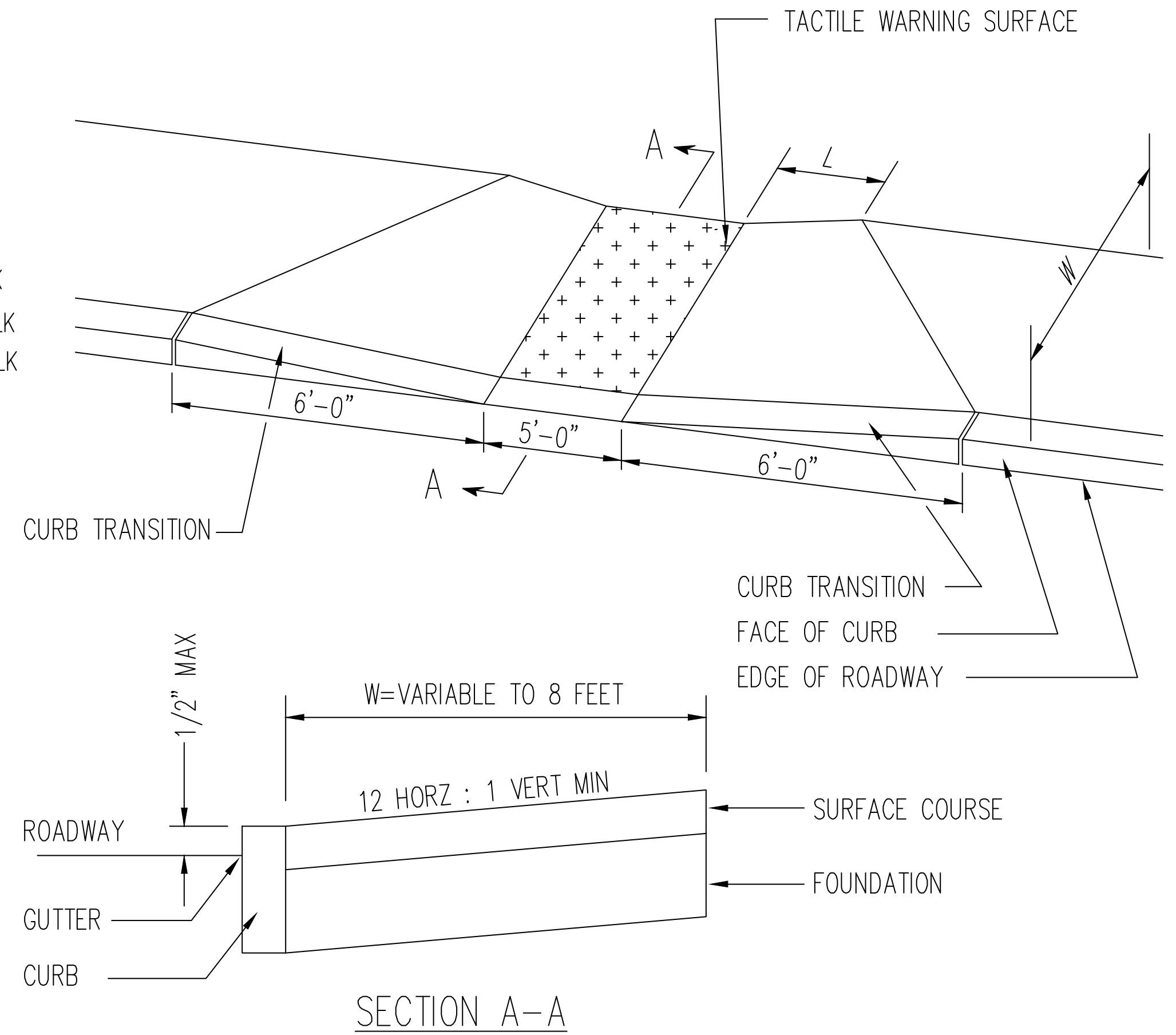
FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 134	C13
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



CROSSWALK

NOT TO SCALE

RD-MARKS-CROSSWALK/10-02



NOTES:

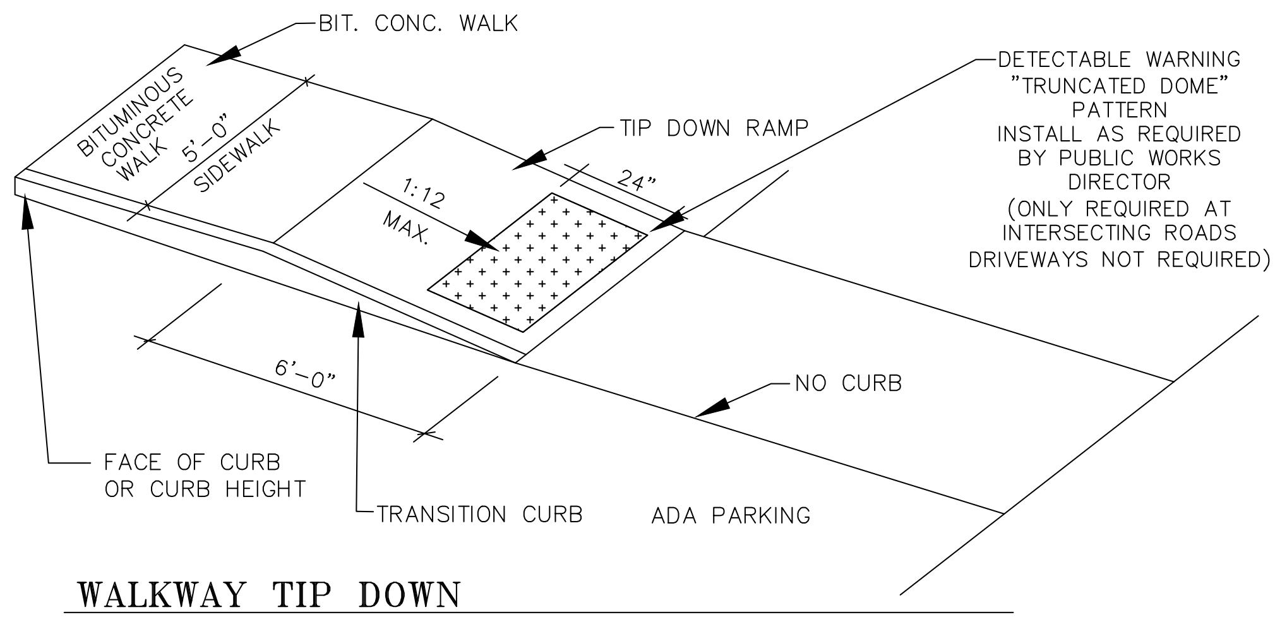
1. THE DIMENSIONS SHOWN AT ROADWAY EDGE ARE FIXED DISTANCES.
2. RAMP CROSS SECTION TO BE SAME AS ADJACENT SIDEWALK; I.E. DEPTH OF SURFACE AND FOUNDATION.
3. IN NO CASE ARE THE RAMPS TO BE PLACED BEHIND THE STOP LINE.

W	L
4'-0"	3'-6"±
5'-0"	2'-9"±
6'-0"	2'-0"±
7'-0"	1'-3"±
8'-0"	0'-0"

WHEEL CHAIR RAMP

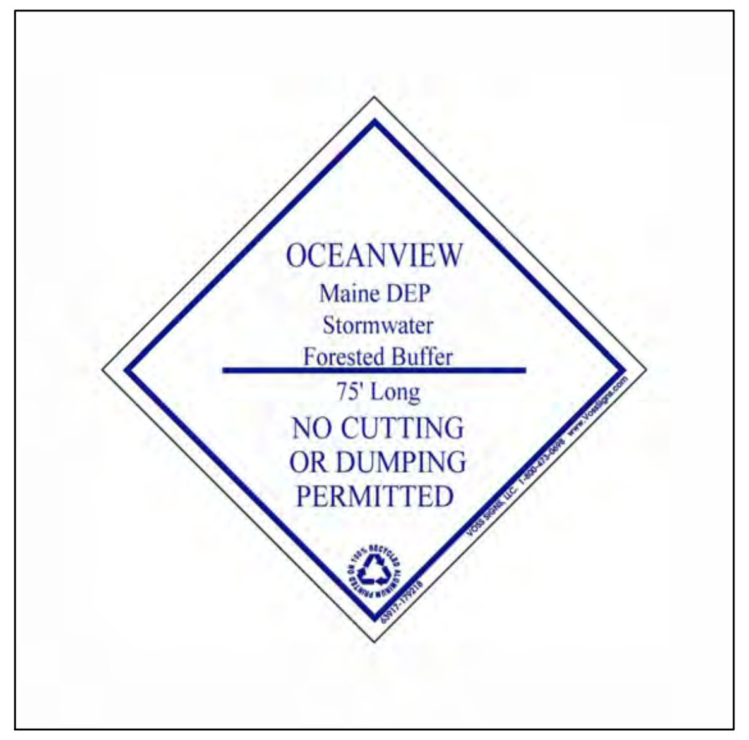
NOT TO SCALE

HC-RAMP-CONC-GCURB/5-95



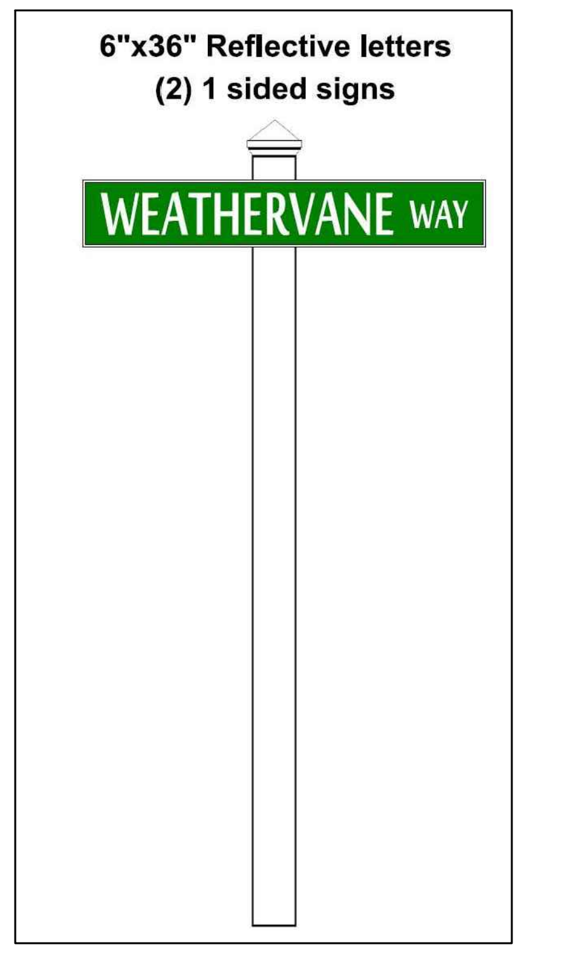
WALKWAY TIP DOWN

N.T.S.



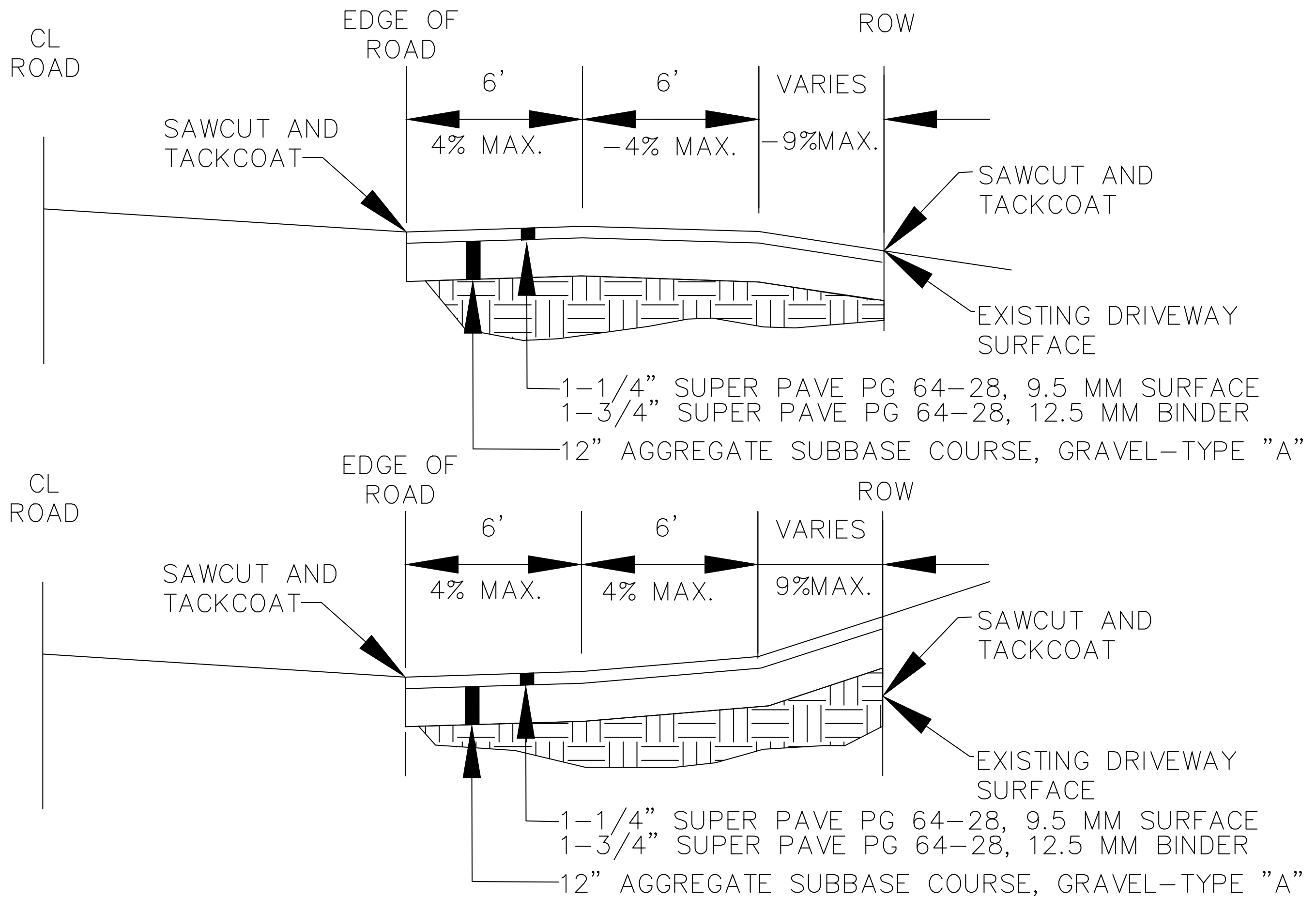
TYPICAL STORMWATER BUFFER SIGN

NOT TO SCALE



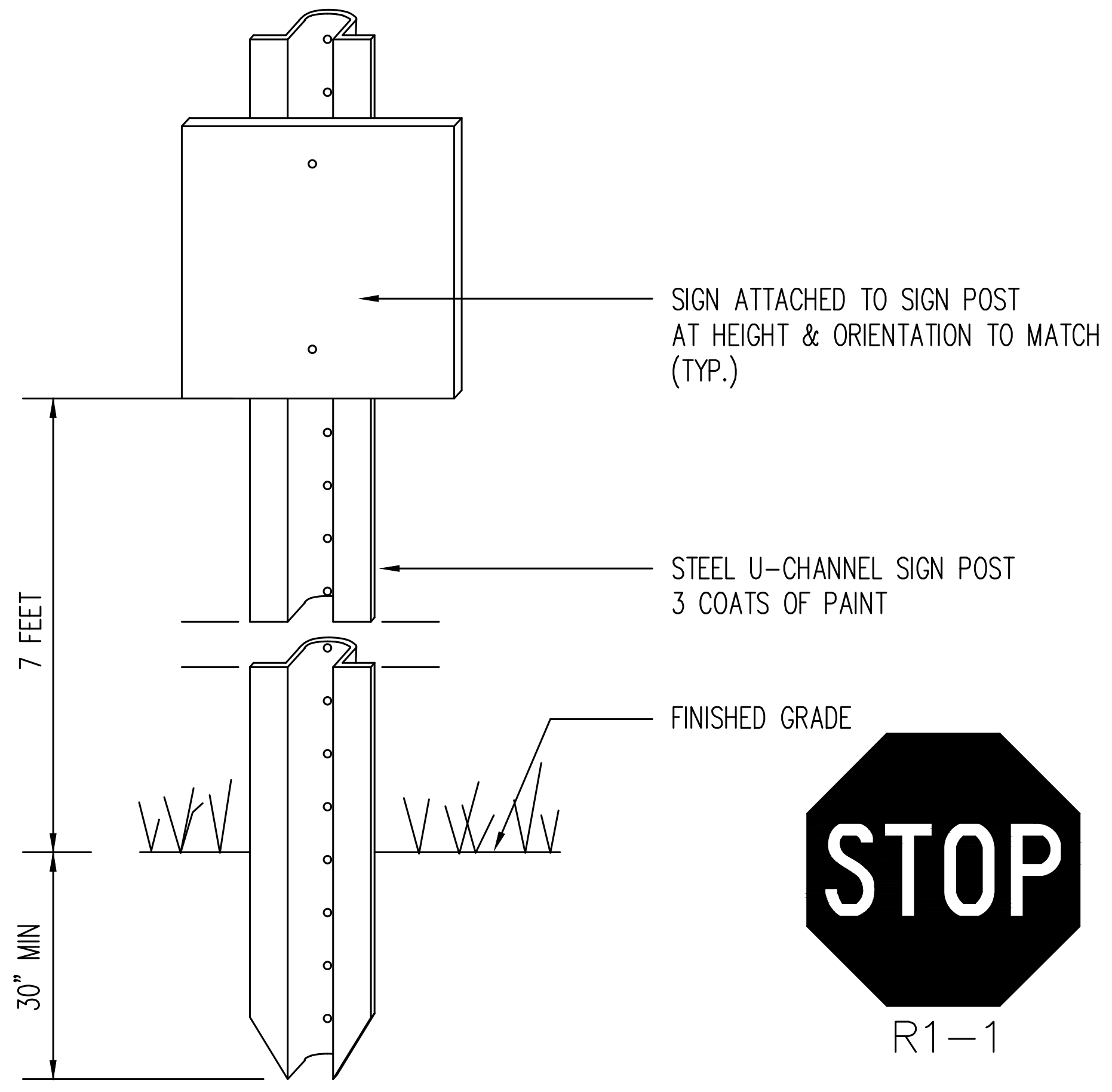
TYPICAL STREET SIGN

NOT TO SCALE



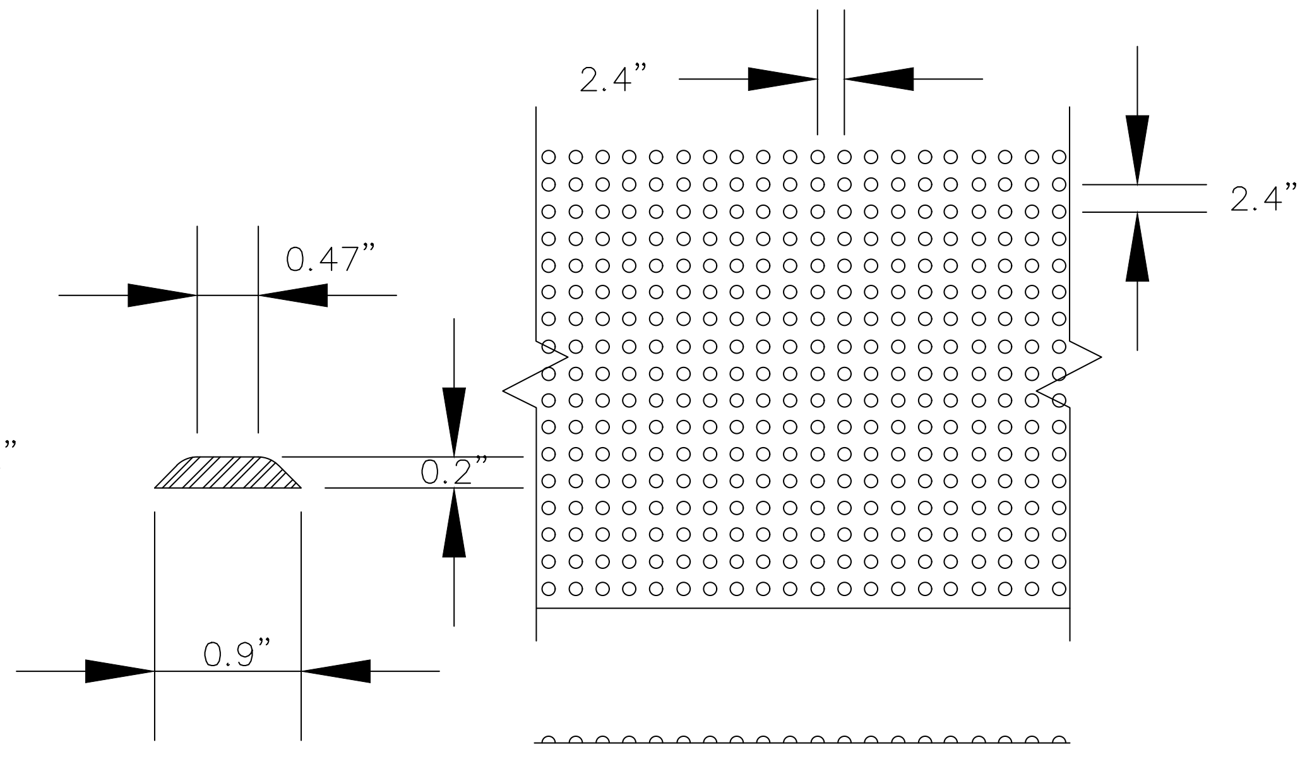
DRIVEWAY APRON DETAIL

NOT TO SCALE



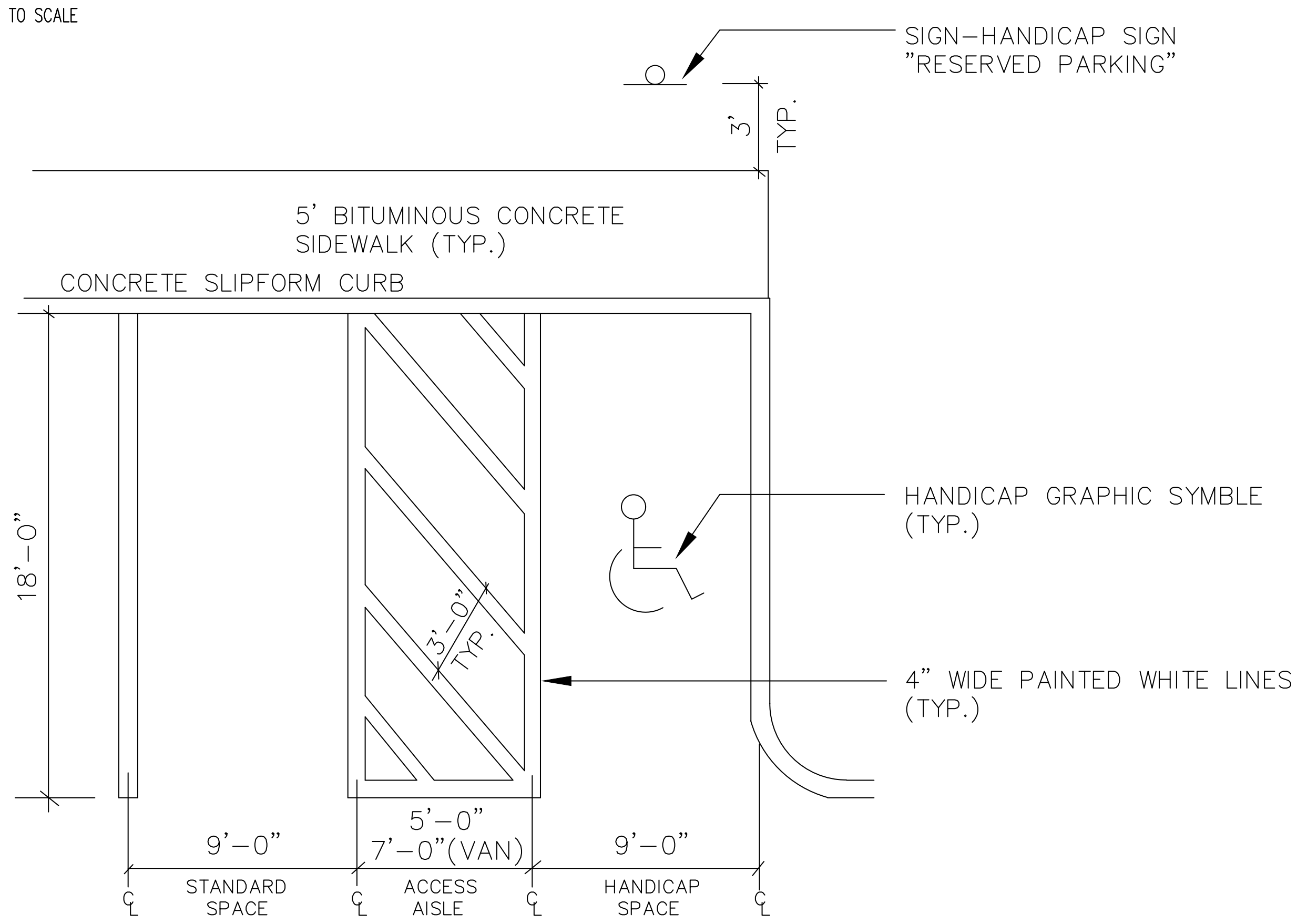
SIGN & POST

NOT TO SCALE



TRUNCATED DOME DETAIL

NOT TO SCALE



NOTE:

1. SYMBOLS AND PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT.

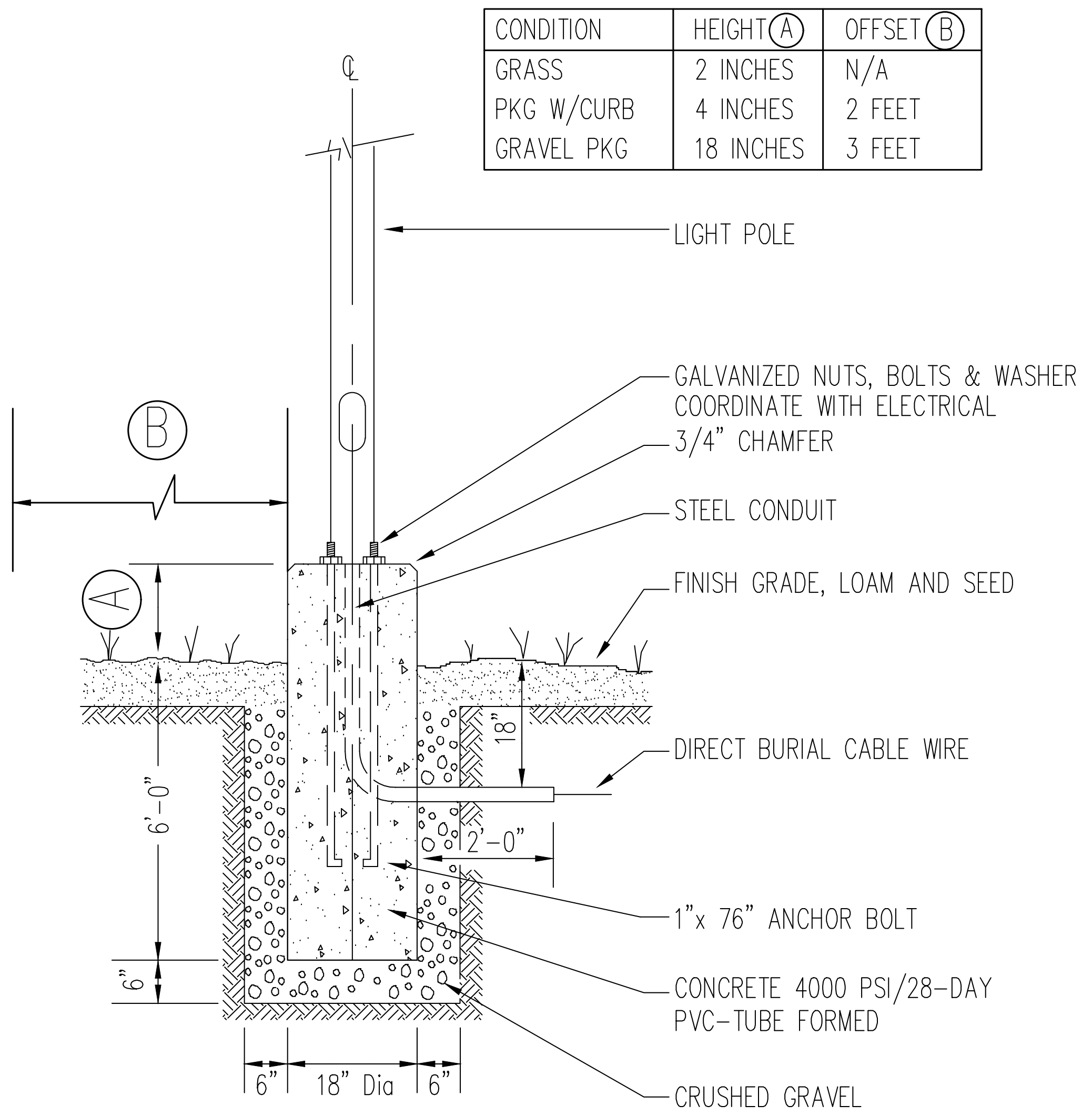
2. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT WITH SILICA SAND FOR SKID RESISTANCE, MEETING THE REQUIREMENTS OF OSHTA M248-TYPE N. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.

PARKING SPACE LAYOUT

NOT TO SCALE

BASE LOCATION

CONDITION	HEIGHT(A)	OFFSET(B)
GRASS	2 INCHES	N/A
PKG W/CURB	4 INCHES	2 FEET
GRAVEL PKG	18 INCHES	3 FEET

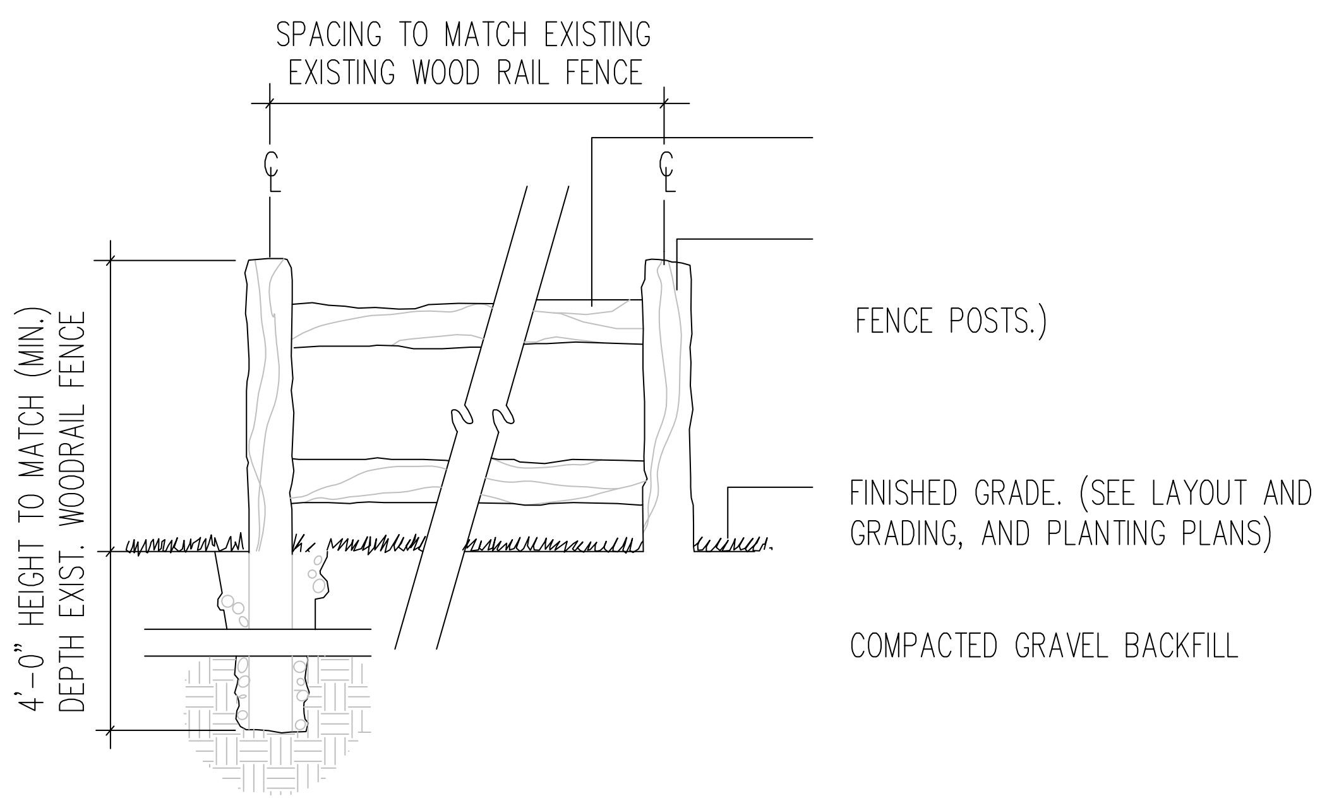


NOTES:

1. SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO INSTALLATION.
2. COORDINATE WITH ELECTRICAL SPECIFICATIONS.
3. COLD-GALVANIZE ALL CUTS.
4. FORM WITH FIBERGLASS OR PVC SMOOTH-FACED FORMS.
5. SEE ELECTRICAL PLANS FOR SIZES

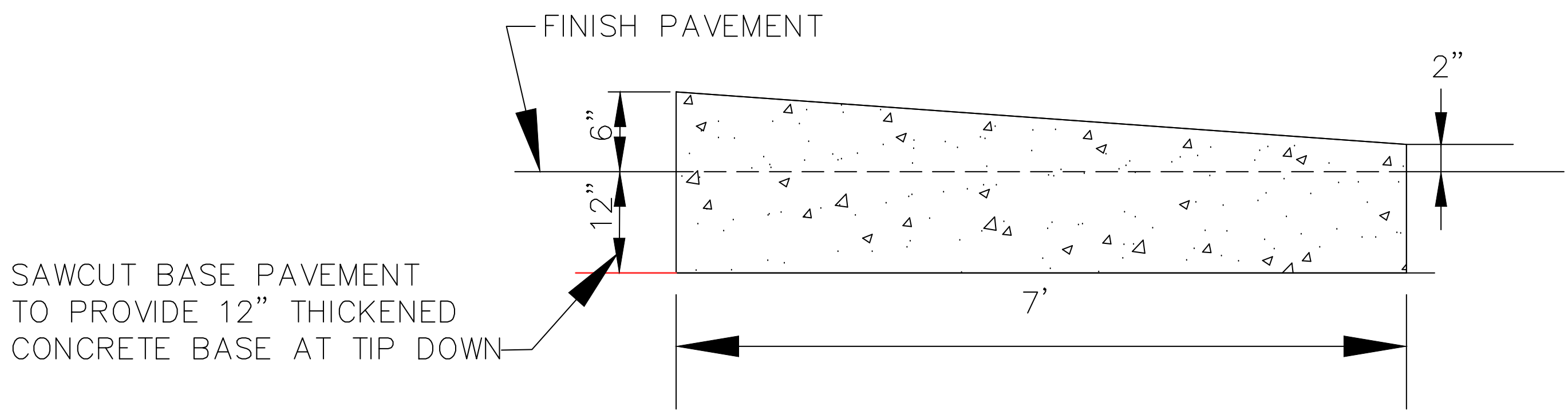
CONCRETE LIGHT POLE BASE

NOT TO SCALE



NEW & REINSTALLED WOOD RAIL FENCE

NOT TO SCALE



TYPICAL TIPDOWN CURB INSTALLATION

NOT TO SCALE

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	No changes this sheet, Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and DEP	CSB

CHRISTOPHER S. BELANGER
9098
6-15-2020

Civil Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

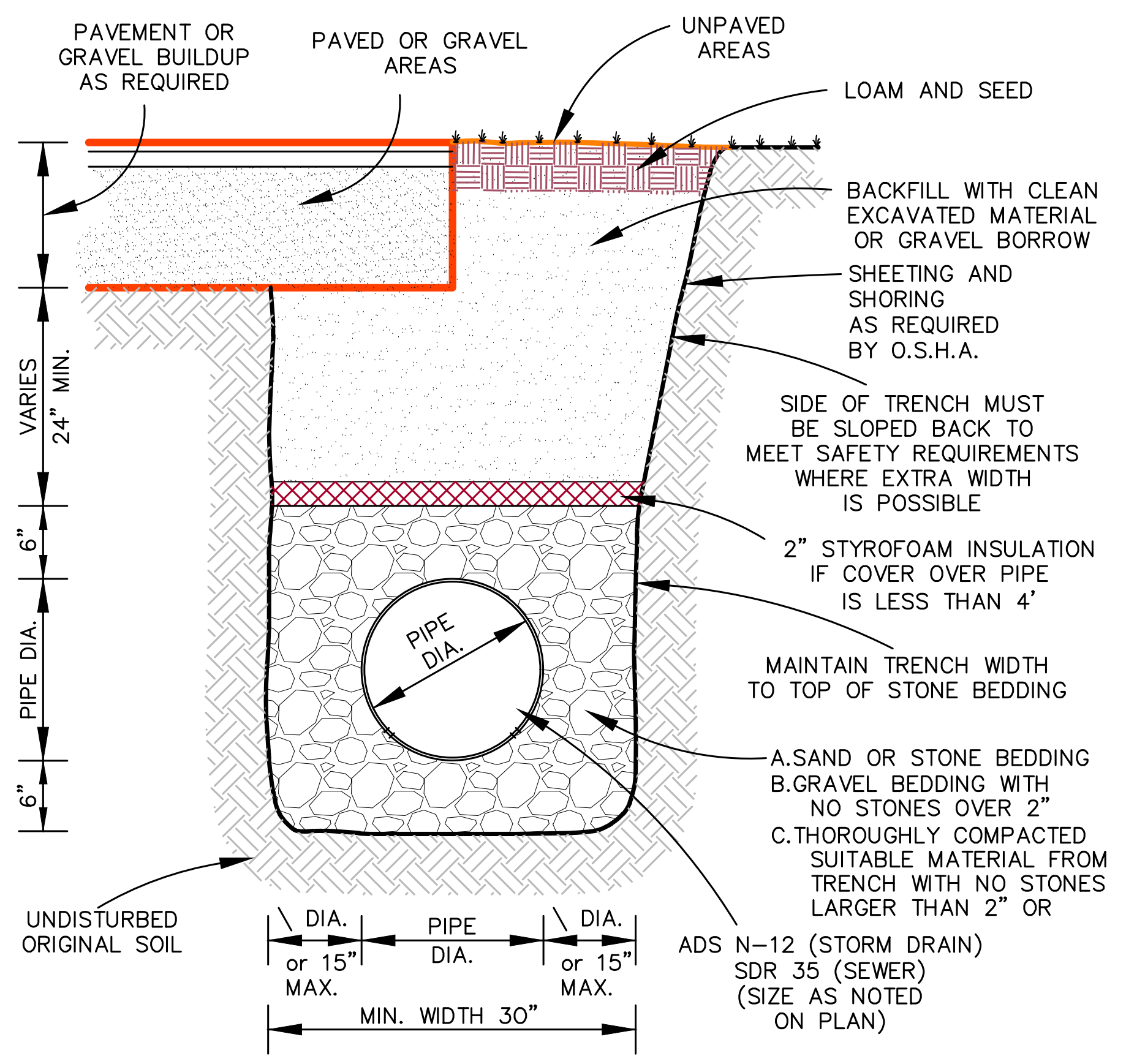
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

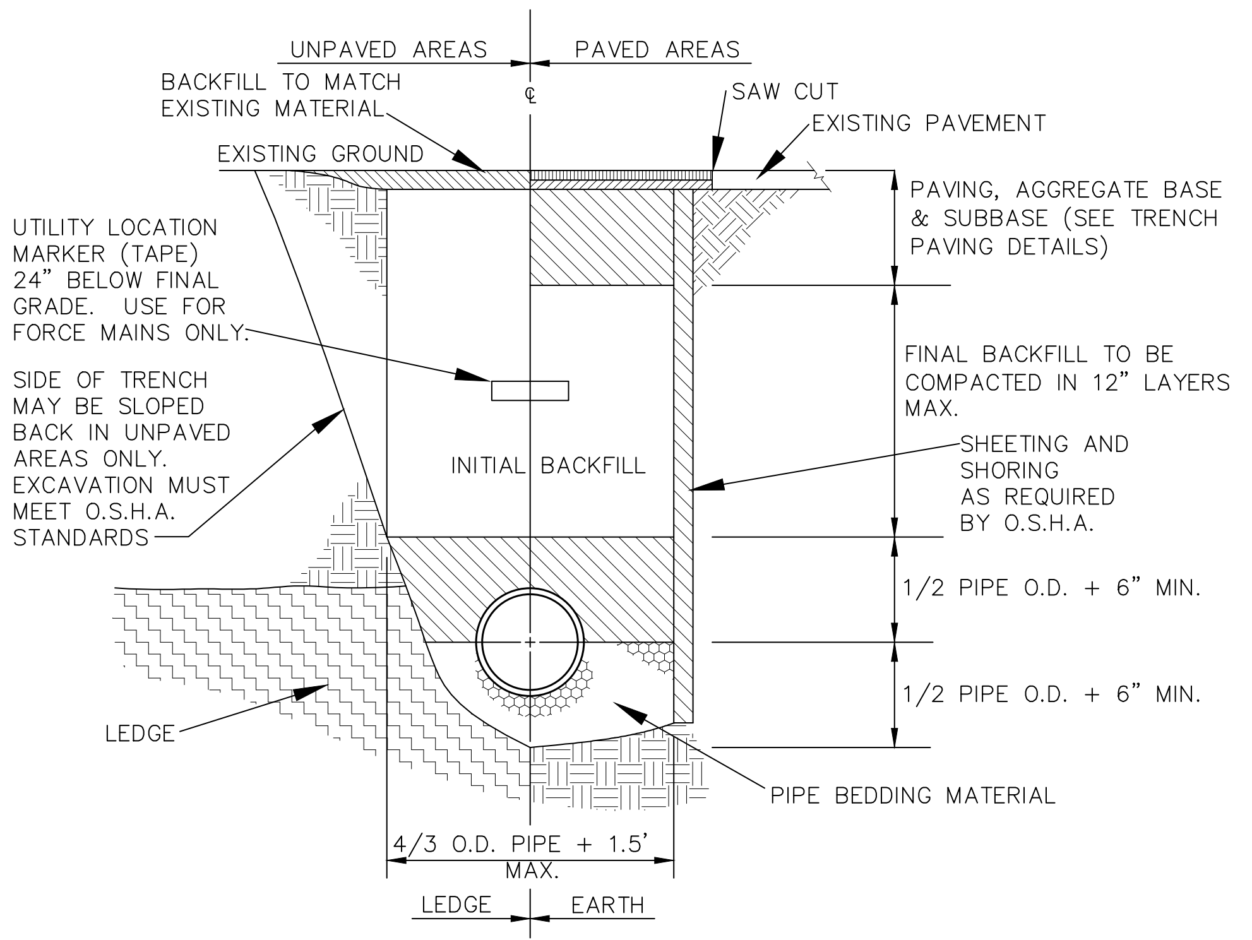
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C14
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



STORM DRAIN / SEWER TRENCH DETAIL

NOT TO SCALE



NOTES:
1. INSTALL 3 FOOT LONG IMPERVIOUS DAMS IN BEDDING/INITIAL BACKFILL MATERIAL EVERY 100 FEET TO PREVENT TRENCH GROUNDWATER FROM BEING CHANNELED ALONG BEDDING/INITIAL BACKFILL
2. REFER TO LATEST MDOT SPECIFICATIONS FOR BEDDING AND BACKFILL REQUIREMENTS.
3. INITIAL BACKFILL TO BE 12 INCHES OVER TOP OF PVC PIPE ONLY.

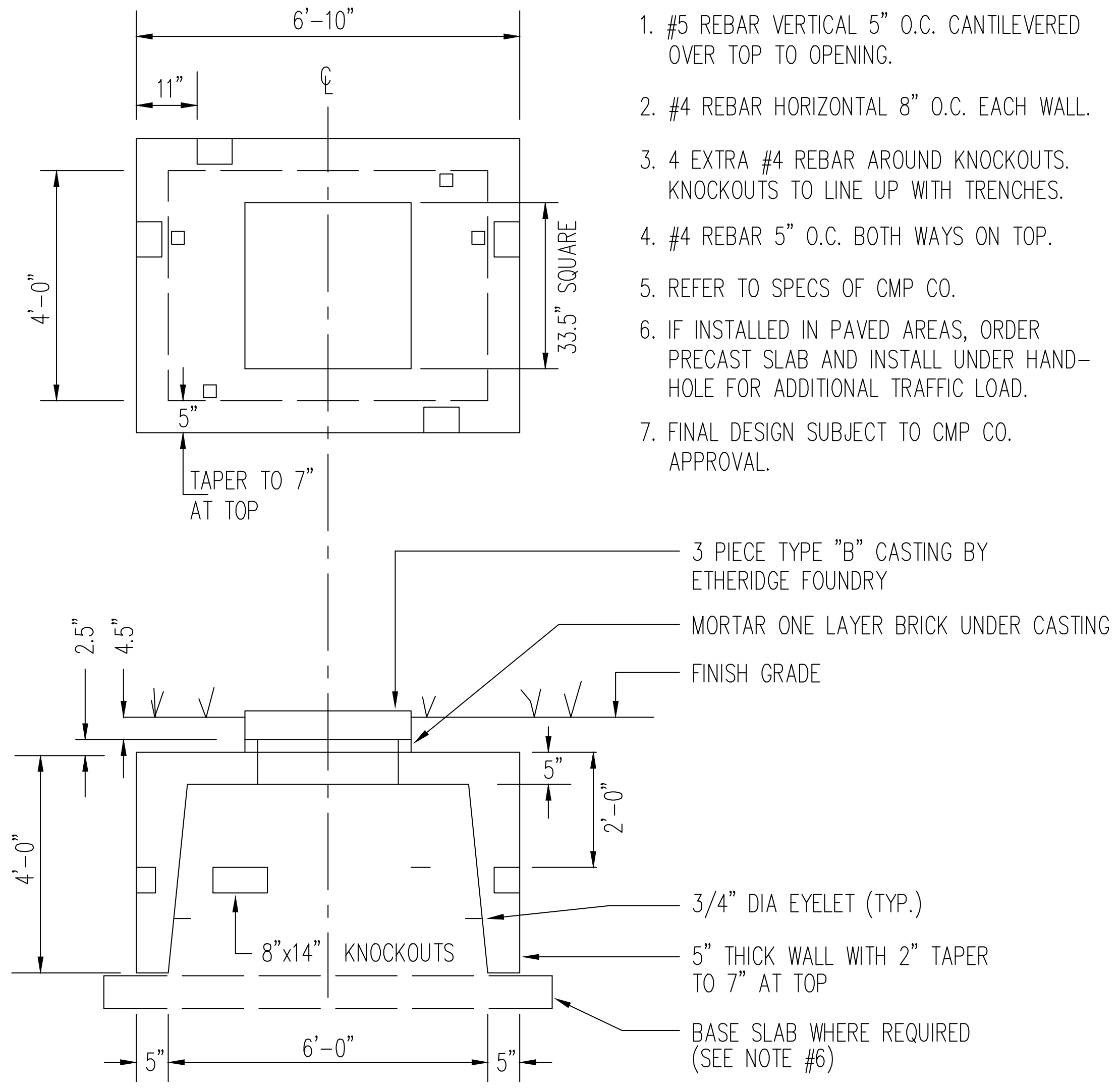
TYPICAL TRENCH DETAIL

NOT TO SCALE

PROGRESS PLAN
NOT FOR CONSTRUCTION

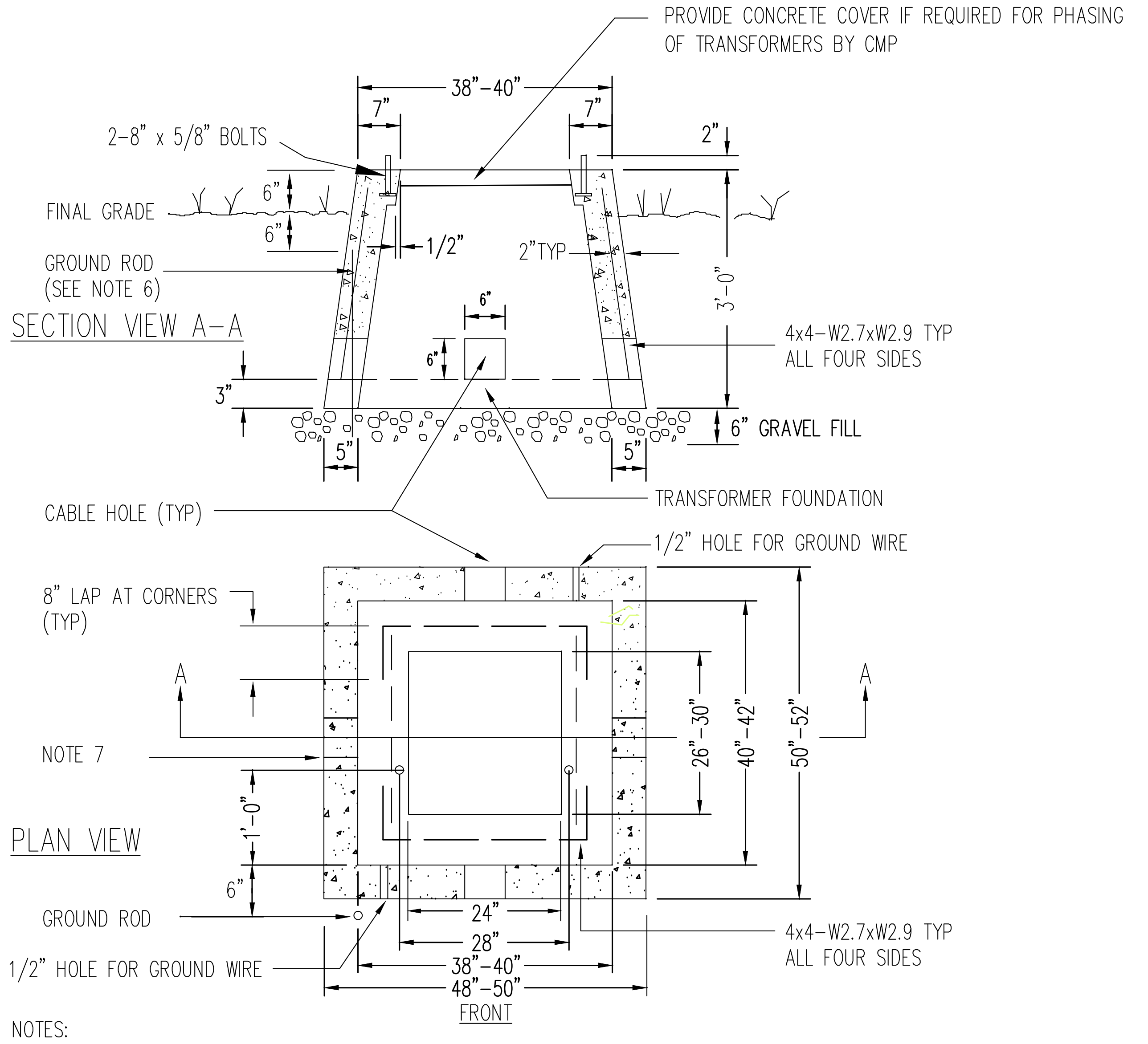
THIS DOCUMENT IS ISSUED FOR INFORMATIONAL PURPOSES ONLY. THE DATA SHOWN HEREON IS SUBJECT TO REVISION.

NOTES:
1. #5 REBAR VERTICAL 5" O.C. CANTILEVERED OVER TOP TO OPENING.
2. #4 REBAR HORIZONTAL 8" O.C. EACH WALL.
3. 4 EXTRA #4 REBAR AROUND KNOCKOUTS. KNOCKOUTS TO LINE UP WITH TRENCHES.
4. #4 REBAR 5" O.C. BOTH WAYS ON TOP.
5. REFER TO SPECS OF CMP CO.
6. IF INSTALLED IN PAVED AREAS, ORDER PRECAST SLAB AND INSTALL UNDER HAND-HOLE FOR ADDITIONAL TRAFFIC LOAD.
7. FINAL DESIGN SUBJECT TO CMP CO. APPROVAL.



ELECTRIC PULLBOX DETAIL

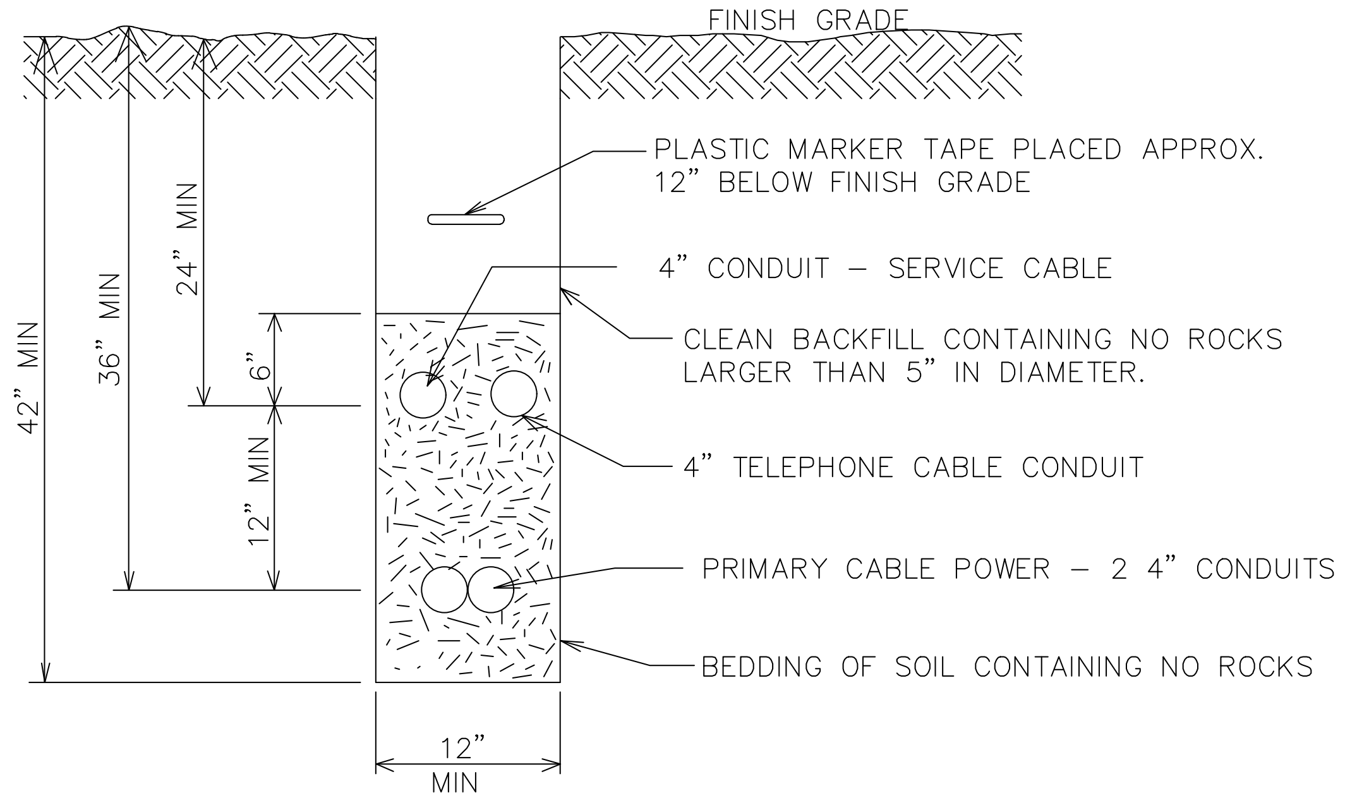
NOT TO SCALE



NOTES:
1. CONCRETE FOUNDATION IS SUITABLE FOR BOTH 7200/12470 VOLT & 20/34.5 KV SINGLE-PHASE TRANSFORMER & PRIMARY JUNCTION BOX INSTALLATIONS.
2. SET FOUNDATION ON SUITABLE GRAVEL FILL AND PROVIDE ADEQUATE DRAINAGE. LOCATION TO BE ACCESSIBLE BY TRUCK & SUITABLY PROTECTED FROM PLOW AND TRAFFIC DAMAGE.
3. FRONT DENOTES THE SIDE ON WHICH THE ACCESS DOORS ARE LOCATED. THE FOUNDATION MUST BE INSTALLED SO THE "FRONT" IS READILY ACESSIBLE.
4. OTHER CMP-APPROVED PADMOUNT TRANSFORMER FOUNDATIONS MAY BE USED.
5. PROVIDE 6" SQUARE CABLE HOLES (BOND OUT) 3" UP THE WALL FROM THE BASE. ONE PER WALL, LINE UP W/TRENCHES.
6. CMPCO. TO FURNISH A 3/4"x8" GALVANIZED ROD TO BE INSTALLED 6" IN FRONT OF THE LEFT FRONT CORNER OF TRANSFORMER FOUNDATION. THE TOP OF THE GROUND ROD IS TO BE 6" BELOW FINAL GRADE.
7. PULLING EYE INSERT, FOR USE WITH 3/4" NATIONAL COURSE THREAD EYE-BOLT (RICHMOND LCB-1 OR EQ.). LOCATED OPPOSITE EACH CABLE HOLE & APPROX. 16" FROM THE BOTTOM.
8. CAN BE USED AS A FOUNDATION FOR 3 PHASE JUNCTION CABINET CU UDCUT3 (S/C 62-1490) WITH CU UDCUT3S (S/C 67-3921) SKIRT.

TRANSFORMER PAD DETAIL 25 TO 167 KVA 1 Φ

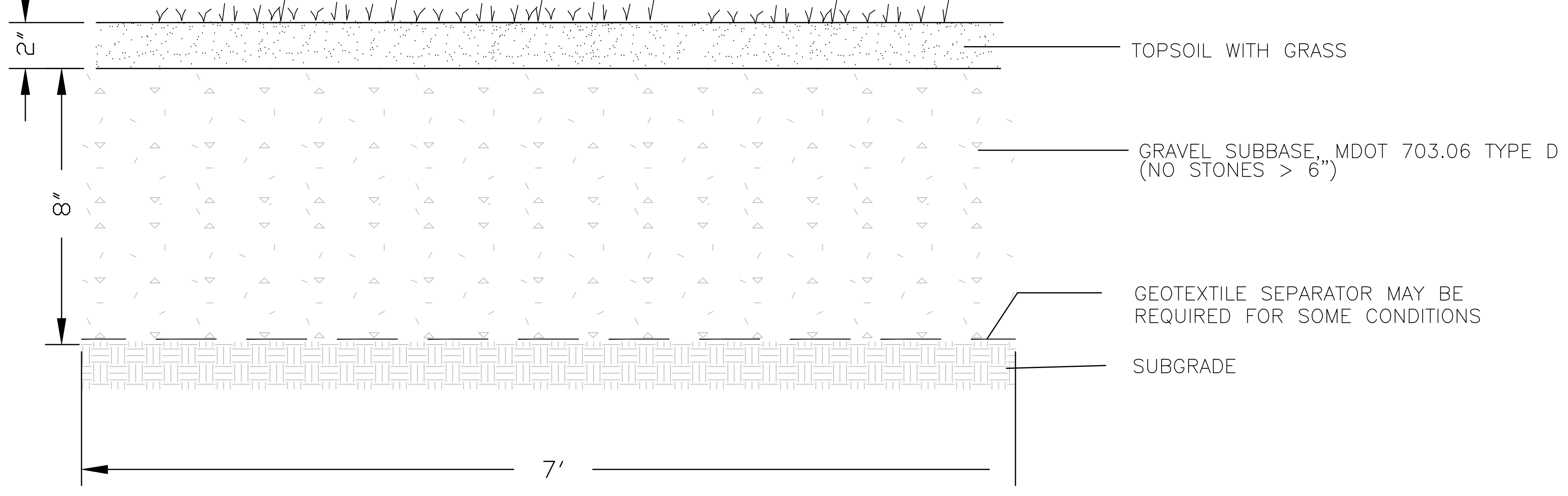
NOT TO SCALE



NOTES:
1. SECONDARY OR SERVICE CABLES AND COMMUNICATION CABLES MAY BE PLACED IN THE SAME TRENCH AT THE SAME DEPTH WITHOUT A REQUIRED CLEARANCE OR SEPARATION BETWEEN THE CABLES.
2. INSTALLATION SHOULD NOT ALLOW THE INTER-TWINING OF CABLES.
3. BEDDING AND BACKFILL SHALL BE FREE OF ROCKS, STUMPS AND OTHER DEBRIS.

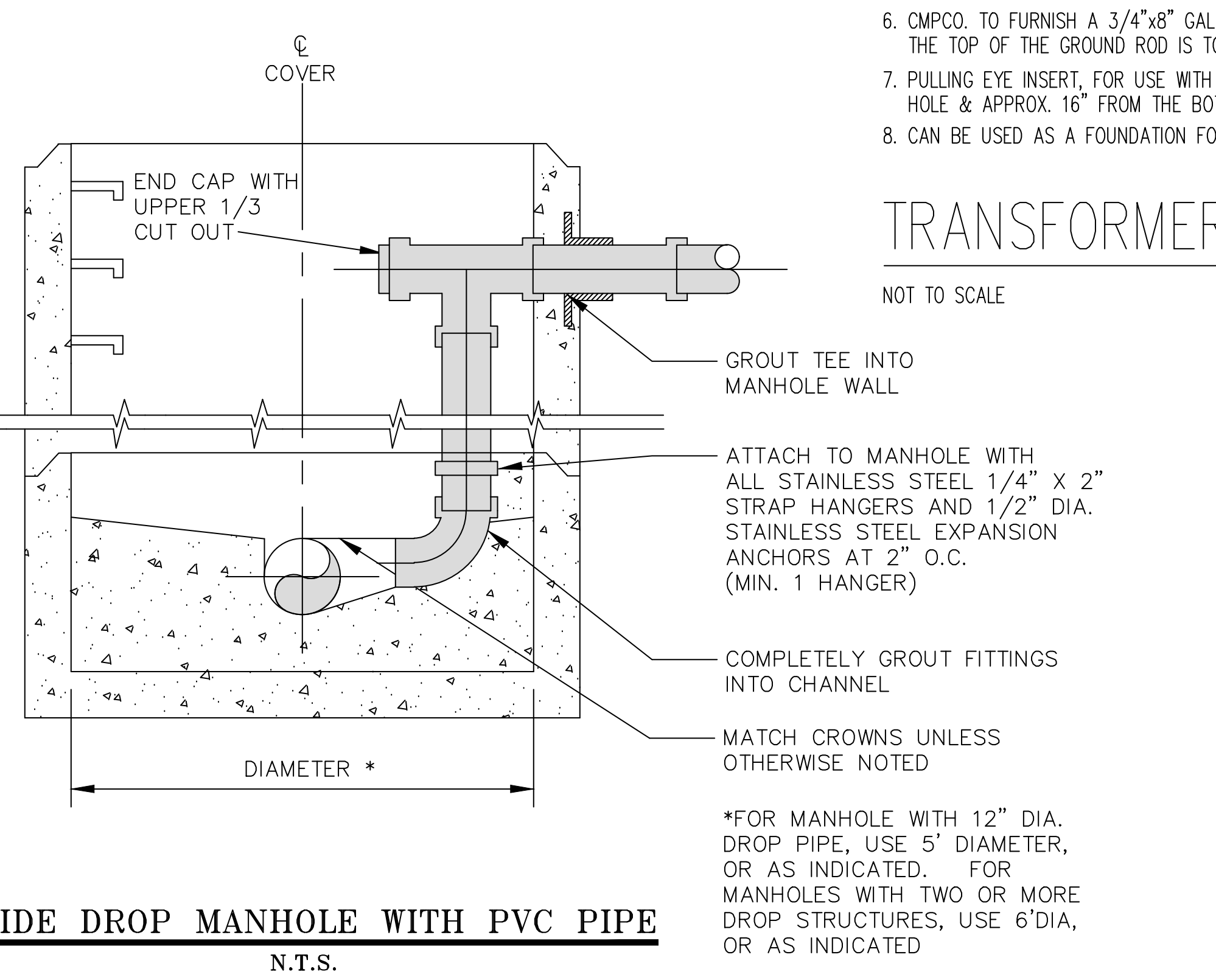
TYPICAL ELECTRICAL TRENCH

NOT TO SCALE



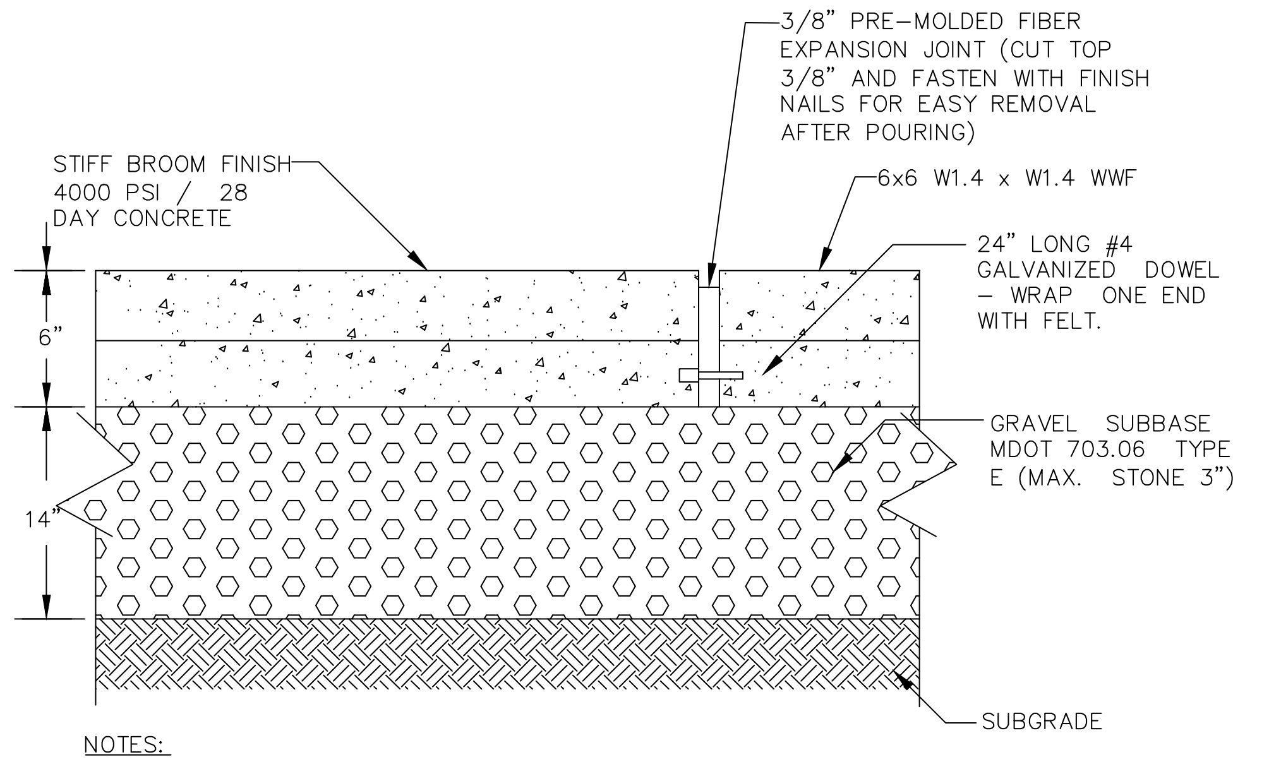
TYPICAL SECTION THRU STABILIZED TRAIL / CART PATH

NOT TO SCALE



INSIDE DROP MANHOLE WITH PVC PIPE

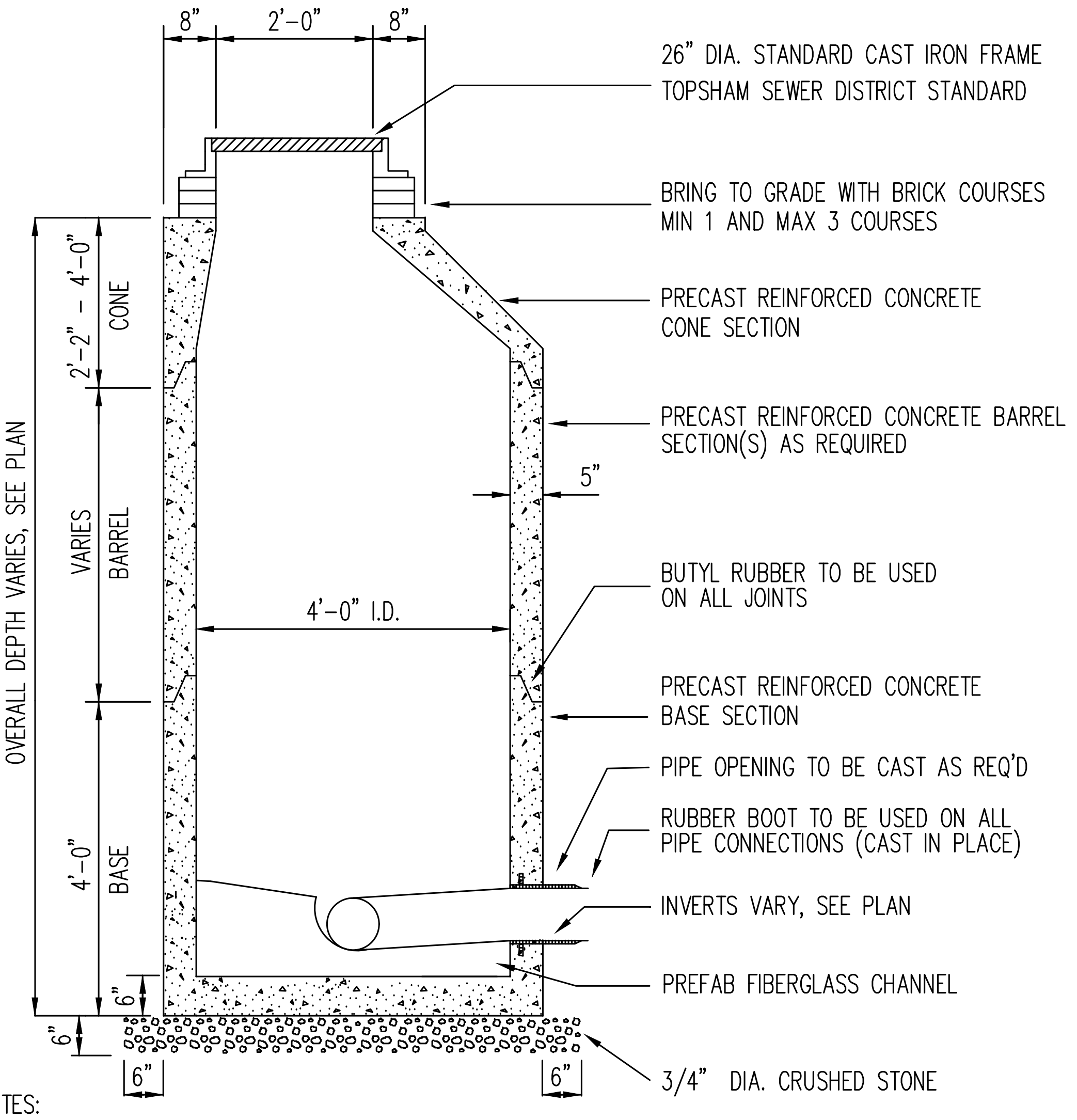
N.T.S.



NOTES:
-DO NOT PLACE CONCRETE DURING COLD OR RAINY WEATHER CONDITIONS (SEE SPECS.) -SEE PLAN DRAWINGS FOR EXPANSION JOINT LOCATIONS.

CONCRETE PAD – SECTION

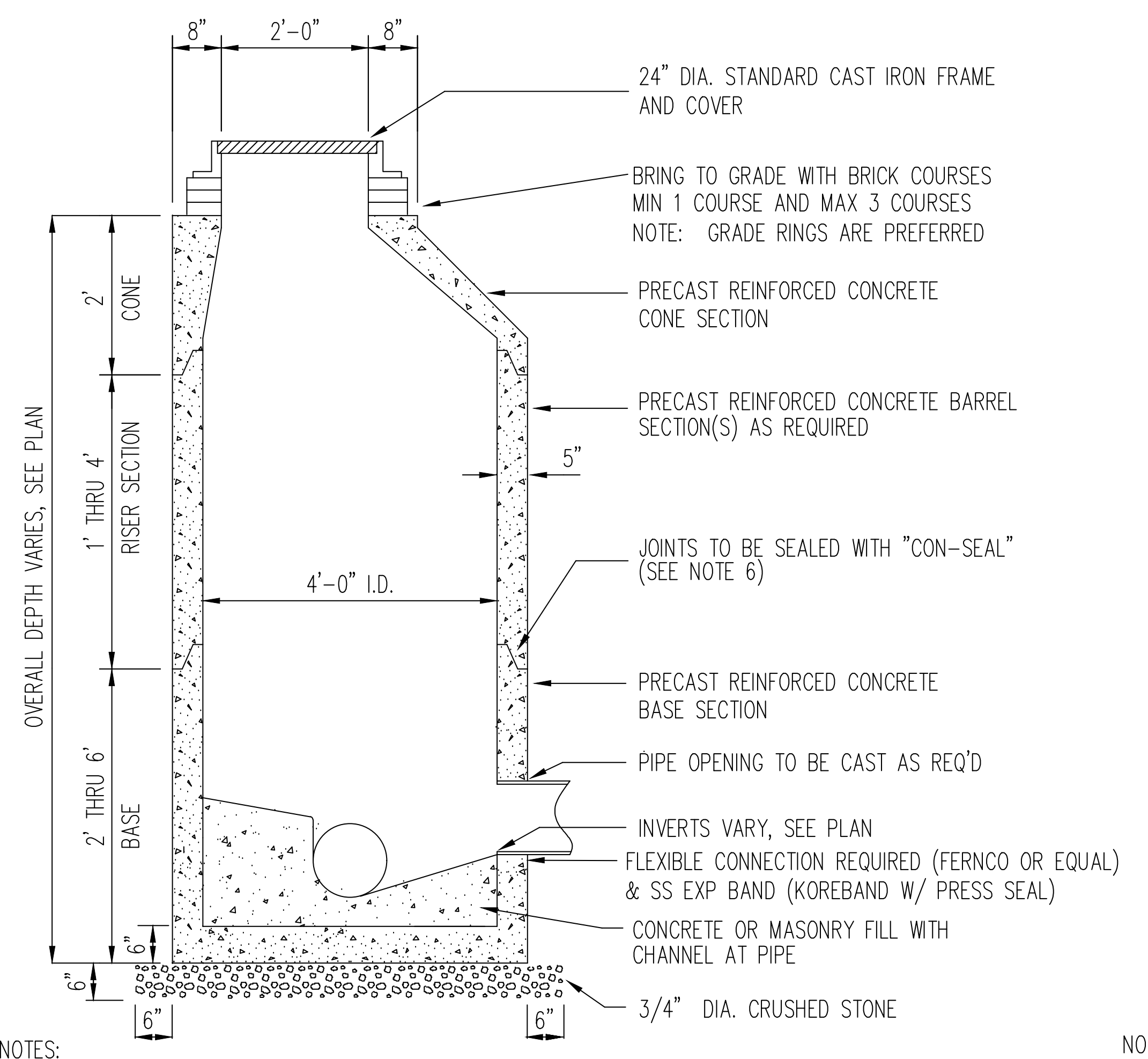
NOT TO SCALE



NOTES:
1. CONCRETE 4000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. MANHOLE STEPS TO BE ALUMINUM OR HIGH IMPACT PLASTIC.
5. APPLY TWO COATS OF BITUMASTIC PAINT ON ALL EXTERIOR SECTIONS.

SANITARY SEWER MANHOLE

NOT TO SCALE

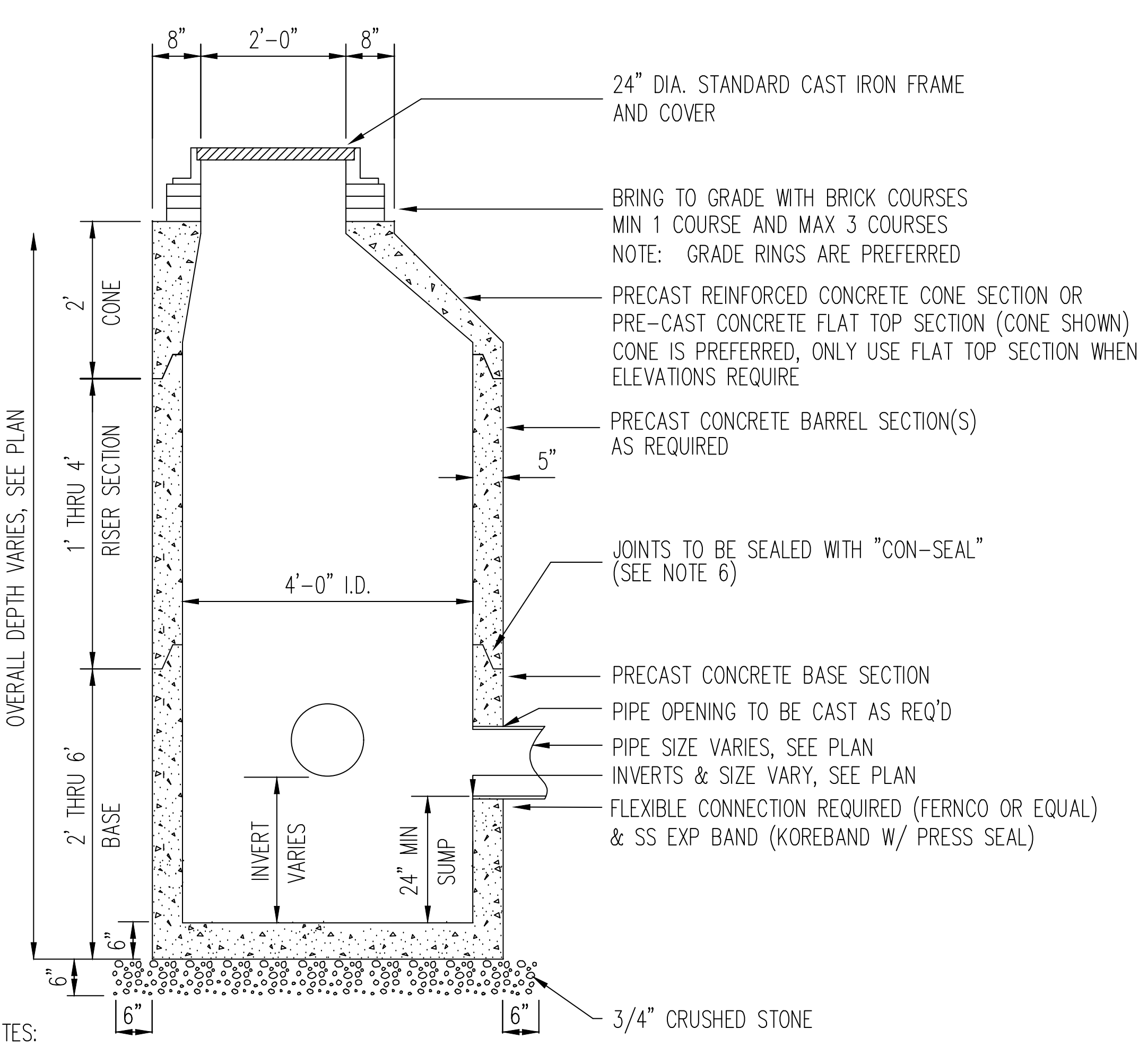


NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM. SLAB TOP – NO. 5 BARS.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. ONE POUR MONOLITHIC BASE SECTION
5. CEMENT: TYPE III PER ASTM C150-81.
6. JOINTS TO BE SEALED WITH "CON-SEAL".
(CONFORMS TO ASTM C443 SPEC. AND FEDERAL SPEC. SS-S-210A)
7. ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING.

PRECAST CONCRETE DRAIN MANHOLE

NOT TO SCALE

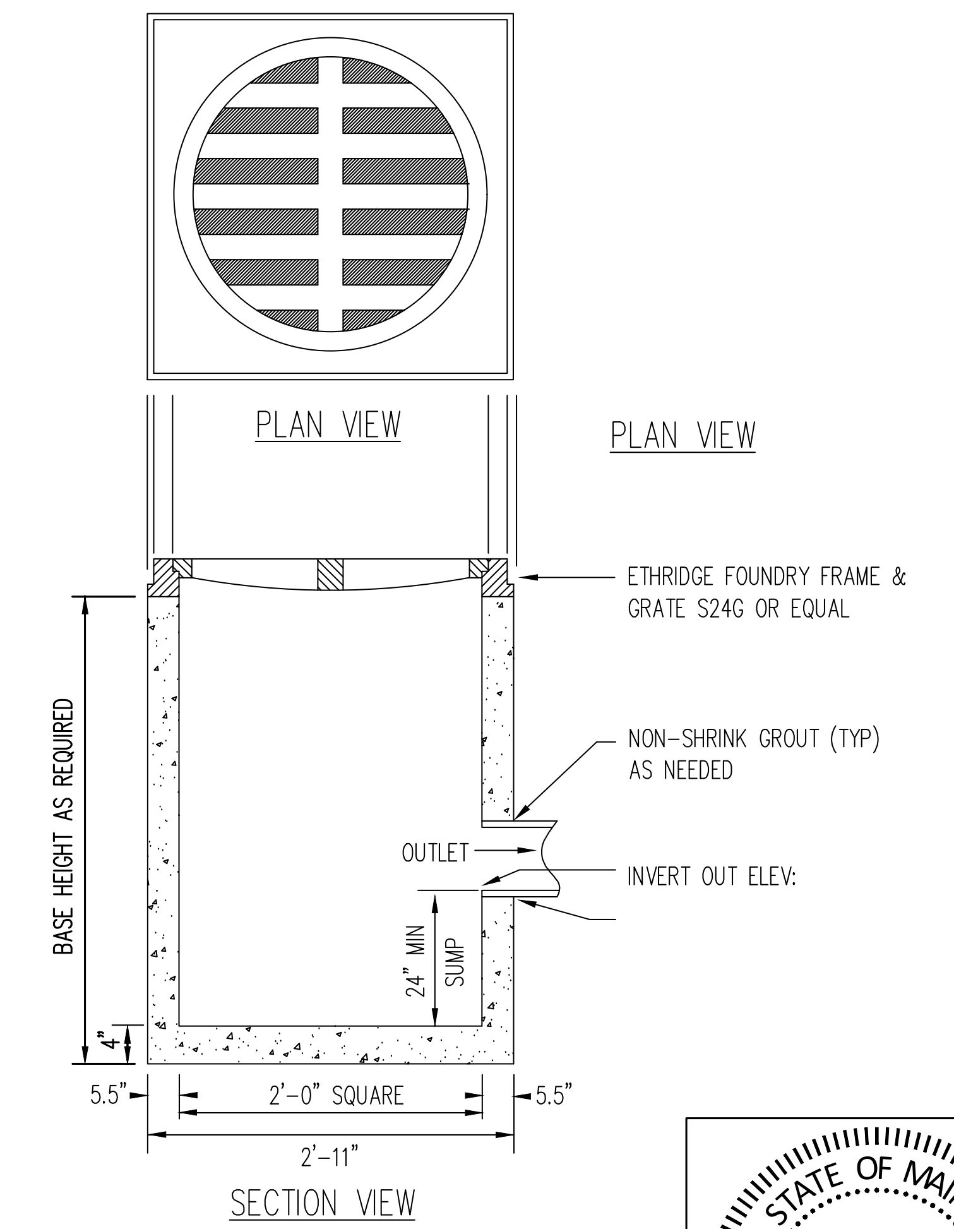
ST-DMH/9-02



NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING H-20 LOADING 4x4 / 4x4 WWM. SLAB TOP – NO. 5 BARS.
3. EACH CASTING TO HAVE LIFTING HOLES TO BE FILLED WITH NON-SHRINK MORTAR.
4. ONE POUR MONOLITHIC BASE SECTION
5. CEMENT: TYPE III PER ASTM C150-81.
6. JOINTS TO BE SEALED WITH "CON-SEAL".
(CONFORMS TO ASTM C443 SPEC. AND FEDERAL SPEC. SS-S-210A)
7. ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING.

TYPICAL PRECAST CONCRETE CATCH BASIN

NOT TO SCALE



NOTES:
1. CONCRETE 5000 PSI AFTER 28 DAYS.
2. REINFORCING: 1 LAYER 4x4 / 4x4 WWM.
3. FIELD INLET IS USED FOR SHALLOW, OFF-DRIVE, DEAD END DRAINAGE AREAS.

FIELD INLET

NOT TO SCALE

3.	6-15-2020	No changes, re-submit to town and dep	CSB
2.	2-24-2020	No changes this sheet, Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

CHRISTOPHER S. BELANGER 9098
6-15-2020

Civil Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

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Email: cbelanger@roadrunner.com
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FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C15
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

EROSION AND SEDIMENTATION NOTES:

1. The Site Contractor shall follow the "Maine Erosion and Sediment Control BMPs" published by the Maine DEP in 2003 and the "Maine Erosion and Sediment Control Practices Field Guide for Contractors published in 2016 or most current update". The manuals can be found on the Maine DEP web site. A Link to the field guide is shown below:

http://www.maine.gov/dep/land/erosion/escbmps/index.html

THE CONTRACTOR SHALL ALSO FOLLOW THE GUIDELINES LISTED IN APPENDICES A, B, C IN MAINE DEP CHAPTER 500 RULES (2015 NOTES PROVIDED ON THIS SHEET).

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES:

EROSION/SEDIMENT CONTROL DEVICES:

THE FOLLOWING EROSION SEDIMENTATION CONTROL DEVICES ARE PROPOSED FOR CONSTRUCTION ON THIS PROJECT. INSTALL THESE DEVICES AS INDICATED ON THE PLANS.

1 SILT FENCE: SILT FENCE WILL BE INSTALLED ALONG THE DOWN GRADING EDGES OF DISTURBED AREAS TO TRAP RUNOFF BORNE SEDIMENTS UNTIL THE SITE IS STABILIZED. IN AREAS WHERE STORMWATER DISCHARGES THE SILT FENCE WILL BE REINFORCED WITH HAY BALES TO HELP MAINTAIN THE INTEGRITY OF THE SILT FENCE AND TO PROVIDE ADDITIONAL TREATMENT.

2. HAY BALES: HAY BALES TO BE PLACED IN LOW FLOW DRAINAGE SWALES AND PATHS TO TRAP SEDIMENTS AND REDUCE RUNOFF VELOCITIES. DO NOT PLACE HAY BALES IN FLOWING WATER OR STREAMS.

3. RIPRAP: PROVIDE RIPRAP IN AREAS WHERE CULVERTS DISCHARGE OR AS SHOWN ON THE PLANS.

4. LOAM, SEED, & MULCH: ALL DISTURBED AREAS, WHICH ARE NOT OTHERWISE TREATED, SHALL RECEIVE PERMANENT SEEDING AND MULCH TO STABILIZE THE DISTURBED AREAS. THE DISTURBED AREAS WILL BE REVEGETATED WITHIN 5 DAYS OF FINAL GRADING. SEEDING REQUIREMENTS ARE PROVIDED AT THE END OF THIS SPECIFICATION.

5. STRAW AND HAY MULCH: USED TO COVER DENUDED AREAS UNTIL PERMANENT SEED OR EROSION CONTROL MEASURES ARE IN PLACE. MULCH BY ITSELF CAN BE USED ON SLOPES LESS THAN 15% IN SUMMER AND 8% IN WINTER. JUTE MESH IS TO BE USED OVER MULCH ONLY. CURLEX II AND EXCELSIOR MAY BE USED IN PLACE OF JUTE MESH OVER MULCH.

6. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.

TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES:

PROVIDE THE FOLLOWING TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION OF THE DEVELOPMENT:

1. SILTATION FENCE ALONG THE DOWNGRADIENT SIDE OF THE PARKING AREAS AND OF ALL FILL SECTIONS. THE SILTATION FENCE WILL REMAIN IN PLACE UNTIL THE SITE IS 90% REVEGETATED. REMOVE SILTATION FENCE, WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED. REMOVE ANY ACCUMULATED SEDIMENT AND STABILIZE.

2. HAY BALES PLACED AT KEY LOCATIONS TO SUPPLEMENT THE SILT FENCE.

3. PROTECT TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS, OR COMMON EXCAVATION AS FOLLOWS:
  A. SOIL STOCKPILE SIDE SLOPES SHALL NOT EXCEED 2:1.
  B. AVOID PLACING TEMPORARY STOCKPILES IN AREAS WITH SLOPES OVER 10 PERCENT, OR NEAR DRAINAGE SWALES. SEE ITEM 3 IN CONSTRUCTION PHASE NOTES BELOW.
  C. STABILIZE STOCKPILES WITHIN 15 DAYS BY TEMPORARILY SEEDING WITH A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH.
  D. SURROUND STOCKPILE SOIL WITH SILTATION FENCE AT BASE OF PILE.

4. ALL DENUDED AREAS WHICH HAVE BEEN ROUGH GRADED AND ARE NOT LOCATED WITHIN THE BUILDING PAD, OR PARKING AND DRIVEWAY SUBBASE AREA THAT WILL NOT BE WORKED FOR MORE THAN 7 DAYS SHALL RECEIVE MULCH OR NON-ERODABLE COVER. STABILIZE AREAS WITHIN 75 FEET OF A WETLAND OR WATERBODY WITHIN 48 HOURS OF THE INITIAL DISTURBANCE OR THE SOIL OR PRIOR TO ANY STORM EVENT, WHICHEVER COMES FIRST. IN THE EVENT THE CONTRACTOR COMPLETES FINAL GRADING AND INSTALLATION OF LOAM AND SOD WITHIN THE TIME PERIODS PRESENTED ABOVE, INSTALLATION OF MULCH AND NETTING, WHERE APPLICABLE, IS NOT REQUIRED.

5. IF WORK IS CONDUCTED BETWEEN OCTOBER 15 AND APRIL 15, ALL DENUDED AREAS ARE TO BE COVERED WITH HAY MULCH, APPLIED AT TWICE THE NORMAL APPLICATION RATE, AND ANCHORED WITH FABRIC NETTING. THE PERIOD BETWEEN FINAL GRADING AND MULCHING SHALL BE REDUCED TO A 15 DAY MAXIMUM.

6. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE HAS BEEN STABILIZED OR IN AREAS WHERE PERMANENT EROSION CONTROL MEASURES HAVE BEEN INSTALLED.

PERMANENT EROSION CONTROL MEASURES:

THE FOLLOWING PERMANENT CONTROL MEASURES ARE REQUIRED BY THIS EROSION/SEDIMENTATION CONTROL PLAN:

1. ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.), WILL BE LOAMED, LIMED, FERTILIZED AND SEEDED. NATIVE TOPSOIL SHALL BE STOCKPILED AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.

2. IF AN AREAS WILL NOT BE WORKED FOR MORE THAN ONE YEAR OR HAS BEEN BROUGHT TO FINAL GRADE, THEN PERMANENTLY STABILIZE THE AREA WITHIN 7 DAYS BY PLANTING VEGETATION, SEEDING, SOD, OR THROUGH THE USE OF PERMANENT MULCH, OR RIPRAP, OR ROAD SUB-BASE. IF USING VEGETATION FOR STABILIZATION, SELECT THE PROPER VEGETATION FOR THE LIGHT, SOIL, AND MOISTURE CONDITIONS; AMEND AREAS OF DISTURBED SUBSOILS WITH TOPSOIL, COMPOST, OR FERTILIZERS; PROTECT SEEDED AREAS WITH MULCH OR, IF NECESSARY, EROSION CONTROL BLANKETS; AND SCHEDULE SODDING, PLANTING, AND SEEDING TO AVOID DIE-OFF FROM SUMMER DROUGHT AND FALL FROSTS. NEWLY SEEDED OR SODDED AREAS MUST BE PROTECTED FROM VEHICLE TRAFFIC, EXCESSIVE PEDESTRIAN TRAFFIC, AND CONCENTRATED RUNOFF UNTIL THE VEGETATION IS WELL ESTABLISHED. IF NECESSARY, AREAS MUST BE SEEDED AND MULCHED AGAIN IF GERMINATION IS SPARCE, PLANT COVERAGE IS SPOTTY, OR TOPSOIL EROSION IS EVIDENT. ONE OR MORE OF THE FOLLOWING MAY APPLY TO A PARTICULAR SITE.

(a) Seeded areas. For seeded areas, permanent stabilization means a 90% cover of healthy plants with no evidence of washing or rilling of the topsoil.

(b) Sodded areas. For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.

(c) Permanent Mulch. For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

(d) Riprap. For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.

(e) Agricultural use. For construction projects on land used for agricultural purposes (e.g., pipelines across crop land), permanent stabilization may be accomplished by returning the disturbed land to agricultural use.

(f) Paved areas. For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed.

(g) Ditches, channels, and swales. For open channels, permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation, with a well-graded riprap lining, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

3. SLOPES GREATER THAN 2:1 WILL RECEIVE RIPRAP.

POST-CONSTRUCTION REVEGETATION:

THE FOLLOWING GENERAL PRACTICES WILL BE USED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING.

1. A MINIMUM OF 4" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE, OR STONE WILL BE PLACED ON SLOPES TO STABILIZE SURFACES.

2. IF FINAL GRADING IS REACHED DURING THE NORMAL GROWING SEASON (4/15 TO 9/15), PERMANENT SEEDING WILL BE DONE AS SPECIFIED BELOW. PRIOR TO SEEDING, LIMESTONE SHALL BE APPLIED AT A RATE OF 138 LBS/1000 SQ. FT. AND 10:20:20 FERTILIZER AT A RATE OF 18.4 LBS/1000 SQ.FT WILL BE APPLIED. BROADCAST SEEDING AT THE FOLLOWING RATES:

LAWNS	SWALES
KENTUCKY BLUEGRASS 0.46 LBS/1000 SF.	RED TOP 0.05 LBS/1000 SF.
CREEPING RED FESCUE 0.46 LBS/1000 SF.	TALL FESCUE 0.46 LBS/1000 SF.
PERENNIAL RYE GRASS 0.11 LB/1000 SF.	

3. AN AREA SHALL BE MULCHED IMMEDIATELY AFTER IS HAS BEEN SEEDED. MULCHING SHALL CONSIST OF HAY MULCH, HYDRO-MULCH, JUTE NET OVER MULCH, PRE-MANUFACTURED EROSION MATS OR ANY SUITABLE SUBSTITUTE DEEMED ACCEPTABLE BY THE DESIGNER.
  A. HAY MULCH SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE. HAY MULCH SHALL BE SECURED BY EITHER: (NOTE: SOIL SHALL NOT BE VISIBLE)
    I. BEING DRIVEN OVER BY TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
    II. BLANKETED BY TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING, OR WITH SPRAY, ON GRADES GREATER THAN 5%.
    III. SEE NOTE 6, GENERAL NOTES, AND NOTE 8, WINTER CONSTRUCTION.
  B. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF EITHER ASPHALT, WOOD FIBER OR PAPER FIBER AND WATER SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 9/15 AND 4/15.

4. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN SEPTEMBER 15 AND APRIL 15. SHOULD SEEDING BE NECESSARY BETWEEN SEPTEMBER 15 AND APRIL 15 THE FOLLOWING PROCEDURE SHALL BE FOLLOWED. ALSO REFER TO NOTE 9 OF WINTER CONSTRUCTION.
  A. ONLY UNFROZEN LOAM SHALL BE USED.
  B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
  C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS/1000 SQ.FT) SHALL BE ADDED TO THE PREVIOUSLY NOTED AREAS.
  D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.6 LBS/1000 SQ. FT.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
  E. FERTILIZING, SEEDING AND MULCHING SHALL BE APPLIED TO LOAM THE DAY THE LOAM IS SPREAD BY MACHINERY.
  F. ALTERNATIVE HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE.

5. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE ENGINEER THAT THE EXISTING CATCH IS INADEQUATE.

MONITORING SCHEDULE:

THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS OR APPOINTING A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. AFTER EACH RAINFALL, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. HAY BALE BARRIERS, SILT FENCE, AND STONE CHECK DAMS SHALL BE INSPECTED AND REPAIRED ONCE A WEEK OR IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING. SHOULD THE HAY BALE BARRIERS PROVE TO BE INEFFECTIVE, THE CONTRACTOR SHALL INSTALL SILT FENCE BEHIND THE HAY BALES.

2. VISUALLY INSPECT RIPRAP ONCE A WEEK OR AFTER EACH SIGNIFICANT RAINFALL AND REPAIR AS NEEDED. REMOVE SEDIMENT TRAPPED BEHIND THESE DEVICES ONCE IT ATTAINS A DEPTH EQUAL TO 1/2 THE HEIGHT OF THE DAM OR RISER. DISTRIBUTE REMOVED SEDIMENT OFF-SITE OR TO AN AREA UNDERGOING FINAL GRADING.

3. REVEGETATION OF DISTURBED AREAS WITHIN 25' OF DRAINAGE-COURSE/STREAM WILL BE SEEDED WITH THE "MEADOW AREA MIX" AND INSPECTED ON A WEEKLY BASIS OR AFTER EACH SIGNIFICANT RAINFALL AND RESEEDED AS NEEDED. EXPOSED AREAS WILL BE RESEEDED AS NEEDED UNTIL THE AREA HAS OBTAINED 100% GROWTH RATE. PROVIDE PERMANENT RIPRAP FOR SLOPES IN EXCESS OF 3:1 AND WITHIN 25' OF DRAINAGE COURSE.

EROSION CONTROL DURING WINTER CONSTRUCTION:

1. WINTER CONSTRUCTION PERIOD: NOVEMBER 1 THROUGH APRIL 15.

2. WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.

3. EXPOSED AREA SHALL BE LIMITED TO THOSE AREAS TO BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT. AT THE END OF EACH WORK WEEK NO AREAS MAY BE LEFT UNSTABILIZED OVER THE WEEKEND.

4. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.

5. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR HAY AT A RATE OF 150 LB. PER 1000 S.F. (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ANCHORED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH. NOTE: AN AREA IS ALSO CONSIDERED STABLE IF SODDED, COVERED WITH GRAVEL (PARKING LOTS) OR STRUCTURAL SAND.

6. BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1 AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED WITH A UNIFORM SURFACE, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE CONTINUOUSLY GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNEXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW, DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY, SILT FENCE OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS SHOWN ON THE DESIGN DRAWINGS. NOTE: DORMANT SEEDING SHOULD NOT BE ATTEMPTED UNLESS SOIL TEMPERATURE REMAINS BELOW 50 DEGREES AND DAY TIME TEMPERATURES REMAIN IN THE 30'S.

7. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%. VEGETATED DRAINAGE SWALES SHALL BE LINED WITH EXCELSIOR OR CURLEX.

8. MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1 THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

9. BETWEEN THE DATES OF OCTOBER 15 TO NOVEMBER 1, WINTER RYE IS RECOMMENDED FOR STABILIZATION. AFTER NOVEMBER 1, WINTER RYE IS NOT EFFECTIVE. AROUND NOVEMBER 15 OR LATER, ONCE TEMPERATURES OF THE AIR AND SOIL PERMIT, DORMANT SEEDING IS EFFECTIVE.

10. IN THE EVENT OF SNOWFALL (FRESH OR CUMULATIVE) GREATER THAN 1 INCH DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM THE AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.

Construction Plan

CONSTRUCTION OF THE PROJECT IS EXPECTED TO COMMENCE IN LATE SUMMER 2018 FOLLOWING ISSUE OF TOWN AND DEP PERMITS AND ONCE UNITS ARE PRE-SOLD. THE CONSTRUCTION OF THE ROAD AND UTILITY INFRASTRUCTURE IS EXPECTED TO CONTINUE INTO THE SPRING OF 2019. CONSTRUCTION OF UNITS WILL DEPEND ON MARKET CONDITIONS BUT BASED ON THE RECENT SUCCESS WE WOULD EXPECT THE UNITS TO BE CONSTRUCTED WITHIN 2-3 YEARS. CONSTRUCTION SEQUENCING WILL INCLUDE THE FOLLOWING:

- TREE CLEARING AND STUMP REMOVAL.
- REMOVAL OF THE THREE HOUSES AND ASSOCIATED DRIVES AND INFRASTRUCTURE.
- ROUGH GRADING, SITE BLASTING FOR ROADWAYS AND UNITS AND INSTALLATION OF UTILITIES AND STORMWATER SYSTEMS.
- FINISH GRAVELS AND SURFACES & PAVING
- LOAM, SEED AND STABILIZATION.

CONSTRUCTION PHASE:

THE FOLLOWING GENERAL PRACTICES WILL BE USED TO PREVENT EROSION DURING CONSTRUCTION OF THIS PROJECT.

1. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. IF FINAL GRADING, LOAMING AND SEEDING WILL NOT OCCUR WITHIN 7 DAYS, SEE ITEM NO. 4.

2. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING AND/OR HAY BALES WILL BE INSTALLED AT THE TOE OF SLOPE AND IN AREAS AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION. IMMEDIATELY FOLLOWING CONSTRUCTION OF CULVERTS AND SWALES, RIP RAP APRONS SHALL BE INSTALLED, AS SHOWN ON THE PLANS.

3. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM THE EXISTING DRAINAGE COURSE. NO STOCKPILE SHALL BE CLOSER THEN 100' OF A RESOURCE INCLUDING, BUT NOT LIMITED TO, WETLANDS, STREAMS, AND OPEN WATER BODIES. ALL STOCKPILES SHALL HAVE A SILTATION FENCE BELOW THEM REGARDLESS OF TIME OF PRESENCE. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 15 DAYS SHALL BE:
  A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
  B. SEEDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
  C. INSTALL SILT FENCE AROUND STOCKPILE AT BASE OF PILE. STOCKPILES TO HAVE SILT FENCE INSTALLED AT TIME OF ESTABLISHMENT AT BASE OF PILE.

4. ALL DISTURBED AREAS THAT WILL NOT BE WORKED FOR MORE THAN 7 DAYS SHALL BE EITHER:
  A. TREATED WITH ANCHORED MULCH IMMEDIATELY, OR
  B. SEEDED WITH CONSERVATION MIX OF ANNUAL RYE GRASS (0.9 LBS/1000 SQ. FT) AND MULCHED IMMEDIATELY.

5. ALL GRADING WILL BE HELD TO A MAXIMUM 2:1 SLOPE WHERE PRACTICAL. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING, OR WITH STONE, WITHIN 7 DAYS AFTER FINAL GRADING IS COMPLETE. (SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION.)

6. ALL CULVERTS WILL BE PROTECTED WITH STONE RIPRAP (D50 = 6" UNLESS OTHERWISE SPECIFIED) AT INLETS AND OUTLETS.

Maine DEP Chapter 500, APPENDIX C. Housekeeping

These performance standards apply to all projects except for stormwater PBR projects.

1. Spill prevention. Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at : http://www.maine.gov/dep/spills/emergspillresp/

2. Groundwater protection. During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. Fugitive sediment and dust. Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Dewatering a stream without a permit from the Department may violate state water quality standards and the Natural Resources Protection Act.

4. Debris and other materials. Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. Excavation de-watering. Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the “Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection.”

6. Authorized Non-stormwater discharges. Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

(a) Discharges from firefighting activity;

(b) Fire hydrant flushings;

(c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);

(d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);

(e) Routine external building washdown, not including surface paint removal, that does not involve detergents;

(f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;

(g) Uncontaminated air conditioning or compressor condensate;

(h) Uncontaminated groundwater or spring water;

(i) Foundation or footer drain-water where flows are not contaminated;

(j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));

(k) Potable water sources including waterline flushings; and

(l) Landscape irrigation.

7. Unauthorized non-stormwater discharges . The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non_stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:

(a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;

(b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;

(c) Soaps, solvents, or detergents used in vehicle and equipment washing; and

(d) Toxic or hazardous substances from a spill or other release.

(8) Additional requirements. Additional requirements may be applied on a site-specific basis.

Maine DEP Chapter 500, APPENDIX A. Erosion and sedimentation control (2015 Update)

This appendix applies to all projects.

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in 38 M.R.S. §480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken.

NOTE: Other requirements may apply, including, but not limited to the Natural Resources Protection Act 38 M.R.S. §480-B.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection.”

1. Pollution prevention. Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable. Control stormwater volume and velocity within the site to minimize soil erosion. Minimize the disturbance of steep slopes. Control stormwater discharges, including both peak flow rates and volume, to minimize erosion at outlets. The discharge may not result in erosion of any open drainage channels, swales, stream channels or stream banks, upland, or coastal or freshwater wetlands off the project site.

Whenever practicable, no disturbance activities should take place within 50 feet of any protected natural resource. If disturbance activities take place between 30 feet and 50 feet of any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled. If disturbance activities take place less than 30 feet from any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled and disturbed areas must be temporarily or permanently stabilized within 7 days.

NOTE: Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Minimizing disturbed areas through phasing limits the amount of exposed soil on the site through retention of natural cover and by retiring areas as permanently stabilized. Less exposed soil results in fewer erosion controls to install and maintain. If work within an area is not anticipated to begin within two weeks' time, consider leaving the area in its naturally existing cover.

NOTE: Many construction activities within 75 feet of a protected natural resource require a permit under the Natural Resources Protection Act prior to initiation. For more information regarding the applicability of the NRPA to your project, you can visit the Department's website at http://www.maine.gov/dep/land/nrpa/index.html or contact staff of the Division of Land Resource Regulation at the nearest regional office.

2. Sediment barriers. Prior to construction, properly install sediment barriers at the downgradient edge of any area to be disturbed and adjacent to any drainage channels within the disturbed area. Sediment barriers should be installed downgradient of soil or sediment stockpiles and stormwater prevented from running onto the stockpile. Maintain the sediment barriers by removing accumulated sediment, or removing and replacing the barrier, until the disturbed area is permanently stabilized. Where a discharge to a storm drain inlet occurs, if the storm drain carries water directly to a surface water and you have authority to access the storm drain inlet, you must install and maintain protection measures that remove sediment from the discharge.

3. Stabilized construction entrance. Prior to construction, properly install a stabilized construction entrance (SCE) at all points of egress from the site. The SCE is a stabilized pad of aggregate, underlain by a geotextile filter fabric, used to prevent traffic from tracking material away from the site onto public ROWs. Maintain the SCE until all disturbed areas are stabilized.

4. Temporary stabilization. Within 7 days of the cessation of construction activities in an area that will not be worked for more than 7 days, stabilize any exposed soil with mulch, or other non-erodible cover. Stabilize areas within 75 feet of a wetland or waterbody within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.

5. Removal of temporary measures. Remove any temporary control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

NOTE: It is recommended that silt fences be removed by cutting the fence materials at ground level to avoid additional soil disturbance.

6. Permanent stabilization. If the area will not be worked for more than one year or has been brought to final grade, then permanently stabilize the area within 7 days by planting vegetation, seeding, sod, or through the use of permanent mulch, or riprap, or road sub-base. If using vegetation for stabilization, select the proper vegetation for the light, moisture, and soil conditions; amend areas of disturbed subsoils with topsoil, compost, or fertilizers; protect seeded areas with mulch or, if necessary, erosion control blankets; and schedule sodding, planting, and seeding so to avoid die-off from summer drought and fall frosts. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established with 90% cover by healthy vegetation. If necessary, areas must be reworked and restabilized if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. One or more of the following may apply to a particular site.

(a) Seeded areas. For seeded areas, permanent stabilization means a 90% cover of the disturbed area with mature, healthy plants with no evidence of washing or rilling of the topsoil.

(b) Sodded areas. For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.

(c) Permanent Mulch. For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion Control Mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

(d) Riprap. For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.

(e) Agricultural use. For construction projects on land used for agricultural purposes (e.g., pipelines across crop land), permanent stabilization may be accomplished by returning the disturbed land to agricultural use.

(f) Paved areas. For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed, provided it is free of fine materials that may runoff with a rain event

(g) Ditches, channels, and swales. For open channels, permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation, with a well-graded riprap lining, turf reinforcement mat, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

7. Winter Construction. "Winter construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.

(a) Site Stabilization. For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.

(b) Sediment Barriers. All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.

(c) Ditch. All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by the Department.

(d) Slopes. Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation during the winter months. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection.”

8. Stormwater channels. Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using measures that achieve long-term erosion control. Ditches, swales and other open stormwater channels must be sized to handle, at a minimum, the expected volume run-off. Each channel should be constructed in sections so that the section's grading, shaping, and installation of the permanent lining can be completed the same day. If a channel's final grading or lining installation must be delayed, then diversion berms must be used to divert stormwater away from the channel, properly-spaced check dams must be installed in the channel to slow the water velocity, and a temporary lining installed along the channel to prevent scouring. Permanent stabilization for channels is addressed under Appendix A(5)(g) above.

(a) The channel should receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.

(b) When the watershed draining to a ditch or swale is less than 1 acre of total drainage and less than ¼ acre of impervious area, diversion of runoff to adjacent wooded or otherwise vegetated buffer areas is encouraged where the opportunity exists.

9. Sediment basins. Sediment basins must be designed to provide storage for either the calculated runoff from a 2-year, 24-hour storm or provide for 3,600 cubic feet of capacity per acre draining to the basin. Outlet structures must discharge water from the surface of the basin whenever possible. Erosion controls and velocity dissipation devices must be used if the discharging waters are likely to create erosion. Accumulated sediment must be removed as needed from the basin to maintain at least ½ of the design capacity of the basin.

The use of cationic treatment chemicals, such as polymers, flocculants, or other chemicals that contain an overall positive charge designed to reduce turbidity in stormwater must receive prior approval from the Department. When requesting approval to use cationic treatment chemicals, you must describe appropriate controls and implementation procedures to ensure the use will not lead to a violation of water quality standards. In addition, you must specify the type(s) of soil likely to be treated on the site, chemicals to be used and how they are to be applied and in what quantity, any manufacturer's recommendations, and any training had by personnel who will handle and apply the chemicals.

10. Roads. Gravel and paved roads must be designed and constructed with crowns or other measures, such as water bars, to ensure that stormwater is delivered immediately to adjacent stable ditches, vegetated buffer areas, catch basin inlets, or street gutters.

NOTE: (1) Gravel and paved roads should be maintained so that they continue to conform to this standard in order to prevent erosion problems. (2) The Department recommends that impervious surfaces, including roads, be designed and constructed so that stormwater is distributed in sheet flow to natural vegetated buffer areas wherever such areas are available. Road ditches should be designed so that stormwater is frequently (at least every 100 to 200 feet) discharged via ditch turnouts in sheet flow to adjacent natural buffer areas wherever possible.

11. Culverts. Culverts must be sized to avoid unintended flooding of upstream areas or frequent overtopping of roadways. Culvert inlets must be protected with appropriate materials for the expected entrance velocity, and protection must extend at least as high as the expected maximum elevation of storage behind the culvert. Culvert outlet design must incorporate measures, such as aprons, to prevent scour of the stream channel. Outlet protection measures must be designed to stay within the channel limits. The design must take account of tailwater depth.

12. Parking areas. Parking areas must be constructed to ensure runoff is delivered to adjacent swales, catch basins, curb gutters, or buffer areas without eroding areas downslope. The parking area's subbase compaction and grading must be done to ensure runoff is evenly distributed to adjacent buffers or side slopes. Catch basins must be located and set to provide enough storage depth at the inlet to allow inflow of peak runoff rates without by-pass of runoff to other areas.

13. Additional requirements. Additional requirements may be applied on a site-specific basis.

Maine DEP Chapter 500, APPENDIX B. Inspection and maintenance (2015 Update)

This appendix applies to all projects, except that a project that is eligible for stormwater PBR need only meet the standards in Section 1.

See Appendix D(5) for additional maintenance requirements related to infiltration of stormwater.

1. During construction. The following standards must be met during construction.

(a) Inspection and corrective action. Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

(b) Maintenance. If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.

(c) Documentation. Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to Department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

2. Post-construction. The following standards must be met after construction.

(a) Plan. Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 7(C)(2) for submission requirements.

(b) Inspection and maintenance. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.

NOTE: Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's “Stormwater Management for Maine: Best Management Practices.”

(i) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).

(ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

(iii) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

(iv) Inspect and clean out catch basins. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

(v) Inspect resource and treatment buffers once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

(vi) Inspect at least once per year, each stormwater management pond or basin, including the pond's embankments, outlet structure, and emergency spillway. Remove and dispose of accumulated sediments in the pond. Control woody vegetation on the pond's embankments.

(vii) Inspect at least one per year, each underdrained filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.

(viii) Inspect each manufactured system installed on the site, including the system's inlet, treatment chamber(s), and outlet at least once per year, or in accordance with the maintenance guidelines recommended by the manufacturer based on the estimated runoff and pollutant load expected to the system from the project. Remove and dispose of accumulated sediments, debris, and contaminated waters from the system and, if applicable, remove and replace any clogged or spent filter media.

(c) Regular maintenance

(i) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.

(ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

NOTE: Contact the Department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's “Stormwater Management for Maine: Best Management Practices.”

(d) Documentation. Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

3. Re-certification. Submit a certification of the following to the Department within three months of the expiration of each five-year interval from the date of issuance of the permit.

(a) Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.

(c) Maintenance. The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

4. Duration of maintenance. Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the Department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with Department standards. Upon such assumption of responsibility, and approval by the Department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

5. Additional requirements. Additional requirements may be applied on a site-specific basis.

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	No changes this sheet, Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and DEP	CSB

Erosion Control Notes

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

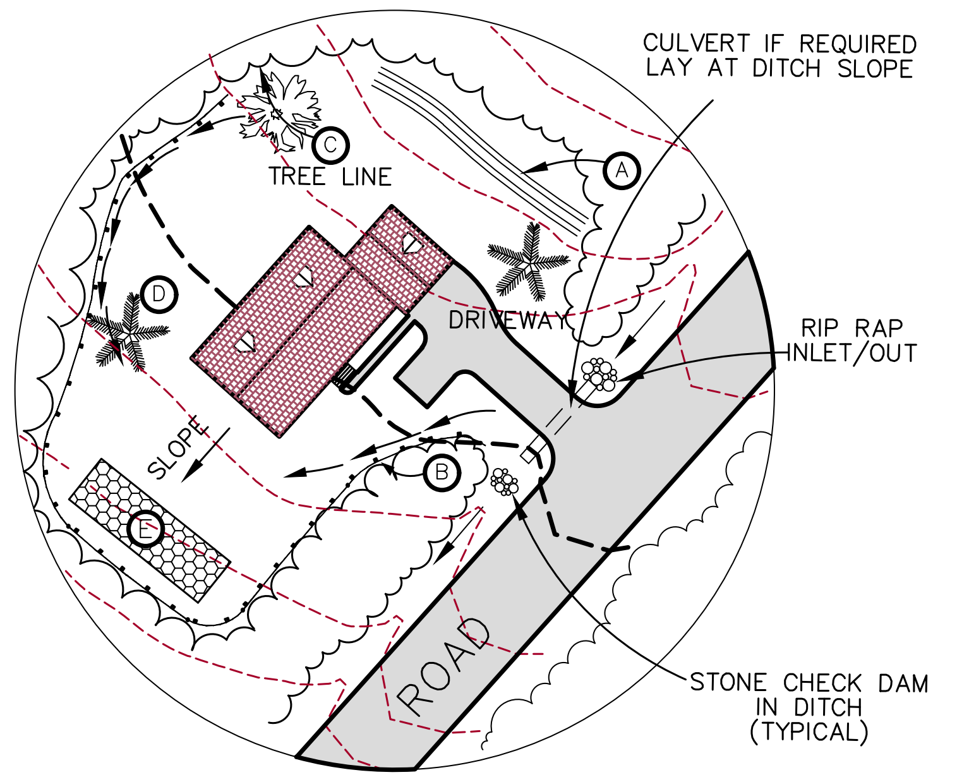
Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER
S.
BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C16
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

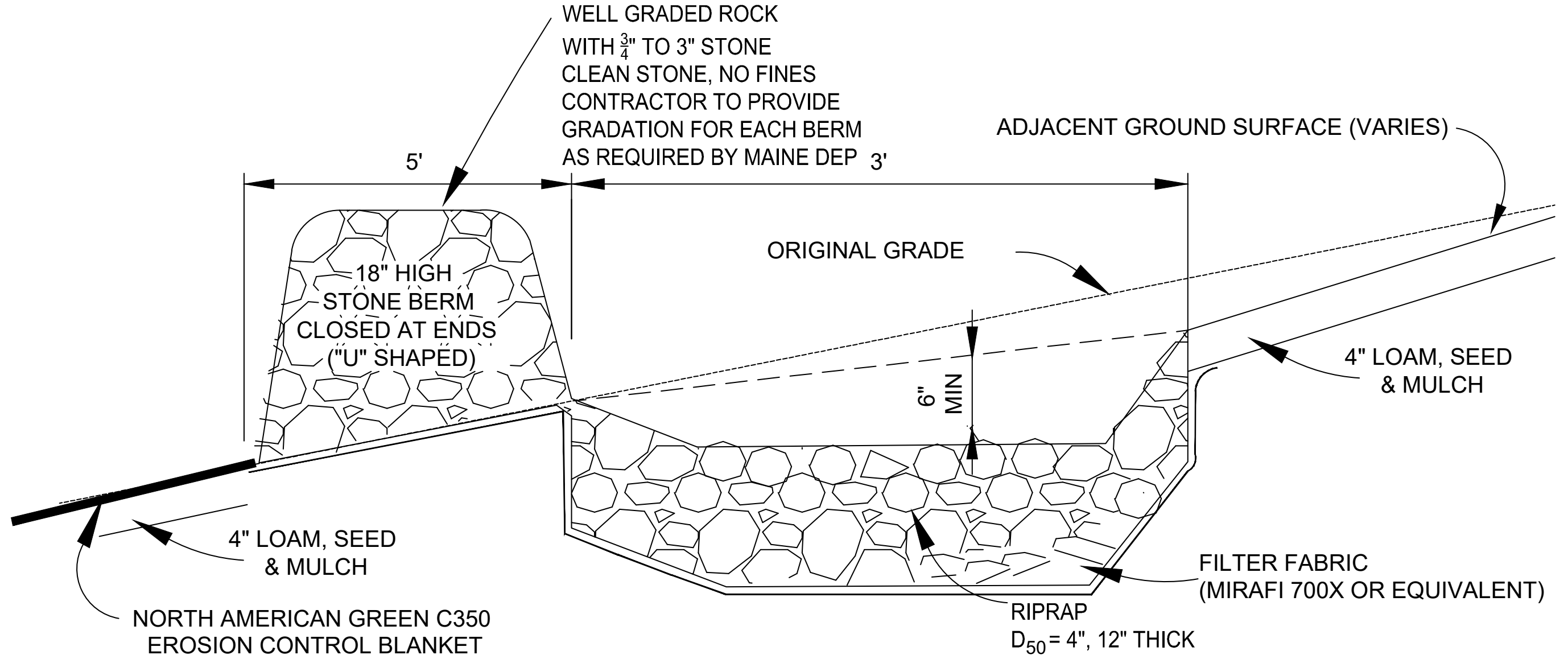


BUILDING SITE EROSION CONTROL

(TYPICAL DETAIL)

NOTES:
THIS SKETCH IS INDICATING THE INTENT OF THE SOIL EROSION MEASURES. ACTUAL SITE CONDITIONS AND LAYOUTS WILL VARY FROM SITE TO SITE. BUILDING CONTRACTORS MUST COMPLY WITH THE EROSION CONTROL NOTES SHOWN ON THESE DRAWINGS AND WITH THE "MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES."

- A.) CONSTRUCT DIVERSION DITCH TO KEEP UPSLOPE DRAINAGE AREA FROM ENTERING SITE.
- B.) INSTALL SILT FENCE BELOW ALL DISTURBED AREAS.
- C.) KEEP CLEARING TO A MINIMUM.
- D.) RE-SEED ALL DISTURBED AREAS. SEE SEEDING NOTES.



NOTE: THE DESIGN ENGINEER SHALL OVERSEE THE LOCATION AND INSTALLATON OF THE STONE BERM LEVEL SPREADER

THE STONE BERM SHALL BE INSTALLED ALONG THE CONTOUR TO THE EXTENT POSSIBLE

THE BERM MUST BE WELL-GRADED AND CONTAIN SOME SMALL STONE TO FORCE FLOWS TO SPREAD OUT BEHIND THE BERM

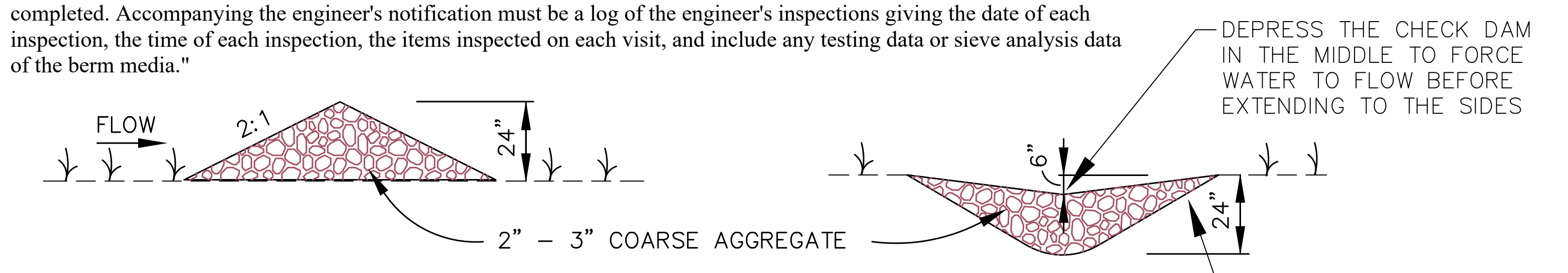
STONE BERM MUST BE AT LEAST 1.5' HIGH AND 2' ACROSS THE TOP WIDTH WITH 2:1 SIDE SLOPES.

SEE MAINE DEP BMP 5.2.2 BUFFER WITH STONE BERMED LEVEL LIP SPREADER

STONE BERM LEVEL SPREADER

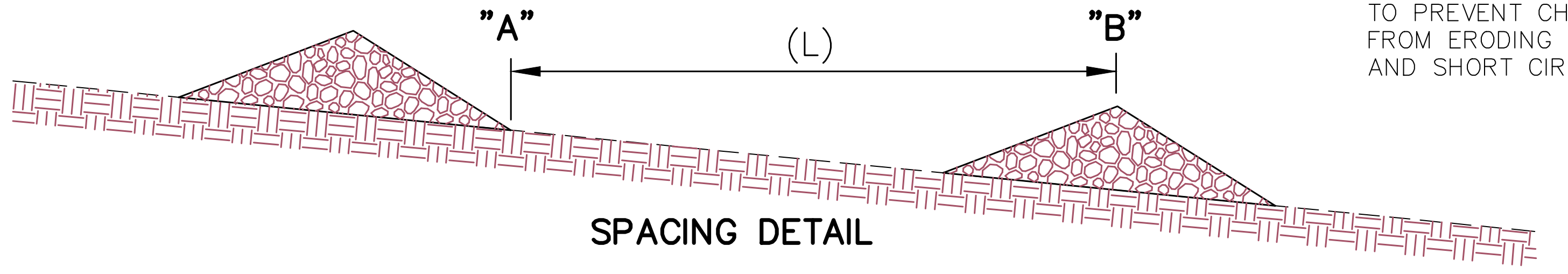
NOT TO SCALE

Construction Oversight:
"The applicant will retain the services of a professional engineer to inspect the construction and stabilization of the stone bermed level spreaders to be built on the site. The engineer shall inspect the stone berm material and its placement, and the upgradient conveyance structure construction. If necessary, the inspecting engineer will interpret the stone bermed level lip spreader's location and construction plan for the contractor. Once the stone bermed level lip spreaders are constructed and stabilized, the inspecting engineer will notifiJ the department in writing within 30 days to state that the level lips have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media."



CROSS SECTIONS

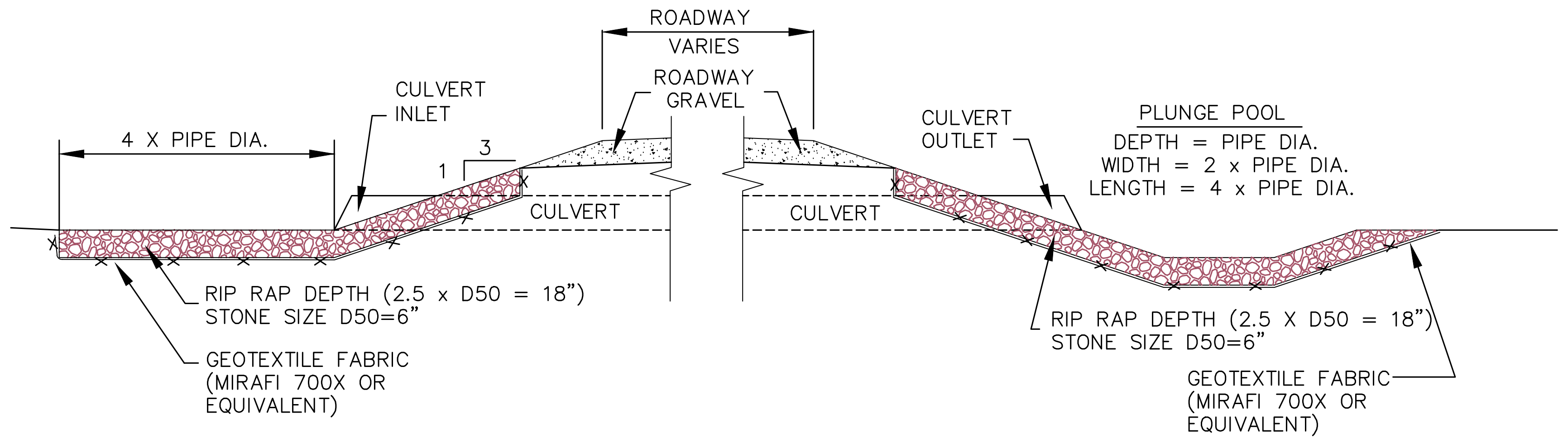
$$L = \frac{2'}{\text{SLOPE (ft/ft)}} = \text{THE DISTANCE SUCH THAT POINTS "A" \& "B" ARE OF EQUAL ELEVATION}$$



SPACING DETAIL

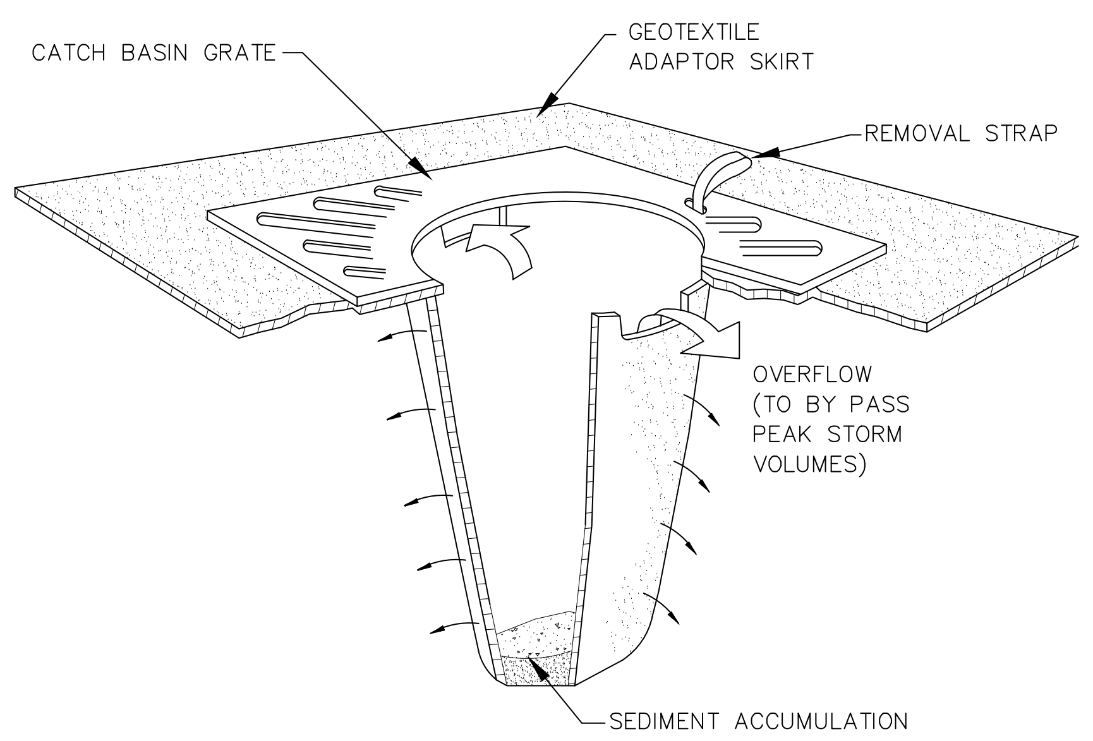
STONE CHECK DAM DETAILS

NOT TO SCALE



TYPICAL CULVERT INLET & OUTLET DETAIL

NOT TO SCALE



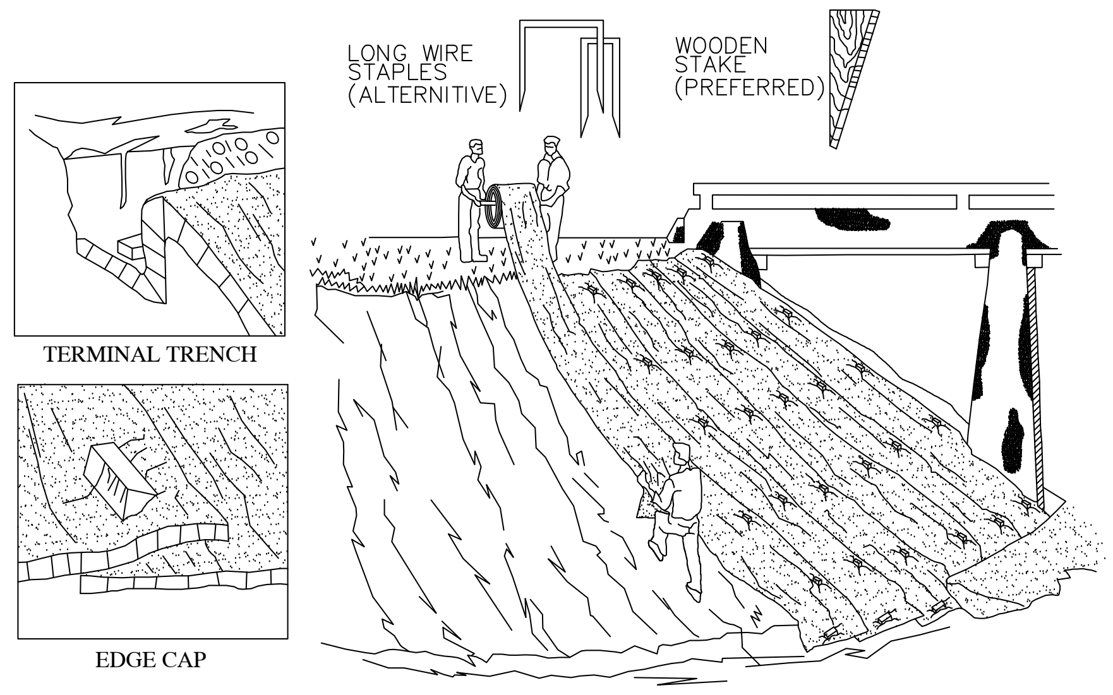
NOTES:
1. CATCH BASIN PROTECTION TO BE "SILTSTACK" (BY ACF ENVIRONMENTAL) OR "STREAM GUARD" (BY FOSS ENVIRONMENTAL SERVICES).

2. INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.

3. INSTALL SILT SACK SEDIMENT BARRIER IN ALL CATCH BASIN AND MAINTAIN UNTIL PROJECT COMPLETION.

TEMPORARY INLET PROTECTION

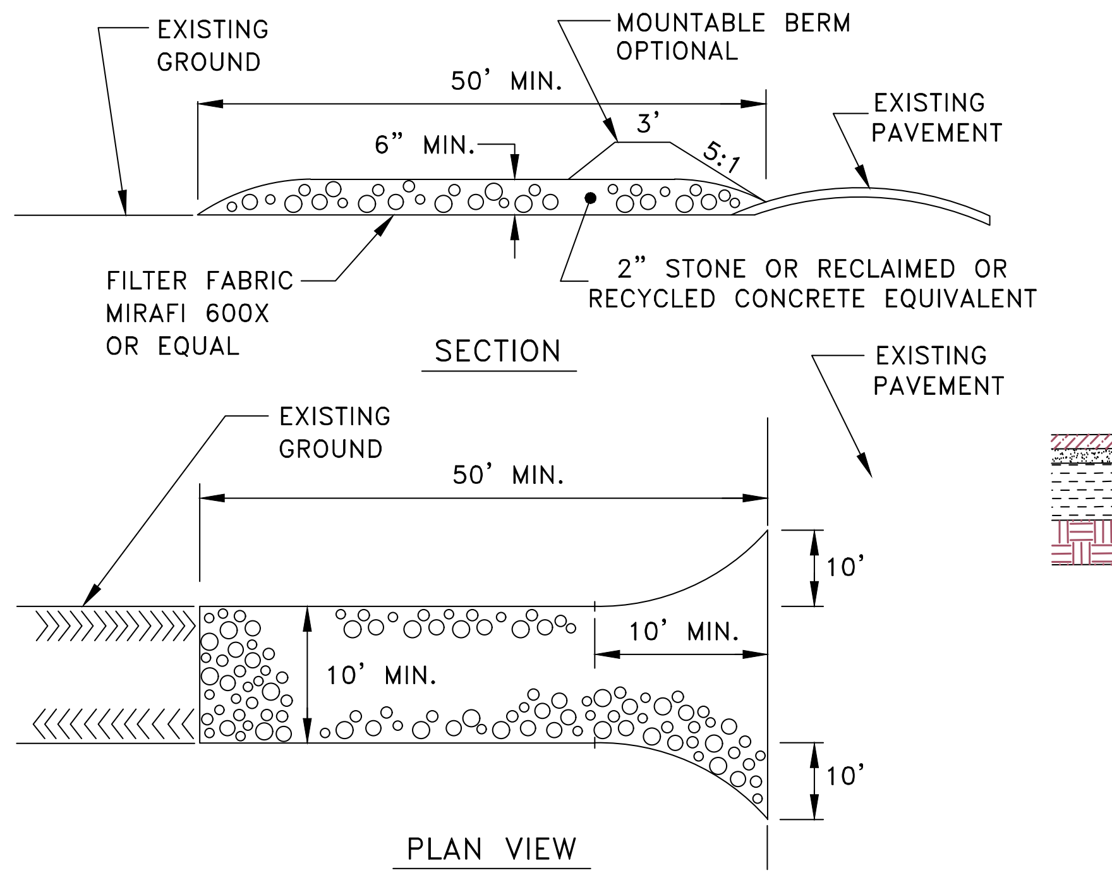
NOT TO SCALE



- –UNROLL MAT ONTO GROUND IN DIRECTION OF WATER FLOW.
- –MAT SHOULD LIE FLAT. DO NOT STRETCH MAT OVER GROUND. STRETCHING MAY CAUSE MAT TO BRIDGE DEPRESSIONS IN THE SURFACE AND ALLOW EROSION UNDERNEATH.
- –BURY TRANSVERSE TERMINAL ENDS OF MAT TO SECURE AND PREVENT EROSIVE FLOW UNDERNEATH.
- –SECURE MAT SNUGLY INTO ALL TRANSVERSE CHECK SLOTS.
- –BACKFILL AND COMPACT TRENCHES AND CHECK SLOTS AFTER STAKING THE MAT IN BOTTOM OF TRENCH.
- –OVERLAP ROLL ENDS BY THREE (3) FEET (MIN.) WITH UPSLOPE MAT ON TOP TO PREVENT UPLIFT OF MAT END BY WATER FLOW. IF INSTALLING IN THE DIRECTION OF A CONCENTRATED WATER FLOW, START NEW ROLLS IN A TRANSVERSE DITCH.
- –WOOD STAKES ARE RECOMMENDED FOR PINNING MAT TO THE GROUND SURFACE. STAKES SHOULD BE 1"x 3" NOMINAL STOCK CUT IN A TRIANGULAR SHAPE. STAKES SHOULD BE 12" TO 18" LONG, DEPENDING ON SOIL DENSITY.
- –DRIVE WOODEN STAKES TO WITHIN THREE (3) INCHES OF GROUND SURFACE. DO NOT DRIVE FLUSH TO SURFACE.
- –IN ALL TRANSVERSE TERMINAL TRENCHES AND CHECK SLOTS, STAKE EACH MAT AT IS CENTER AND OVERLAP EDGES BEFORE BACKFILLING AND COMPACTING.
- –STAKE OVERLAPS LONGITUDINALLY AT THREE (3) TO FIVE (5) FOOT INTERVALS.

GENERAL INSTALLATION GUIDELINES FOR EROSION CONTROL BLANKET

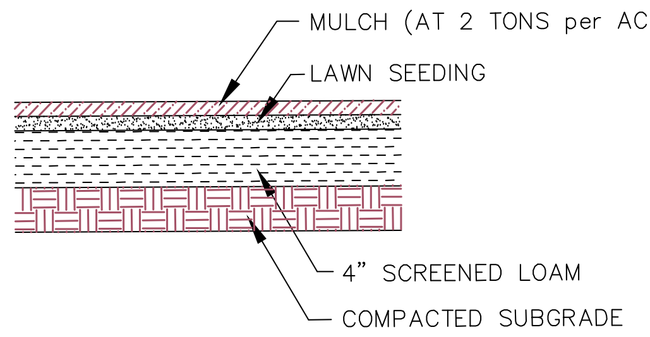
NOT TO SCALE



NOTE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH AGGREGATE WHICH DRAINS INTO AN APPROVED SEDIMENT OR WATERWAYS.

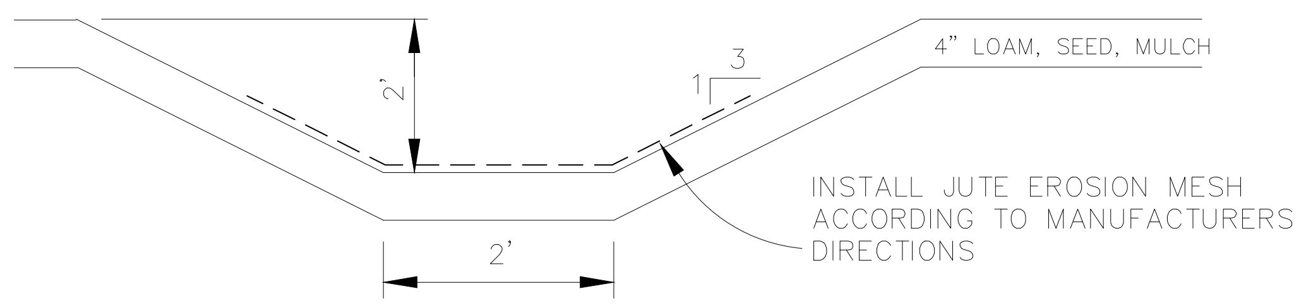
STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



LOAM AND SEED

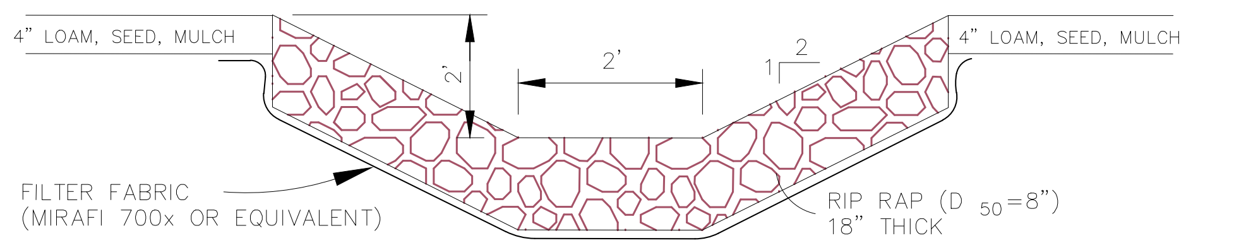
NOT TO SCALE



GRASSED DITCH CROSS SECTION

NOT TO SCALE

NOTE:
A CORRECTLY INSTALLED AND MAINTAINED PERMANENT VEGETATED EROSION CONTROL MESH MAY BE AN ACCEPTABLE ALTERNATIVE TO RIP-RAP



RIP RAP DITCH CROSS SECTION

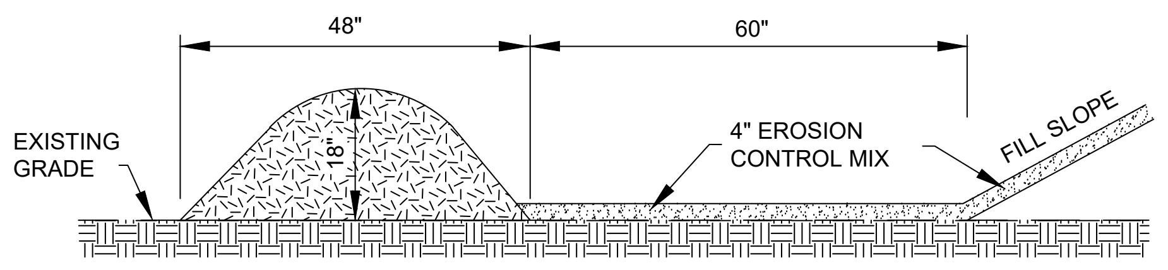
NOT TO SCALE

THE FILTER BERM SHALL CONSIST OF AN EROSION CONTROL MIX/BARK MULCH MIX OR RECYCLED COMPOSTED BARK FLUME GRIT AND FRAGMENTED WOOD GENERATED FROM WATER FLUME LOG HANDLING SYSTEMS. COMPARABLE COMPOSTED MIXES CAN BE USED UPON WRITTEN APPROVAL OF THE ENGINEER.

THE MIX SHALL CONFORM TO THE FOLLOWING: pH BETWEEN 5.0-8.0, PARTICLE SIZE - 100% PASSING THROUGH A 6" SCREEN AND 80% RETAINED ON A 3/4" SCREEN, SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 mmhos/cm.

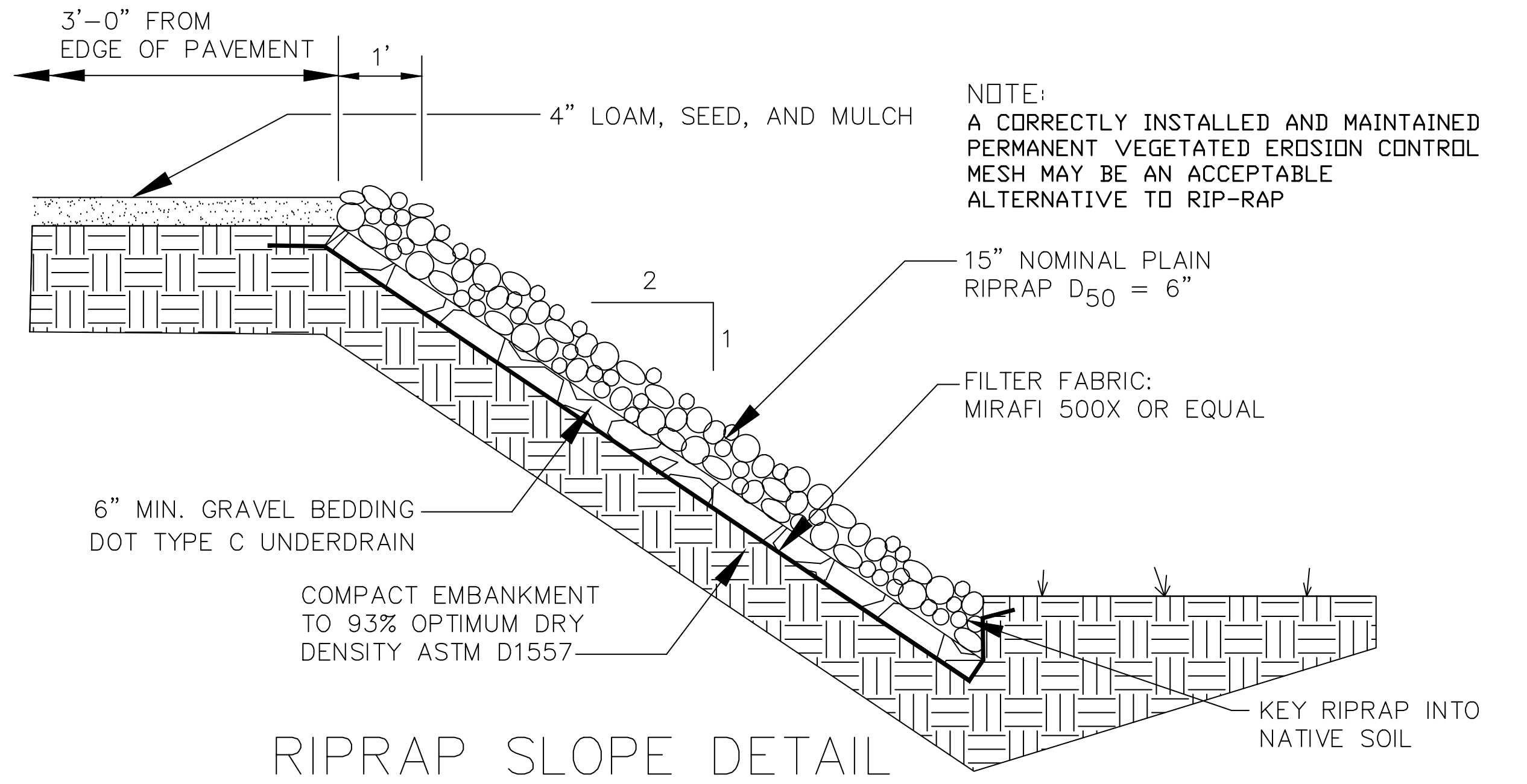
THE COMPOSTED BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL CONTOUR.

THE BERM MAY BE USED IN COMBINATION WITH SILT FENCE TO IMPROVE SEDIMENT REMOVAL AND PREVENT CLOGGING OF THE BERM BY LARGER SEDIMENT PARTICLES (SILT FENCE PLACED ON THE UPHILL SIDE OF BERM).



Erosion Control Mix Filter Berm

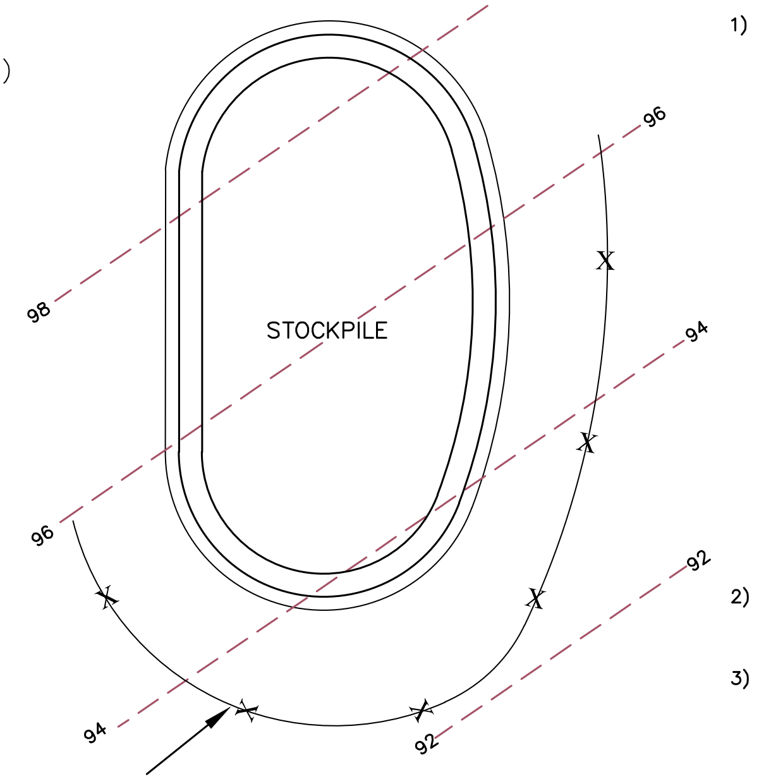
NOT TO SCALE



NOTE:
A CORRECTLY INSTALLED AND MAINTAINED PERMANENT VEGETATED EROSION CONTROL MESH MAY BE AN ACCEPTABLE ALTERNATIVE TO RIP-RAP

RIPRAP SLOPE DETAIL

NOT TO SCALE



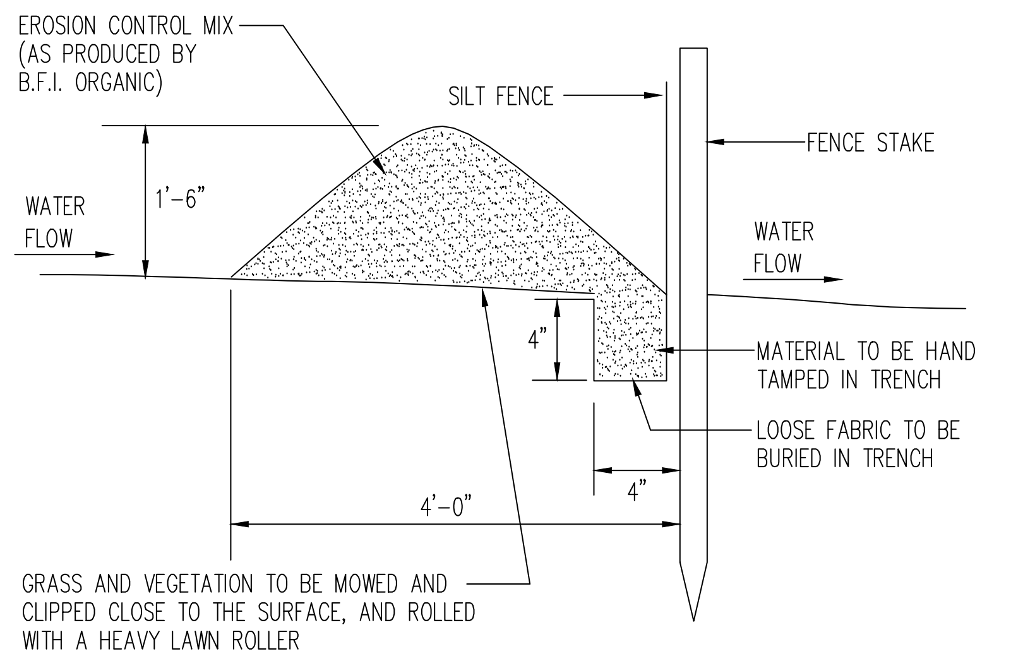
1) SEED TOPSOIL STOCKPILE WITH WINTER RYE AT THE RATE OF 3lbs PER 1000 sq.ft. BY OCTOBER 1st OF CONSTRUCTION SEASON. APPLY HAY MULCH AT THE RATE OF 100lbs PER 1000 sq,ft. OR APPLY A TACKIFIER BY HYDRO SEEDING METHODS AFTER SEEDING. MULCH SHALL BE REAPPLIED ON THE STOCKPILE IF GRASS GROWTH DOES NOT COVER AT LEAST 75% OF THE STOCKPILE SURFACE WITH SEEDLINGS AT LEAST 3" HIGH BY NOVEMBER 1st. THE USE OF RYE FOR STABILIZING STOCKPILES IS LIMITED TO TEMPORARY PILES STANDING NO LONGER THAN 1 YEAR OR CONSERVATION MIX FOR TIMES LONGER.

2) SILT FENCE TO BE INSTALLED PER THE SILT FENCE DETAIL.

3) ACCUMULATED SEDIMENTS WILL BE REMIXED INTO THE TOPSOIL.

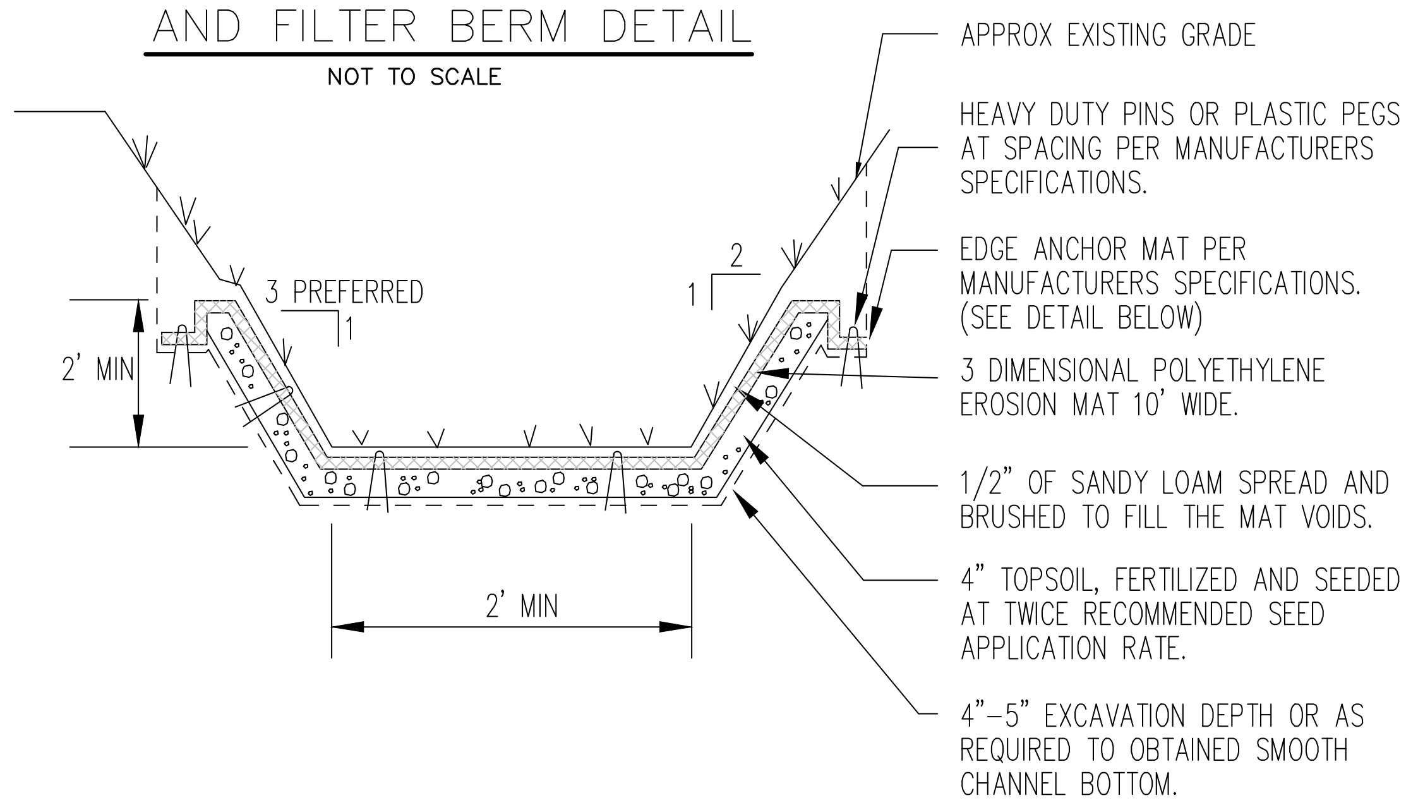
MATERIAL STOCKPILE EROSION PREVENTION DETAIL

NOT TO SCALE



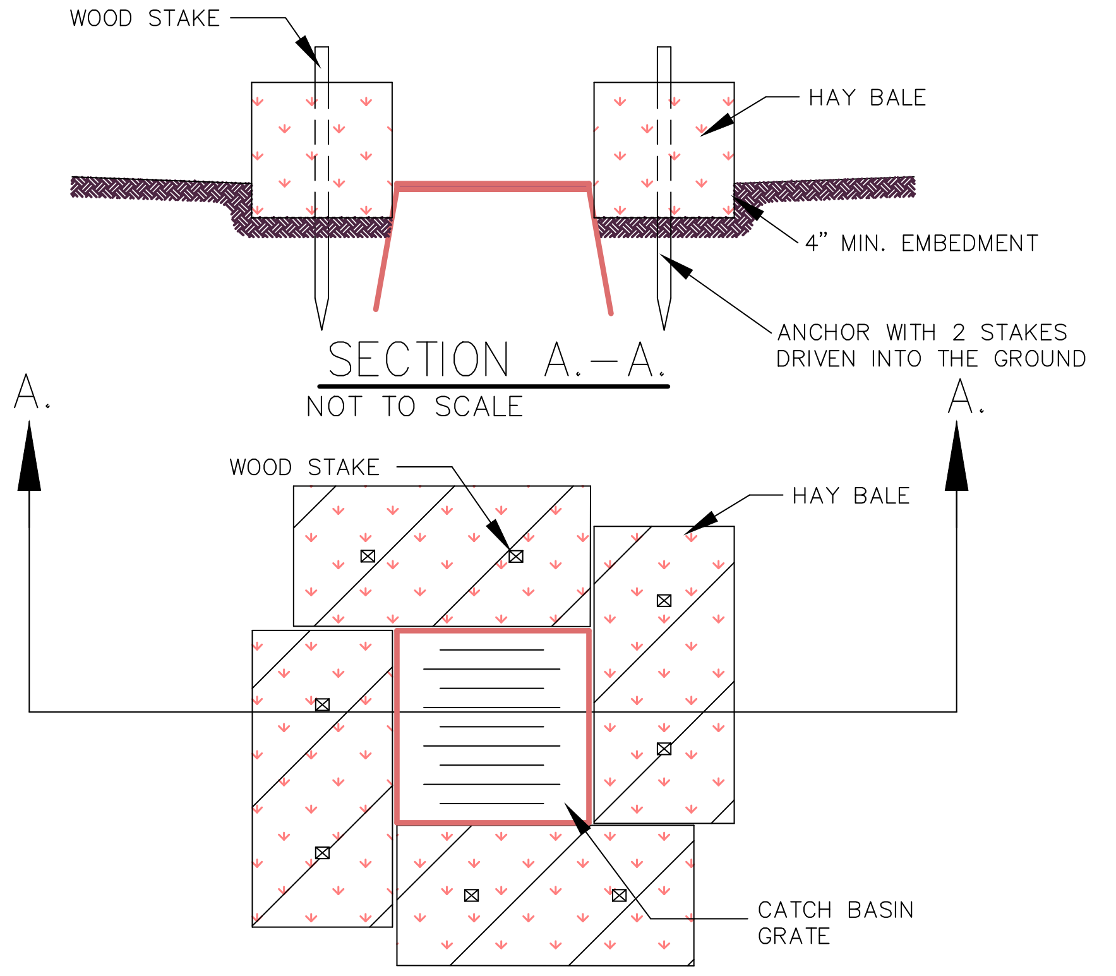
SILT FENCE AND FILTER BERM DETAIL

NOT TO SCALE



EROSION MAT INSTALLATION IN DITCHES

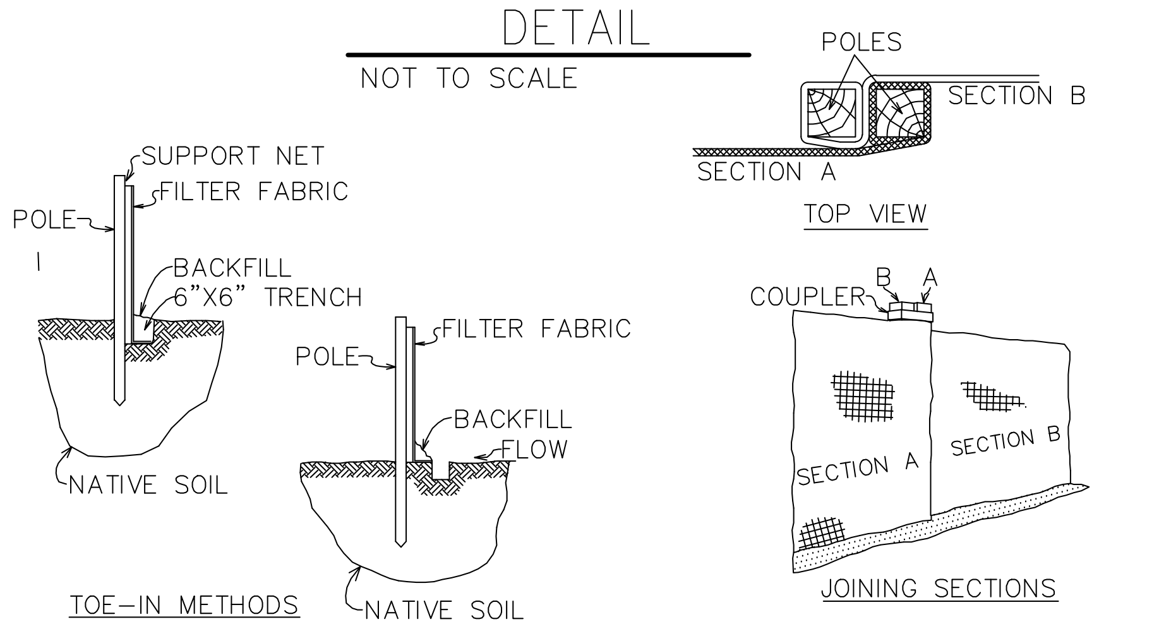
NOT TO SCALE



NOTE: INSTALL BARRIER AT EACH CATCH BASIN

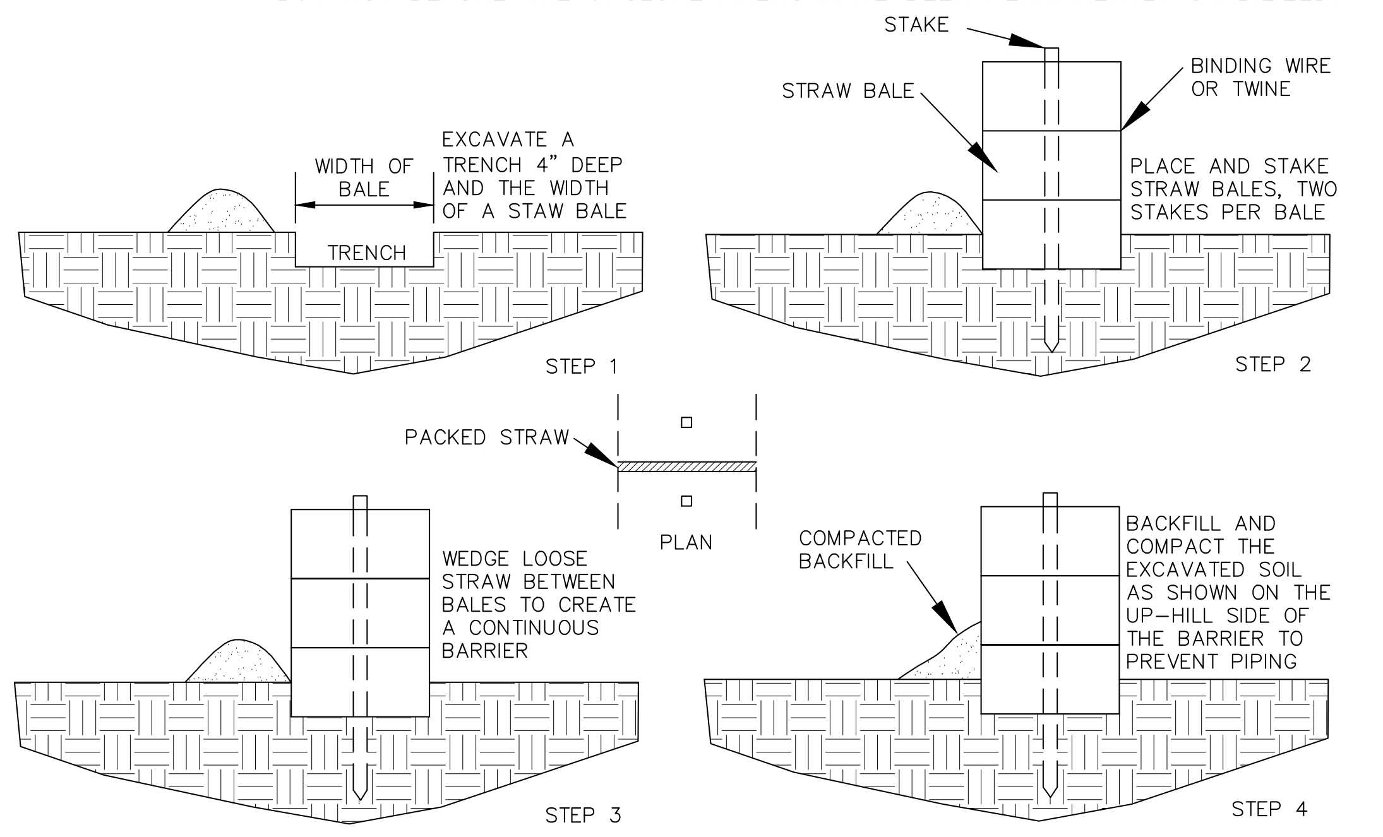
CATCH BASIN HAY BALE BARRIER DETAIL

NOT TO SCALE



SILTATION FENCING

1. INSTALL DOWNSLOPE OF ALL CONSTRUCTION ACTIVITIES AS NECCESSARY.
2. INSPECTION SHOULD BE FREQUENT AND REPAIR OR REPLACEMENT MADE PROMPTLY AS NEEDED. CHECK AFTER EACH RAINFALL.
3. BARRIERS SHOULD BE REMOVED WHEN THAY HAVE SERVED THEIR USEFULNESS, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.



HAY BALE BARRIER INSTALLATION IN DITCHES

NOT TO SCALE

3.	6-15-2020	Erosion Control Details	CSB
2.	2-24-2020	No changes this sheet, Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

CHRISTOPHER S. BELANGER 9098
6-15-2020

Erosion Control Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
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- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C17
CH'D BY:	SS:	
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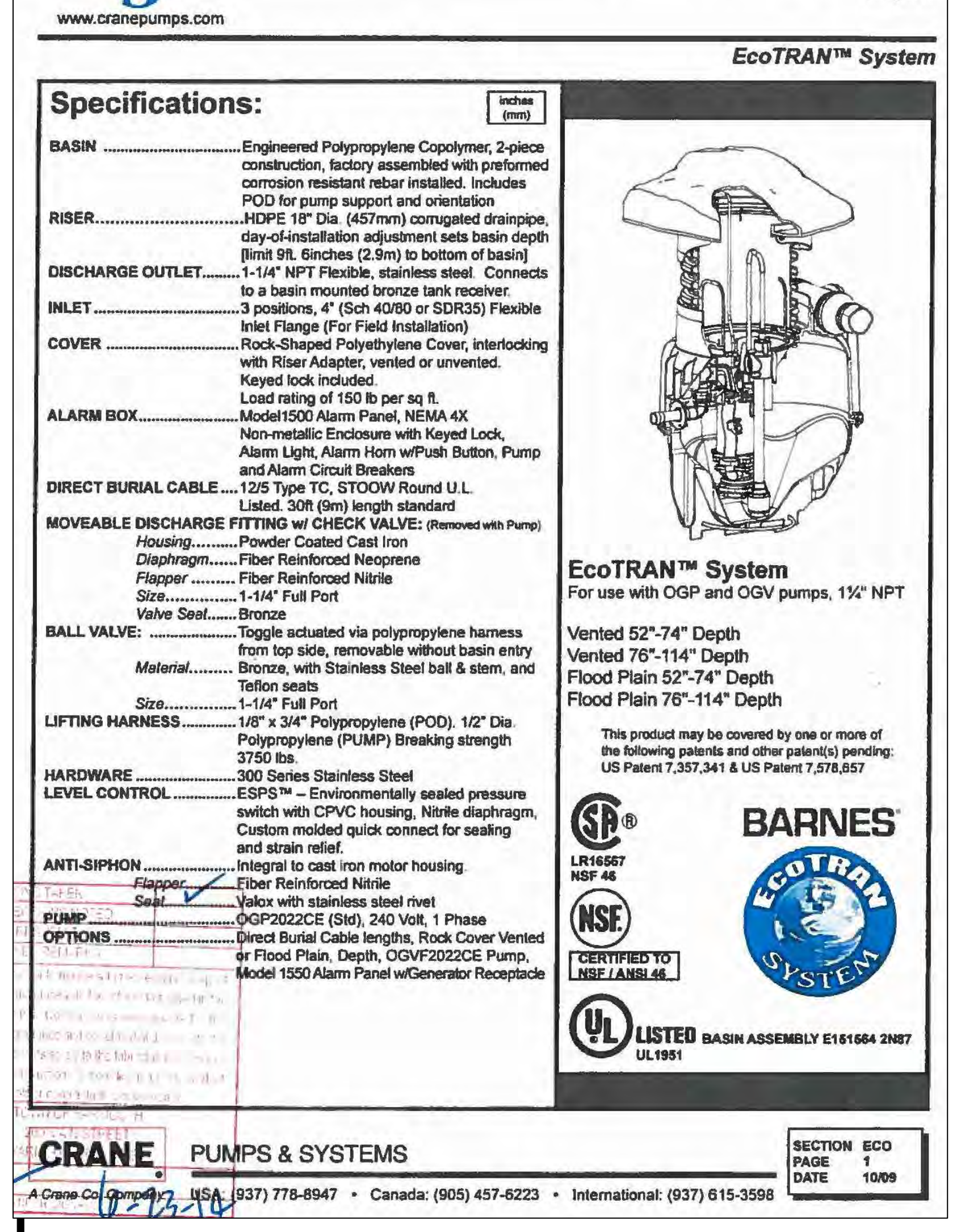


EcoTRAN™ System

Simplex

www.cranepumps.com

EcoTRAN™ System

Specifications:

inches (mm)

BASIN	Engineered Polypropylene Copolymer, 2-piece construction, factory assembled with preformed corrosion resistant rebar installed. Includes POD for pump support and orientation
RISER	HDPE 18" Dia. (457mm) corrugated drainpipe, day-of-installation adjustment sets basin depth [limit 9ft. 6inches (2.9m) to bottom of basin]
DISCHARGE OUTLET	1-1/4" NPT Flexible, stainless steel. Connects to a basin mounted bronze tank receiver.
INLET	3 positions, 4" (Sch 40/80 or SDR35) Flexible Inlet Flange (For Field Installation)
COVER	Rock-Shaped Polyethylene Cover, interlocking with Riser Adapter, vented or unvented. Keyed lock included. Load rating of 150 lb per sq ft.
ALARM BOX	Model1500 Alarm Panel, NEMA 4X Non-metallic Enclosure with Keyed Lock, Alarm Light, Alarm Horn w/Push Button, Pump and Alarm Circuit Breakers
DIRECT BURIAL CABLE	12/5 Type TC, STOOW Round U.L. Listed. 30ft (9m) length standard
MOVEABLE DISCHARGE FITTING w/ CHECK VALVE: (Removed with Pump)	
Housing	Powder Coated Cast Iron
Diaphragm	Fiber Reinforced Neoprene
Flapper	Fiber Reinforced Nitrile
Size	1-1/4" Full Port
Valve Seat	Bronze
BALL VALVE:	Toggle actuated via polypropylene harness from top side, removable without basin entry
Material	Bronze, with Stainless Steel ball & stem, and Teflon seats
Size	1-1/4" Full Port
LIFTING HARNESS	1/8" x 3/4" Polypropylene (POD). 1/2" Dia. Polypropylene (PUMP) Breaking strength 3750 lbs.
HARDWARE	300 Series Stainless Steel
LEVEL CONTROL	ESPS™ – Environmentally sealed pressure switch with CPVC housing, Nitrile diaphragm, Custom molded quick connect for sealing and strain relief.
ANTI-SIPHON	Integral to cast iron motor housing.
Flapper ✓	Fiber Reinforced Nitrile
Seat ✓	Valox with stainless steel rivet
PUMP	OGP2022CE (Std), 240 Volt, 1 Phase
OPTIONS	Direct Burial Cable lengths, Rock Cover Vented or Flood Plain, Depth, OGVF2022CE Pump, Model 1550 Alarm Panel w/Generator Receptacle

EcoTRAN™ System
For use with OGP and OGV pumps, 1¼" NPT

Vented 52"-74" Depth
Vented 76"-114" Depth
Flood Plain 52"-74" Depth
Flood Plain 76"-114" Depth

This product may be covered by one or more of the following patents and other patent(s) pending: US Patent 7,357,341 & US Patent 7,578,657

LR16567
NSF 46
CERTIFIED TO NSF / ANSI 46

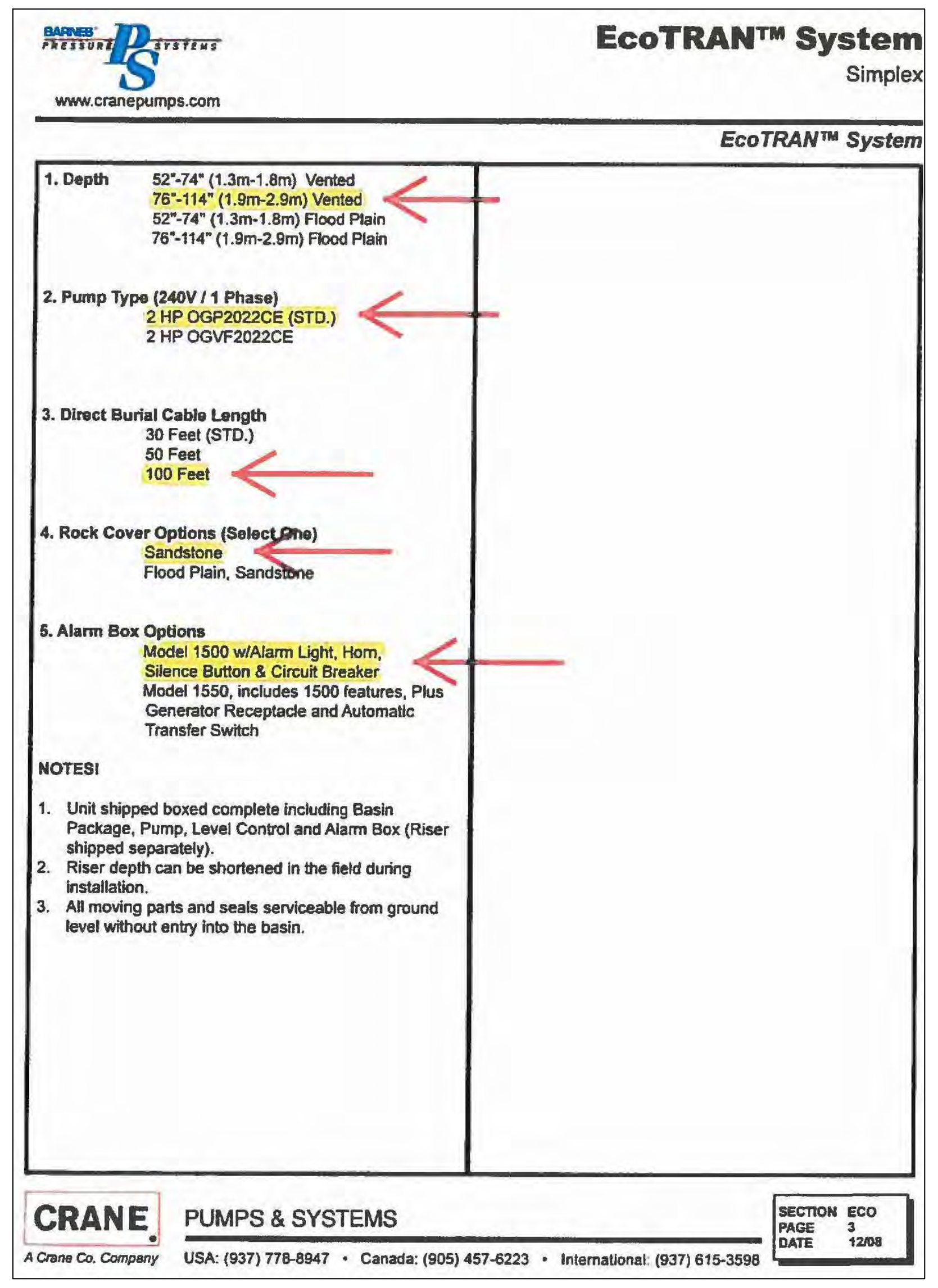
BARNES

LISTED BASIN ASSEMBLY E151664 2N87
UL1951

CRANE PUMPS & SYSTEMS
A Crane Co. Company
USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

SECTION ECO
PAGE 1
DATE 10/09

6-23-14



EcoTRAN™ System

Simplex

www.cranepumps.com

EcoTRAN™ System

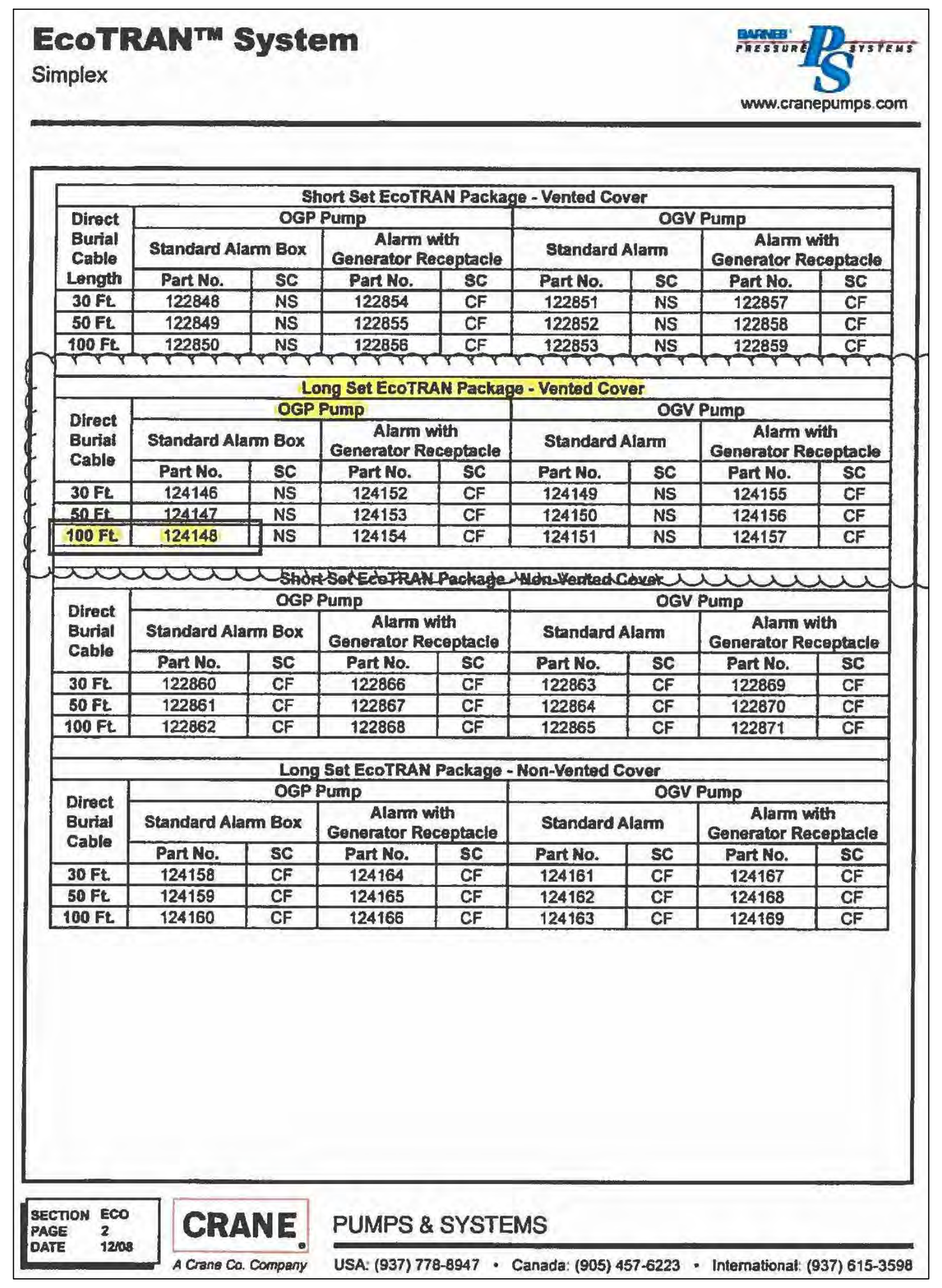
1. Depth
   - 52"-74" (1.3m-1.8m) Vented
   - 76"-114" (1.9m-2.9m) Vented
   - 52"-74" (1.3m-1.8m) Flood Plain
   - 76"-114" (1.9m-2.9m) Flood Plain
2. Pump Type (240V / 1 Phase)
   - 2 HP OGP2022CE (STD.)
   - 2 HP OGVF2022CE
3. Direct Burial Cable Length
   - 30 Feet (STD.)
   - 50 Feet
   - 100 Feet
4. Rock Cover Options (Select One)
   - Sandstone
   - Flood Plain, Sandstone
5. Alarm Box Options
   - Model 1500 w/Alarm Light, Horn, Silence Button & Circuit Breaker
   - Model 1550, includes 1500 features, Plus Generator Receptacle and Automatic Transfer Switch

NOTES!

1. Unit shipped boxed complete including Basin Package, Pump, Level Control and Alarm Box (Riser shipped separately).
2. Riser depth can be shortened in the field during installation.
3. All moving parts and seals serviceable from ground level without entry into the basin.

CRANE PUMPS & SYSTEMS
A Crane Co. Company
USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

SECTION ECO
PAGE 3
DATE 12/08



EcoTRAN™ System

Simplex

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Short Set EcoTRAN Package - Vented Cover

Direct Burial Cable Length	OGP Pump				OGV Pump			
	Standard Alarm Box		Alarm with Generator Receptacle		Standard Alarm		Alarm with Generator Receptacle	
	Part No.	SC	Part No.	SC	Part No.	SC	Part No.	SC
30 Ft.	122848	NS	122854	CF	122851	NS	122857	CF
50 Ft.	122849	NS	122855	CF	122852	NS	122858	CF
100 Ft.	122850	NS	122856	CF	122853	NS	122859	CF

Long Set EcoTRAN Package - Vented Cover

Direct Burial Cable	OGP Pump				OGV Pump			
	Standard Alarm Box		Alarm with Generator Receptacle		Standard Alarm		Alarm with Generator Receptacle	
	Part No.	SC	Part No.	SC	Part No.	SC	Part No.	SC
30 Ft.	124146	NS	124152	CF	124149	NS	124155	CF
50 Ft.	124147	NS	124153	CF	124150	NS	124156	CF
100 Ft.	124148	NS	124154	CF	124151	NS	124157	CF

~~Short Set EcoTRAN Package - Non-Vented Cover~~

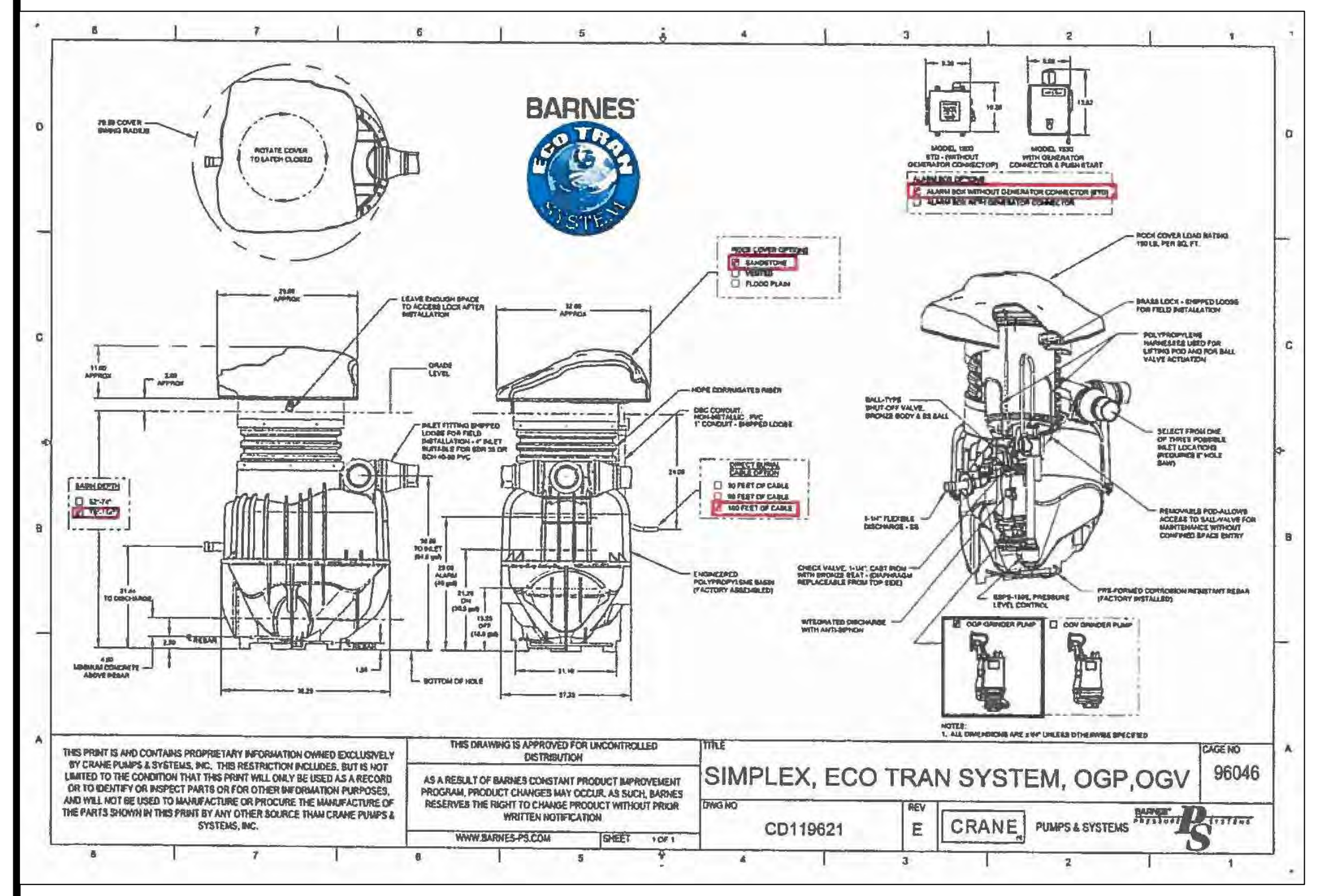
Direct Burial Cable	OGP Pump				OGV Pump			
	Standard Alarm Box		Alarm with Generator Receptacle		Standard Alarm		Alarm with Generator Receptacle	
	Part No.	SC	Part No.	SC	Part No.	SC	Part No.	SC
30 Ft.	122860	CF	122866	CF	122863	CF	122869	CF
50 Ft.	122861	CF	122867	CF	122864	CF	122870	CF
100 Ft.	122862	CF	122868	CF	122865	CF	122871	CF

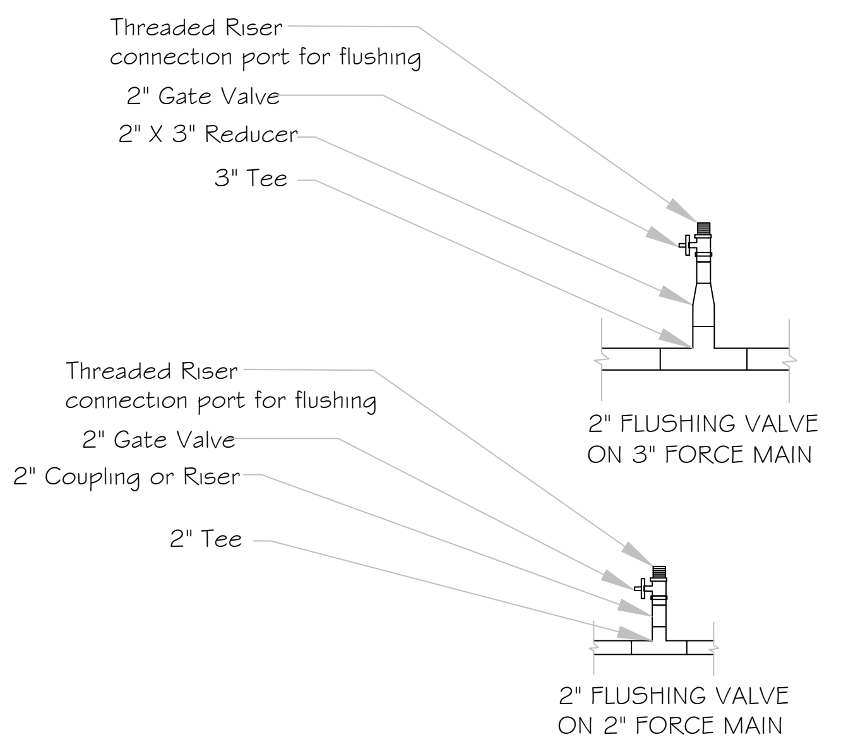
Long Set EcoTRAN Package - Non-Vented Cover

Direct Burial Cable	OGP Pump				OGV Pump			
	Standard Alarm Box		Alarm with Generator Receptacle		Standard Alarm		Alarm with Generator Receptacle	
	Part No.	SC	Part No.	SC	Part No.	SC	Part No.	SC
30 Ft.	124158	CF	124164	CF	124161	CF	124167	CF
50 Ft.	124159	CF	124165	CF	124162	CF	124168	CF
100 Ft.	124160	CF	124166	CF	124163	CF	124169	CF

SECTION ECO
PAGE 2
DATE 12/08

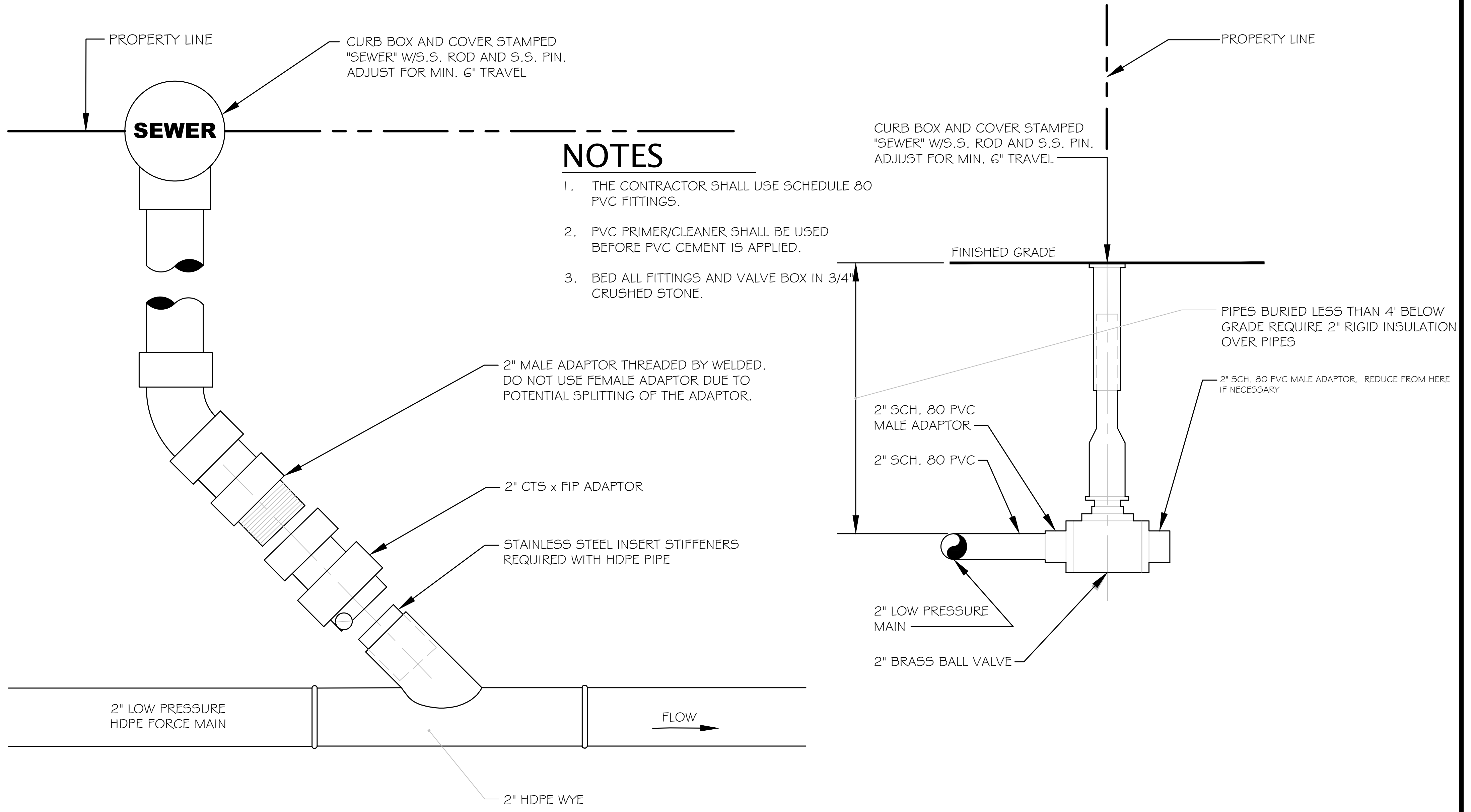
CRANE PUMPS & SYSTEMS
A Crane Co. Company
USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598





2" Sanitary Sewer Flushing Valve Detail

NOT TO SCALE



NOTES

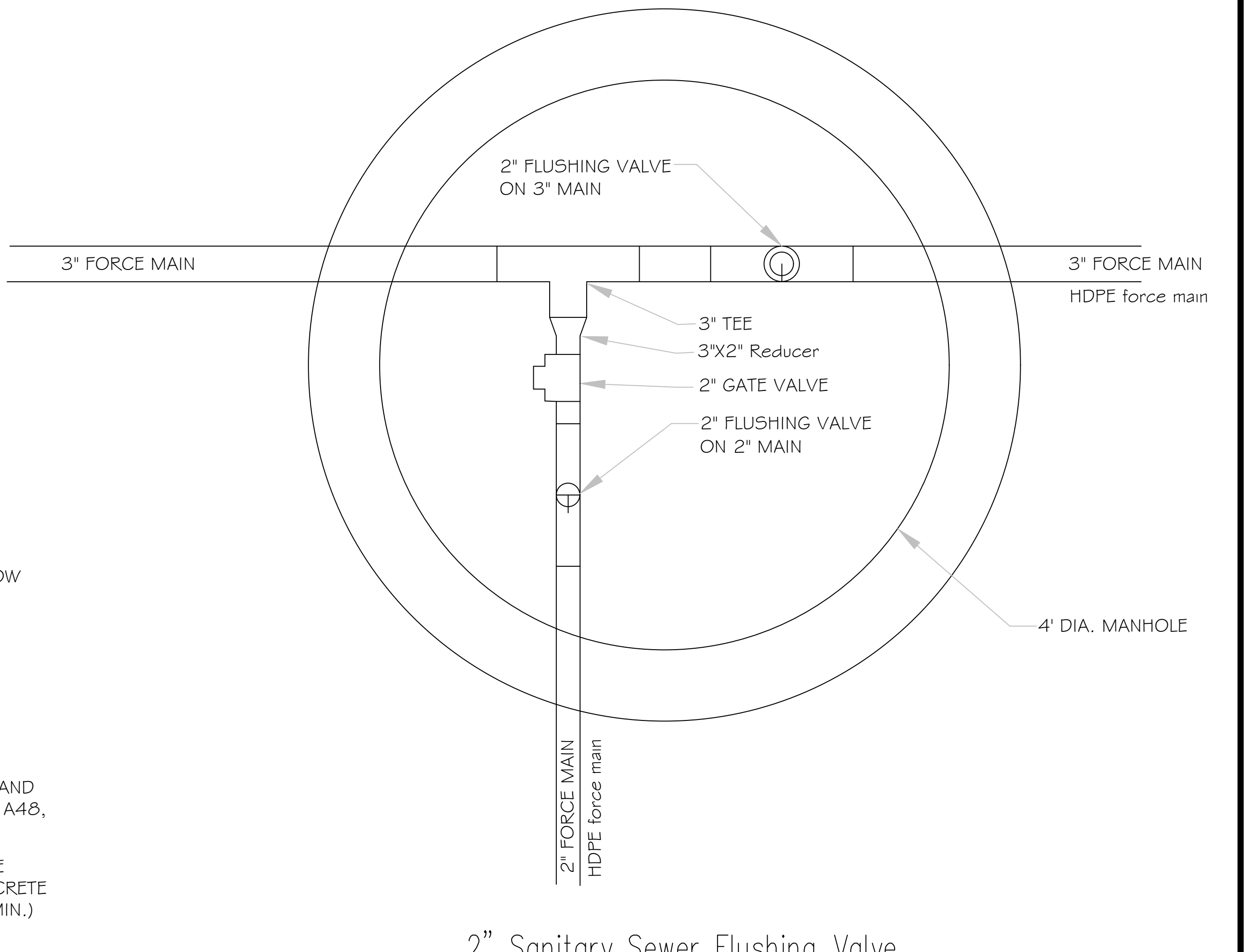
1. THE CONTRACTOR SHALL USE SCHEDULE 80 PVC FITTINGS.
2. PVC PRIMER/CLEANER SHALL BE USED BEFORE PVC CEMENT IS APPLIED.
3. BED ALL FITTINGS AND VALVE BOX IN 3/4" CRUSHED STONE.

PLAN VIEW

PROFILE VIEW

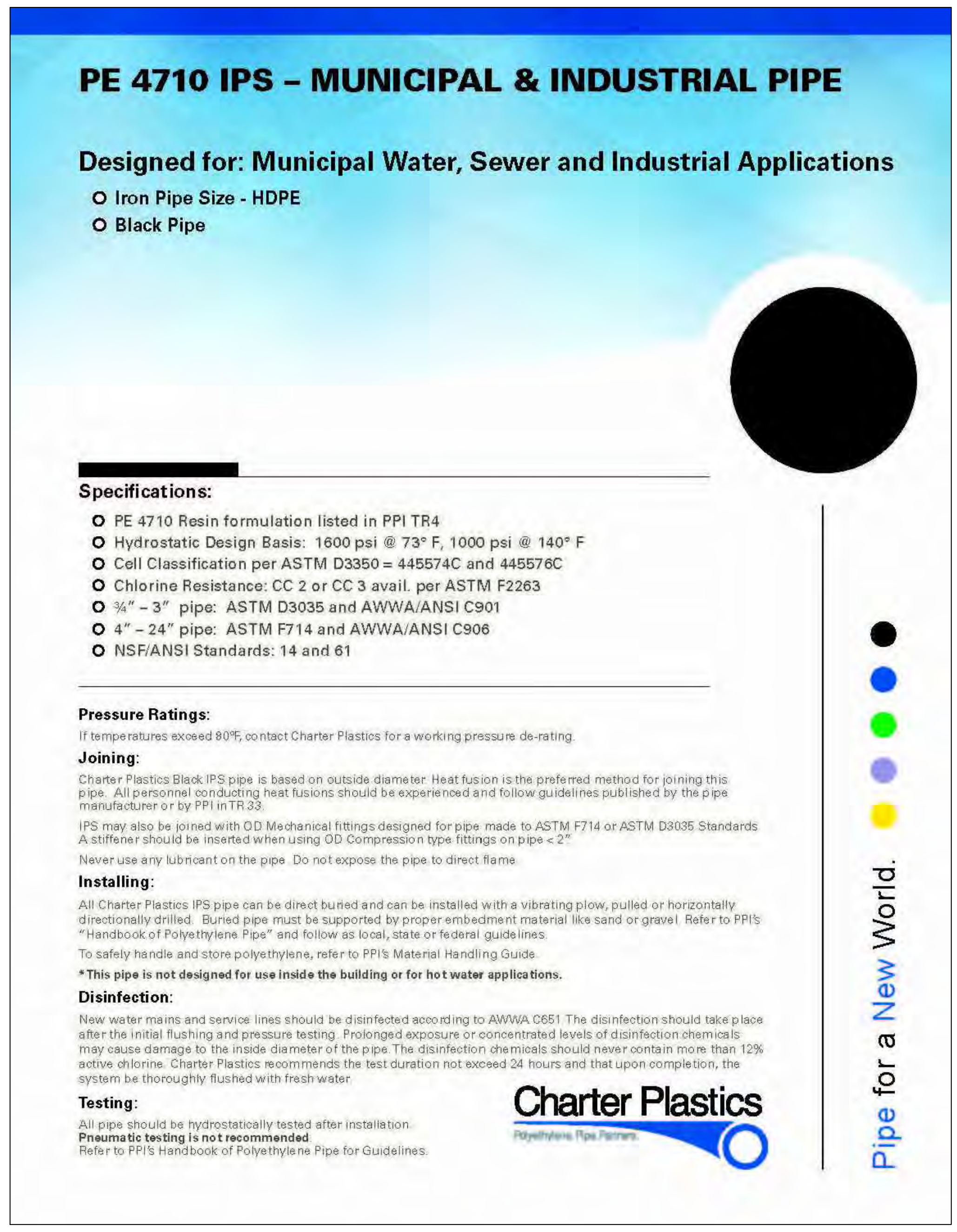
LOW PRESSURE SEWER CONNECTION SERVICE DETAIL

NOT TO SCALE



2" Sanitary Sewer Flushing Valve and 2" isolation valve inside SMH's 8 and 9

NOT TO SCALE



PE 4710 IPS – MUNICIPAL & INDUSTRIAL PIPE

Designed for: Municipal Water, Sewer and Industrial Applications

- ○ Iron Pipe Size - HDPE
- ○ Black Pipe

Specifications:

- ○ PE 4710 Resin formulation listed in PPI TR4
- ○ Hydrostatic Design Basis: 1600 psi @ 73° F, 1000 psi @ 140° F
- ○ Cell Classification per ASTM D3350 = 445574C and 445576C
- ○ Chlorine Resistance: CC 2 or CC 3 avail. per ASTM F2263
- ○ ¾" – 3" pipe: ASTM D3035 and AWWA/ANSI C901
- ○ 4" – 24" pipe: ASTM F714 and AWWA/ANSI C906
- ○ NSF/ANSI Standards: 14 and 61

Pressure Ratings:

If temperatures exceed 80°F, contact Charter Plastics for a working pressure de-rating.

Joining:

Charter Plastics Black IPS pipe is based on outside diameter. Heat fusion is the preferred method for joining this pipe. All personnel conducting heat fusions should be experienced and follow guidelines published by the pipe manufacturer or by PPI in TR 33.

IPS may also be joined with OD Mechanical fittings designed for pipe made to ASTM F714 or ASTM D3035 Standards. A stiffener should be inserted when using OD Compression type fittings on pipe < 2".

Never use any lubricant on the pipe. Do not expose the pipe to direct flame.

Installing:

All Charter Plastics IPS pipe can be direct buried and can be installed with a vibrating plow, pulled or horizontally directionally drilled. Buried pipe must be supported by proper embedment material like sand or gravel. Refer to PPI's "Handbook of Polyethylene Pipe" and follow as local, state or federal guidelines.

To safely handle and store polyethylene, refer to PPI's Material Handling Guide.

***This pipe is not designed for use inside the building or for hot water applications.**

Disinfection:

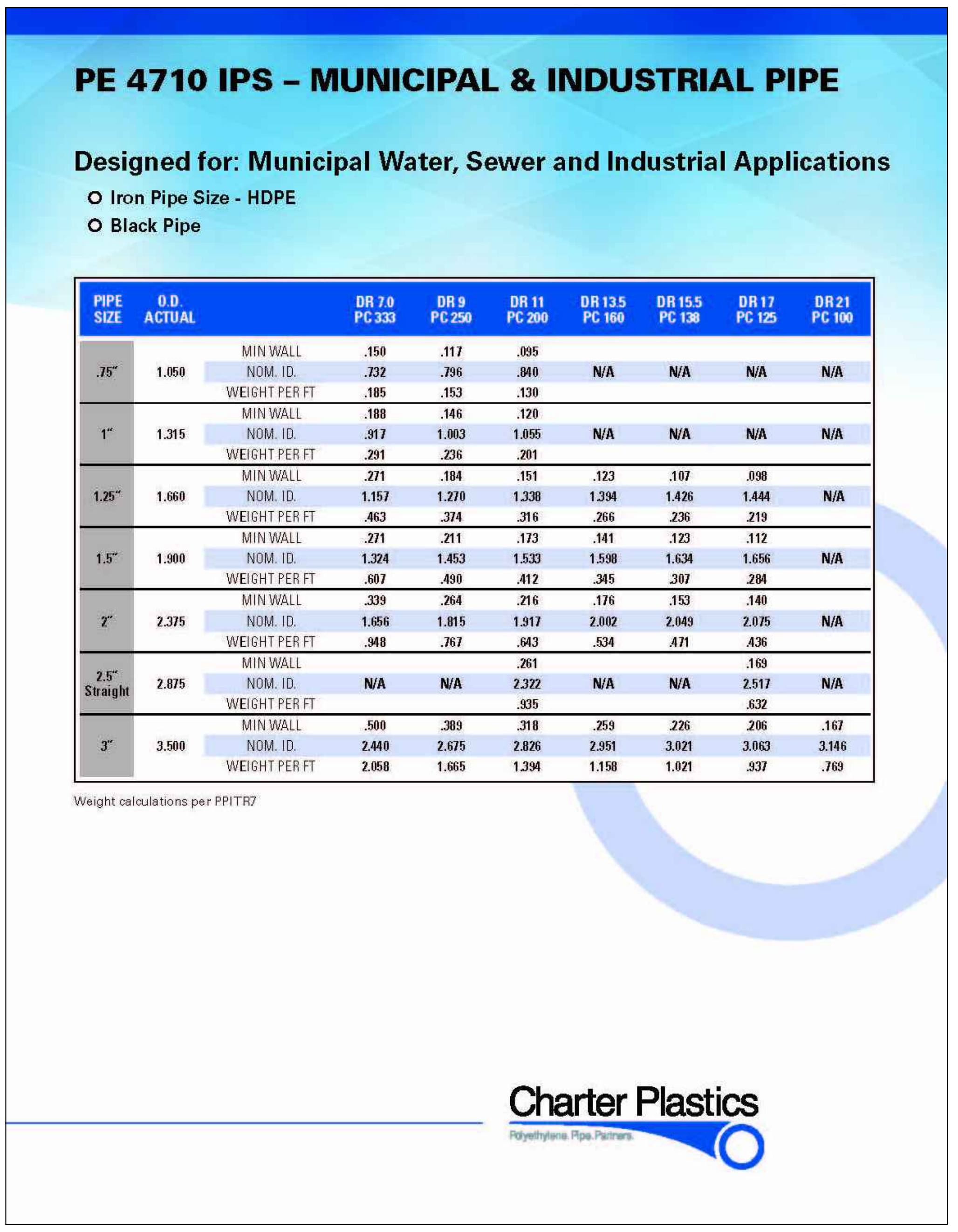
New water mains and service lines should be disinfected according to AWWA C651. The disinfection should take place after the initial flushing and pressure testing. Prolonged exposure or concentrated levels of disinfection chemicals may cause damage to the inside diameter of the pipe. The disinfection chemicals should never contain more than 12% active chlorine. Charter Plastics recommends the test duration not exceed 24 hours and that upon completion, the system be thoroughly flushed with fresh water.

Testing:

All pipe should be hydrostatically tested after installation.
Pneumatic testing is not recommended.
Refer to PPI's Handbook of Polyethylene Pipe for Guidelines.

Charter Plastics
Polyethylene Pipe Partners

Pipe for a New World.



PE 4710 IPS – MUNICIPAL & INDUSTRIAL PIPE

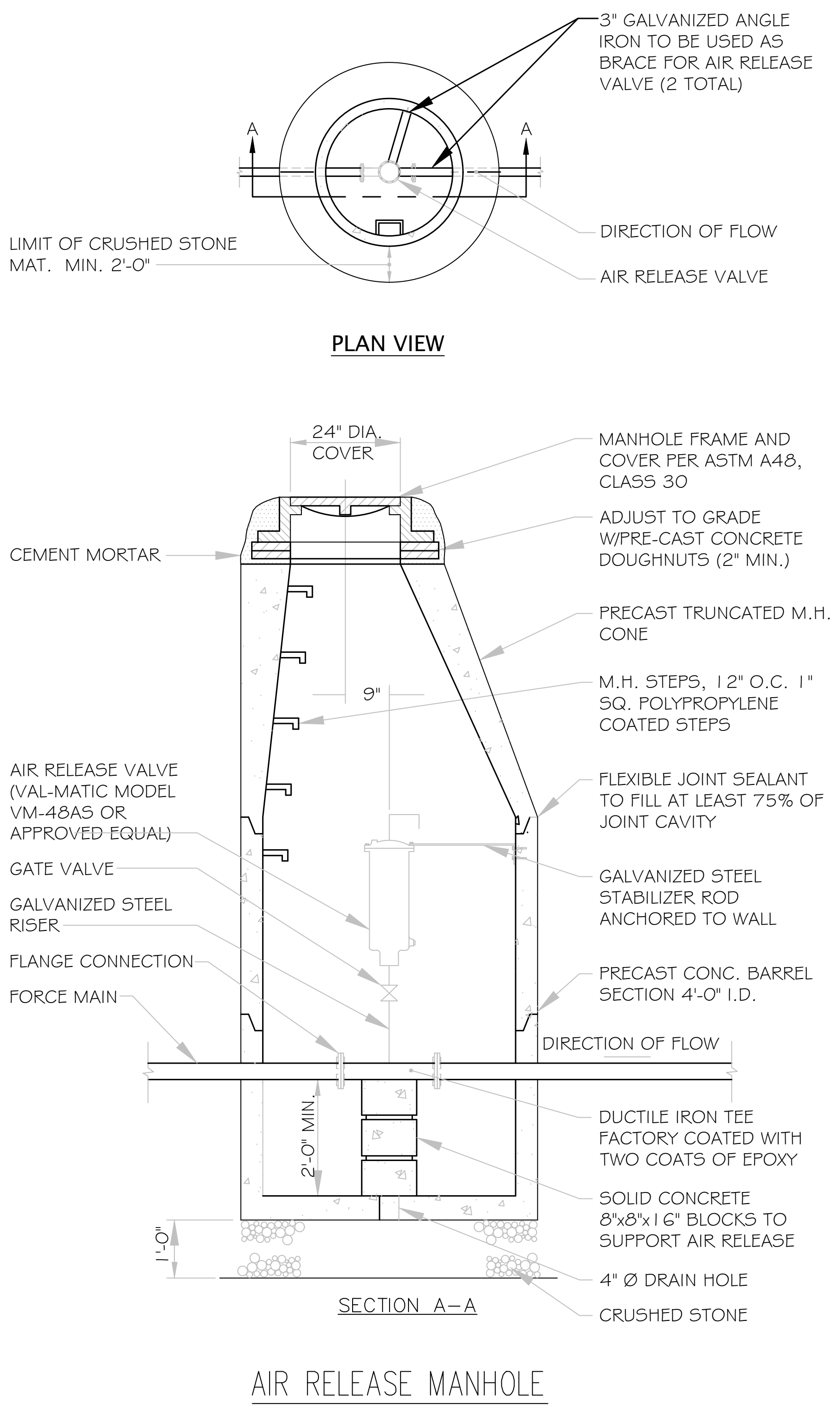
Designed for: Municipal Water, Sewer and Industrial Applications

- ○ Iron Pipe Size - HDPE
- ○ Black Pipe

PIPE SIZE	O.D. ACTUAL		DR 7.0 PC 333	DR 9 PC 250	DR 11 PC 200	DR 13.5 PC 160	DR 15.5 PC 138	DR 17 PC 125	DR 21 PC 100
.75"	1.050	MIN WALL	.150	.117	.095				
		NOM. ID.	.732	.796	.840	N/A	N/A	N/A	N/A
		WEIGHT PER FT	.185	.153	.130				
1"	1.315	MIN WALL	.188	.146	.120				
		NOM. ID.	.917	1.003	1.055	N/A	N/A	N/A	N/A
		WEIGHT PER FT	.291	.236	.201				
1.25"	1.660	MIN WALL	.271	.184	.151	.123	.107	.098	
		NOM. ID.	1.157	1.270	1.338	1.394	1.426	1.444	N/A
		WEIGHT PER FT	.463	.374	.316	.266	.236	.219	
1.5"	1.900	MIN WALL	.271	.211	.173	.141	.123	.112	
		NOM. ID.	1.324	1.453	1.533	1.598	1.634	1.656	N/A
		WEIGHT PER FT	.607	.490	.412	.345	.307	.284	
2"	2.375	MIN WALL	.339	.264	.216	.176	.153	.140	
		NOM. ID.	1.656	1.815	1.917	2.002	2.049	2.075	N/A
		WEIGHT PER FT	.948	.767	.643	.534	.471	.436	
2.5" Straight	2.875	MIN WALL			.261			.169	
		NOM. ID.	N/A	N/A	2.322	N/A	N/A	2.517	N/A
		WEIGHT PER FT			.935			.632	
3"	3.500	MIN WALL	.500	.389	.318	.259	.226	.206	.167
		NOM. ID.	2.440	2.675	2.826	2.951	3.021	3.063	3.146
		WEIGHT PER FT	2.058	1.665	1.394	1.158	1.021	.937	.769

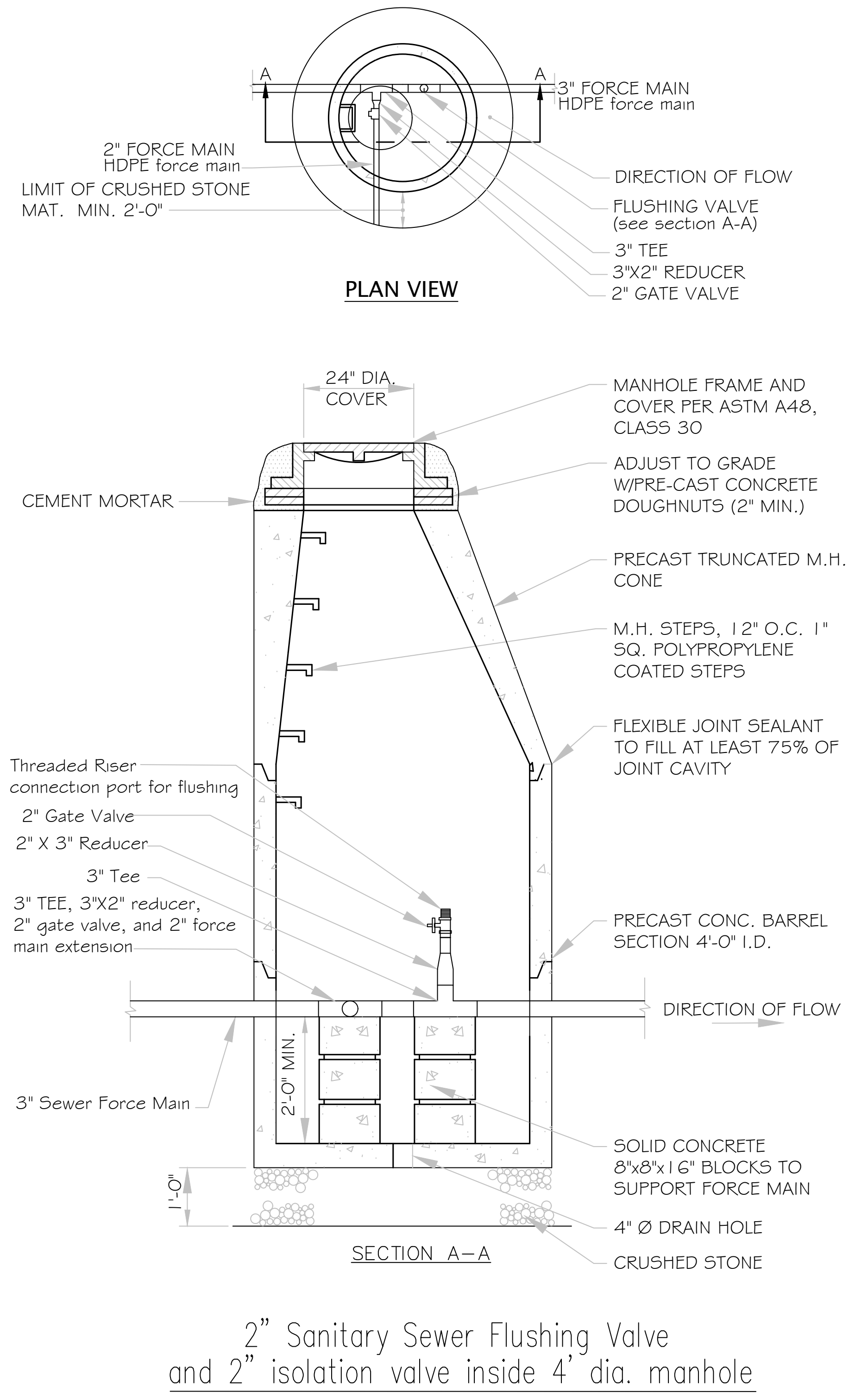
Weight calculations per PPITR7

Charter Plastics
Polyethylene Pipe Partners



AIR RELEASE MANHOLE

NOT TO SCALE



2" Sanitary Sewer Flushing Valve and 2" isolation valve inside 4' dia. manhole

NOT TO SCALE

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	No changes this sheet Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

Low Pressure Sewer Pump Details

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

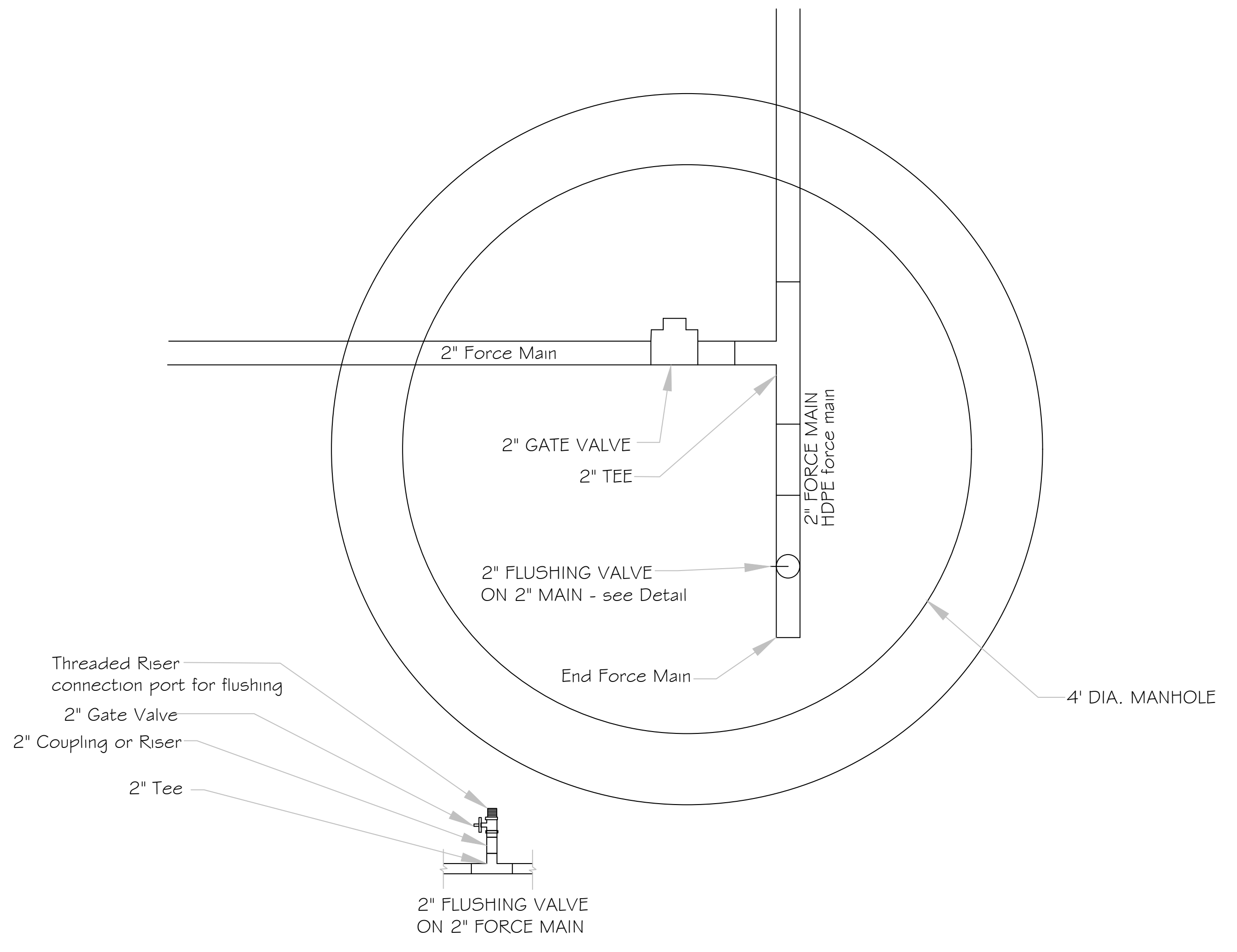
CHRISTOPHER S. BELANGER 9098

6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

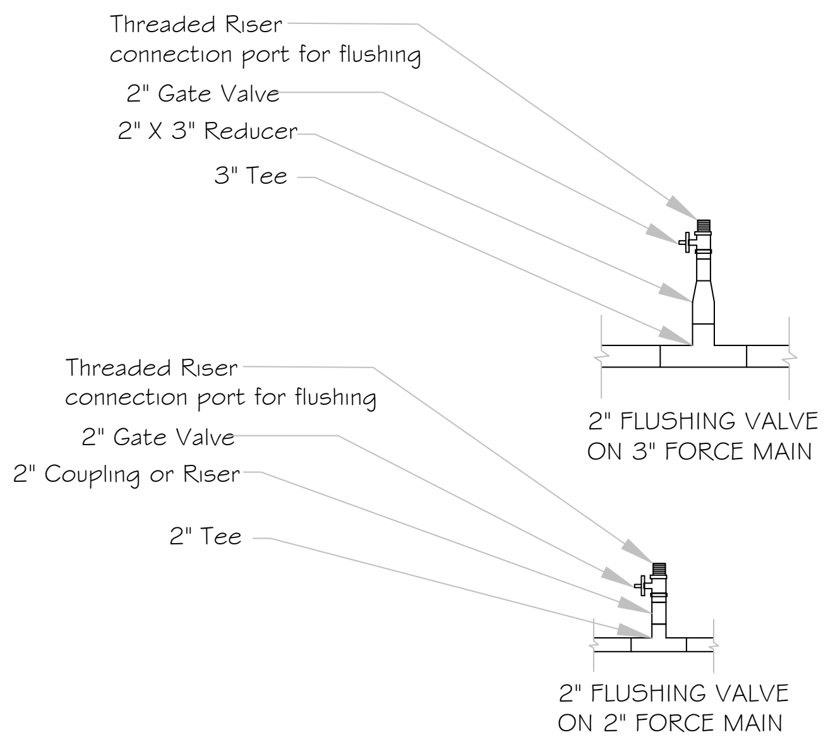
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C18
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



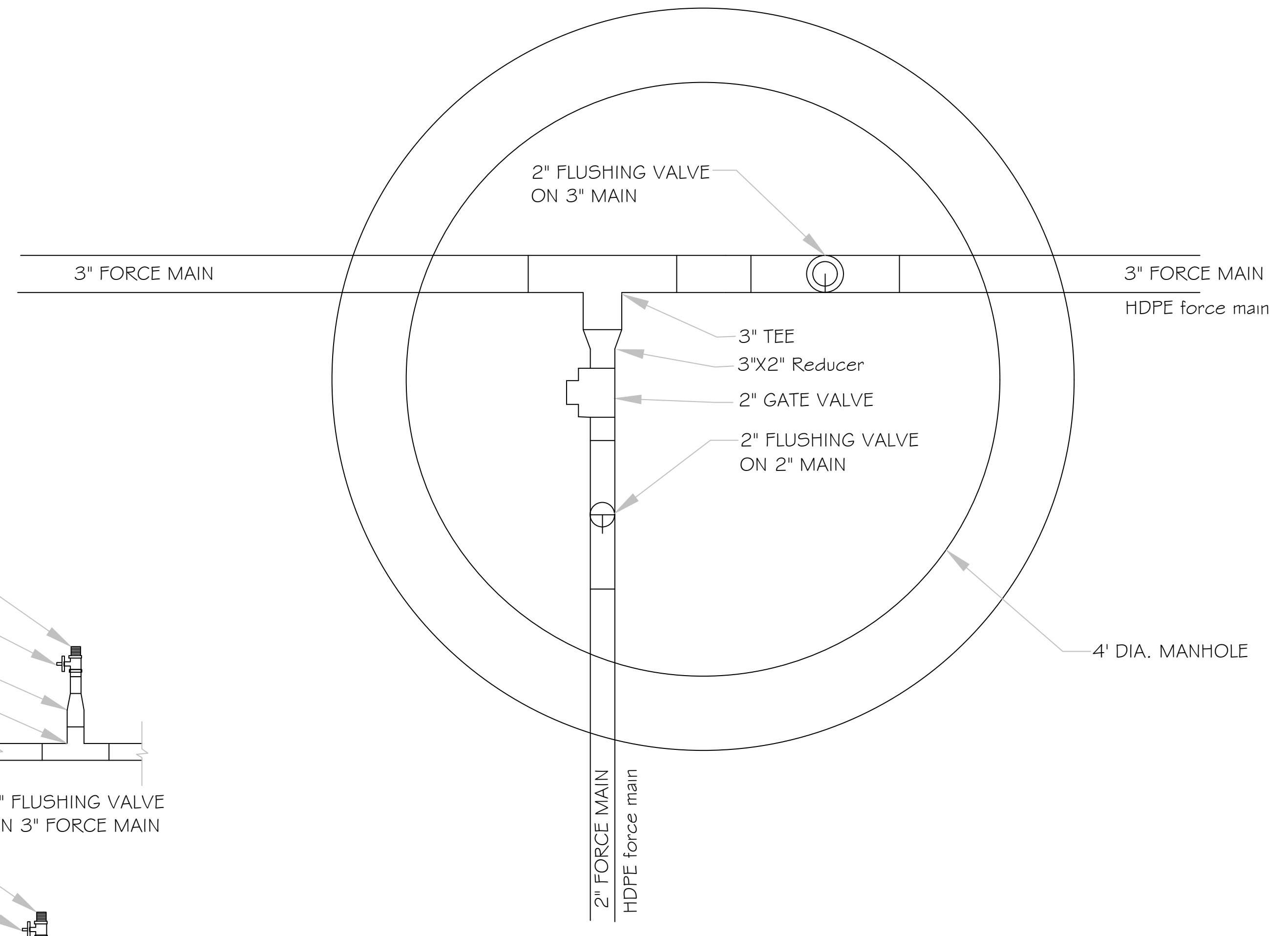
2" Sanitary Sewer Flushing Valve and 2" isolation valve inside SMH 7

NOT TO SCALE



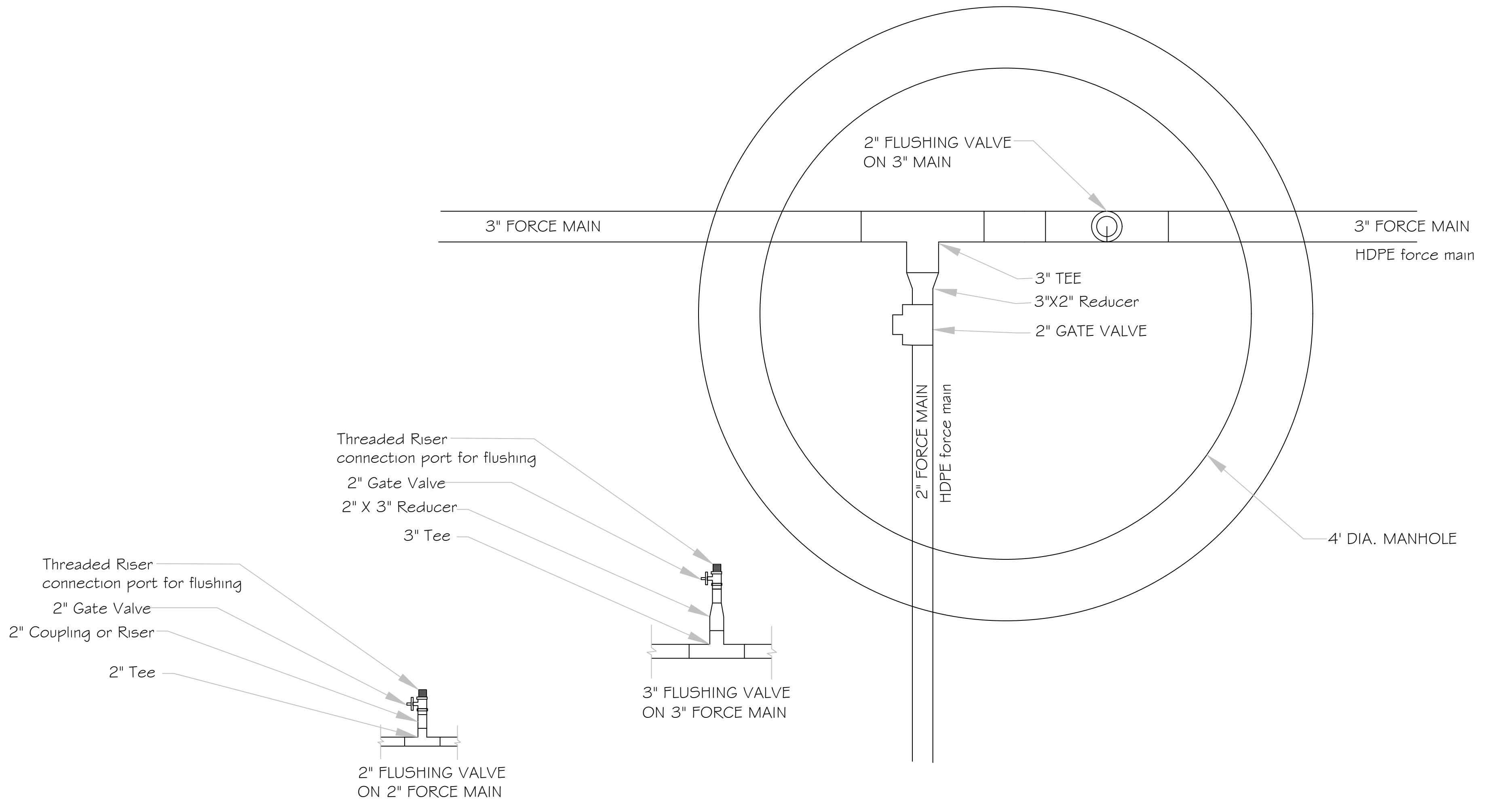
2" Sanitary Sewer Flushing Valve Detail

NOT TO SCALE



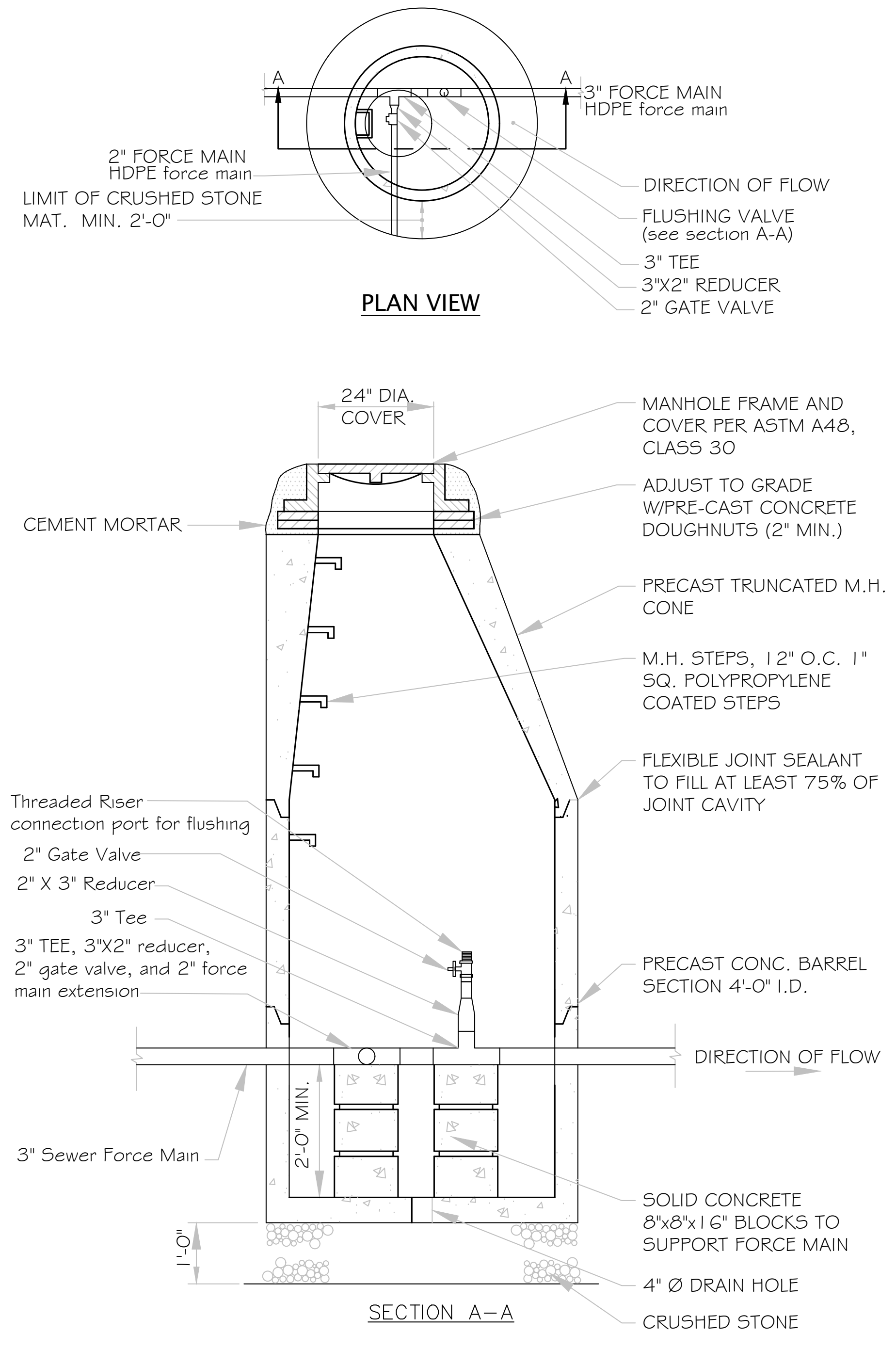
2" Sanitary Sewer Flushing Valve and 2" isolation valve inside SMH's 8 and 9

NOT TO SCALE



2" Sanitary Sewer Flushing Valve and 2" isolation valve inside SMH 6

NOT TO SCALE



2" Sanitary Sewer Flushing Valve and 2" isolation valve inside 4' dia. manhole

NOT TO SCALE

3.	6-15-2020	No changes, re-submit to town and DEP	CSB
2.	2-24-2020	No changes this sheet Re-submit to Town	CSB
1.	12-6-2018	Add Sewer Flushing details	CSB

Low Pressure Sewer Pump Details

Oceanview at Cumberland
291 Tuttle Road, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER
S.
BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

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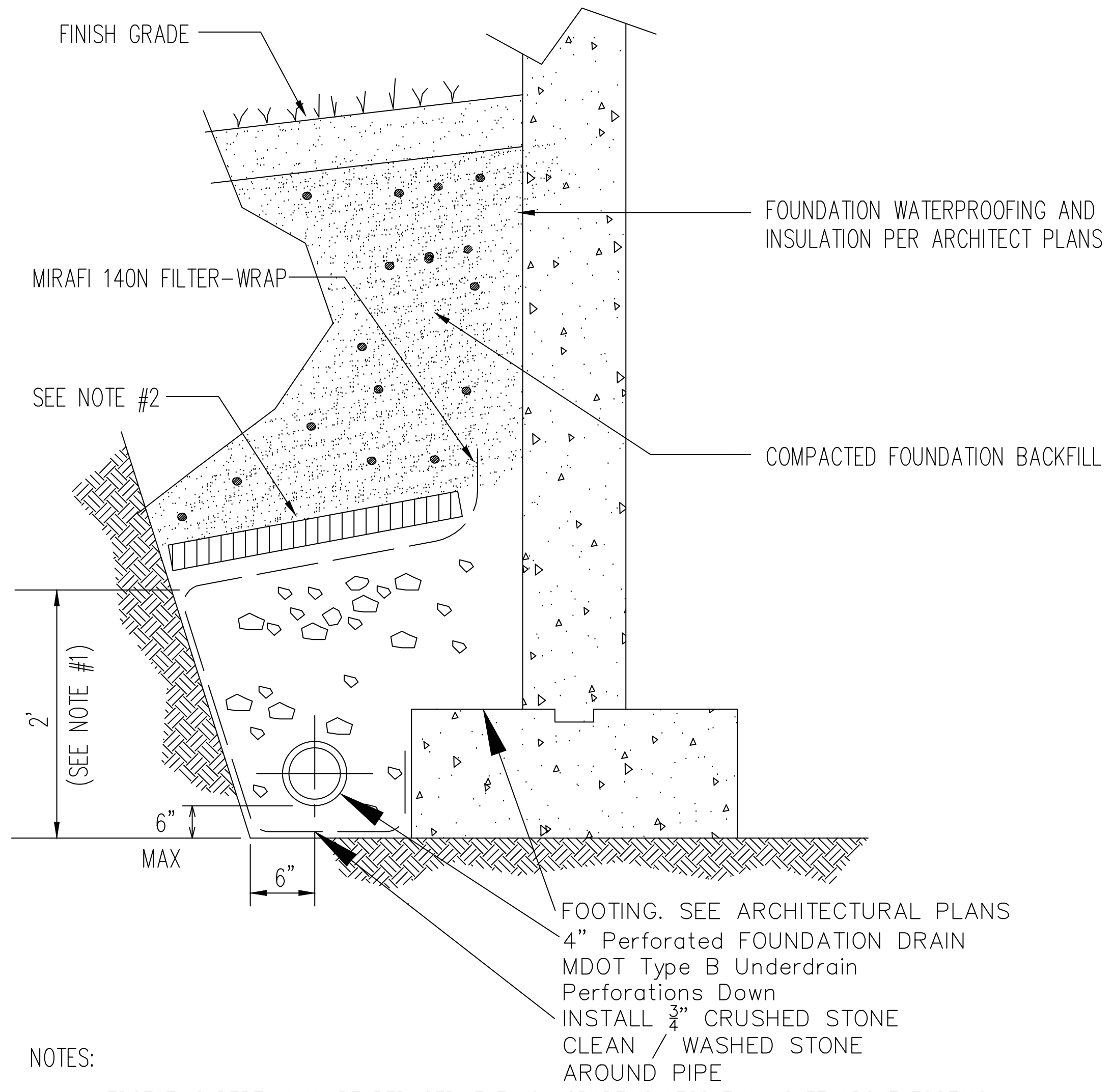
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C18A
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



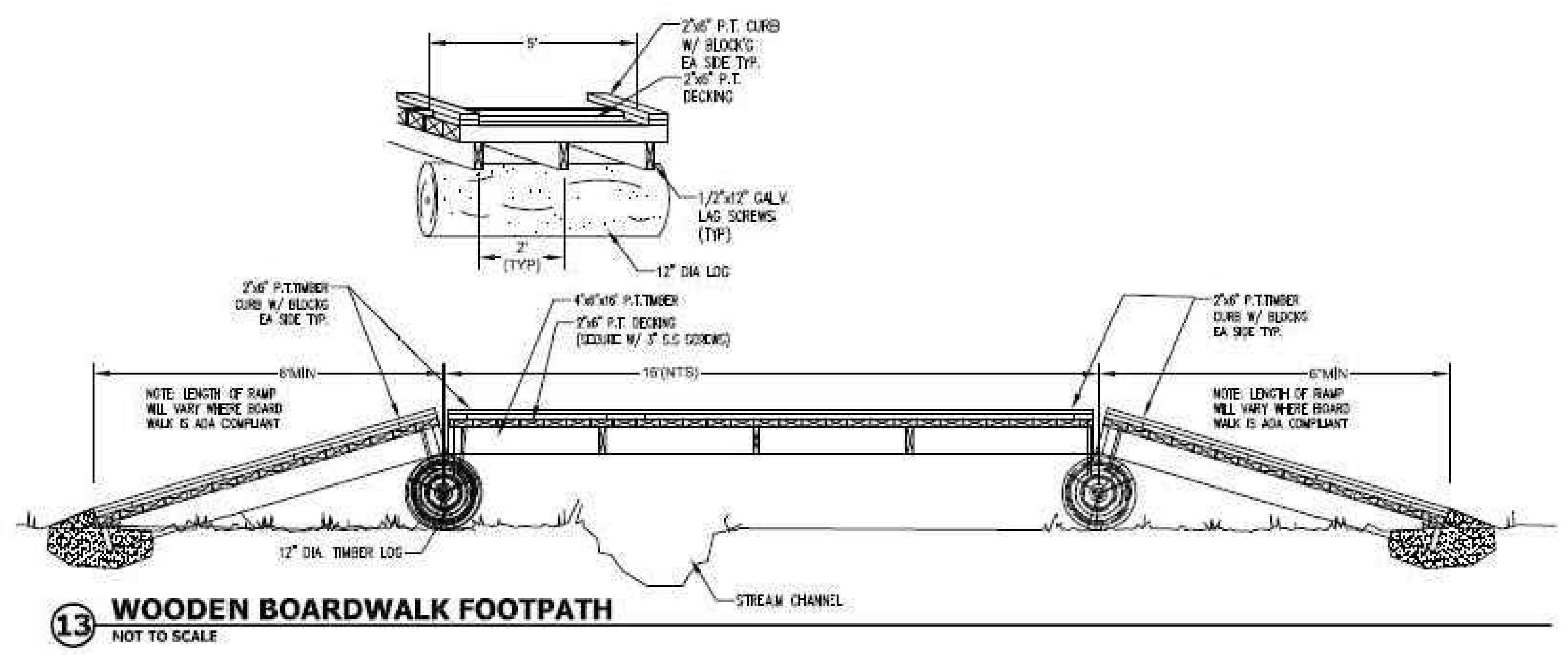
NOTES:

1. IN LEDGE THIS DEPTH MAY BE REDUCED IF FINISH GRADE IS LESS THAN 2 FT ABOVE FOOTING.
2. PROVIDE POLYSTYRENE INSULATION BOARD OVER PIPE WHERE COVER IS LESS THAN 4 FT AND/OR AS NOTED ON PLANS.
3. SEE PLANS FOR LOCATIONS OF DRAINBOARD AND PERIMETER DRAINS.

PERIMETER OR FOUNDATION DRAIN DETAIL

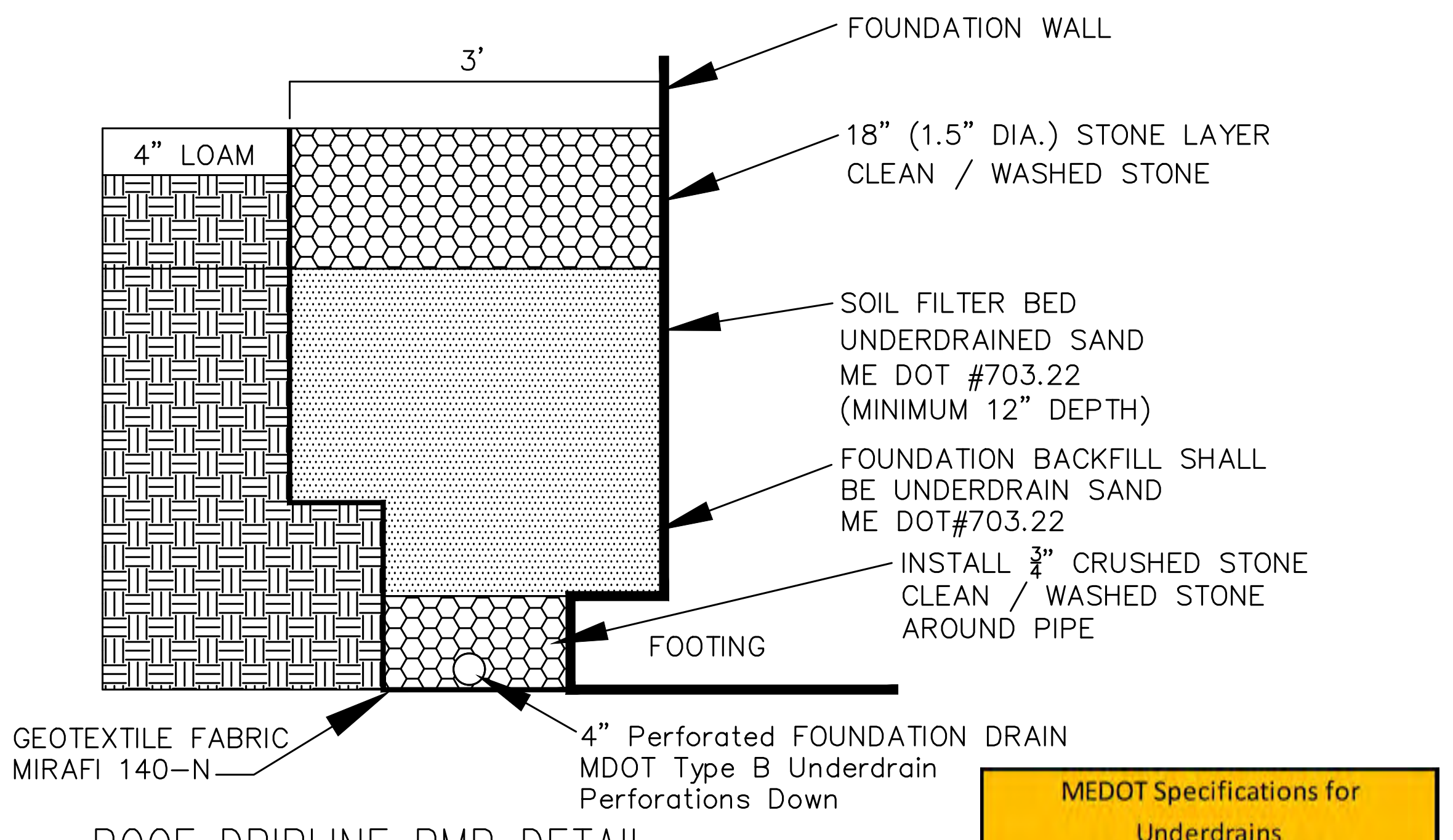
NOT TO SCALE

ST-UD-FOUND/02-97



13 WOODEN BOARDWALK FOOTPATH

NOT TO SCALE



ROOF DRIPLINE BMP DETAIL

NOT TO SCALE

OV @ CUMBERLAND SENIOR HOUSING

MEDOT Specifications for Underdrains (ME DOT #703.22)	
Sieve Size	% Passing by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
Underdrain Type C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

CONSTRUCTION OVERSIGHT ROOF DRIPLINE INSTALLATION

The Contractor will retain the services of a professional engineer of the clients choosing to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Roof Dripline Filtration

Construction inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the geotextile lining, after the foundation drain pipe is installed but not yet backfilled, after the pipe bedding gravel is placed but prior to the placement of the gravel filter media, after the gravel filter media has been placed but prior to installing the crushed stone surface layer, and after the surface crushed stone surface layer is installed.

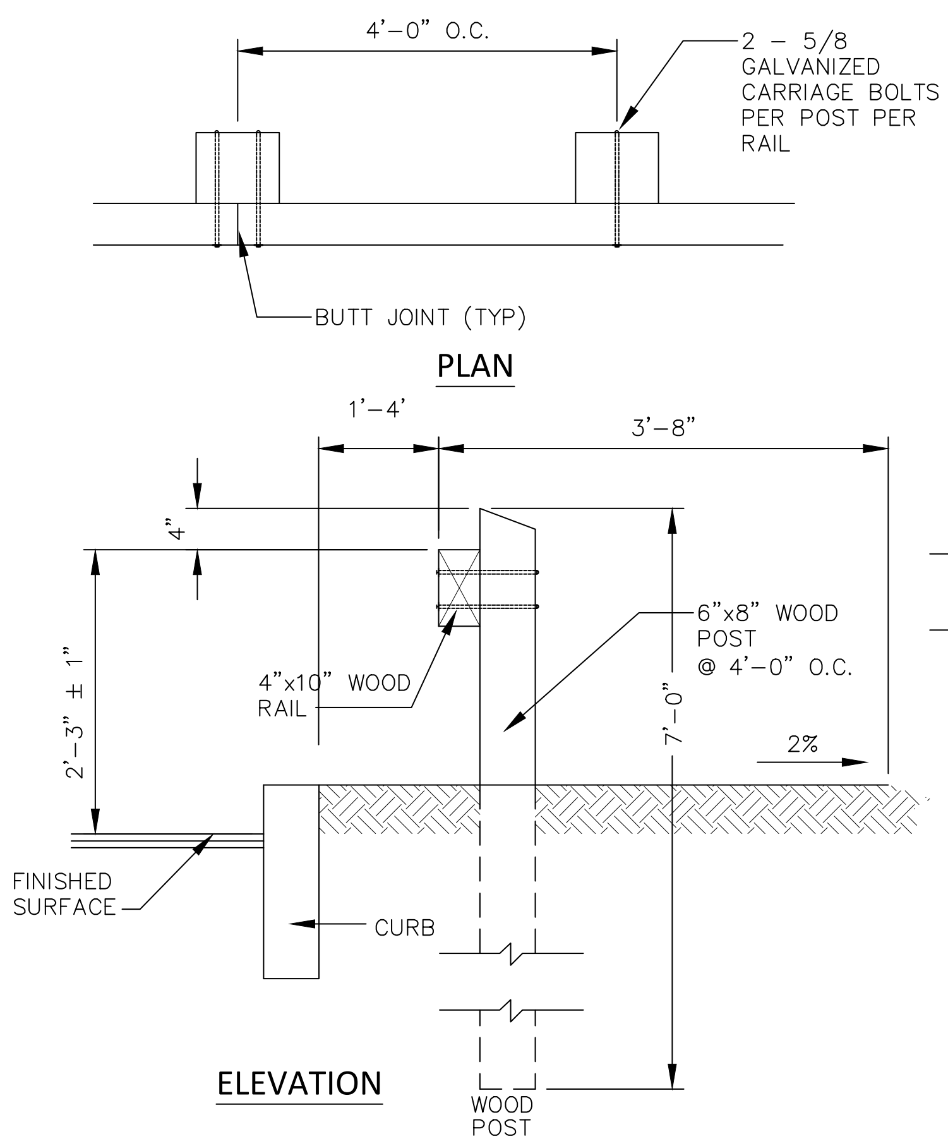
Testing and submittals: The gravel filter media and pipe bedding media used in the roof dripline filtration BMP must be confirmed as suitable by testing. The contractor shall identify the source of these gravels and obtain samples for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the gravel is placed as part of the dripline filter's construction.

- Obtain a sample of the gravel filter media. The sample must be a composite of three different locations (grabs) from the gravel stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the sand filter media showing it meets the following gradation:

Sieve Size	% Passing by Weight
3"	100
#200	4-7

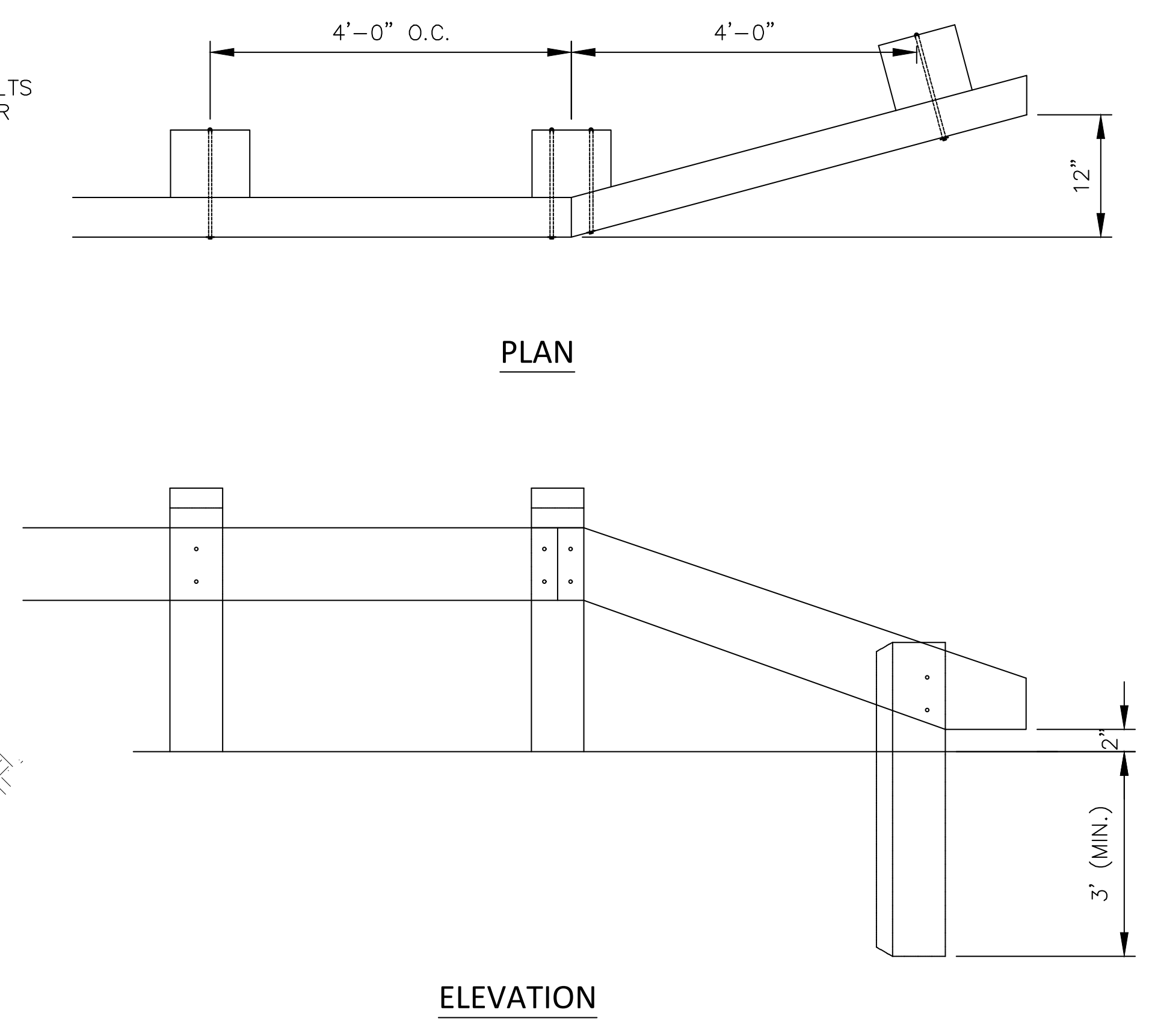
- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.



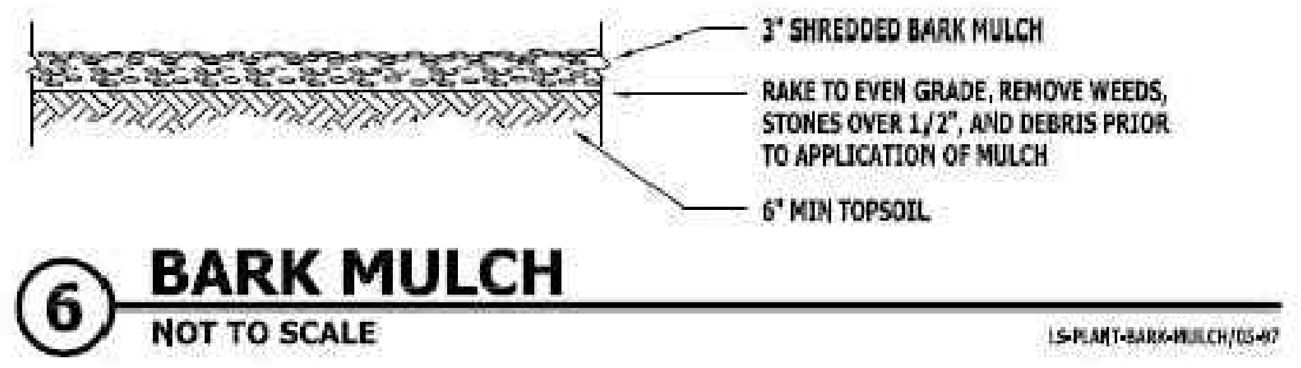
WOOD GUARD RAIL

NOT TO SCALE



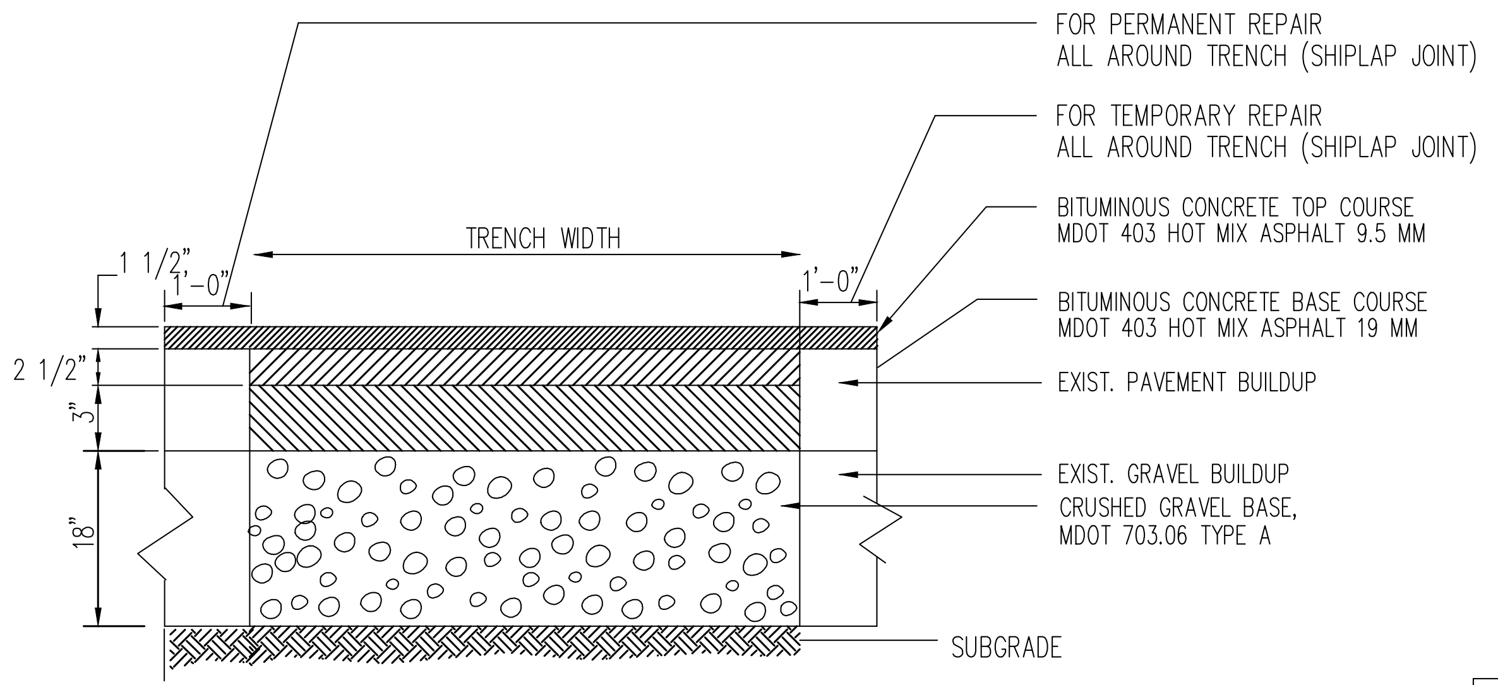
WOOD GUARD RAIL- TAPERED END

NOT TO SCALE



6 BARK MULCH

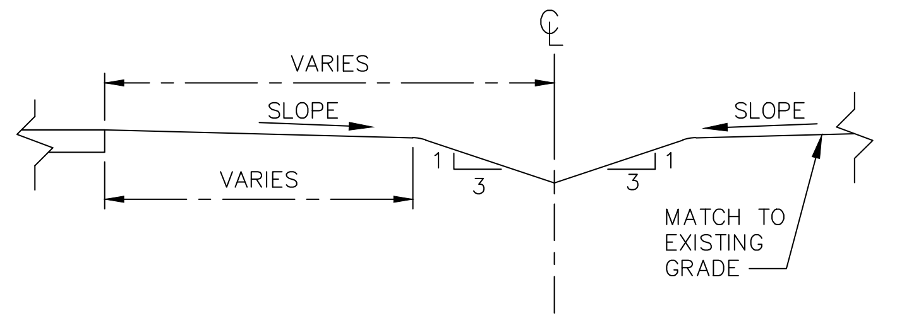
NOT TO SCALE



NOTE:
TRENCH REPAIR TO MEET TOWN OF CUMBERLAND DPW REQUIREMENTS

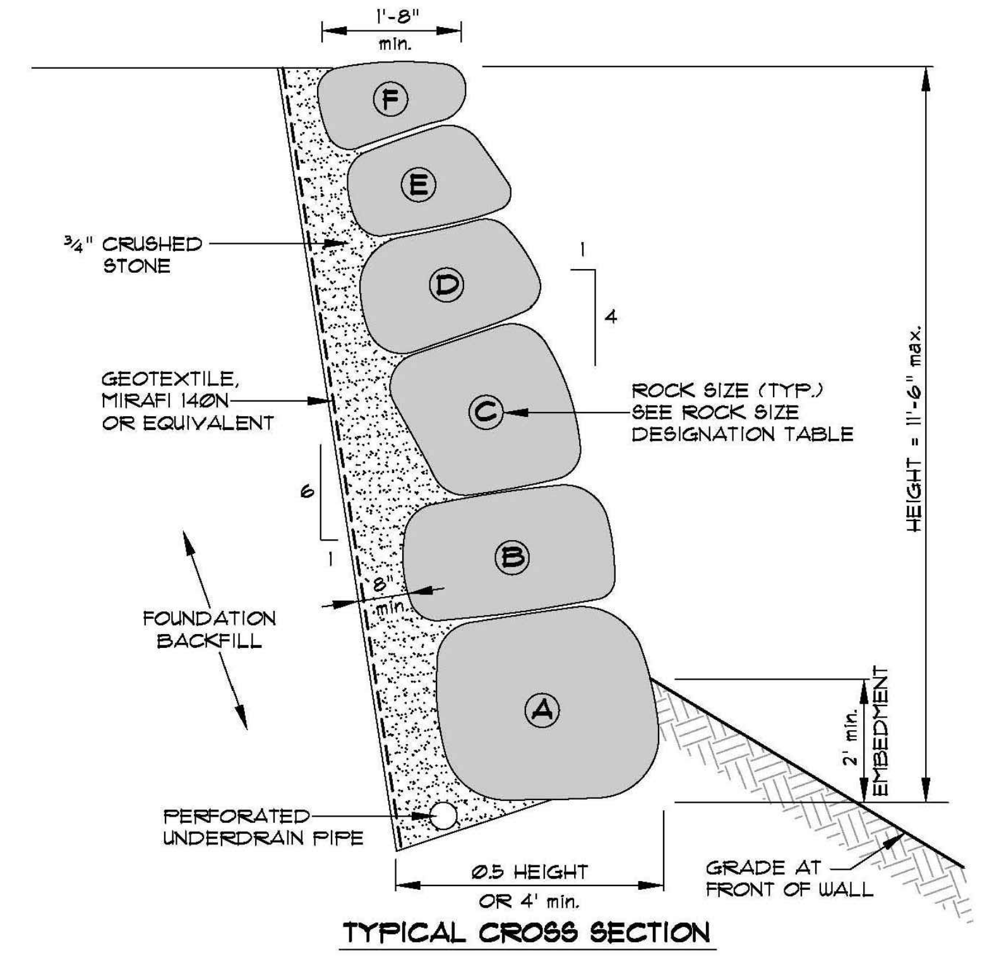
TRENCH REPAIR
BITUMINOUS CONCRETE

NOT TO SCALE



TYPICAL DRAINGE SWALE

N.T.S.



TYPICAL CROSS SECTION

WALL HEIGHT	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ
0 TO 3'-3"	2	1	-	-	-	-
3'-3" TO 6'-6"	3	2	1	-	-	-
6'-6" TO 9'-9"	3	3	2	1	-	-
TALLER THAN 9'-9"	4	3	2	2	1	1

NUMBER IN TABLE CORRESPONDS TO ROCK TYPE

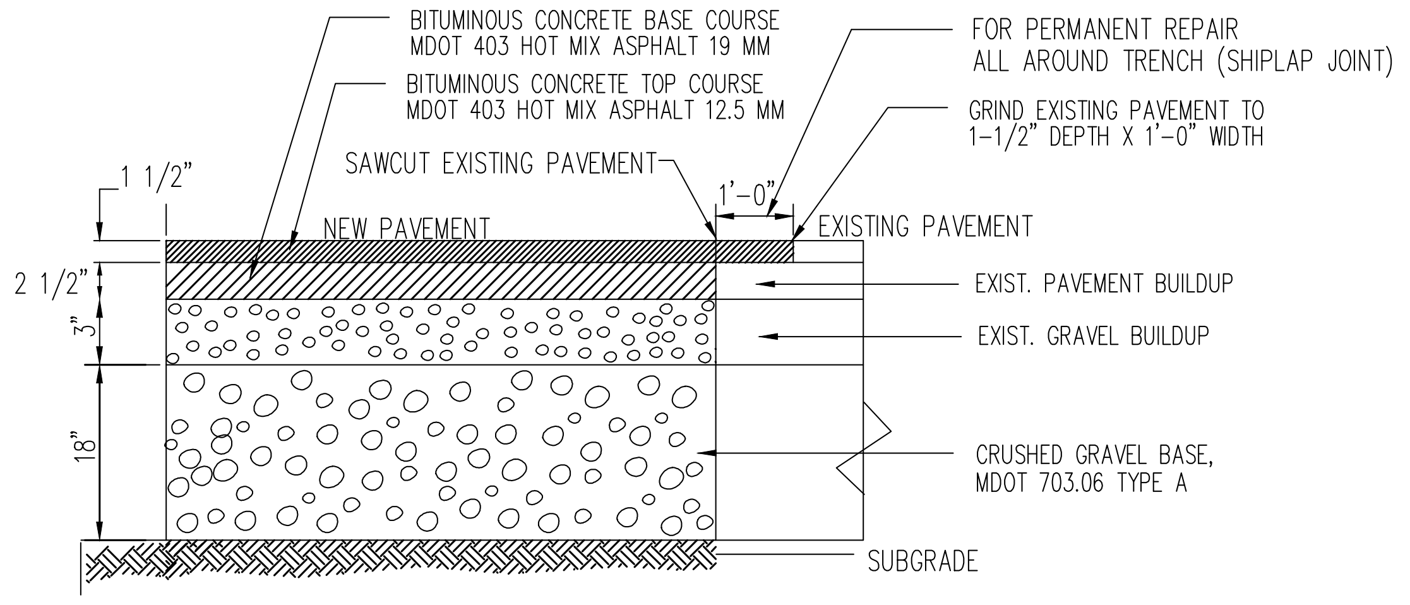
ROCK TYPE DESIGNATION

ROCK TYPE	ROCK WEIGHT (POUNDS)	AVERAGE DIMENSION
1	200 - 660	1'-6" TO 2'-4"
2	660 - 2000	2'-4" TO 3'-0"
3	2000 - 4000	3'-0" TO 4'-0"
4	4000 - 6000	4'-0" TO 4'-6"

ROCK SIZING

BOULDER RETAINING WALL 4–11' HIGH

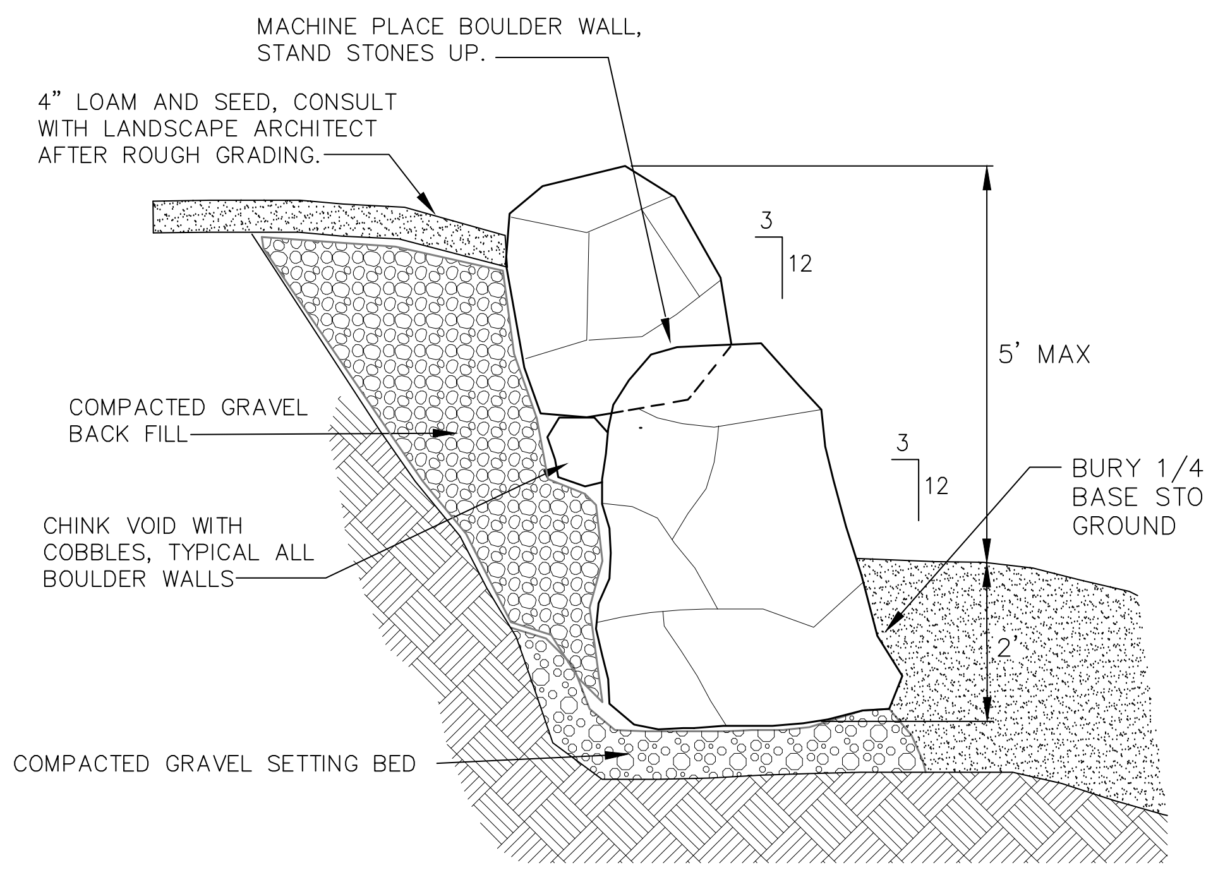
NOT TO SCALE



NOTE:
TRENCH REPAIR TO MEET TOWN OF CUMBERLAND DPW REQUIREMENTS

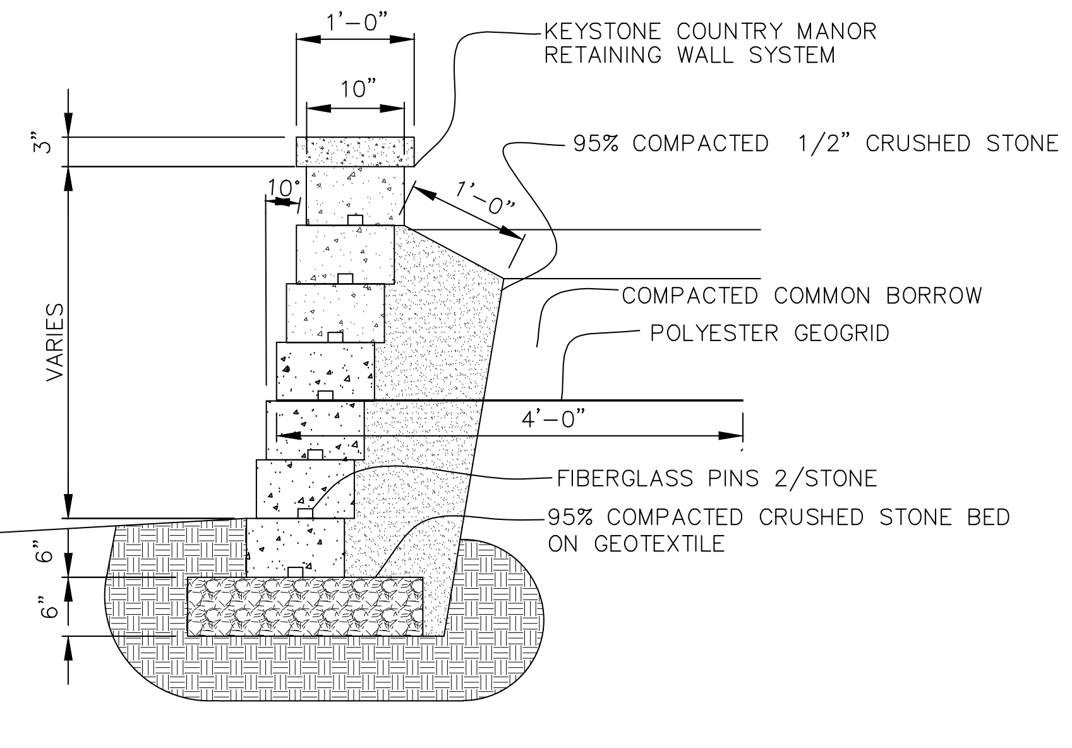
PAVEMENT BUTT JOINT DETAIL
BITUMINOUS CONCRETE

NOT TO SCALE



RETAINING BOULDER WALL

NOT TO SCALE



KEYSTONE COUNTRY MANOR

SEGMENTAL RETAINING WALL

NOT TO SCALE

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	No changes this sheet Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

Roof Dripline BMP and Misc. Details

Cumberland Crossing - Phase 2
Tuttle and Greely Road, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
Ch Belanger
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

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- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C19
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

Storm Drain Structure Table

Structure Name	Structure Details	
CB1	RIM = 83.284 SUMP = 75.500 SD1 INV OUT = 79.500	Sta=45+14.88 OFF=10.000 R N=350434.6522 E=2934442.4111
CB2	RIM = 83.285 SUMP = 75.190 SD1 INV IN = 79.300 SD2 INV OUT = 79.190	Sta=45+14.88 OFF=-10.000 L N=350453.0695 E=2934450.2087
CB3	RIM = 84.702 SUMP = 73.316 SDOCS1 INV IN = 75.400 SD3 INV OUT = 75.316	Sta=46+75.53 OFF=-10.742 L N=350433.4933 E=2934602.2004
CB4	RIM = 86.340 SUMP = 72.232 SD3 INV IN = 74.300 SD4 INV OUT = 74.232	Sta=48+81.28 OFF=-13.133 L N=350496.9257 E=2934795.3215
CB5	RIM = 86.466 SUMP = 71.871 SD4 INV IN = 74.000 SD5 INV OUT = 73.871	Sta=49+27.61 OFF=-13.524 L N=350512.4640 E=2934838.9684
CB6	RIM = 85.904 SUMP = 71.357 SD5 INV IN = 73.500 SD6 INV OUT = 73.357	Sta=49+99.74 OFF=-8.870 L N=350526.2539 E=2934911.9748
CB7	RIM = 85.419 SUMP = 72.374 SD11 INV IN = 74.400 SD7 INV OUT = 74.374	Sta=50+09.97 OFF=19.227 R N=350499.5074 E=2934925.1992
CB8	RIM = 85.269 SUMP = 72.019 SD7 INV IN = 74.100 SD8 INV OUT = 74.019	Sta=50+67.08 OFF=10.578 R N=350508.2935 E=2934979.3596
CB9	RIM = 84.393 SUMP = 71.500 SD8 INV IN = 73.600 SD9 INV OUT = 73.500	Sta=51+51.03 OFF=10.233 R N=350499.1179 E=2935062.5590
CB10	RIM = 84.418 SUMP = 71.355 SD9 INV IN = 73.400 SD10 INV OUT = 73.355	Sta=51+49.80 OFF=-9.632 L N=350518.9925 E=2935063.6144
CB11	RIM = 81.102 SUMP = 75.304 SD12 INV IN = 75.400 CULV2 INV IN = 75.400 SD11 INV OUT = 75.304	Sta=22+00.67 OFF=10.128 R N=350319.0790 E=2934937.9827
CB12	RIM = 80.364 SUMP = 75.797 SD13 INV IN = 75.900 SD14 INV IN = 75.900 SD12 INV OUT = 75.797	Sta=22+77.68 OFF=10.000 R N=350240.2756 E=2934947.5071
CB13	RIM = 80.365 SUMP = 76.000 SD13 INV OUT = 76.000	Sta=22+77.68 OFF=-10.000 L N=350246.0265 E=2934966.6624
CB14	RIM = 80.737 SUMP = 75.200 SD16 INV IN = 76.600 SD15 INV IN = 75.200 SD14 INV OUT = 76.201	Sta=23+33.86 OFF=17.405 R N=350182.8712 E=2934965.9062
CB15	RIM = 80.916 SUMP = 75.369 SD15 INV OUT = 75.369	Sta=23+53.17 OFF=-10.000 L N=350182.8062 E=2934999.6062
CB16	RIM = 80.000 SUMP = 76.777 SD16 INV OUT = 76.777	Sta=23+41.01 OFF=33.693 R N=350167.1080 E=2934956.8661
CB17	RIM = 83.501 SUMP = 79.100 CULV3 INV IN = 79.100 SD17 INV OUT = 79.216	Sta=53+32.47 OFF=373.194 R N=350117.7509 E=2935201.2036
CB18	RIM = 83.395 SUMP = 78.981 SD19 INV IN = 79.100 SD17 INV IN = 79.100 SD18 INV OUT = 78.981	Sta=25+90.12 OFF=13.488 R N=350095.6682 E=2935208.2665
CB19	RIM = 83.833 SUMP = 79.316 SD19 INV OUT = 79.316	Sta=26+33.29 OFF=12.683 R N=350108.4962 E=2935249.4985
CB20	RIM = 81.985 SUMP = 78.200 SD21 INV IN = 78.300 SD18 INV IN = 78.300 SD20 INV OUT = 78.200	Sta=95+48.49 OFF=7.607 R N=349970.4768 E=2935261.8623
CB21	RIM = 81.984 SUMP = 78.394 SD21 INV OUT = 78.394	Sta=95+48.25 OFF=-7.798 L N=349975.4917 E=2935276.4301
CB23	RIM = 82.206 SUMP = 76.950 SD23 INV OUT = 76.950	Sta=97+36.34 OFF=14.173 R N=350180.9382 E=2935503.2990
CB24	RIM = 81.856 SUMP = 76.441 SD23 INV IN = 76.800 SD24 INV OUT = 76.441	Sta=97+35.39 OFF=-7.980 L N=350196.6347 E=2935518.9602

Storm Drain Structure Table

Structure Name	Structure Details	
CB25	RIM = 82.650 SUMP = 75.964 SD24 INV IN = 76.100 SD25 INV OUT = 75.964	Sta=96+73.52 OFF=-19.285 L N=350246.5032 E=2935472.5774
CB26	RIM = 83.555 SUMP = 75.853 SD26 INV OUT = 75.853	Sta=28+13.44 OFF=10.108 R N=350209.6395 E=2935399.0317
CB27	RIM = 83.073 SUMP = 75.538 SD25 INV IN = 75.600 SD26 INV IN = 75.600 SD28 INV IN = 75.600 SD27 INV OUT = 75.538	Sta=28+59.74 OFF=10.594 R N=350260.2365 E=2935401.1737
CB28	RIM = 83.058 SUMP = 76.705 SD28 INV OUT = 76.705	Sta=28+61.68 OFF=-10.372 L N=350257.7985 E=2935380.2607
CB29	RIM = 81.155 SUMP = 74.460 SD27 INV IN = 74.600 SD30 INV IN = 76.627 SD29 INV OUT = 74.460	Sta=54+67.51 OFF=27.102 R N=350446.0829 E=2935375.0243
CB30	RIM = 81.255 SUMP = 74.862 SD30 INV OUT = 76.862	Sta=54+44.19 OFF=24.447 R N=350451.3932 E=2935352.1626
CB31	RIM = 81.577 SUMP = 74.163 SD29 INV IN = 74.200 SD31 INV OUT = 74.163	Sta=54+57.01 OFF=-20.871 L N=350494.9441 E=2935370.0857
CB32	RIM = 75.833 SUMP = 73.605 SD31 INV IN = 73.700 SD32 INV OUT = 73.605	Sta=54+52.86 OFF=-113.934 L N=350587.8687 E=2935376.6385
CB33	RIM = 79.687 SUMP = 73.272 SD32 INV IN = 73.300 SD33 INV OUT = 73.272	Sta=55+13.44 OFF=-121.057 L N=350588.0003 E=2935437.6330
CB34	RIM = 81.357 SUMP = 75.700 SD34 INV OUT = 77.700	Sta=54+23.02 OFF=9.686 R N=350468.4842 E=2935332.8211
CB35	RIM = 81.550 SUMP = 75.500 SD34 INV IN = 77.604 SD35 INV OUT = 77.500	Sta=54+23.58 OFF=-9.462 L N=350487.4416 E=2935335.5695
CB36	RIM = 79.416 SUMP = 72.500 SD35 INV IN = 74.600 SD36 INV OUT = 74.500	Sta=55+98.74 OFF=-9.893 L N=350484.0998 E=2935505.2634
CB37	RIM = 77.100 SUMP = 70.400 SD38 INV IN = 72.500 SD36 INV IN = 72.500 SD37 INV OUT = 72.400	Sta=56+99.14 OFF=-10.021 L N=350533.1821 E=2935585.9107
CB38	RIM = 77.113 SUMP = 70.599 SD38 INV OUT = 72.599	Sta=56+98.71 OFF=9.866 R N=350518.9483 E=2935599.8059
CB39	RIM = 73.175 SUMP = 65.442 SD37 INV IN = 67.540 SD39 INV OUT = 67.442	Sta=58+48.87 OFF=-10.114 L N=350660.4841 E=2935658.1590
CB40	RIM = 70.535 SUMP = 62.500 SD41 INV IN = 64.600 SD39 INV IN = 64.600 SD40 INV OUT = 64.500	Sta=59+61.06 OFF=-9.373 L N=350750.5150 E=2935727.5377
CB41	RIM = 70.528 SUMP = 62.694 SD41 INV OUT = 64.694	Sta=59+61.27 OFF=9.504 R N=350738.9112 E=2935742.4286
CB42	RIM = 70.155 SUMP = 62.500 SD43 INV IN = 64.825 SD42 INV OUT = 64.500	Sta=59+85.61 OFF=-16.679 L N=350774.2639 E=2935737.1218
CB43	RIM = 69.904 SUMP = 63.000 SD60 INV IN = 65.070 SD46 INV IN = 65.067 SD43 INV OUT = 65.000	Sta=60+20.50 OFF=-19.303 L N=350803.1863 E=2935756.8165
CB45	RIM = 69.511 SUMP = 63.500 SD45 INV OUT = 65.500	Sta=60+67.04 OFF=9.857 R N=350821.9096 E=2935808.6933
CB46	RIM = 69.507 SUMP = 63.300 SD45 INV IN = 65.400 SD46 INV OUT = 65.300	Sta=60+66.71 OFF=-10.078 L N=350833.3681 E=2935792.3776
CB47	RIM = 91.749 SUMP = 87.700 SD47 INV OUT = 87.700	Sta=??? OFF=??? ??? N=351624.6483 E=2935227.0229
CB48	RIM = 91.099 SUMP = 85.200 SD49 INV IN = 85.314 SD47 INV IN = 85.300 SD48 INV OUT = 85.200	Sta=102+90.74 OFF=-107.050 L N=351545.2972 E=2935187.3039

Storm Drain Structure Table

Structure Name	Structure Details	
CB49	RIM = 89.625 SUMP = 85.600 SD49 INV OUT = 85.600	Sta=102+35.46 OFF=-121.516 L N=351493.9831 E=2935162.1676
CB50	RIM = 91.812 SUMP = 82.600 SD48 INV IN = 84.706 SD50 INV OUT = 84.600	Sta=102+93.07 OFF=-8.177 L N=351527.9882 E=2935284.6774
CB51	RIM = 90.087 SUMP = 82.100 SD50 INV IN = 84.206 SD51 INV OUT = 84.100	Sta=8+88.53 OFF=16.576 R N=351452.8892 E=2935260.5804
CB52	RIM = 89.852 SUMP = 81.800 SD51 INV IN = 83.934 SD52 INV OUT = 83.800	Sta=8+62.42 OFF=16.757 R N=351446.6652 E=2935293.0938
CB53	RIM = 87.858 SUMP = 80.900 SD52 INV IN = 83.068 SD54 INV IN = 83.100 SD53 INV OUT = 82.900	Sta=6+98.18 OFF=10.203 R N=351301.8399 E=2935313.9284
CB54	RIM = 88.386 SUMP = 81.900 SD54 INV OUT = 83.900	Sta=10+91.61 OFF=17.224 R N=351301.8297 E=2935282.6691
CB55	RIM = 83.829 SUMP = 77.316 SD53 INV IN = 79.400 SD56 INV IN = 79.400 SD55 INV OUT = 79.316	Sta=5+58.65 OFF=9.965 R N=351179.5650 E=2935379.8309
CB56	RIM = 83.954 SUMP = 77.529 SD57 INV IN = 79.600 SD56 INV OUT = 79.529	Sta=5+59.15 OFF=-15.867 L N=351166.4143 E=2935357.5916
CB57	RIM = 85.111 SUMP = 77.766 SD57 INV OUT = 79.766	Sta=5+91.27 OFF=-17.846 L N=351194.3751 E=2935339.7913
CB58	RIM = 76.229 SUMP = 71.700 SD58 INV OUT = 71.700	Sta=60+09.55 OFF=-301.413 L N=350970.4450 E=2935529.3724
CB59	RIM = 76.279 SUMP = 69.500 SD55 INV IN = 71.604 SD58 INV IN = 71.610 SD59 INV OUT = 71.500	Sta=3+01.81 OFF=9.099 R N=350983.9792 E=2935543.6747
CB60	RIM = 73.328 SUMP = 66.900 SD59 INV IN = 69.000 SD60 INV OUT = 68.900	Sta=1+73.46 OFF=10.018 R N=350893.5460 E=2935631.5958
J1	RIM = 77.089 SUMP = ??? UD2 INV IN = 76.523 UD1 INV OUT = 76.523	Sta=45+65.32 OFF=-35.315 L N=350462.5492 E=2934502.3222
J2	RIM = 77.395 SUMP = ??? UD2 INV OUT = 76.829	Sta=44+96.43 OFF=-35.858 L N=350483.9012 E=2934444.9622
J3	RIM = 76.605 SUMP = ??? UD4 INV IN = 76.214 UD3 INV OUT = 76.134	Sta=45+88.32 OFF=-51.693 L N=350474.8164 E=2934524.7698
J4	RIM = 76.660 SUMP = ??? UD5 INV IN = 76.270 UD4 INV OUT = 76.273	Sta=45+76.62 OFF=-58.664 L N=350483.3448 E=2934516.5793
J5	RIM = 76.791 SUMP = ??? UD6 INV IN = 76.400 UD5 INV OUT = 76.404	Sta=45+50.61 OFF=-76.254 L N=350505.1758 E=2934501.1359
J6	RIM = 76.927 SUMP = ??? UD7 INV IN = 76.540 UD6 INV OUT = 76.539	Sta=45+13.16 OFF=-77.216 L N=350515.4679 E=2934475.2408
J7	RIM = 77.061 SUMP = ??? UD8 INV IN = 76.670 UD7 INV OUT = 76.674	Sta=44+85.95 OFF=-65.835 L N=350515.4679 E=2934448.4082
J8	RIM = 77.298 SUMP = ??? UD8 INV OUT = 76.911	Sta=44+58.34 OFF=-26.238 L N=350491.6090 E=2934406.4457
OCS1	RIM = 81.997 SUMP = 73.872 O1 INV IN = 80.500 UD1 INV IN = 76.399 UD3 INV IN = 76.000 SDOCS1 INV OUT = 75.872	Sta=45+75.81 OFF=-27.284 L N=350452.6999 E=2934509.7911

Storm Drain Pipe Table

NAME	SIZE	LENGTH	SLOPE			MATERIAL
Box Culvert 3A	96"	68.71'	0.73%	INV IN=54.500	INV OUT=54.000	Concrete Box Culvert
Box Culvert 3B	96"	68.70'	0.73%	INV IN=54.500	INV OUT=54.000	96 x 96 inch Concrete Box Culvert
CULV1	36"	72.28'	0.69%	INV IN=78.500	INV OUT=78.000	N-12 ADS
CULV2	18"	15.66'	10.22%	INV IN=77.000	INV OUT=75.400	N-12 ADS
CULV3	15"	23.90'	5.02%	INV IN=80.300	INV OUT=79.100	N-12 ADS
CULV4	24"	111.08'	0.90%	INV IN=57.500	INV OUT=56.500	24" N-12 ADS
CULV5	36"	68.65'	1.46%	INV IN=87.000	INV OUT=86.000	N-12 ADS
CULV6	36"	92.38'	1.08%	INV IN=61.000	INV OUT=60.000	N-12 ADS
CULV7	18"	73.66'	0.50%	INV IN=79.368	INV OUT=79.000	18" N-12 ADS
O1	6"	8.18'	0.00%	INV IN=80.500	INV OUT=80.500	6" N-12 ADS
Pipe - (6)	15"	54.26'	0.92%	INV IN=76.500	INV OUT=76.000	15" N-12 ADS
Pipe - (7)	15"	43.30'	1.15%	INV IN=78.500	INV OUT=78.000	15" N-12 ADS
SD1	15"	20.00'	1.00%	INV IN=79.500	INV OUT=79.300	15" N-12 ADS
SD2	15"	19.02'	1.00%	INV IN=79.190	INV OUT=79.000	15" N-12 ADS
SD3	18"	203.27'	0.50%	INV IN=75.316	INV OUT=74.300	18" N-12 ADS
SD4	18"	46.33'	0.50%	INV IN=74.232	INV OUT=74.000	N-12 ADS
SD5	18"	74.30'	0.50%	INV IN=73.871	INV OUT=73.500	N-12 ADS
SD6	18"	200.27'	0.43%	INV IN=73.357	INV OUT=72.500	N-12 ADS
SD7	18"	54.87'	0.50%	INV IN=74.374	INV OUT=74.100	N-12 ADS
SD8	18"	83.70'	0.50%	INV IN=74.019	INV OUT=73.600	N-12 ADS
SD9	18"	19.90'	0.50%	INV IN=73.500	INV OUT=73.400	N-12 ADS
SD10	18"	62.46'	0.57%	INV IN=73.355	INV OUT=73.000	N-12 ADS
SD11	18"	180.88'	0.50%	INV IN=75.304	INV OUT=74.400	N-12 ADS
SD12	15"	79.38'	0.50%	INV IN=75.797	INV OUT=75.400	N-12 ADS
SD13	15"	20.00'	0.50%	INV IN=76.000	INV OUT=75.900	N-12 ADS
SD14	15"	60.28'	0.50%	INV IN=76.201	INV OUT=75.900	N-12 ADS
SD15	15"	33.70'	0.50%	INV IN=75.369	INV OUT=75.200	N-12 ADS
SD16	15"	18.17'	0.98%	INV IN=76.777	INV OUT=76.600	N-12 ADS
SD17	15"	23.18'	0.50%	INV IN=79.216	INV OUT=79.100	N-12 ADS
SD18	15"	136.18'	0.50%	INV IN=78.981	INV OUT=78.300	N-12 ADS
SD19	15"	43.18'	0.50%	INV IN=79.316	INV OUT=79.100	N-12 ADS
SD20	15"	41.59'	0.48%	INV IN=78.200	INV OUT=78.000	N-12 ADS
SD21	15"	15.41'	0.61%	INV IN=78.394	INV OUT=78.300	N-12 ADS
SD23	15"	22.17'	0.68%	INV IN=76.950	INV OUT=76.800	N-12 ADS
SD24	15"	68.10'	0.50%	INV IN=76.441	INV OUT=76.100	N-12 ADS
SD25	15"	72.71'	0.50%	INV IN=75.964	INV OUT=75.600	N-12 ADS
SD26	15"	50.64'	0.50%	INV IN=75.853	INV OUT=75.600	N-12 ADS
SD27	18"	187.68'	0.50%	INV IN=75.538	INV OUT=74.600	N-12 ADS
SD28	15"	21.05'	5.25%	INV IN=76.705	INV OUT=75.600	N-12 ADS
SD29	18"	49.11'	0.53%	INV IN=74.460	INV OUT=74.200	N-12 ADS
SD30	15"	23.47'	1.00%	INV IN=76.862	INV OUT=76.627	N-12 ADS
SD31	18"	93.16'	0.50%	INV IN=74.163	INV OUT=73.700	N-12 ADS
SD32	18"	60.99'	0.50%	INV IN=73.605	INV OUT=73.300	N-12 ADS
SD33	18"	54.31'	0.50%	INV IN=73.272	INV OUT=73.000	N-12 ADS
SD34	12"	19.16'	0.50%	INV IN=77.700	INV OUT=77.604	N-12 ADS
SD35	15"	169.73'	1.71%	INV IN=77.500	INV OUT=74.600	N-12 ADS
SD36	15"	94.41'	2.12%	INV IN=74.500	INV OUT=72.500	N-12 ADS
SD37	15"	146.37'	3.32%	INV IN=72.400	INV OUT=67.540	N-12 ADS
SD38	15"	19.89'	0.50%	INV IN=72.599	INV OUT=72.500	N-12 ADS
SD39	15"	113.66'	2.50%	INV IN=67.442	INV OUT=64.600	N-12 ADS
SD40	18"	24.44'	0.39%	INV IN=64.500	INV OUT=64.406	N-12 ADS
SD41	15"	18.88'	0.50%	INV IN=64.694	INV OUT=64.600	N-12 ADS
SD42	15"	16.34'	0.55%	INV IN=64.500	INV OUT=64.410	N-12 ADS
SD43	15"	34.99'	0.50%	INV IN=65.000	INV OUT=64.825	N-12 ADS
SD45	15"	19.94'	0.50%	INV IN=65.500	INV OUT=65.400	N-12 ADS
SD46	15"	46.64'	0.50%	INV IN=65.300	INV OUT=65.067	N-12 ADS
SD47	15"	88.74'	2.70%	INV IN=87.700	INV OUT=85.300	N-12 ADS
SD48	15"	98.90'	0.50%	INV IN=85.200	INV OUT=84.706	N-12 ADS
SD49	15"	57.14'	0.50%	INV IN=85.600	INV OUT=85.314	N-12 ADS
SD50	15"	78.87'	0.50%	INV IN=84.600	INV OUT=84.206	N-12 ADS
SD51	15"	33.10'	0.50%	INV IN=84.100	INV OUT=83.934	N-12 ADS
SD52	15"	146.32'	0.50%	INV IN=83.800	INV OUT=83.068	N-12 ADS
SD53	15"	138.90'	2.52%	INV IN=82.900	INV OUT=79.400	N-12 ADS
SD54	15"	31.26'	2.56%	INV IN=83.900	INV OUT=83.100	N-12 ADS
SD55	15"	255.14'	3.02%	INV IN=79.316	INV OUT=71.604	N-12 ADS
SD56	15"	25.84'	0.50%	INV IN=79.529	INV OUT=79.400	N-12 ADS

Storm Drain Pipe Table

NAME	SIZE	LENGTH	SLOPE			MATERIAL
SD57	15"	33.15'	0.50%	INV IN=79.766	INV OUT=79.600	N-12 ADS
SD58	15"	19.69'	0.45%	INV IN=71.700	INV OUT=71.610	N-12 ADS
SD59	15"	126.13'	1.98%	INV IN=71.500	INV OUT=69.000	N-12 ADS
SD60	15"	154.42'	2.48%	INV IN=68.900	INV OUT=65.070	N-12 ADS
SDOCS1	18"	94.38'	0.50%	INV IN=75.872	INV OUT=75.400	18" N-12 ADS
UD1	6"	12.36'	1.00%	INV IN=76.523	INV OUT=76.399	6" N-12 ADS
UD2	6"	61.21'	0.50%	INV IN=76.829	INV OUT=76.523	6" N-12 ADS
UD3	4"	26.71'	0.50%	INV IN=76.134	INV OUT=76.000	4" N-12 ADS
UD4	4"	11.82'	0.50%	INV IN=76.273	INV OUT=76.214	4" N-12 ADS
UD5	4"	26.74'	0.50%	INV IN=76.404	INV OUT=76.270	4" N-12 ADS
UD6	4"	27.87'	0.50%	INV IN=76.539	INV OUT=76.400	4" N-12 ADS
UD7	4"	26.83'	0.50%	INV IN=76.674	INV OUT=76.540	4" N-12 ADS
UD8	4"	48.27'	0.50%	INV IN=76.911	INV OUT=76.670	4" N-12 ADS

PROGRESS PLAN
NOT FOR CONSTRUCTION

THIS DOCUMENT IS ISSUED FOR
INFORMATIONAL PURPOSES ONLY.
THE DATA SHOWN HEREON
IS SUBJECT TO REVISION.

1. 6–15–2020 Respond to SME memo dated 3–4–2020
Re–submit to Town and DEP

Structure and Pipe Tables

Cumberland Crossing – Phase 2

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

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6-15-2020

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Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET: C20

Sewer Structure Table

Structure Name	Structure Details		
SMH1	RIM = 84.924 SUMP = 79.400 SP1A INV IN = 79.400 SP1B INV IN = 79.400	Sta=43+99.90 OFF=-5.000 L N=350494.5846 E=2934342.4724	
SMH2	RIM = 86.732 SUMP = 81.200 SP2A INV IN = 81.200 SP2B INV IN = 81.200 SP2C INV IN = 81.200	Sta=48+99.41 OFF=-5.049 L N=350495.2237 E=2934815.0977	
SMH3	RIM = 85.876 SUMP = 80.400 SP3A INV IN = 80.400 SP3B INV IN = 80.400 SP3C INV IN = 80.400	Sta=50+34.74 OFF=-5.000 L N=350525.0549 E=2934947.9487	
SMH4	RIM = 91.678 SUMP = 86.200 SP4A INV OUT = 86.200	Sta=48+40.43 OFF=-300.448 L N=350755.0294 E=2934662.6517	
SMH5	RIM = 80.884 SUMP = 75.400 SP5A INV IN = 75.400 SP5C INV IN = 75.400 SP5B INV OUT = 75.400	Sta=23+27.44 OFF=-5.000 L N=350200.3211 E=2934981.4343	
SMH6	RIM = 82.872 SUMP = 77.400 SP6A INV OUT = 77.400	Sta=91+30.69 OFF=-5.000 L N=350154.9023 E=2934853.0569	
SMH7	RIM = 84.020 SUMP = 78.500 SP7A INV IN = 78.500 SP7B INV OUT = 78.500	Sta=26+14.19 OFF=-5.000 L N=350120.1402 E=2935226.2131	
SMH8	RIM = 83.600 SUMP = 78.100 SP8A INV IN = 78.100 SP8C INV IN = 78.100 SP8B INV OUT = 78.100	Sta=28+34.49 OFF=-5.000 L N=350233.3004 E=2935387.6139	
SMH9	RIM = 82.467 SUMP = 77.000 SP9A INV OUT = 77.000	Sta=55+63.39 OFF=278.027 R N=350191.3073 E=2935506.2240	
SMH10	RIM = 81.492 SUMP = 76.000 SP10A INV IN = 76.000 SP10C INV IN = 76.000 SP10B INV OUT = 76.000	Sta=20+50.70 OFF=-419.004 L N=350479.7599 E=2935363.2191	
SMH11	RIM = 72.091 SUMP = 66.600 SP11A INV IN = 66.600 SP11B INV OUT = 66.600	Sta=58+99.90 OFF=-5.000 L N=350699.9562 E=2935692.8365	
SMH12	RIM = 70.172 SUMP = 64.700 SP12A INV IN = 64.700 SP12B INV IN = 64.700 SP12C INV OUT = 64.700	Sta=0+05.09 OFF=-5.000 L N=350777.9517 E=2935754.9320	
SMH13	RIM = 84.430 SUMP = 78.900 SP13B INV IN = 78.900 SP13C INV IN = 78.900 SP13A INV OUT = 78.900	Sta=5+69.23 OFF=-5.137 L N=351180.9058 E=2935361.5033	
SMH14	RIM = 86.450 SUMP = 81.000 SP14A INV OUT = 81.000	Sta=62+90.37 OFF=-602.197 L N=351158.7028 E=2935276.4339	
SMH15	RIM = 88.909 SUMP = 83.400 SP15A INV IN = 83.400 SP15B INV OUT = 83.400	Sta=10+99.74 OFF=-5.000 L N=351325.7116 E=2935283.8559	
SMH16	RIM = 90.349 SUMP = 84.900 SP16B INV IN = 84.900 SP16C INV IN = 84.900 SP16A INV OUT = 84.900	Sta=8+80.63 OFF=-5.000 L N=351431.0100 E=2935268.3075	
SMH17	RIM = 92.492 SUMP = 87.000 SP17A INV OUT = 87.000	Sta=103+34.53 OFF=-5.000 L N=351567.9900 E=2935296.0087	
SMH18	RIM = 89.867 SUMP = 84.400 SP18A INV OUT = 84.400	Sta=10+47.69 OFF=-5.000 L N=351327.1942 E=2935237.6466	
SMH19	RIM = 81.310 SUMP = 75.800 SP19A INV IN = 75.800 SP19B INV OUT = 75.800	Sta=65+13.45 OFF=-5.000 L N=351252.7254 E=2935928.6468	
SMH20	RIM = 84.621 SUMP = 79.900 SP20A INV IN = 79.900 SP20B INV OUT = 79.900	Sta=68+22.94 OFF=-4.929 L N=351549.5533 E=2935969.6804	

Sewer Pipe Table

NAME	SIZE	LENGTH	SLOPE	MATERIAL
SP1A	4"	3.16'	0.00%	4" HDPE FM
SP1B	4"	4.73'	0.00%	4" HDPE FM
SP2A	4"	3.73'	0.00%	4" HDPE FM
SP2B	4"	5.49'	0.00%	4" HDPE FM
SP2C	4"	5.80'	0.00%	4" HDPE FM
SP3A	4"	4.36'	0.00%	4" HDPE FM
SP3B	4"	3.55'	0.00%	4" HDPE FM
SP3C	4"	5.54'	0.00%	4" HDPE FM
SP4A	4"	3.46'	0.00%	4" HDPE FM
SP5A	4"	3.80'	0.00%	4" HDPE FM
SP5B	4"	5.05'	0.00%	4" HDPE FM
SP5C	4"	4.34'	0.00%	4" HDPE FM
SP6A	4"	5.17'	0.00%	4" HDPE FM
SP7A	4"	4.18'	0.00%	4" HDPE FM
SP7B	4"	2.93'	0.00%	4" HDPE FM
SP8A	4"	4.22'	0.00%	4" HDPE FM
SP8B	4"	4.76'	0.00%	4" HDPE FM
SP8C	4"	5.61'	0.00%	4" HDPE FM
SP9A	4"	2.88'	0.00%	4" HDPE FM
SP10A	4"	4.23'	28.39%	4" HDPE FM
SP10B	4"	4.48'	-26.80%	4" HDPE FM
SP10C	4"	5.10'	23.51%	4" HDPE FM
SP11A	4"	5.25'	0.00%	4" HDPE FM
SP11B	4"	6.25'	0.00%	4" HDPE FM

Sewer Pipe Table

NAME	SIZE	LENGTH	SLOPE	MATERIAL
SP12A	4"	5.01'	0.00%	4" HDPE FM
SP12B	4"	5.36'	0.00%	4" HDPE FM
SP12C	4"	7.29'	0.00%	4" HDPE FM
SP13A	4"	6.20'	0.00%	4" HDPE FM
SP13B	4"	5.32'	0.00%	4" HDPE FM
SP13C	4"	8.68'	0.00%	4" HDPE FM
SP14A	4"	5.96'	-18.47%	4" HDPE FM
SP15A	4"	5.40'	0.00%	4" HDPE FM
SP15B	4"	9.20'	0.00%	4" HDPE FM
SP16A	4"	7.54'	0.00%	4" HDPE FM
SP16B	4"	5.82'	0.00%	4" HDPE FM
SP16C	4"	4.87'	0.00%	4" HDPE FM
SP17A	4"	5.16'	0.00%	4" HDPE FM
SP18A	4"	4.59'	0.00%	4" HDPE FM
SP19A	4"	3.31'	30.22%	4" HDPE FM
SP19B	4"	3.93'	-25.46%	4" HDPE FM
SP20A	4"	3.84'	26.06%	4" HDPE FM
SP20B	4"	4.05'	-24.70%	4" HDPE FM

Little Acres Drive Extension

Number	Radius	Length	Line/Chord Direction	A Value
L31		120.47	N83° 42' 40.60"E	
C23	300.00	51.92	N78° 45' 11.90"E	
L32		111.93	N73° 47' 43.20"E	
C24	300.00	218.33	S85° 21' 21.92"E	
L33		55.45	S64° 30' 27.04"E	
C25	300.00	233.55	S86° 48' 35.01"E	
L34		204.33	N70° 53' 17.02"E	
C26	300.00	134.53	N83° 44' 06.12"E	
L35		442.92	S83° 25' 04.77"E	
C27	200.00	248.80	N60° 56' 40.75"E	
L36		68.42	N25° 18' 26.28"E	
C28	200.00	46.24	N31° 55' 48.61"E	
L37		175.54	N38° 33' 10.94"E	
C29	250.00	118.16	N25° 00' 48.22"E	
L38		200.78	N11° 28' 25.50"E	
C30	250.00	51.69	N17° 23' 47.61"E	
L39		146.87	N23° 19' 09.72"E	
C31	250.00	74.09	N14° 49' 47.28"E	
L40		73.15	N6° 20' 24.83"E	
C32	250.00	142.48	N9° 59' 13.41"W	
L41		226.96	N26° 18' 51.64"W	
C33	250.00	56.89	N32° 50' 02.20"W	
L42		216.36	N39° 21' 12.77"W	

Leonard Lane

Number	Radius	Length	Line/Chord Direction	A Value
L55		183.77	N51° 57' 10.65"W	
C41	250.00	48.59	N46° 23' 05.50"W	
L56		286.85	N40° 49' 00.36"W	
C42	250.00	54.91	N34° 31' 27.48"W	
L57		154.08	N28° 13' 54.59"W	
C43	60.00	375.91	S62° 16' 55.82"W	

Monarch Drive

Number	Radius	Length	Line/Chord Direction	A Value
L46		224.36	S1° 26' 12.44"E	
C36	200.00	365.74	S53° 49' 30.44"E	
L47		121.00	N73° 47' 11.56"E	
C37	100.00	151.85	N30° 17' 02.92"E	
L48		103.10	N13° 13' 05.72"W	
C38	200.00	69.12	N3° 19' 05.25"W	
L49		44.20	N6° 34' 55.23"E	

Cricket Lane

Number	Radius	Length	Line/Chord Direction	A Value
L58		18.69	S61° 46' 05.41"W	
C44	125.00	58.69	S75° 13' 08.64"W	
L59		65.33	S88° 40' 11.88"W	

Skipper Way

Number	Radius	Length	Line/Chord Direction	A Value
L43		75.96	N18° 17' 12.28"W	
C34	160.00	35.26	N24° 36' 02.06"W	
L44		92.06	N30° 54' 51.84"W	
C35	160.00	28.48	N36° 00' 47.51"W	
L45		88.20	N41° 06' 43.17"W	

Northwind Farm Road

Number	Radius	Length	Line/Chord Direction	A Value
L60		154.53	N11° 25' 57.44"E	

Firefly Lane

Number	Radius	Length	Line/Chord Direction	A Value
L50		60.53	S62° 33' 45.81"W	
C39	125.00	55.04	S75° 10' 37.43"W	
L51		24.03	S87° 47' 29.05"W	

Luna Lane

Number	Radius	Length	Line/Chord Direction	A Value
L52		150.01	S18° 05' 53.08"E	

PROGRESS PLAN
NOT FOR CONSTRUCTION

THIS DOCUMENT IS ISSUED FOR
INFORMATIONAL PURPOSES ONLY.
THE DATA SHOWN HEREON
IS SUBJECT TO REVISION.

1. 6–15–2020 Re–submit to Town and Maine DEP

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

CHRISTOPHER S. BELANGER
9098
6-15-2020

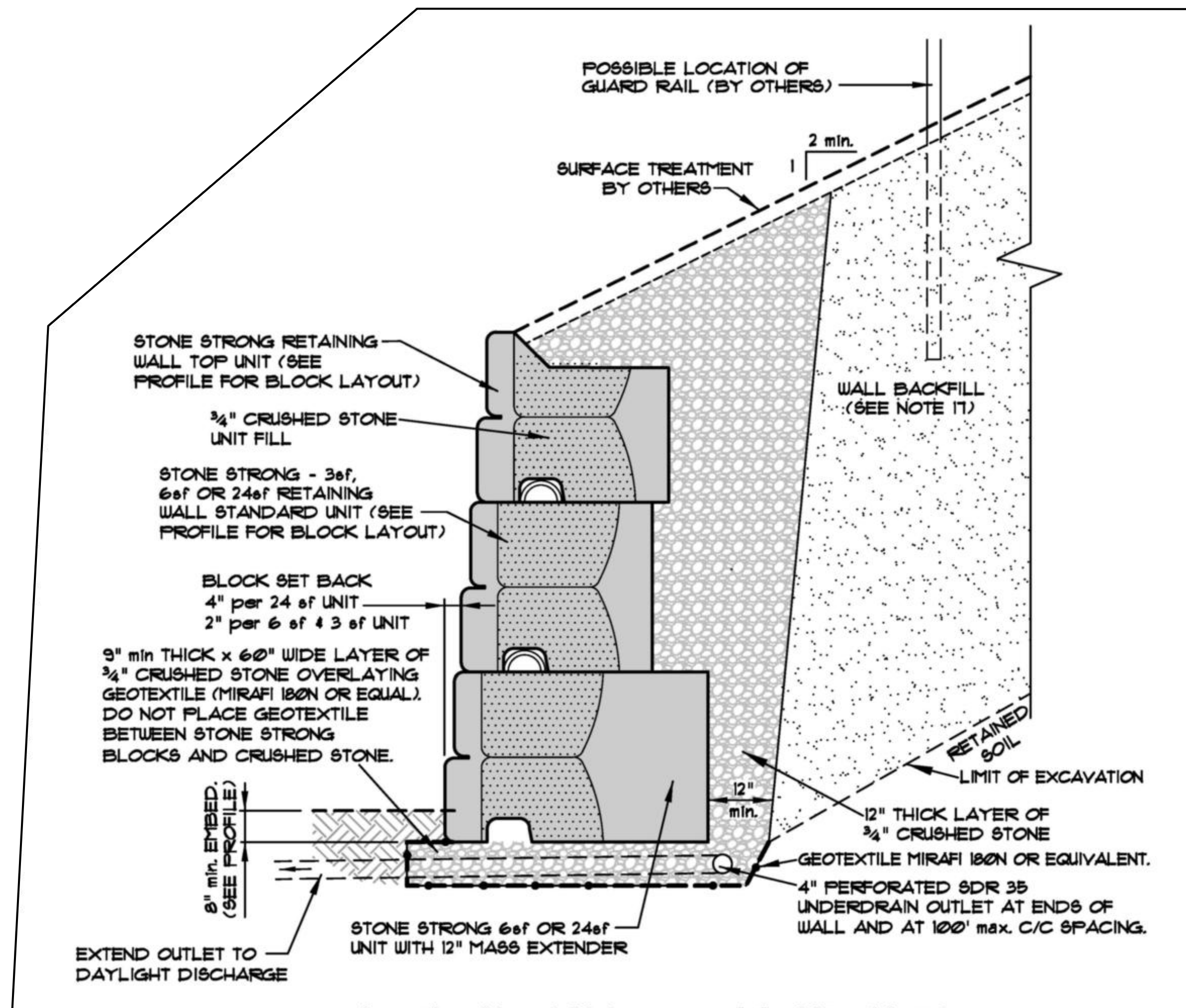
Structure and Pipe Tables

Cumberland Crossing – Phase 2

BELANGER ENGINEERING
CONSULTING ENGINEERS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713
63 Second Avenue
Augusta, Maine 04330

SCALE: 1"=40' H, 4' V
JOB #: 134
DATE: 6-15-2020
SHEET: C21



TYPICAL WALL CROSS SECTION

NOT TO SCALE

GENERAL NOTES

1) WALL PLAN & PROFILE IS BASED UPON A SET OF PLANS ENTITLED "OCEANVIEW AT CUMBERLAND", DATED AUGUST 21, 2018, PREPARED BY BELANGER ENGINEERING. REFERENCE IS SPECIFICALLY MADE TO SHEET C21 OF THE PLAN SET FOR BOX CULVERT INFORMATION.

2) IT IS THE RESPONSIBILITY OF THE OWNER, CONTRACTOR OR THEIR RESPECTIVE REPRESENTATIVES TO ENSURE THAT CONSTRUCTION OF THE WALL AND MATERIALS USED IN THE CONSTRUCTION OF THE WALL ARE IN ACCORDANCE WITH THESE SPECIFICATIONS AND/OR THE CONTRACT SPECIFICATIONS WHICH EVER ARE MORE STRINGENT.

3) THE CONTRACTOR SHALL VERIFY THE CULVERT LOCATION PRIOR TO INSTALLING THE WALLS. THE CONTRACTOR SHALL CONTACT SGS PRIOR TO INSTALLING ANY BLOCKS IN IF ADJUSTMENTS ARE NEEDED BASED ON THE CULVERT LOCATION.

4) SUMMIT GEOENGINEERING SERVICES (SGS) ACCEPTS NO RESPONSIBILITY NOR LIABILITY IN THE DETERMINATION OF THE ADEQUACY OF SITE MATERIALS AND WALL LAYOUT.

5) PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL VERIFY THAT ALL ELEVATIONS AND ASSUMED SITE CONDITIONS SHOWN ON THESE DRAWINGS ARE ACCURATE TO THE GIVEN SITE CONDITIONS. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF SGS PRIOR TO THE START OF CONSTRUCTION.

6) TEST PITS WERE PERFORMED AT THE SITE BY SGS. THE FOLLOWING PARAMETERS WERE USED IN THE DESIGN:
   - A) SLOPE AT TOP : 2(H) : 1(V)
   - B) SLOPE AT BASE = LEVEL
   - C) GROUNDWATER CONTROLLED TO BELOW BASE OF WALL
   - D) MAXIMUM CONTACT PRESSURE AT WALL BASE 2,400 psf
   - E) RETAINED SOIL - uw = 135 pcf, phi = 32°
   - F) FOUNDATION SOIL - uw = 120 pcf, phi = 32°
   - G) PEAK GROUND ACCELERATION COEFFICIENT = 020

   IF ACTUAL CONDITIONS VARY FROM THOSE LISTED ABOVE, SGS SHALL BE NOTIFIED IMMEDIATELY.

7) WALL INSPECTION AND CERTIFICATION ARE NOT PART OF THE SGS SCOPE OF DESIGN SERVICES. IT IS THE OWNERS RESPONSIBILITY TO CONFIRM WITH THE JURISDICTIONAL AUTHORITY PRIOR TO CONSTRUCTION OF THE WALL WHETHER A CONSTRUCTION CERTIFICATION IS REQUIRED. A CONSTRUCTION CERTIFICATION WILL REQUIRE ON-SITE INSPECTIONS, MATERIAL TESTING, PHOTOGRAPHIC DOCUMENTATION AND OTHER QUALITY CONTROL MEASURES AND AS-BUILT DOCUMENTATION. SGS CAN PROVIDE CERTIFICATION, IF REQUIRED, UNDER A SEPARATE CONTRACT.

8) THE OWNER IS RESPONSIBLE TO RETAIN THE SERVICES OF A QUALIFIED CONSTRUCTION MATERIALS FIRM TO PERFORM COMPACTION TESTS ON WALL BACKFILL TO CONFIRM THAT THE MINIMUM COMPACTION REQUIREMENTS ARE MET.

WALL INSTALLATION

9) THE STONE STRONG WALL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE STONE STRONG MANUALS (www.stonestrong.com).

10) FOUNDATION EXCAVATION SHALL EXTEND TO COMPETENT SOIL. ALL EXISTING TOPSOIL, LOOSE MATERIAL, FILL, ORGANIC SOIL AND OTHER SOFT OR UNSTABLE FOUNDATION SOILS SHALL BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE WALL AND REPLACED WITH GEOTEXTILE AND ¾" CRUSHED STONE IN ACCORDANCE WITH THESE PLANS AND AS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER.

11) UPON COMPLETION OF THE EXCAVATION, THE WALL BASE SUBGRADE SHALL BE PROOF ROLLED BY MAKING A MINIMUM OF 6 PASSES USING A LARGE VIBRATORY PLATE COMPACTOR. THE WALL SUBGRADE SHALL BE DE-WATERED TO A MINIMUM OF 12" BELOW THE CRUSHED STONE BASE.

12) INSTALL A 9" (MINIMUM THICK) LAYER OF COMPACTED ¾" CRUSHED STONE ON TOP OF THE GEOTEXTILE LAYER FOR BLOCK WALL LEVELING PAD. EXTEND LEVELING PAD (1) ONE FOOT HORIZONTALLY IN ALL DIRECTIONS BEYOND LIMITS OF THE STONE STRONG BLOCKS.

13) INSTALL THE BASE COURSE OF BLOCKS ON A PREPARED FOUNDATION LEVELING PAD. ENSURE THAT THE BASE COURSE IS LEVEL SIDE TO SIDE AND PLUMB. ADJUST BLOCKS AS REQUIRED TO PROVIDE A STRAIGHT AND LEVEL BASE COURSE. PLACE AND BACKFILL ONLY ONE COURSE OF BLOCKS AT A TIME. DO NOT STACK BLOCKS PRIOR TO BACKFILLING.

14) PLACE CRUSHED STONE AND WALL BACKFILL WITH A MAXIMUM LIFT THICKNESS OF 18", COMPACT WALL BACKFILL TO A MINIMUM OF 95% OF ASTM D1557. FIELD DENSITY TESTS SHALL BE PERFORMED AT A MINIMUM RATE OF 3 TESTS PER EVERY OTHER LIFT.

15) AT THE END OF EACH WORKDAY, BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE A MINIMUM OF 2% SLOPE. THE BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH DRUM ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL. A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE CREST OF THE GRAVITY STRUCTURES TO PREVENT SURFACE WATER RUNOFF FROM OVERTOPPING THE WALLS.

MATERIAL SPECIFICATIONS

16) ¾" CRUSHED DRAINAGE STONE SHALL BE CLEAN ANGULAR CRUSHED STONE MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422.

SIEVE SIZE	PERCENT PASSING
1"	100
1/4"	90 - 100
3/8"	20 - 55
No. 4	0 -10
No. 8	0 - 5

17) WALL BACKFILL SHALL MEET THE FOLLOWING GRADATION SPECIFICATIONS (MDOT 703.06 TYPE D)

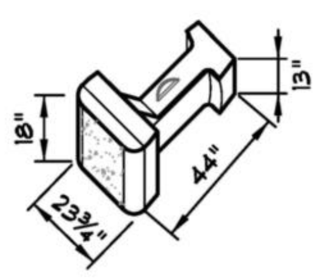
SIEVE SIZE	PERCENT PASSING
3"	100
1/2"	35 - 80
1/4"	25 - 65
No. 40	0 - 30
No. 200	0 - 7

18) THE MAXIMUM PARTICLE SIZE SHALL BE LIMITED TO 6".

19) BLOCKS SHALL BE 3 s.f., 6 s.f., 9 s.f. AND 24 s.f. "STONE STRONG", MANUFACTURED BY PRECAST CONCRETE PRODUCTS OF MAINE, INC.

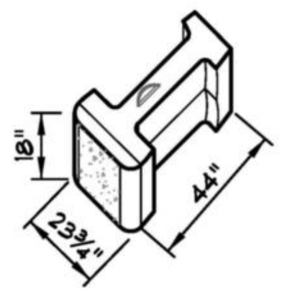
20) GEOTEXTILE SHALL CONSIST OF MIRAFI 180N OR APPROVED EQUIVALENT.

21) UNDERDRAIN PIPE SHALL CONSIST OF 4" PERFORATED SDR 35 PVC OR APPROVED EQUIVALENT.



STONE STRONG 3 S.F. TOP UNIT

NOT TO SCALE



STONE STRONG 3 S.F. UNIT

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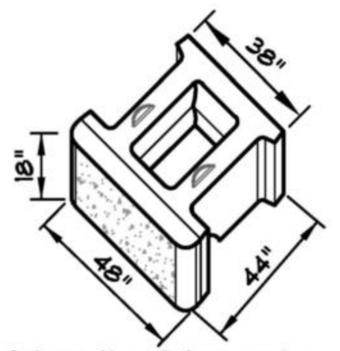
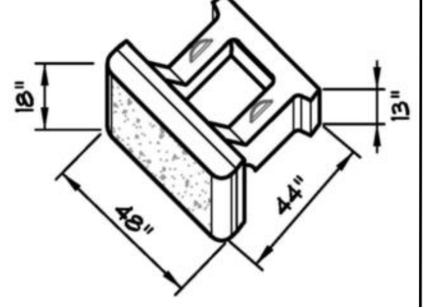


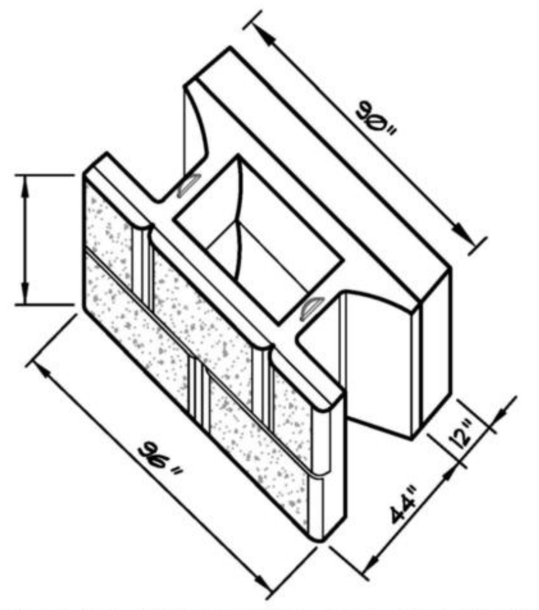
STONE STRONG 6 S.F. UNIT

NOT TO SCALE



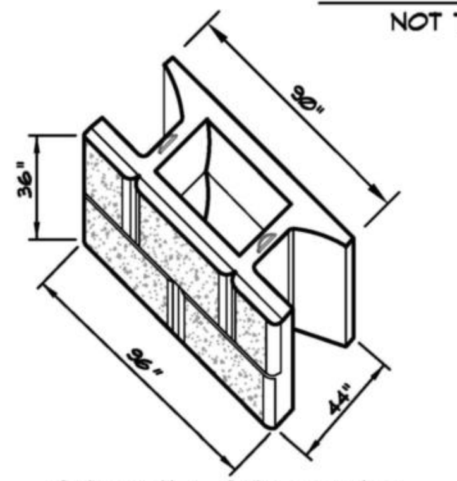
STONE STRONG 6 S.F. TOP UNIT

NOT TO SCALE



STONE STRONG 24 SF UNIT WITH 12" MASS EXTENDER

NOT TO SCALE

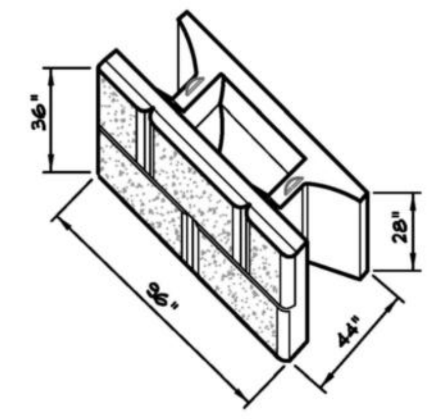


STONE STRONG 24 SF UNIT

NOT TO SCALE

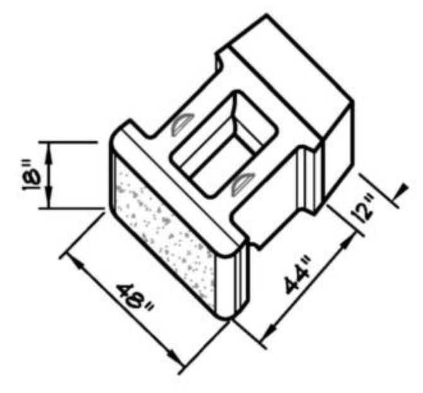
STONE STRONG 9 S.F. END UNIT

NOT TO SCALE



STONE STRONG 24 SF TOP UNIT

NOT TO SCALE



STONE STRONG 6 S.F. UNIT WITH 12" MASS EXTENDER

NOT TO SCALE

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

CHRISTOPHER
S.
BELANGER
9098

6-15-2020

1. 6-15-2020 Re-submit to Town and DEP CSB

Stone Strong Block Notes and Detail
(coordinate design with Summit Engineering)

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

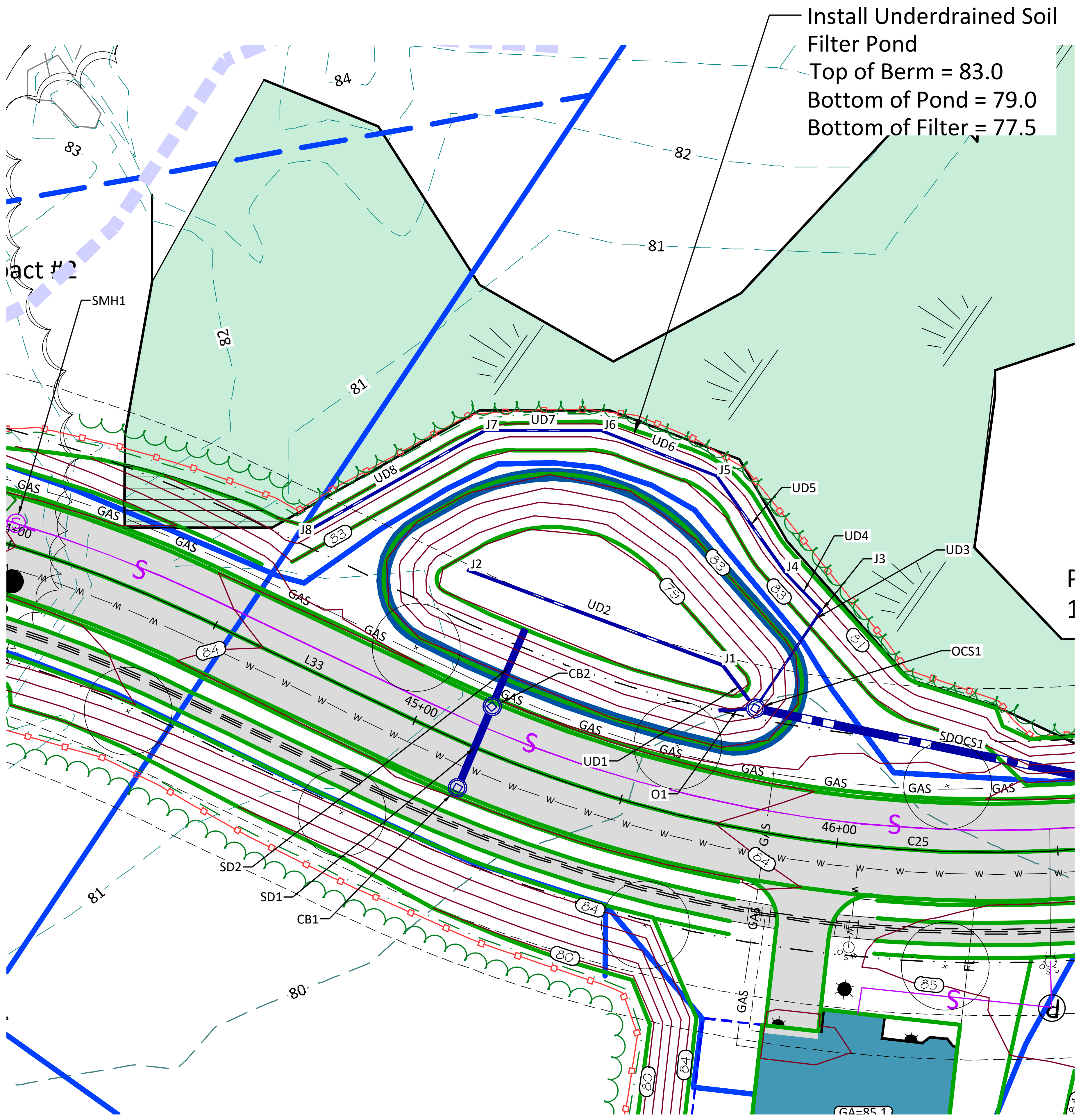
Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER
ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

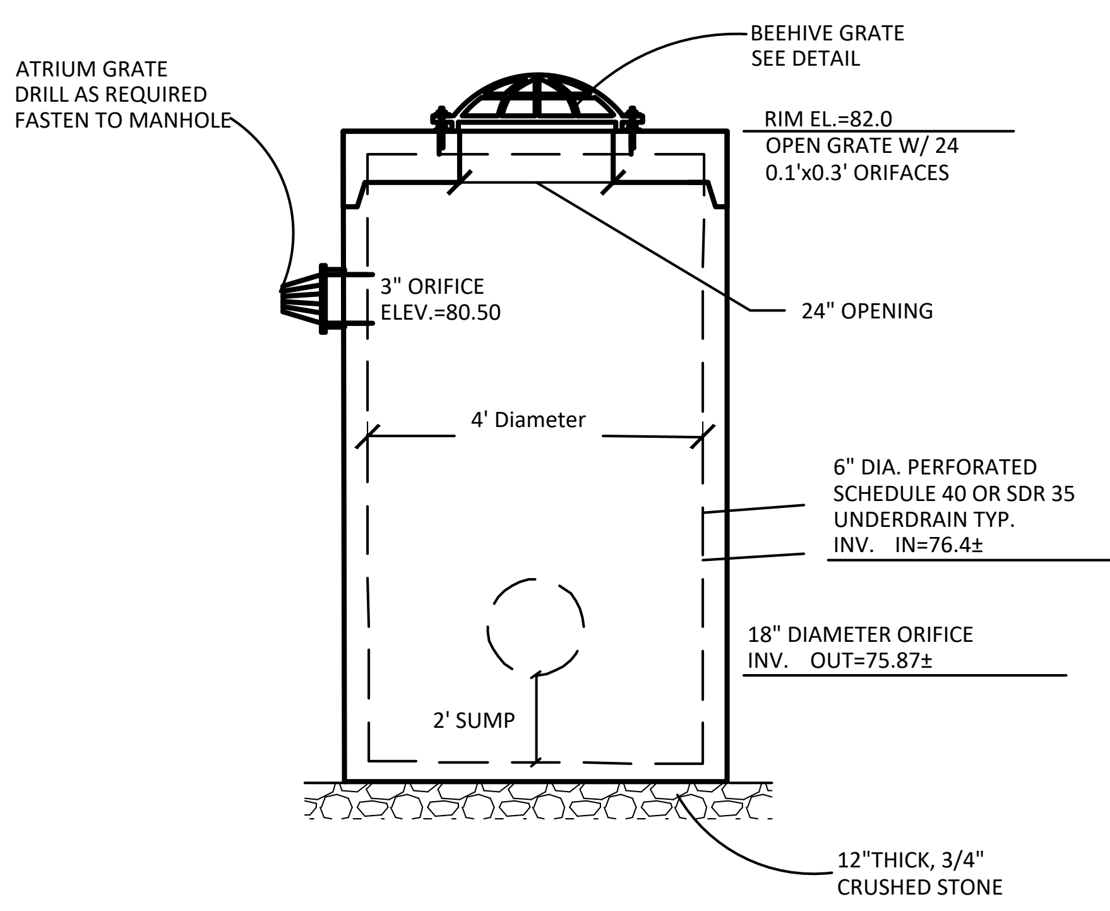
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #:	C24
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



Plan View
1"=40'



FILTER POND 47P CONTROL STRUCTURE DETAIL (OCS1)

(NOT TO SCALE)

CONSTRUCTION OVERSIGHT

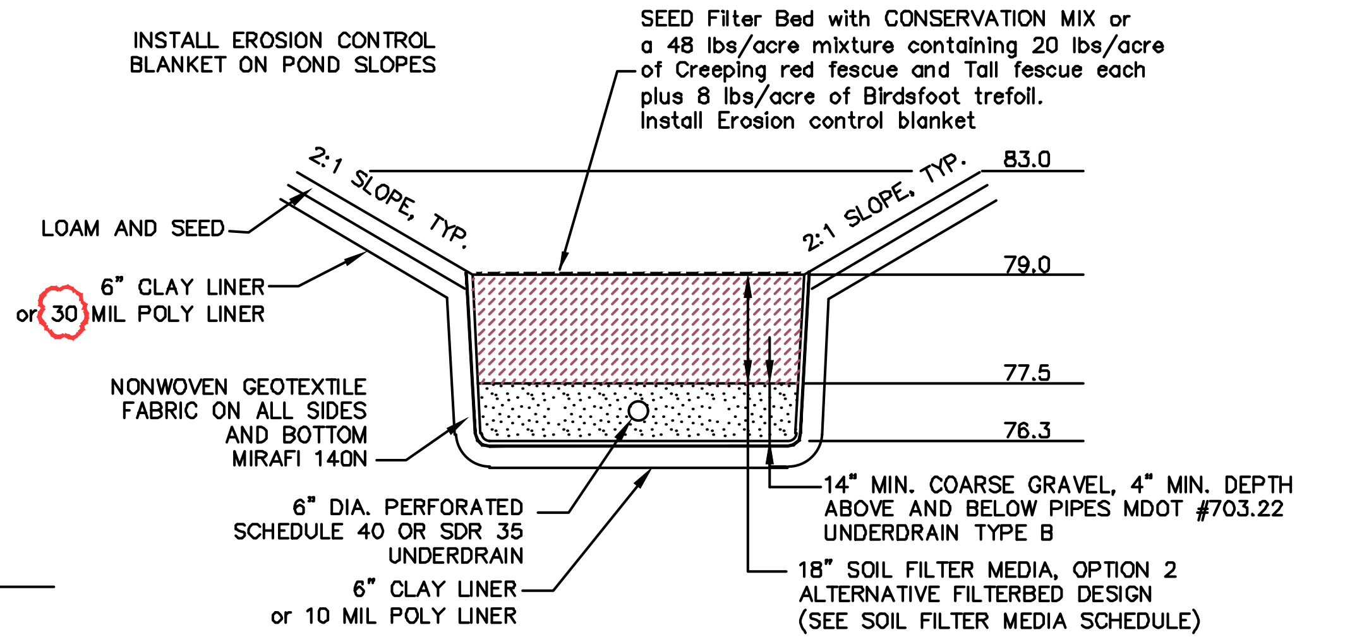
The applicant will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

VEGETATED UNDERDRAINED SOIL FILTER BASINS

Construction inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the embankment fill, after the underdrain pipes are installed but not backfilled, after the pipe bedding fill is placed but prior to the placement of the filter media, and after the filter media has been placed and the filter surface seeded.

Testing and submittals: All the soil, mulch, and aggregate used for the construction of the vegetated underdrained soil filter basin must be confirmed as suitable by testing. The contractor shall identify the source of each material and obtain samples for each material for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the fill or aggregate is placed as part of the vegetated underdrained soil filter basin's construction.

- Obtain a sample of the filter media consisting of a blend of sand, topsoil, and wood fiber mulch (or other approved organic source). The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform analyses of the blended filter media showing it has 8% to 12% by weight passing the #200 sieve as determined by ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A), has a clay content of less than 2%, and has an organic matter content of no less than 10% by dry weight.
- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.
- If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.



FILTER POND 47P SOIL FILTER DETAIL

(NOT TO SCALE)

MEDOT Specifications for Underdrains (ME DOT #703.22)	
Sieve Size	% Passing by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
Underdrain Type C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

NOTE:
FILTER POND SOIL FILTER DETAILS DEPICTS ELEVATIONS AT THE BOTTOM PERIMETER OF THE POND AND NOT THE LOW POINT OF THE POND. SEE SITE PLAN GRADING AND SECTION FOR LOW POINT OF ELEVATION (TYPICALY NEAR THE CONTROL STRUCTURE)

SOIL FILTER MEDIA (OPTION 2)		
DEPTH	FILTER MEDIA	SPECIFICATION
0" – 4"	TOPSOIL	LOAMY COARSE SAND WITH 8–15% FINES PASSING THE #200 SIEVE SEE TABLE 7.1.3
4" – 6"	WOOD CHIPS	pH BETWEEN 5.0–8.0, SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 mmhos/cm.
6" – 18"	GRAVELY COARSE SAND MIX	GRAVELY COURSE SAND MIXED WITH 20–30% WOOD FIBER MULCH, LESS THAN 12% FINES PASSING THE #200 SIEVE

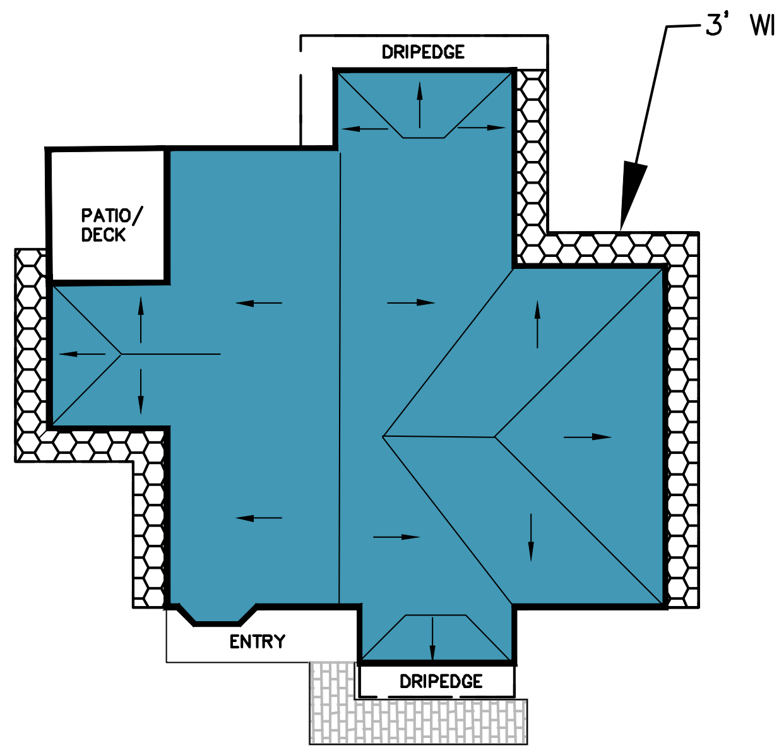
INSTALLATION NOTES:
THE FILTER MEDIA IS TO BE INSTALLED IN THE BASIN ONLY AFTER THE AREA DRAINING TO THE BASIN HAS BEEN STABILIZED WITH PERMANENT MEASURES.

THE FILTER MEDIA IN THE BASIN IS TO BE ONLY LIGHTLY COMPACTED TO NO MORE THAN 92% STANDARD PROCTOR.

Table 7.1.3 Loamy Coarse Sand Specifications	
Sieve Size #	% Passing by Weight
No. 10	85-100
No. 20	70-100
No. 60	15-40
No. 200	8-15
(200 Clay Size)	< 2.0

Table 7.1.2 Sandy Loam to Fine Sandy Loam Specifications	
Sieve Size #	% Passing by Weight
No. 4	75-95
No. 10	60-90
No. 40	35-85
No. 200	20-70
(200 Clay Size)	< 2.0

SOIL FILTER MEDIA SCHEDULE



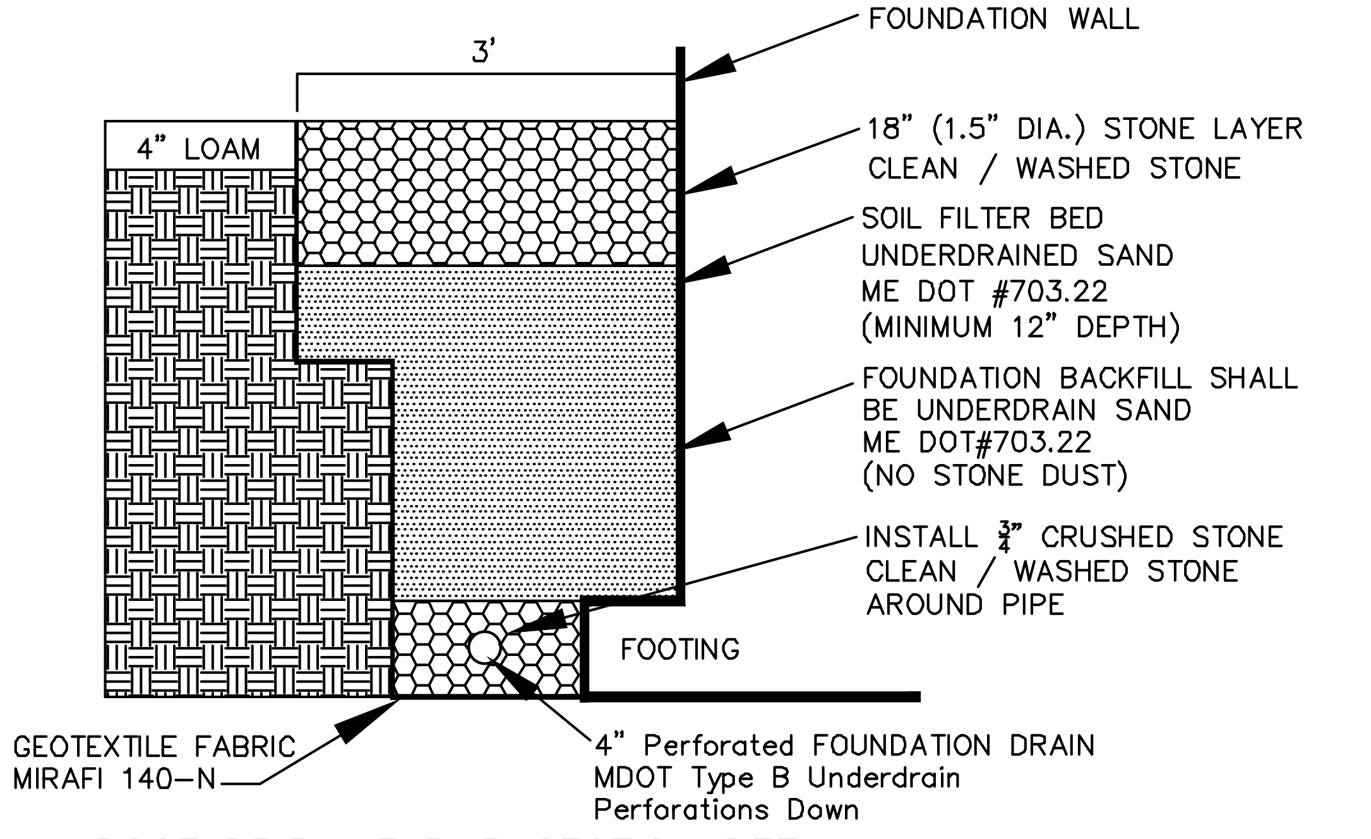
ROOF DRIPLINE BMP PLAN DETAIL

NOT TO SCALE HG COTTAGES – PHASES 4 A–C

Highland Green Cottage

Cross Sectional Area of Dripedge = (((3'X1.5')X0.4) = 1.8 s.f./l.f.
Linear Feet of Dripedge = 120'
Volume of voids = 1.8 s.f./l.f. X 120 l.f. = 216 c.f.

Area of building roof = 2,000 s.f.
Store 1"
Volume of dripedge required = 2,000 s.f. X .083' (1 inch) = 166 c.f.



ROOF DRIPLINE BMP SECTION DETAIL

NOT TO SCALE HG COTTAGES – PHASES 4 A–C

CONSTRUCTION OVERSIGHT ROOF DRIPLINE INSTALLATION

The applicant/owner will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures to be built as part of the project. If necessary, the inspecting engineer will interpret the construction plans for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the structures have been completed. Accompanying the engineer's notification must be a copy of the test results for any soil fill, aggregate, or mulch materials used in the construction of the stormwater management structures and a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Roof Dripline Filtration

Construction inspections: At a minimum, the professional engineer's inspection will occur after foundation soil preparation but prior to placement of the geotextile lining, after the foundation drain pipe is installed but not yet backfilled, after the pipe bedding gravel is placed but prior to the placement of the gravel filter media, after the gravel filter media has been placed but prior to installing the crushed stone surface layer, and after the surface crushed stone surface layer is installed.

Testing and submittals: The gravel filter media and pipe bedding media used in the roof dripline filtration BMP must be confirmed as suitable by testing. The contractor shall identify the source of these gravels and obtain samples for testing. All testing must be done by a certified laboratory. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. It shall be the contractor's responsibility to ensure completion of the following sampling and testing before the gravel is placed as part of the dripline filter's construction.

- Obtain a sample of the gravel filter media. The sample must be a composite of three different locations (grabs) from the gravel stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the sand filter media showing it meets the following gradation:

Sieve Size	% Passing by Weight
3"	100
#200	4-7

- If the underdrain pipes will be bedded in gravel, obtain a sample of the gravel fill to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile or pit face. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the gravel to be used for the underdrain pipe bedding. The gravel fill must conform to MEDOT specification 703.22 Underdrain Type B.

If the underdrain pipes will be bedded in crushed stone, obtain a sample of the crushed stone to be used for the pipe bedding. The sample must be a composite of three different locations (grabs) from the stockpile. The sample size required will be determined by the testing laboratory. Perform a sieve analysis conforming to ASTM C136 (Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates 1996A) of the crushed stone to be used for the underdrain pipe bedding. The crushed stone fill must conform to MEDOT specification 703.22 Underdrain Type C.

MEDOT Specifications for Underdrains (ME DOT #703.22)	
Sieve Size	% Passing by Weight
Underdrain Type B	
1"	90-100
1/2"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5
Underdrain Type C	
1"	100
3/4"	90-100
3/8"	0-75
#4	0-25
#10	0-5

1. 6–15–2020 Re–submit to Town and DEP CSB

Underdrained Soil Filter Pond Details
Cottage Roof Drip Line Details

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

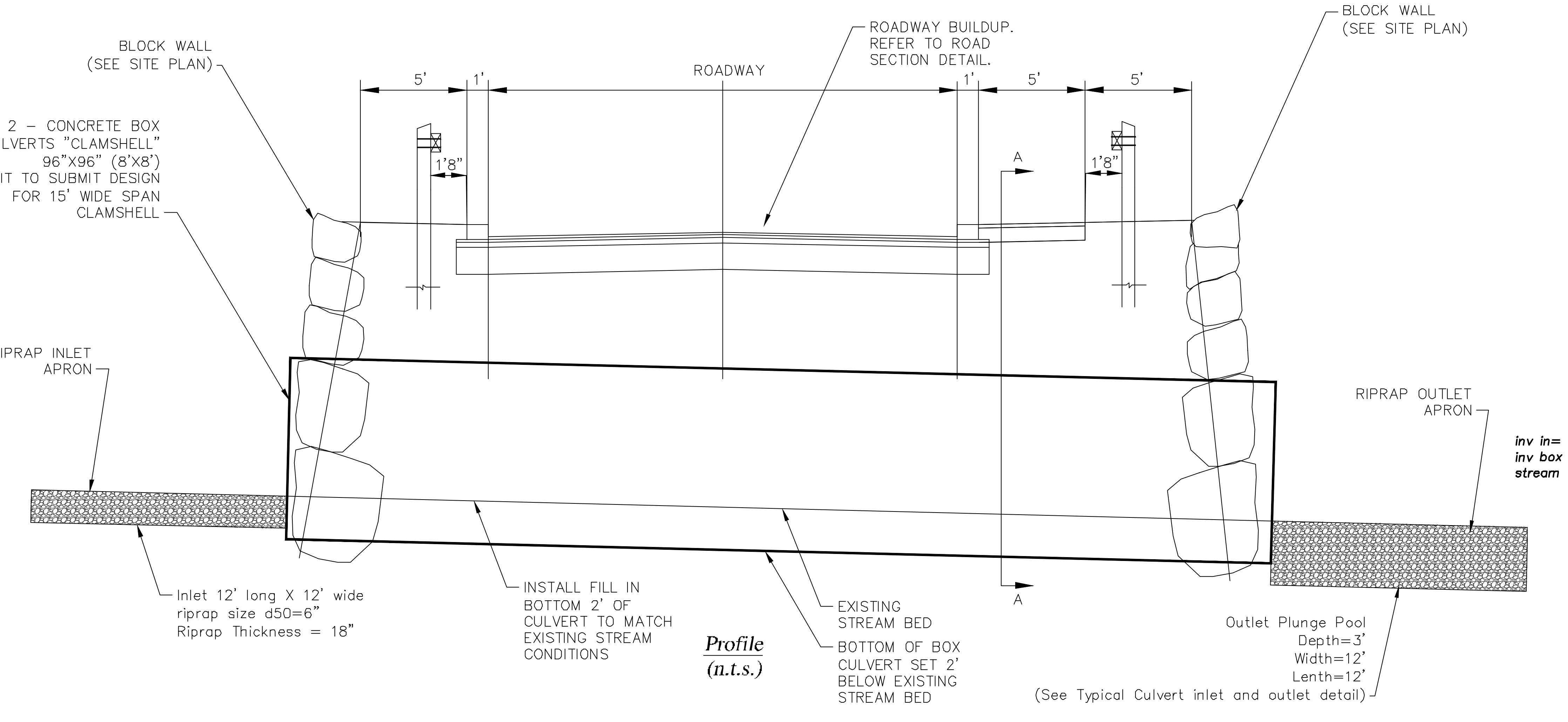
BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

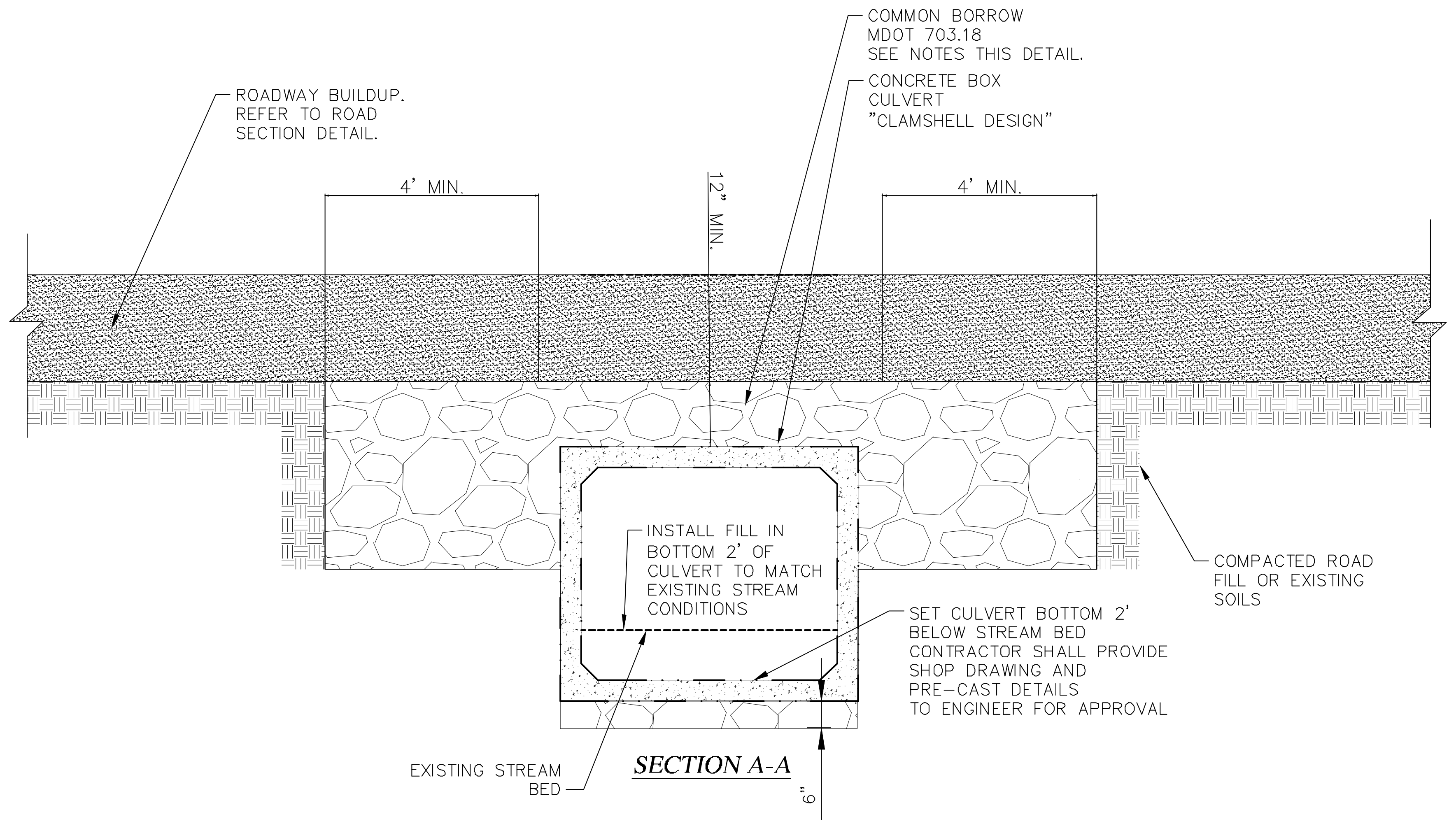
FIELD WK:	SCALE:	SHEET: C25
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

NOTES:

1. COMMON BORROW USED FOR BACKFILL SHALL CONSIST OF EARTH, SUITABLE FOR EMBANKMENT CONSTRUCTION. IT SHALL BE FREE FROM FROZEN MATERIAL, PERISHABLE RUBISSH, PEAT, AND OTHER UNSUITABLE MATERIALS INCLUDING MATERIAL CURRENTLY OR PREVIOUSLY CONTAMINATED BY CHEMICAL, RADIOLOGICAL, OR BIOLOGIAL AGENTS. ALL MATERIAL SHALL HAVE NO ROCKS WITH A MAXIMUM DIMENSION OVER 6 INCHES. ON-SITE MATERIAL MAY BE USED IF IT MEETS THE ABOVE SPECIFIED REQUIREMENTS.

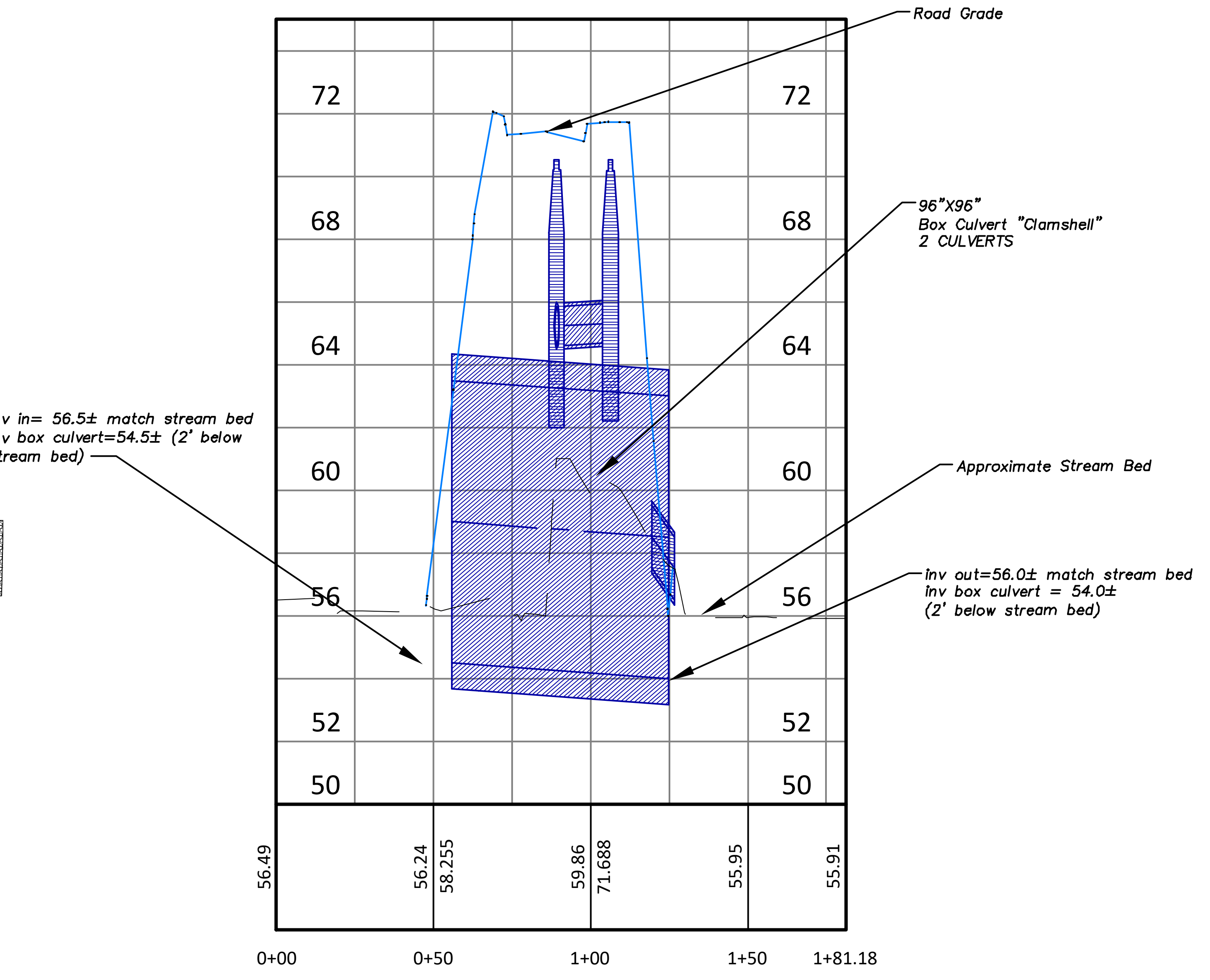


Profile
(n.t.s.)



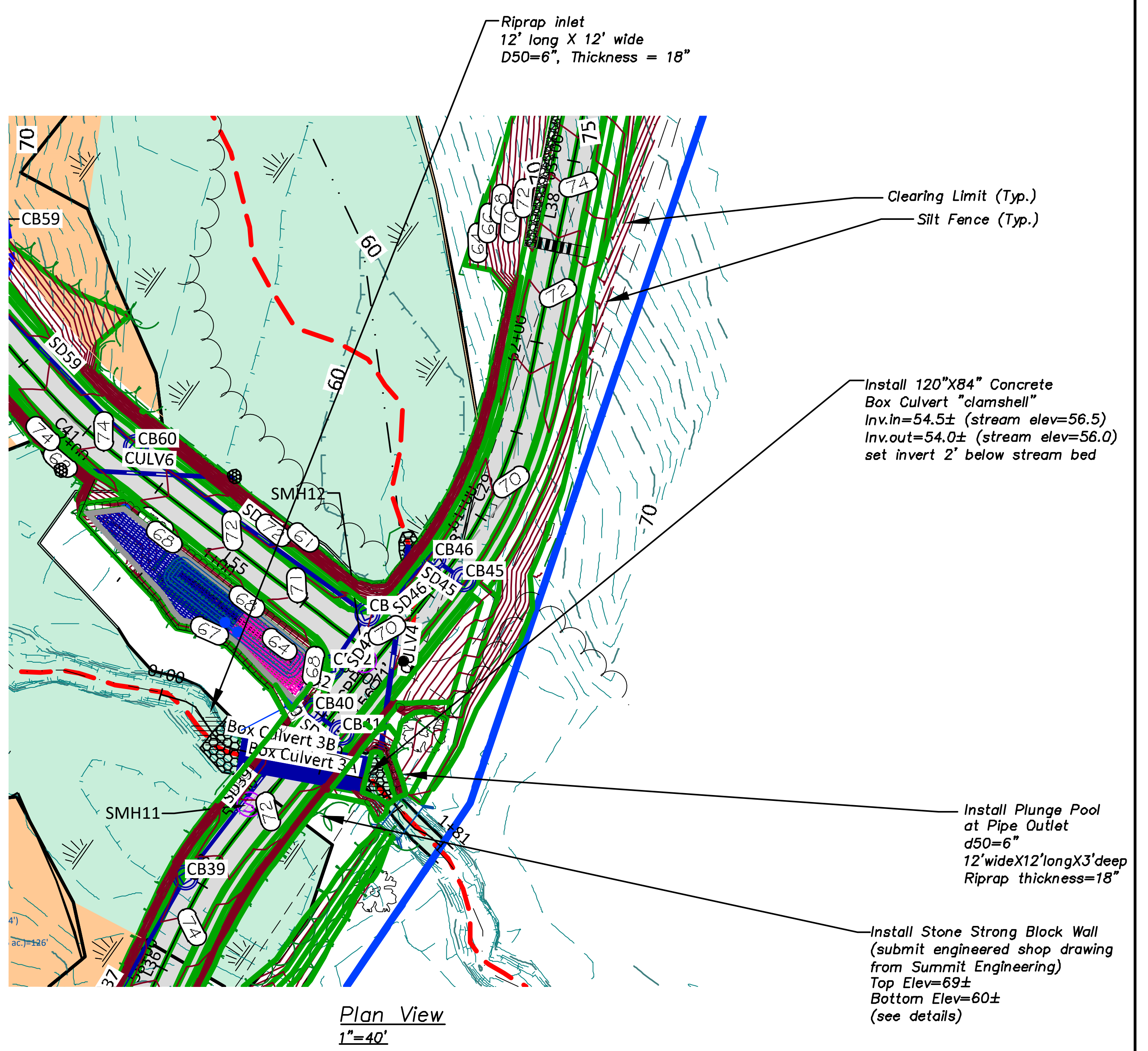
SECTION A-A

Box Culvert 3 Profile PROFILE

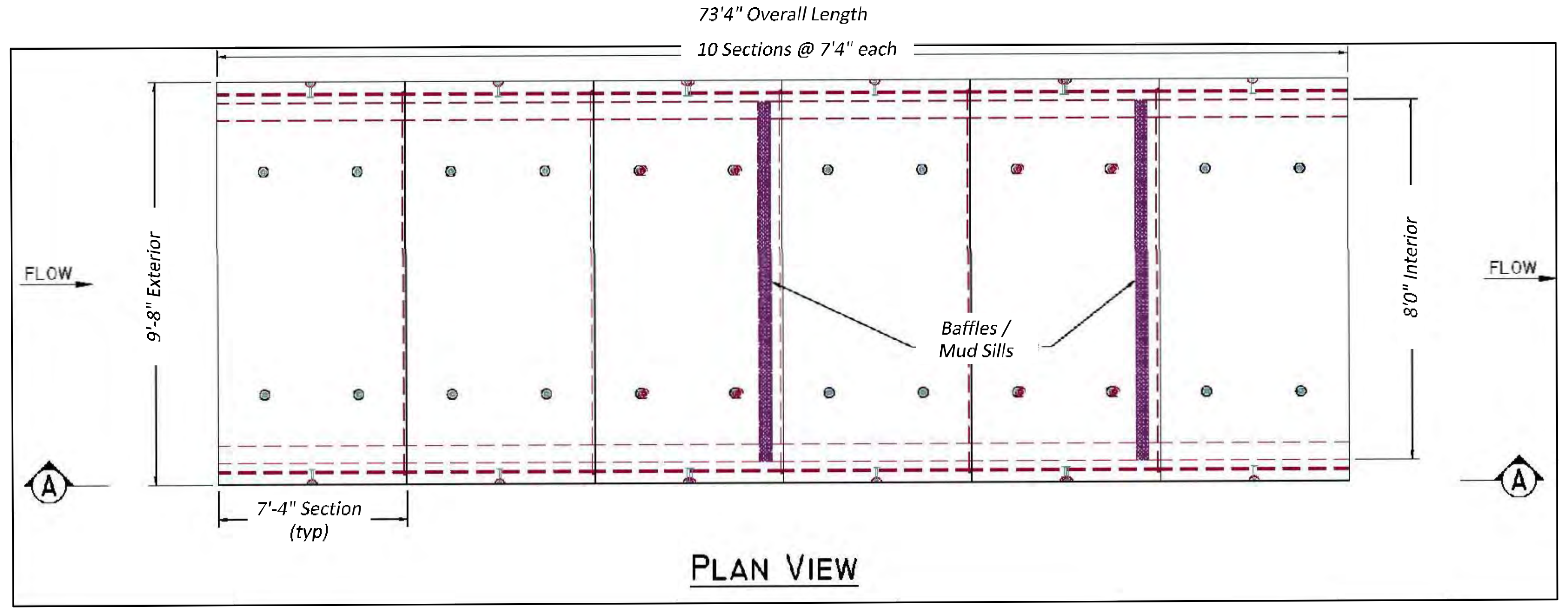


Profile View
1"=40'Horizontal
1"=4'Vertical

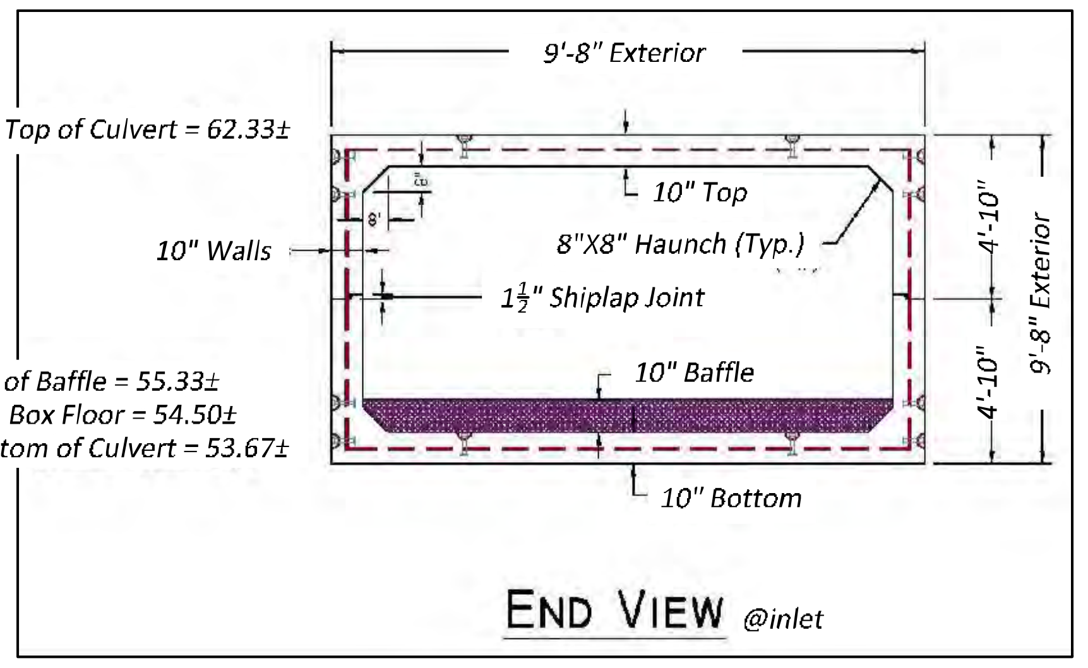
Note:
1. CONTRACTOR SHALL PROVIDE SHOP DRAWING TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.



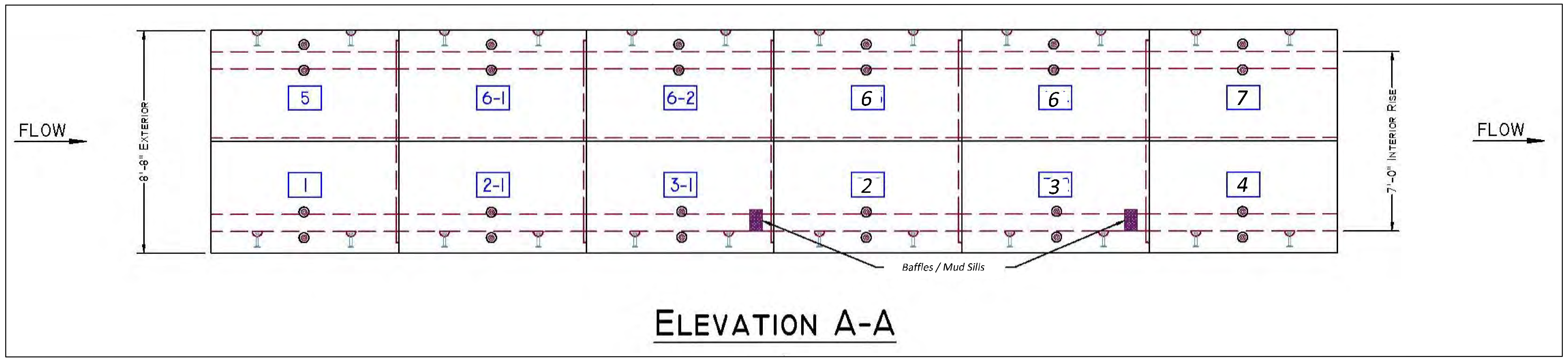
Plan View
1"=40'



PLAN VIEW



END VIEW @inlet



ELEVATION A-A

American Concrete Industries
1717 Stillwater Ave. Veazie, ME
Tel: 207-947-8334
Fax: 207-947-3580

982 Minot Ave. Auburn, ME
Tel: 207-784-1388
Fax: 207-783-4039

ITEM	QTY	BILL OF MATERIALS
1	(1)	7'-4" UPSTREAM END BOTTOM (21,150 #)
5	(1)	7' 4" UPSTREAM END TOP (20,975 #)
2	(4)	7' 4" MID SECTION BOTTOM (21,350 # EA)
6	(8)	7'-4" MID SECTION TOP (21,150 # EA)
3	(4)	7'-4" MID BOTTOM W/ MUDSILL (22,200 # EA)
4	(1)	7'-4" DOWNSTREAM END BOTTOM (21,550 #)
7	(1)	7'-4" DOWNSTREAM END TOP (21,350 #)

Prepared in association with:

LICHT
ENVIRONMENTAL DESIGN, LLC

CHRISTOPHER S. BELANGER 9098

6-15-2020

1. 6-15-2020 Re-submit to Town and Maine DEP CSB

Box Culvert 3 Details
Twin Clamshell Box Culverts

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
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- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #:	C26
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

PROGRESS PLAN
NOT FOR CONSTRUCTION

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Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

1. 6-15-2020 Respond to SME memo dated 3-4-2020 Re-submit to Town and DEP CSB

Culvert and Wall Site Plan

Cumberland Crossing — Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

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Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=20'	SHEET:
DRN BY:	JOB #:	C26a
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

PROGRESS PLAN
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Prepared in association with:

LICHT ENVIRONMENTAL DESIGN, LLC

1. 6-15-2020 Respond to SME memo dated 3-4-2020 Re-submit to Town and DEP CSB

Focal Point Site Plan

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
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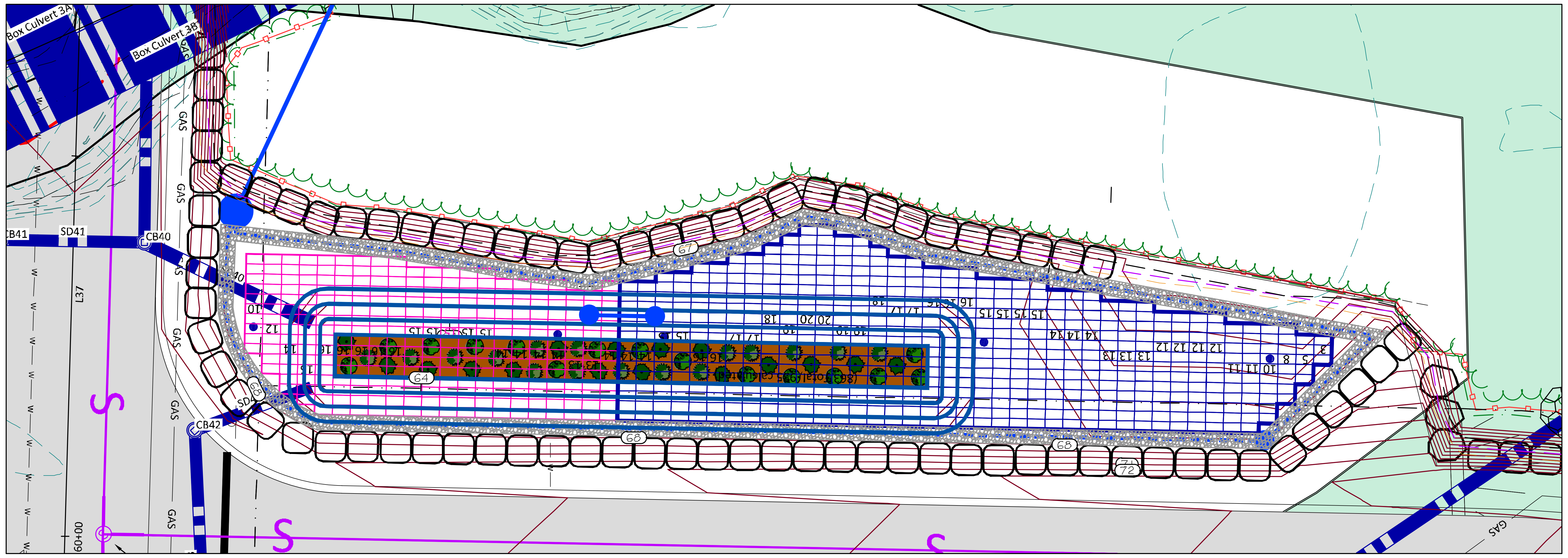
Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=10'	SHEET:
DRN BY:	JOB #:	C27
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



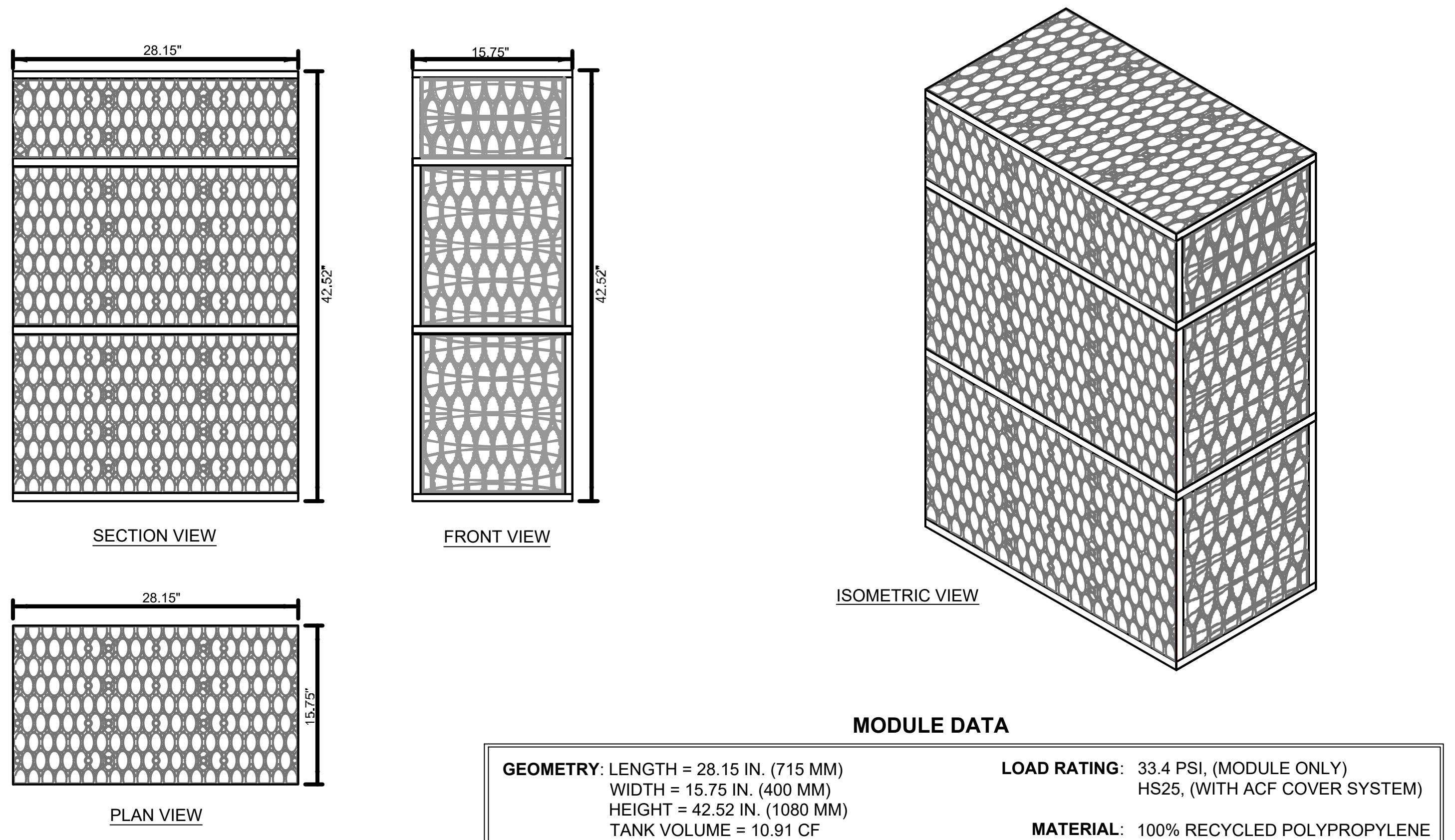
EXPANDED R-TANK SYSTEM LAYOUT (10 SCALE)

R-TANK SYSTEM DIMESIONAL DATA

R-TANK SYSTEM I.D.	FP-1		
R-TANK^{HD} MODULE	Double-Mini		
# TANKS WIDE	see plan		
# TANKS LONG	see plan		
STONE PERIMETER WIDTH	2 FT		
SYSTEM WIDTH	26.25'		
SYSTEM LENGTH	110.25'		
R-TANK INVERT	58.21		
STONE BASE ELEV	57.71'		
R-TANK TOP ELEV	61.76		
MIN COVER (20")	2'		
MAX COVER (7 FT)	2'		

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
6-15-2020

DATE	REVISION
-	-



MODULE DATA

GEOMETRY: LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 42.52 IN. (1080 MM)
TANK VOLUME = 10.91 CF
STORAGE VOLUME = 10.36 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING: 33.4 PSI, (MODULE ONLY)
HS25, (WITH ACF COVER SYSTEM)

MATERIAL: 100% RECYCLED POLYPROPYLENE

SMALL PLATES PER SEGMENT/TOTAL: 5/15

R-TANK^{HD} - DOUBLE + MINI MODULES

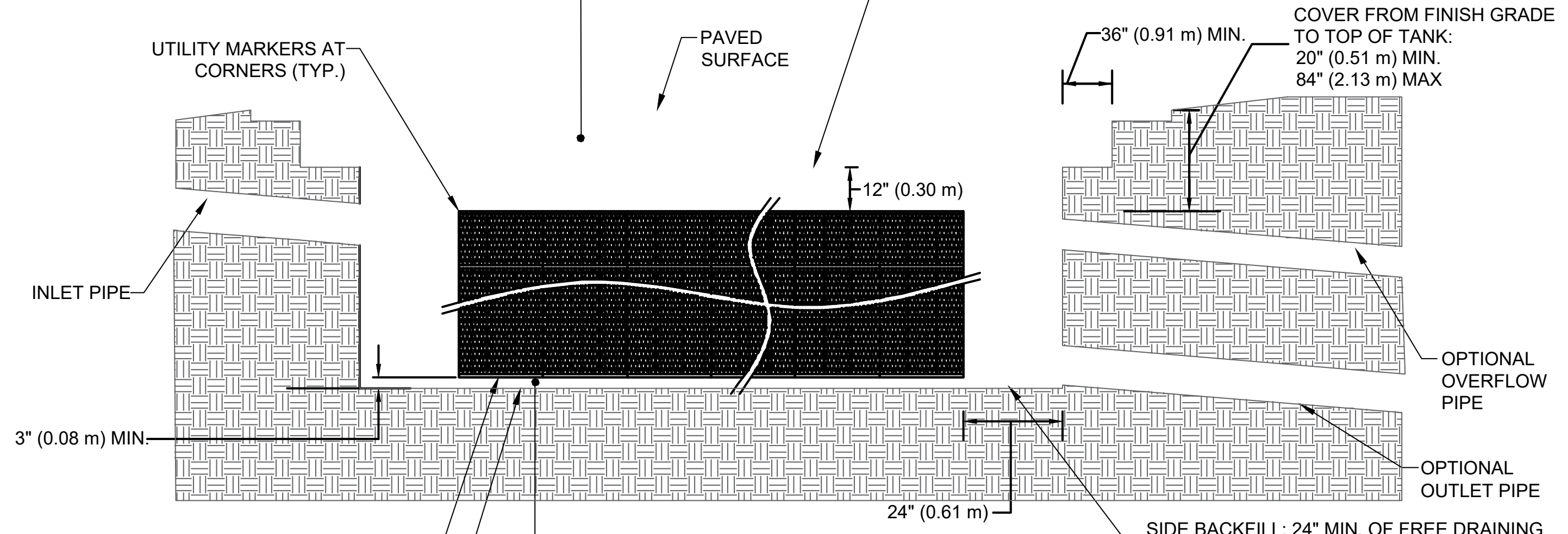
1

TOTAL COVER: 20" MINIMUM AND 84" MAXIMUM. FIRST 12" MUST BE FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4. A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 7'. CONTACT ACF ENVIRONMENTAL IF MORE THAN 7' OR LESS THAN 20" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

NOTES:

- FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{HD} MODULE SHEET
- INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF H20 LOADING PER THE 1983, 13TH EDITION OF THE AMERICAN ASSOCIATION OF STATE, HIGHWAY AND TRAFFIC OFFICIALS (AASHTO) STANDARD SPECIFICATIONS
- PRE-TREATMENT STRUCTURES NOT SHOWN

GEOGRID (TENSAR BX-1200 OR EQUAL) PLACED 12" ABOVE THE R-TANK^{HD} SYSTEM. OVERLAP ADJACENT PANELS BY 18" MIN. GEOGRID SHOULD EXTEND 3' BEYOND THE EXCAVATION FOOTPRINT.



R-TANK^{HD} UNITS WRAPPED IN 8 OZ. NONWOVEN GEOTEXTILE (OR EQUAL) LOAD RATING: 33.4 PSI (MODULE ONLY)

PLACE 8OZ FABRIC BETWEEN SUBGRADE AND STONE (ALL SIDES OF SYSTEM)

BASE: 3" MIN. FREE DRAINING BACKFILL (SPEC SECTION 2.03B) COMPACTED TO 95% STANDARD PROCTOR DENSITY IS REQUIRED * TO PROVIDE A LEVEL BASE SURFACE. MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT. A BEARING CAPACITY OF 2,000 PSF MUST BE ACHIEVED PRIOR TO INSTALLING R-TANK^{HD}. NATIVE SOILS MAY BE ACCEPTABLE IF DETERMINED TO BE STABLE BY OWNER'S ENGINEER.

SIDE BACKFILL: 24" MIN. OF FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). MUST BE FREE FROM LUMPS, DEBRIS AND OTHER SHARP OBJECTS. SPREAD EVENLY TO PREVENT R-TANK^{HD} MOVEMENT. COMPACT SIDE BACKFILL WITH POWERED MECHANICAL COMPACTOR IN 12" LIFTS.

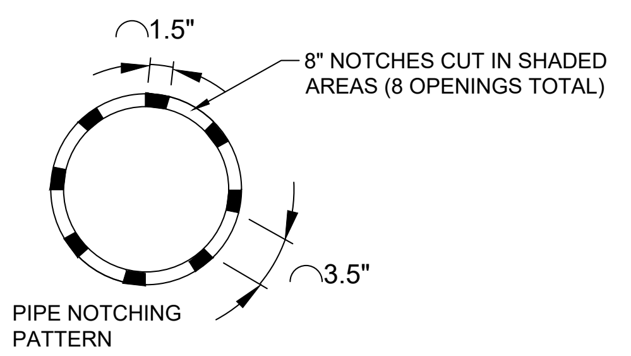
* FOR INFILTRATION APPLICATIONS, BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03B) TO PROVIDE A LEVEL BASE SURFACE. MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT. A BEARING CAPACITY OF 2,000 PSF MUST BE ACHIEVED PRIOR TO INSTALLING R-TANK^{HD}.

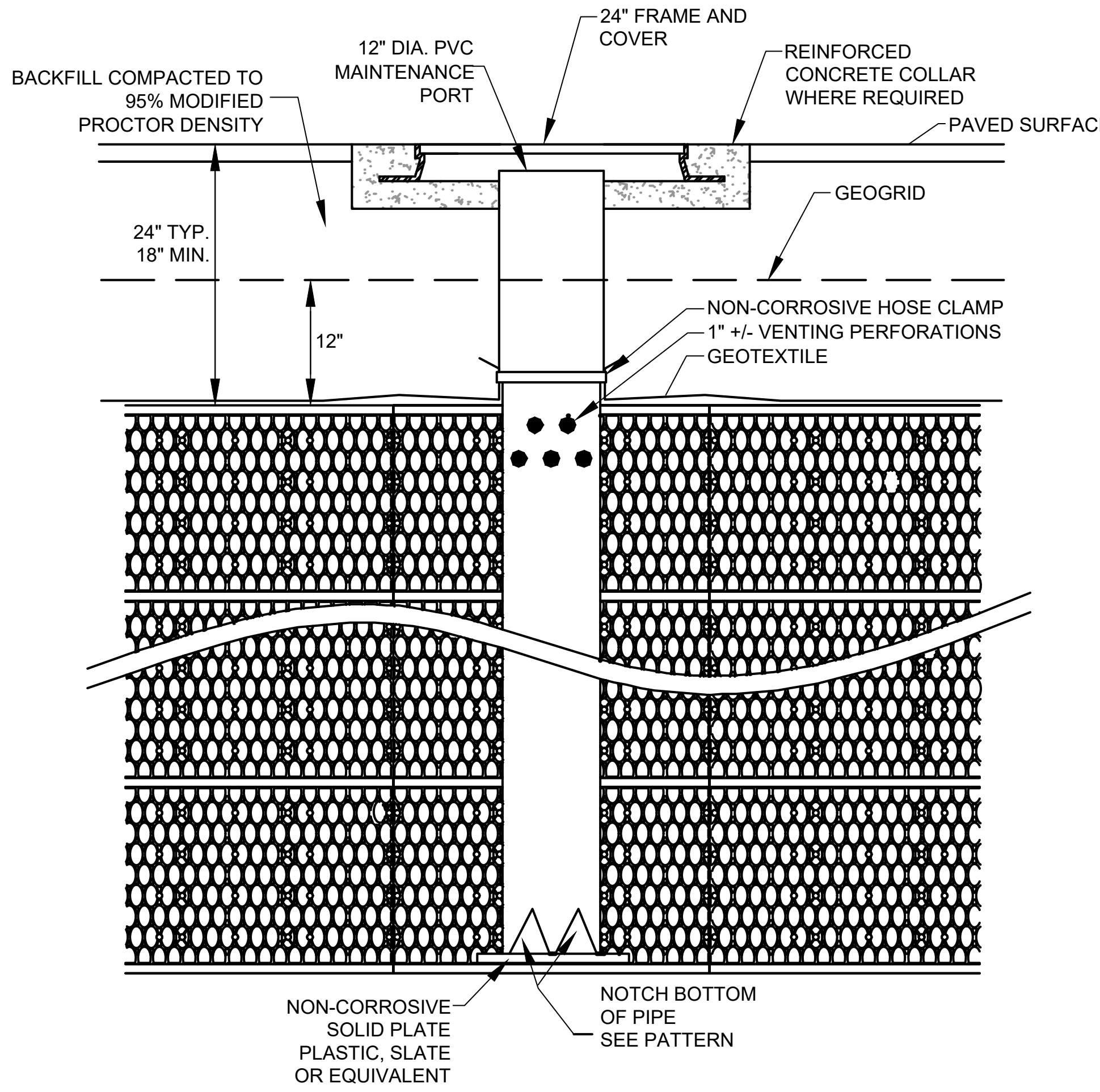
2

R-TANK^{HD} - H-20 LOADS

MAINTENANCE PORT

THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.





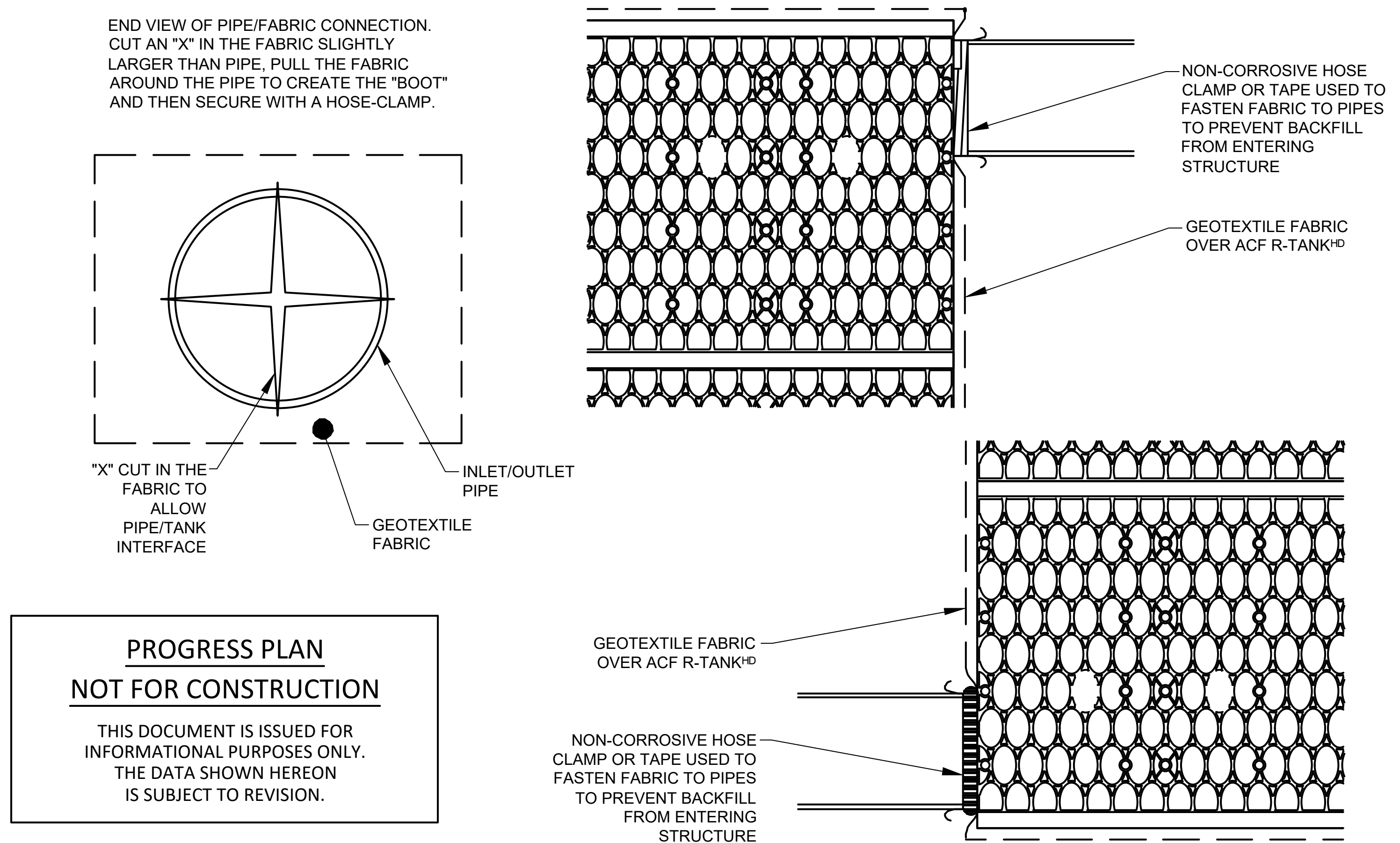
3

R-TANK^{HD} TYPICAL MAINTENANCE PORT

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF ENVIRONMENTAL 1-800-448-3636
www.acfenvironmental.com

ACF ENVIRONMENTAL
LET'S GET IT DONE

END VIEW OF PIPE/FABRIC CONNECTION. CUT AN "X" IN THE FABRIC SLIGHTLY LARGER THAN PIPE, PULL THE FABRIC AROUND THE PIPE TO CREATE THE "BOOT" AND THEN SECURE WITH A HOSE-CLAMP.



PROGRESS PLAN
NOT FOR CONSTRUCTION

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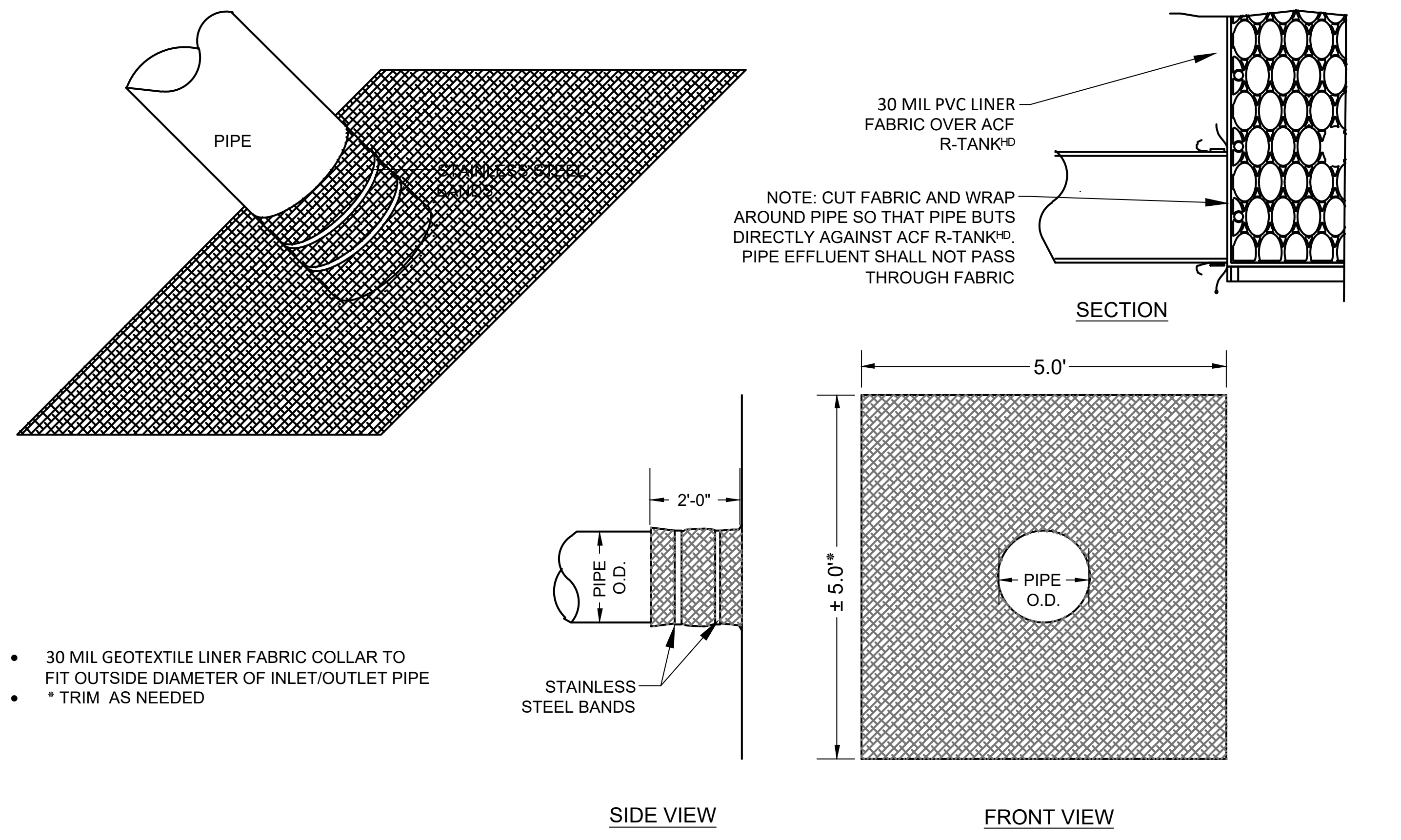
4

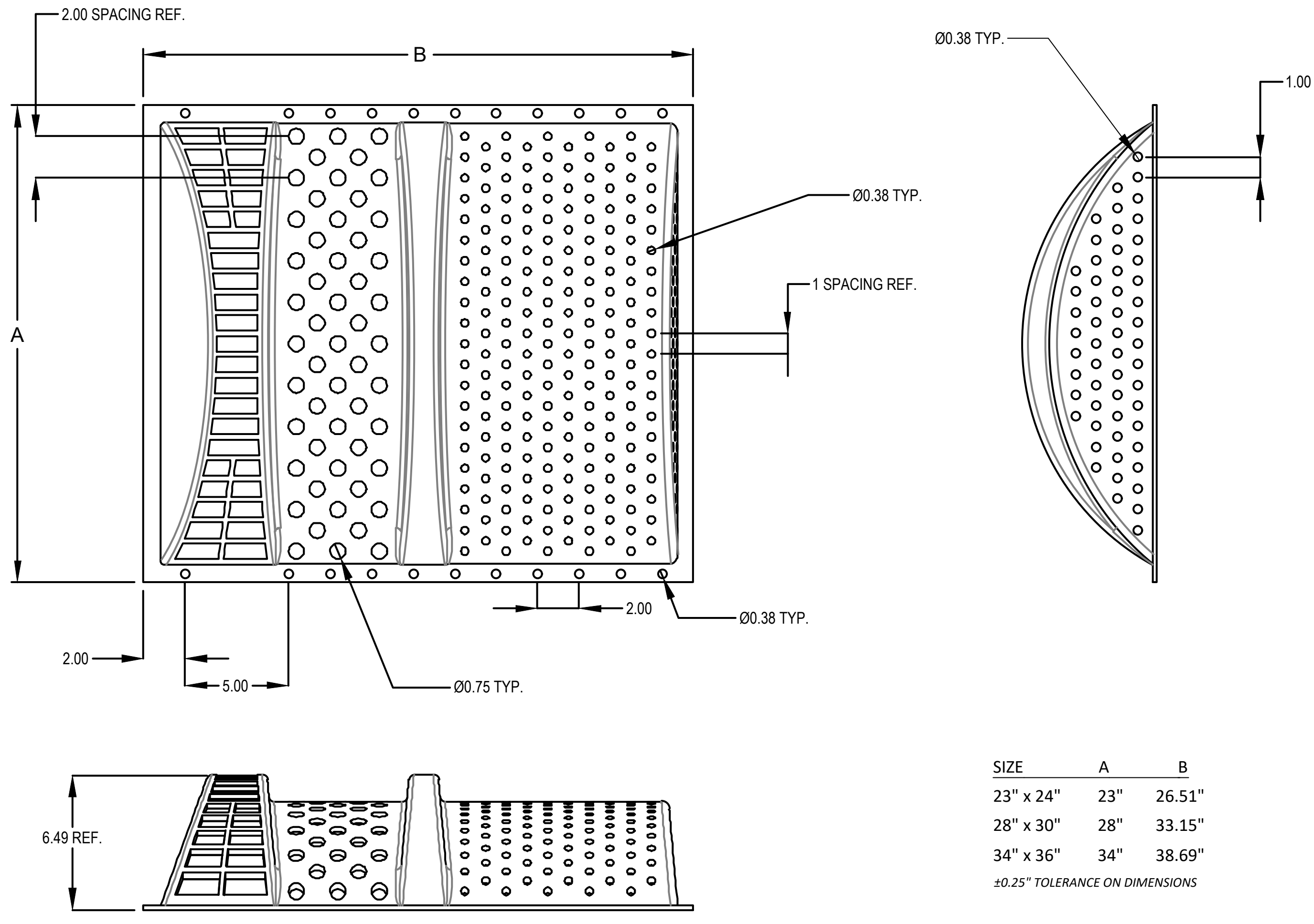
R-TANK^{HD} TYPICAL TANK INLET/OUTLET DETAIL



- 30 MIL GEOTEXTILE LINER FABRIC COLLAR TO FIT OUTSIDE DIAMETER OF INLET/OUTLET PIPE
- * TRIM AS NEEDED

5

GEOTEXTILE PIPE BOOT FOR R-TANK^{HD}



SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

6

TRASH GUARD PLUS DETAIL

R-TANK^{HD} DETAILS FOR EXPANDED FOCALPOINT SYSTEM UNDERDRAINS

CUMBERLAND CROSSING PHASE 2

GREELY ROAD, CUMBERLAND, MAINE

PROJECT NO.
109

DATE
June 15, 2020

SHEET NO.
C28

REV 3/18/16

FOCALPOINT KEY DIMENSIONAL DATA

FOCALPOINT I.D.		#1-Sta 60+00 lt.					
A	FOCALPOINT LENGTH	25.83'					
B	# UNDERDRAIN LONG	see expanded R-tank					
C	FOCALPOINT WIDTH	18'					
D	# UNDERDRAIN WIDE	see expanded R-tank					
E	WATER QUALITY VOLUME	9683 c.f.					
F	OVERFLOW ELEVATION	65.0					
G	OUTLET FLOWLINE	60.75					
H	TOP OF MULCH	64.0					
J	UNDERDRAIN HEIGHT	Double + MINI = 3.54'					

PROGRESS PLAN
NOT FOR CONSTRUCTION
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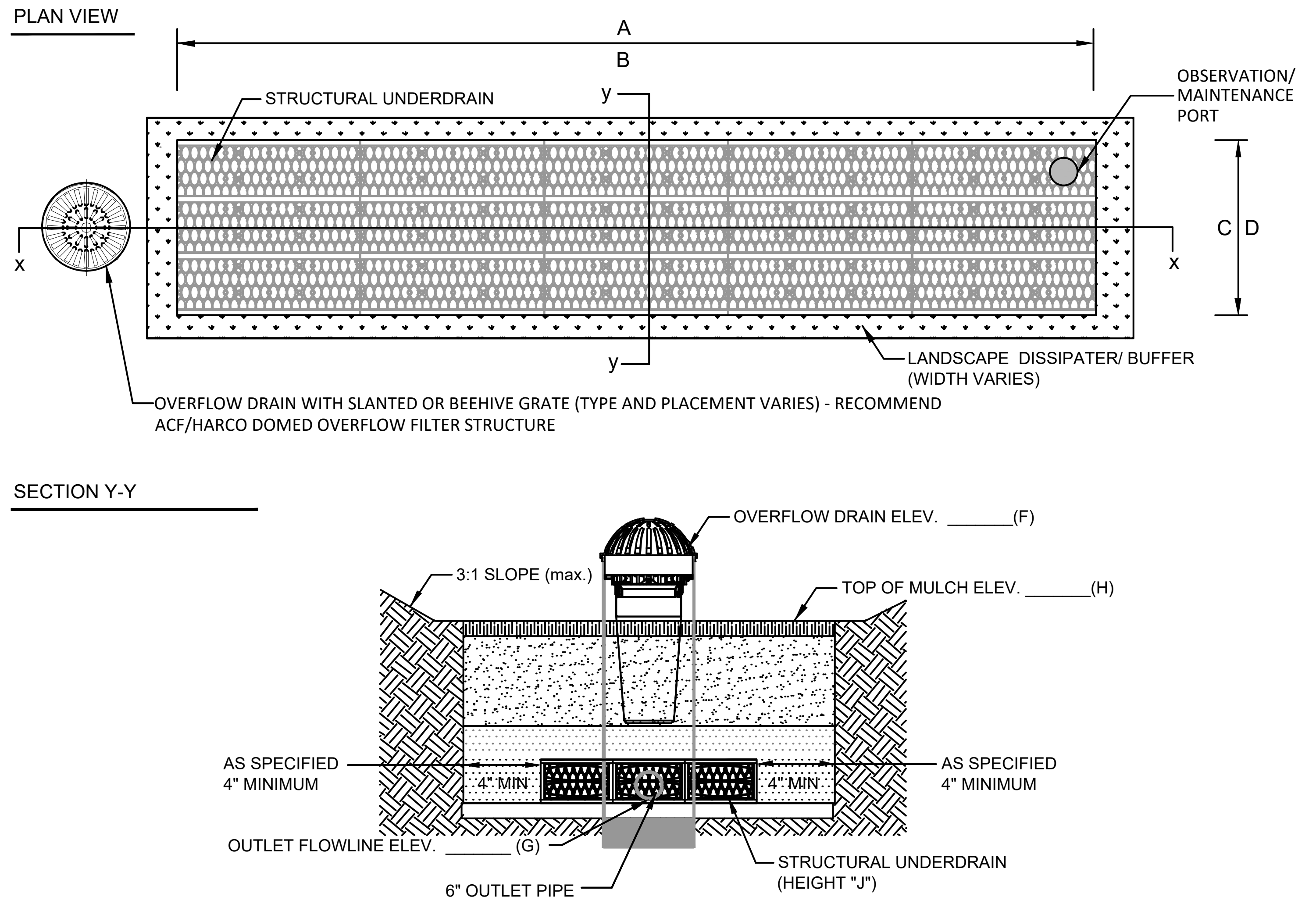
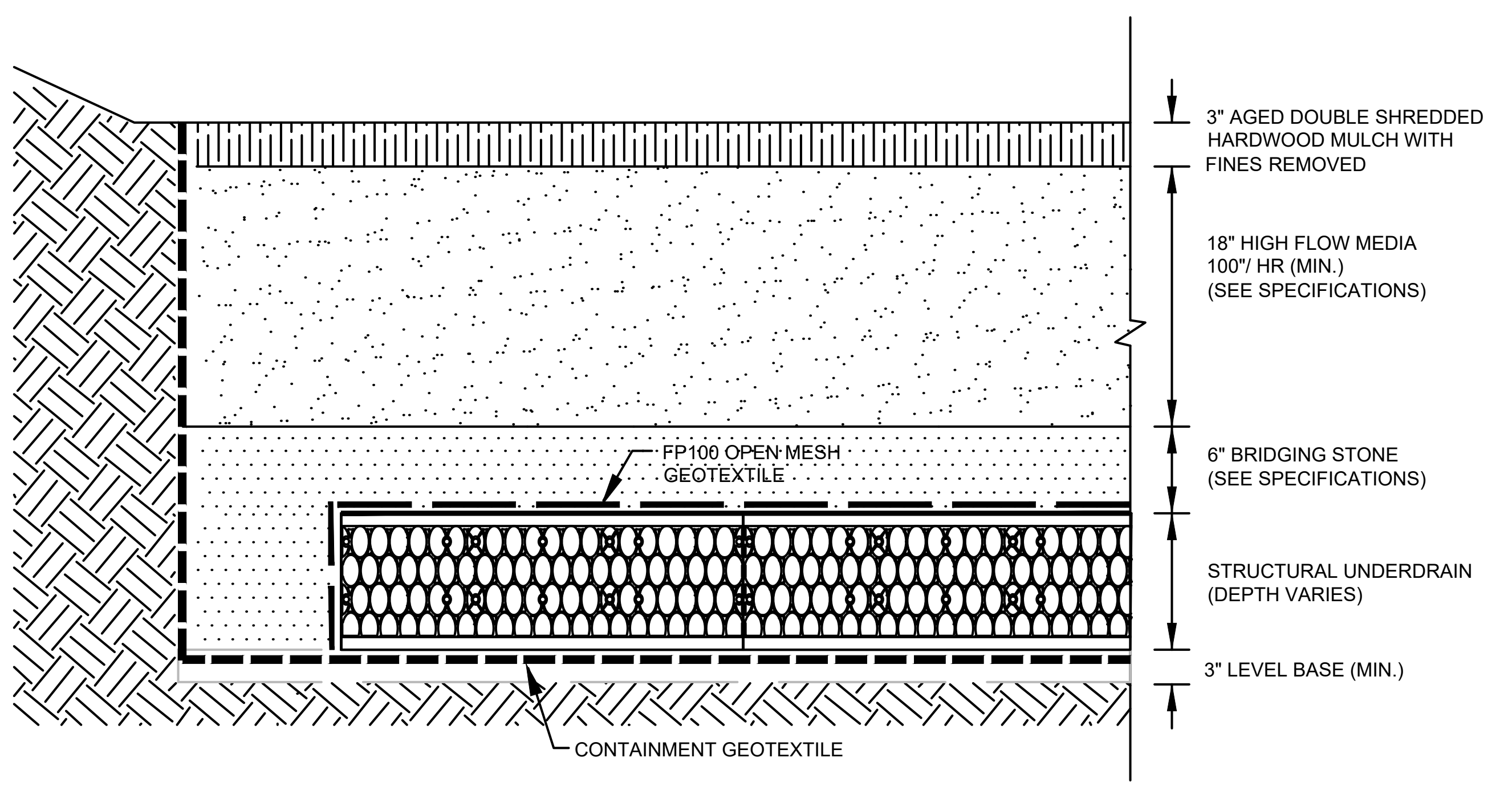


① FOCALPOINT CONSTRUCTION GUIDE



FOCALPOINT HP PERFORMANCE SPECIFICATION:

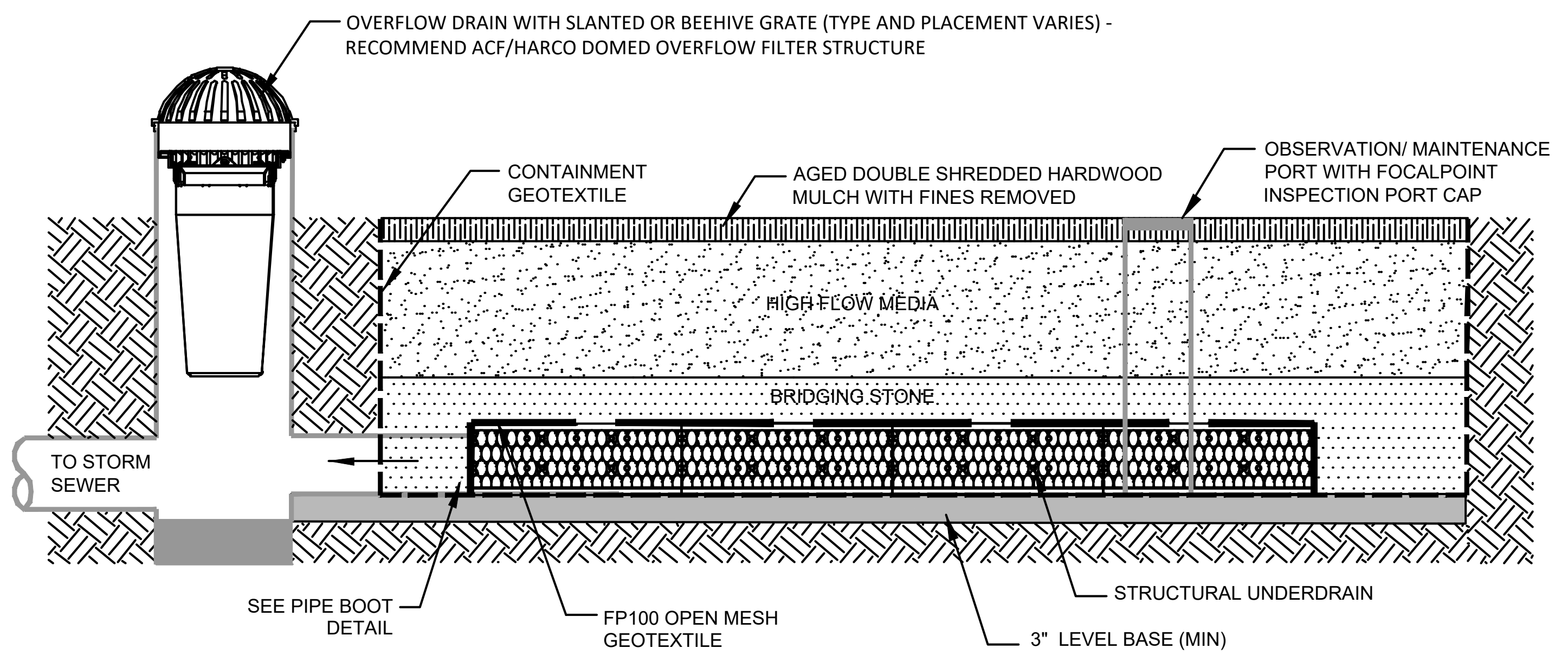
HIGH PERFORMANCE MEDIA

HIGH PERFORMANCE MEDIA MUST MEET A MINIMUM OF 100" PER HOUR INFILTRATION RATE.

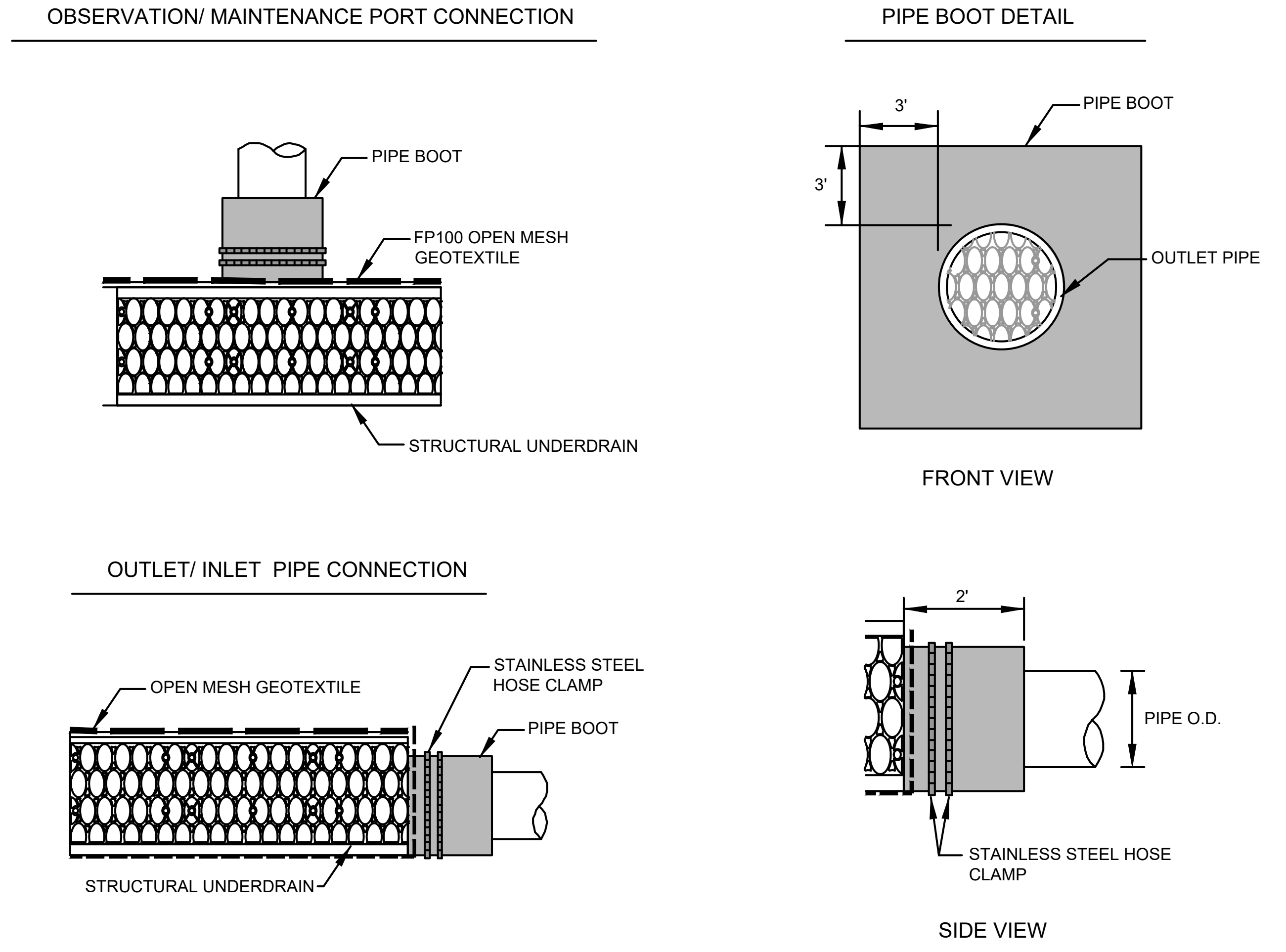
HIGH PERFORMANCE STRUCTURAL UNDERDRAIN

MUST HAVE A MINIMUM OF 19 SQUARE INCHES OF ORIFICE OPENING PER SQUARE FOOT.
MUST MEET H20 LOADING REQUIREMENTS.
MUST BE MODULAR IN NATURE AND ASSEMBLED ON SITE.
MUST HAVE MINIMUM 90% INTERIOR VOID SPACE.

② FOCALPOINT DETAILED CROSS SECTION



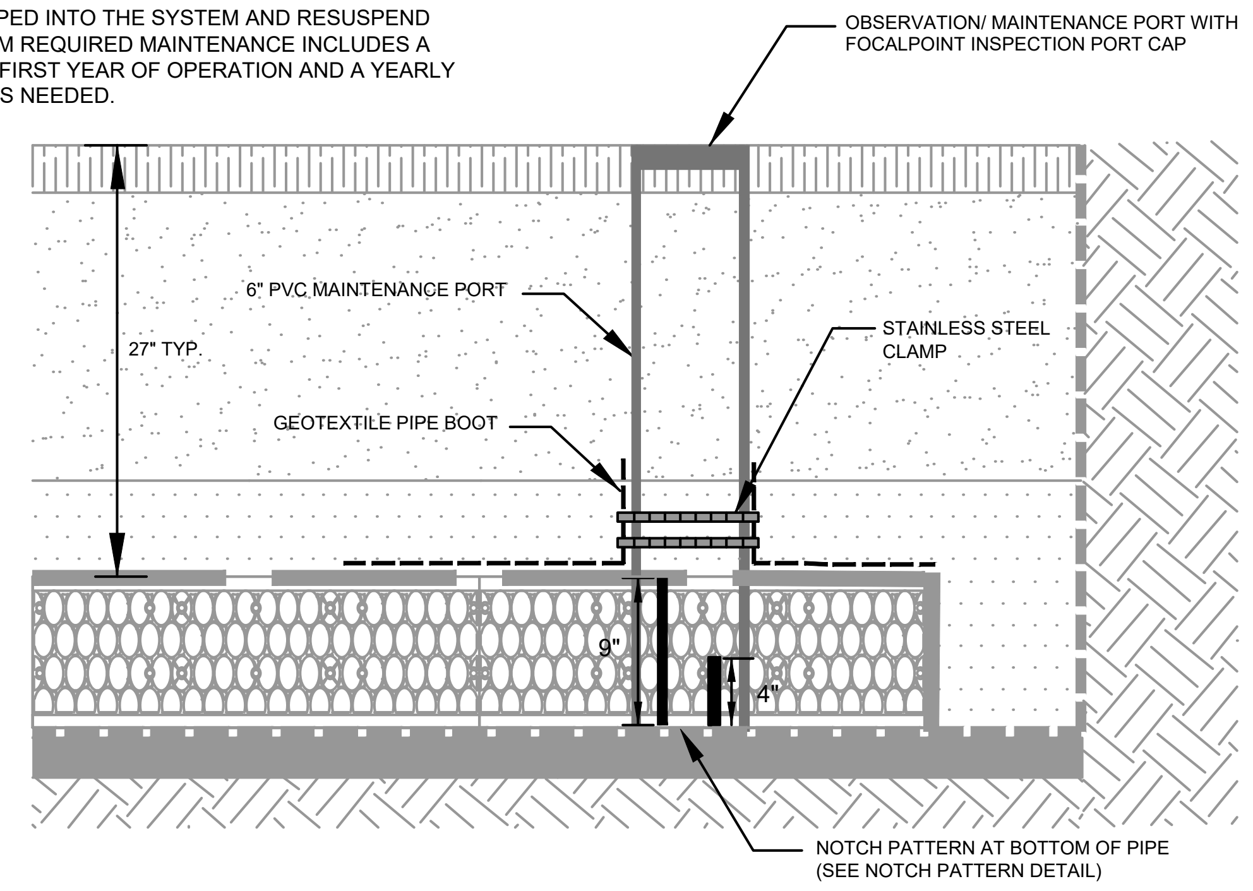
③ FOCALPOINT SECTION X-X



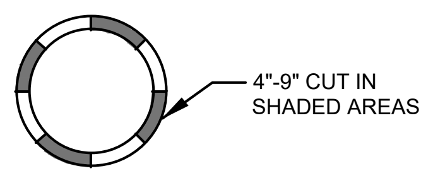
④ FOCALPOINT PIPE CONNECTION DETAIL

OBSERVATION/ MAINTENANCE PORT

PORT USED FOR INSPECTION PURPOSES AND FOR SYSTEM MAINTENANCE AS REQUIRED. WATER SHALL BE PUMPED INTO THE SYSTEM AND RESUSPEND ACCUMULATED SEDIMENT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION FOR THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER FLUSH AS NEEDED.



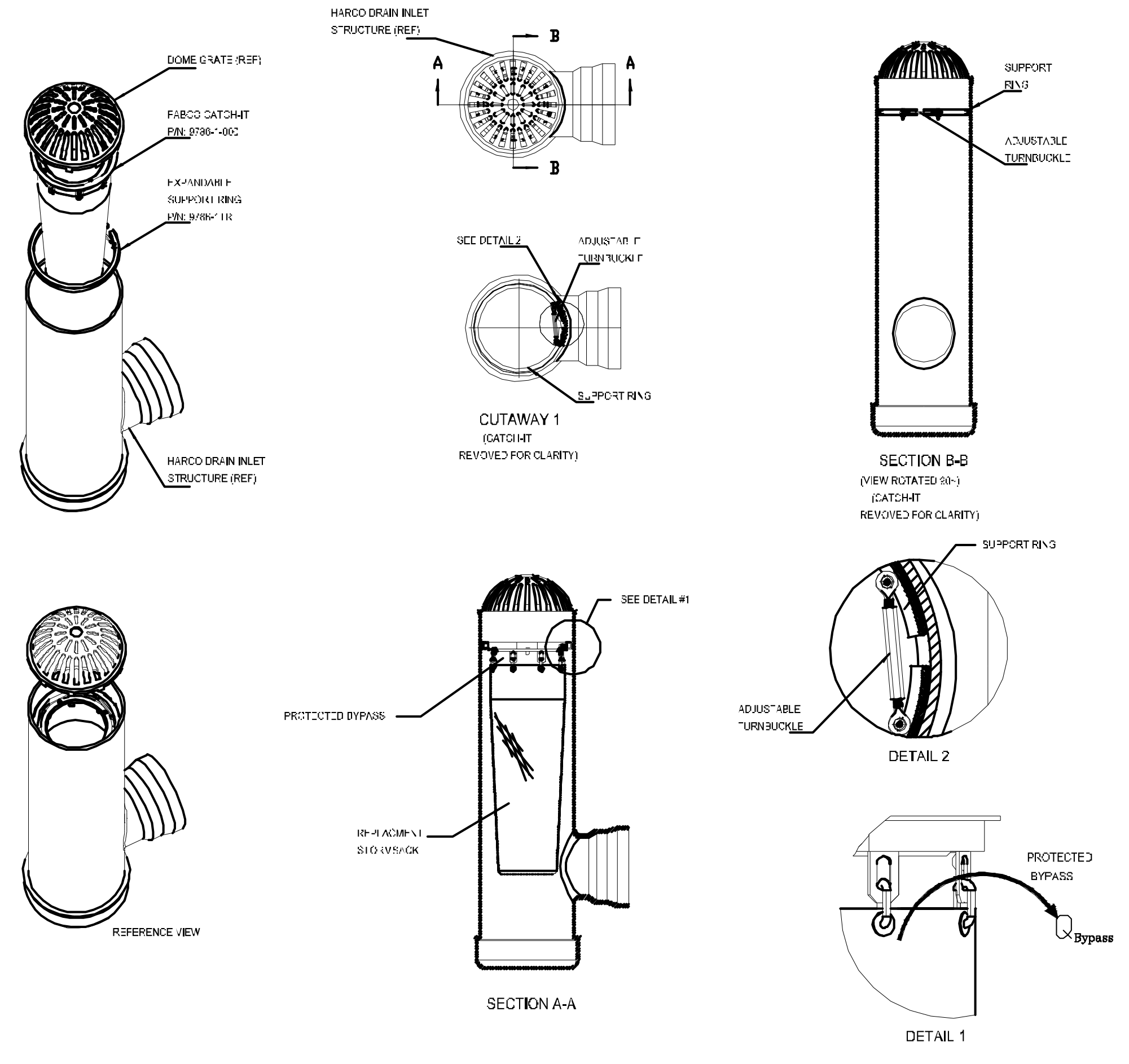
PIPE NOTCH PATTERN DETAIL



⑤ FOCALPOINT OBSERVATION PORT DETAIL

NOTES:
1. STORMSACK WEIGHT (EMPTY): 12 LB MAX
2. MATERIAL:
A) SHROUD: HIGH DENSITY POLYETHYLENE (TYPICAL WALL THICKNESS .125")
B) SUPPORT HUB: CRS, POWDER COATED
C) STORMSACK: WOVEN POLYPROPYLENE GEOTEXTILE (GEOTEX 117F)
D) HARDWARE: ALUMINUM POP-RIVETS
3. RECOMMENDED MINIMUM VAULT DEPTH: 2-IN BELOW CARTRIDGE
4. TYPICAL INSTALLATION: RAISE STORM GRATE, PUSH CATCH-IT SHROUD DOWN ON FRAME SUPPORT LEDGE UNTIL LOCKING-CLIPS CLICK IN PLACE, LOWER STORM GRATE.
5. USE ONLY WITH FABCO REPLACEABLE STORMSACK.

STRUCTURE DIAMETER (INCHES)	DEBRIS CAPACITY (CF)	FILTERED FLOWRATE (CFS)	BYPASS FLOWRATE (CFS)	TOTAL SYSTEM FLOWRATE (CFS)
12	0.77	2.2	1.2	3.4
18	1.65	2.5	1.0	3.5
24	3.60	4.9	2.4	7.3
30	6.20	4.9	2.4	7.3



⑥ ACF/HARCO DOMED OVERFLOW FILTER RISER

REV 12/14/19

NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOCALPOINT WITH R-TANK TREATMENT ROW

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
PROFESSIONAL ENGINEER
6-15-2020

DATE	REVISION
-	-

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF ENVIRONMENTAL 1-800-448-3636
www.acfenvironmental.com

FOCALPOINT SYSTEM DETAILS

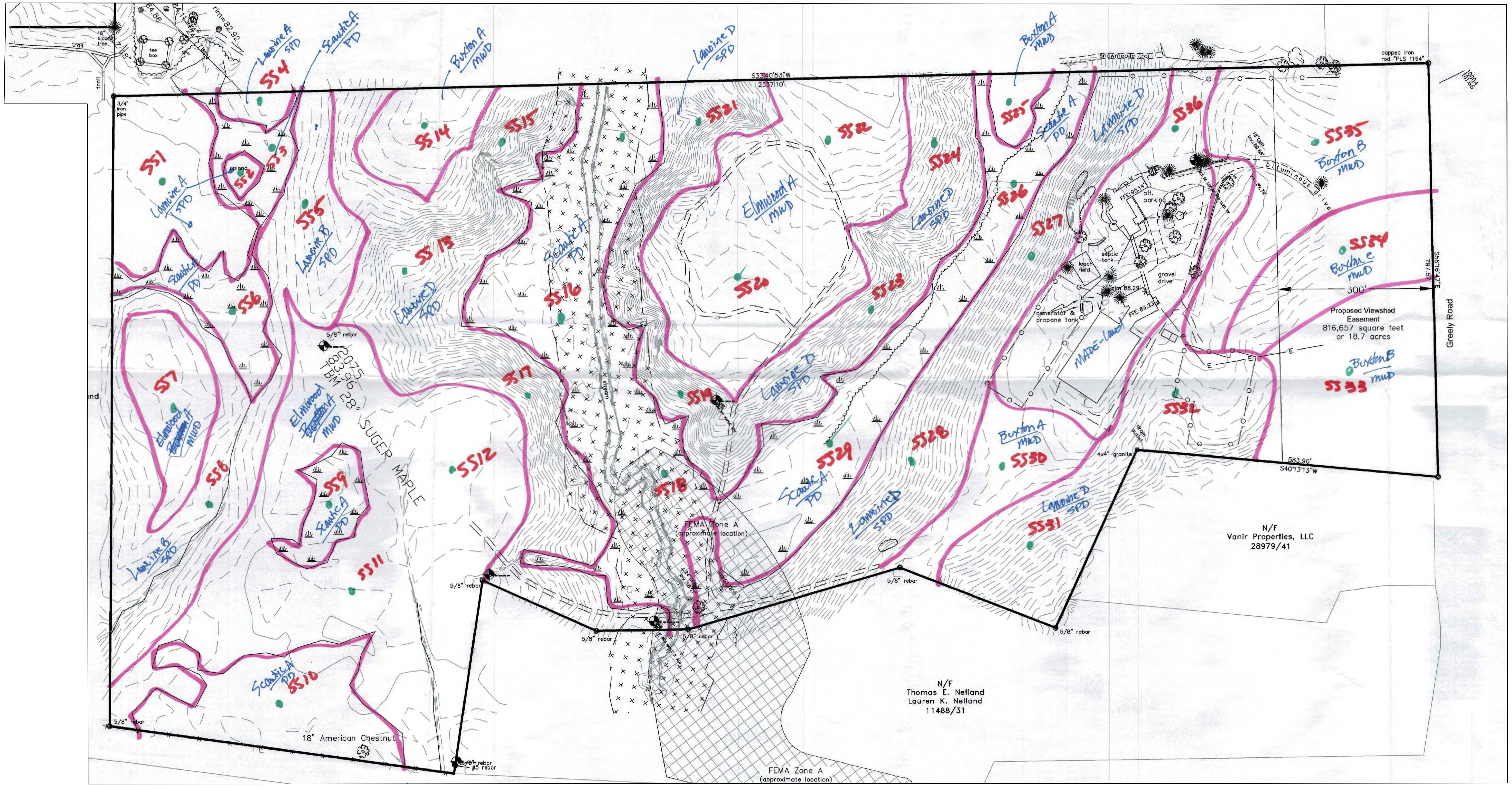
Oceanview @ Cumberland

Tuttle Road, Cumberland, Maine

PROJECT NO.
134

DATE
June 15, 2020

SHEET NO.
C29



Legend for Soil Maps

1. *Drainage Class*

Excessively Well Drained	*EWD*
Well Drained	*WD*
Moderately Well Drained	*MWD*
Somewhat Poorly Drained	*SPD*
Poorly Drained	*PD*
Very Poorly Drained	*VPD*

2. *Slope Designation*

0-3%	*A*
3-8%	*B*
8-15%	*C*
15-25%	*D*
>25%	*E*

3. *Note: High Intensity Soil Survey has been prepared by Mark Hampton Associates, Inc. in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.*

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST

CHRISTOPHER S. BELANGER
9098
6-15-2020

1. 6–15–2020 No changes, resubmit to Town and DEP CSB

Class B High Intensity Soil Survey

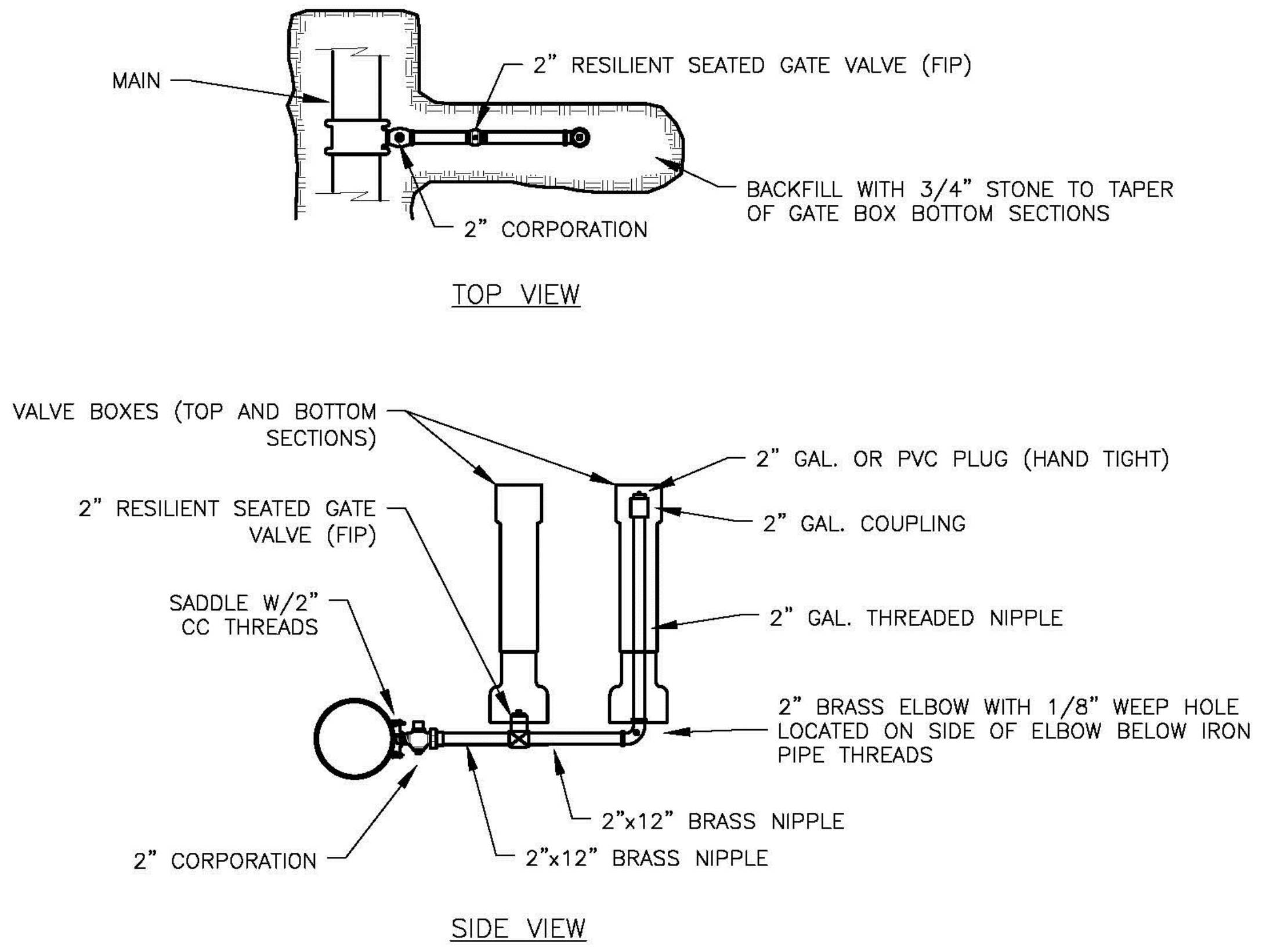
Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

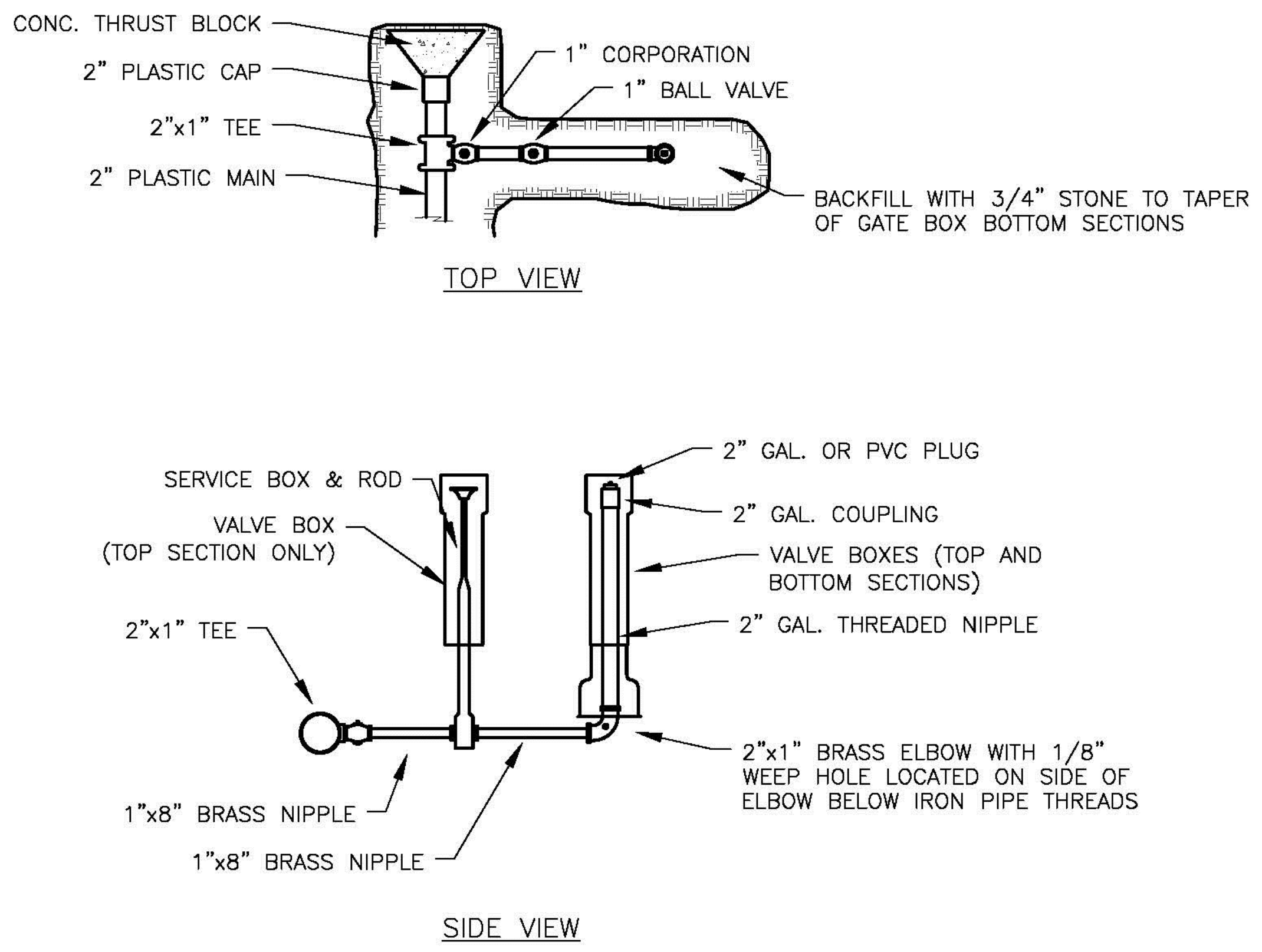
BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330
- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=100'	SHEET:
DRN BY:	JOB #:	C32
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



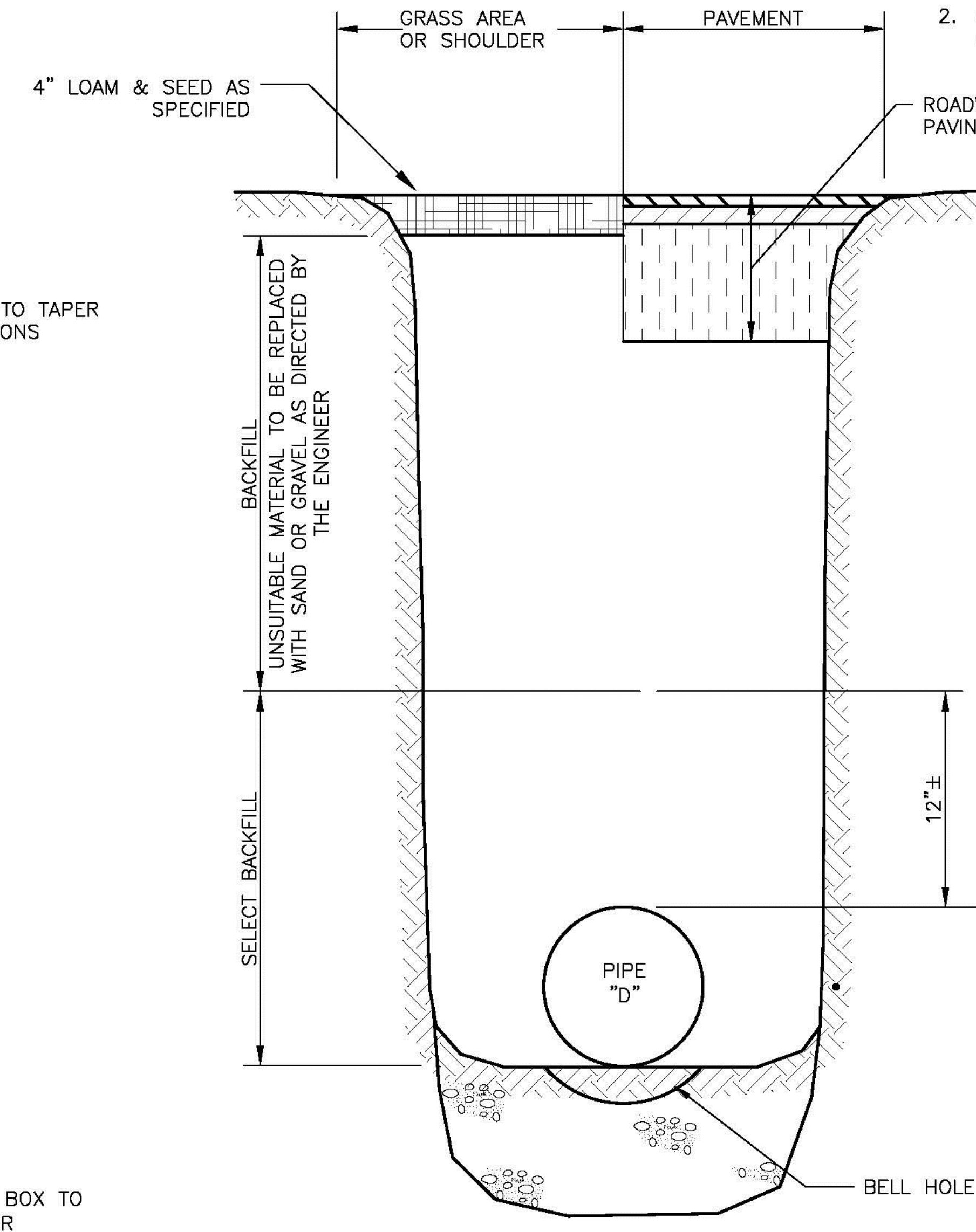
SIDE-ARM BLOW-OFF (4" & LARGER MAINS)



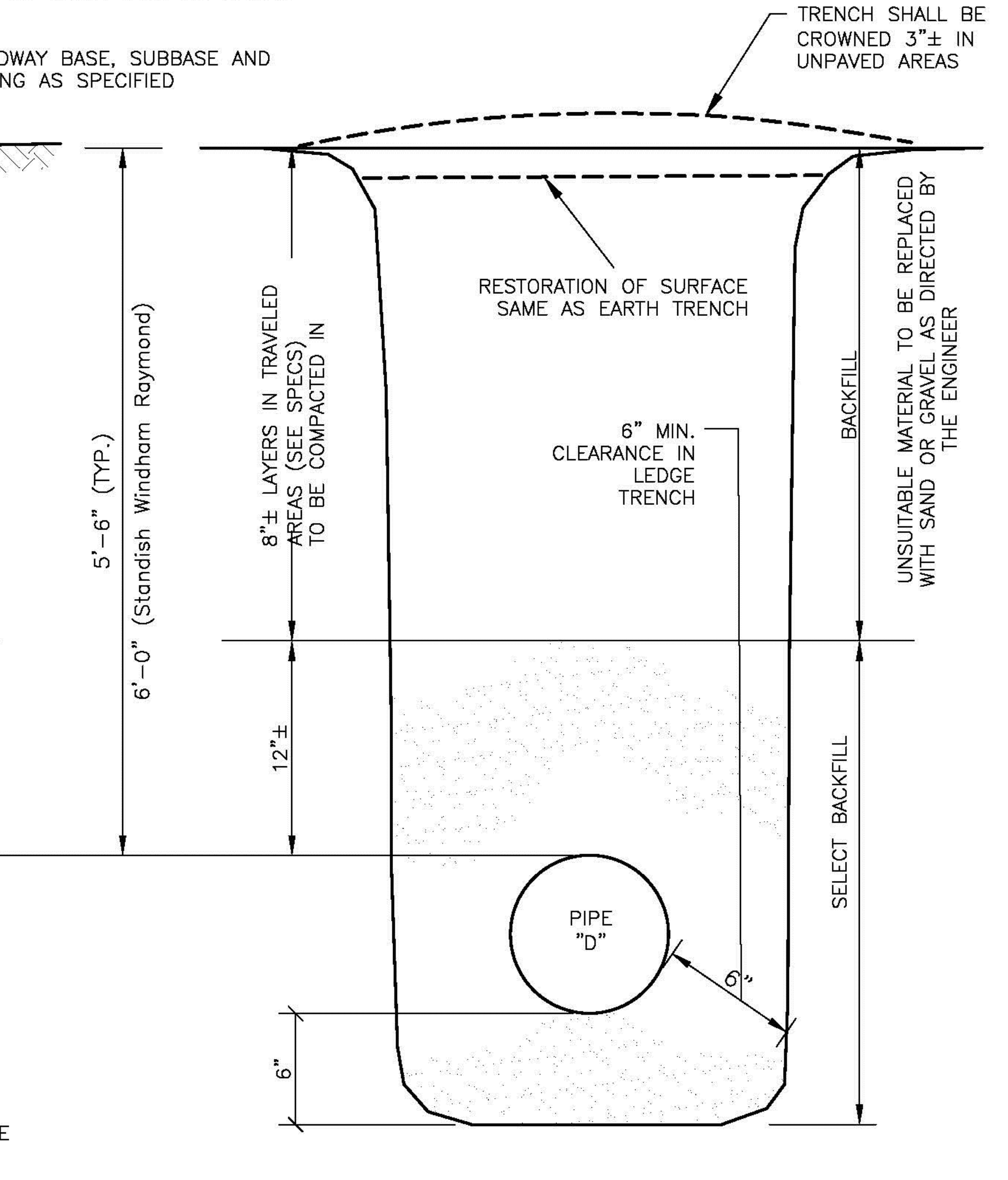
SIDE-ARM BLOW-OFF (2" MAIN)

TRENCH NOTES

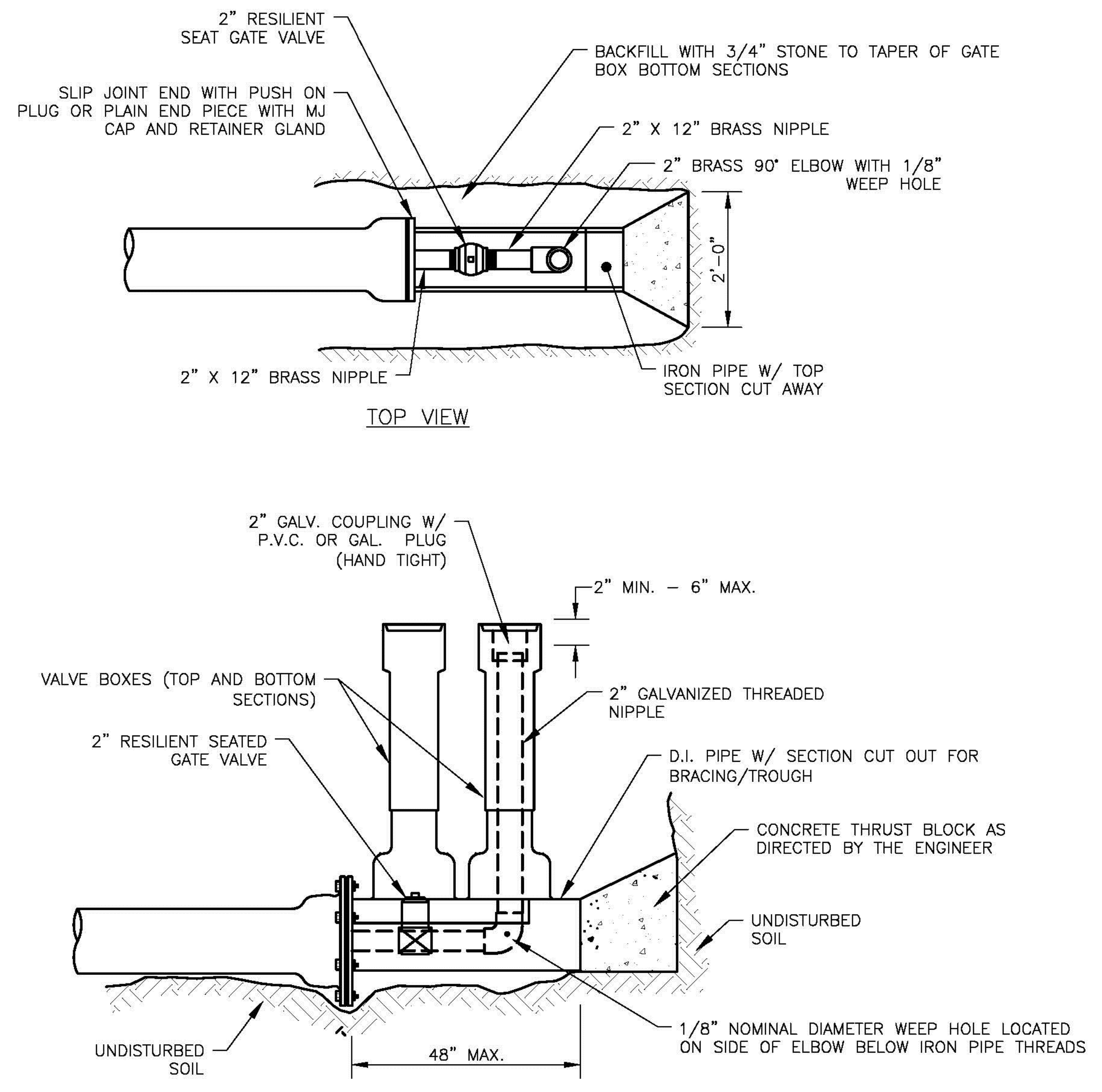
1. MAX PAY LIMITS SHALL BE 1.5 TIMES THE PIPE DIAMETER ON EACH SIDE OF PIPE
2. CLAY DAMS WILL BE INSTALLED IN LEDGE TRENCHES EVERY 100'± IN AREAS OF MORE THAN 3% SLOPE.



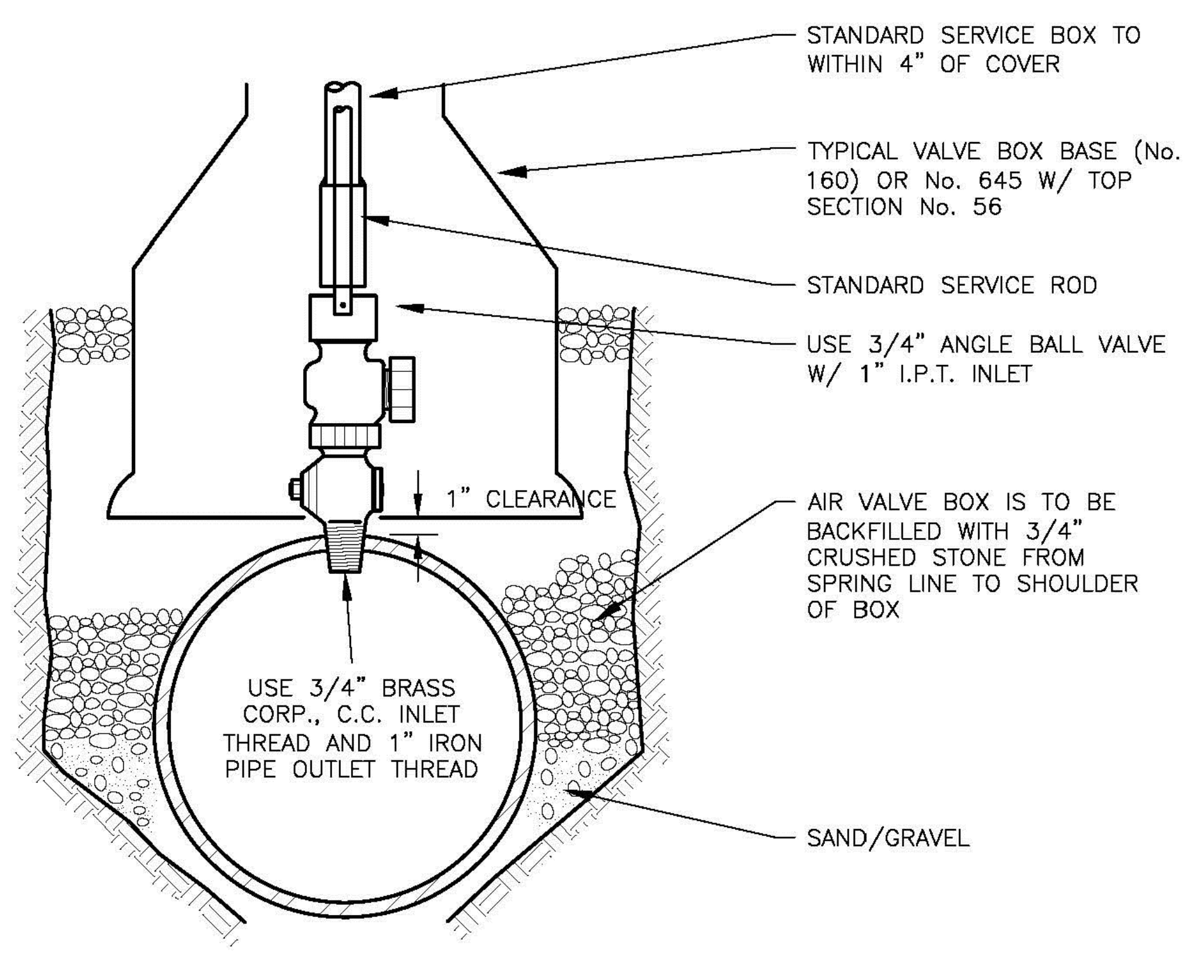
SECTION THRU EARTH TRENCH



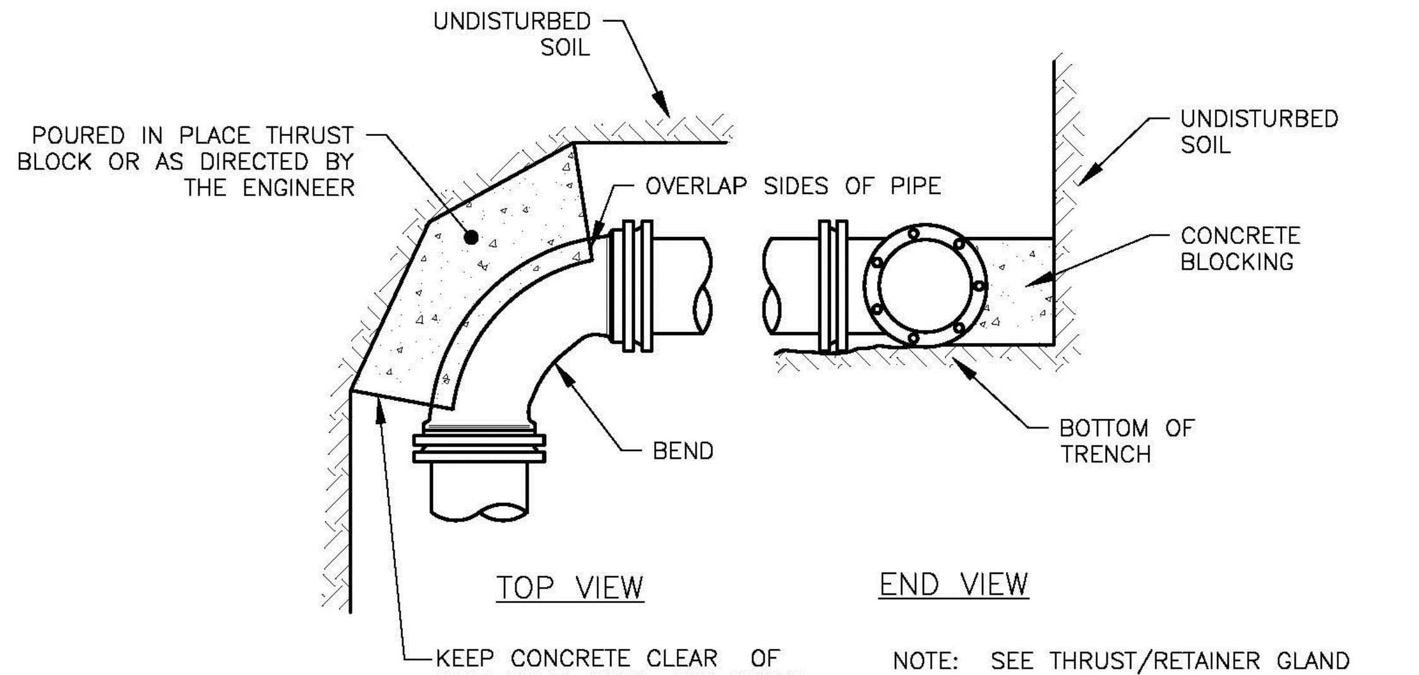
SECTION THRU LEDGE TRENCH



STANDARD 2" BLOW OFF

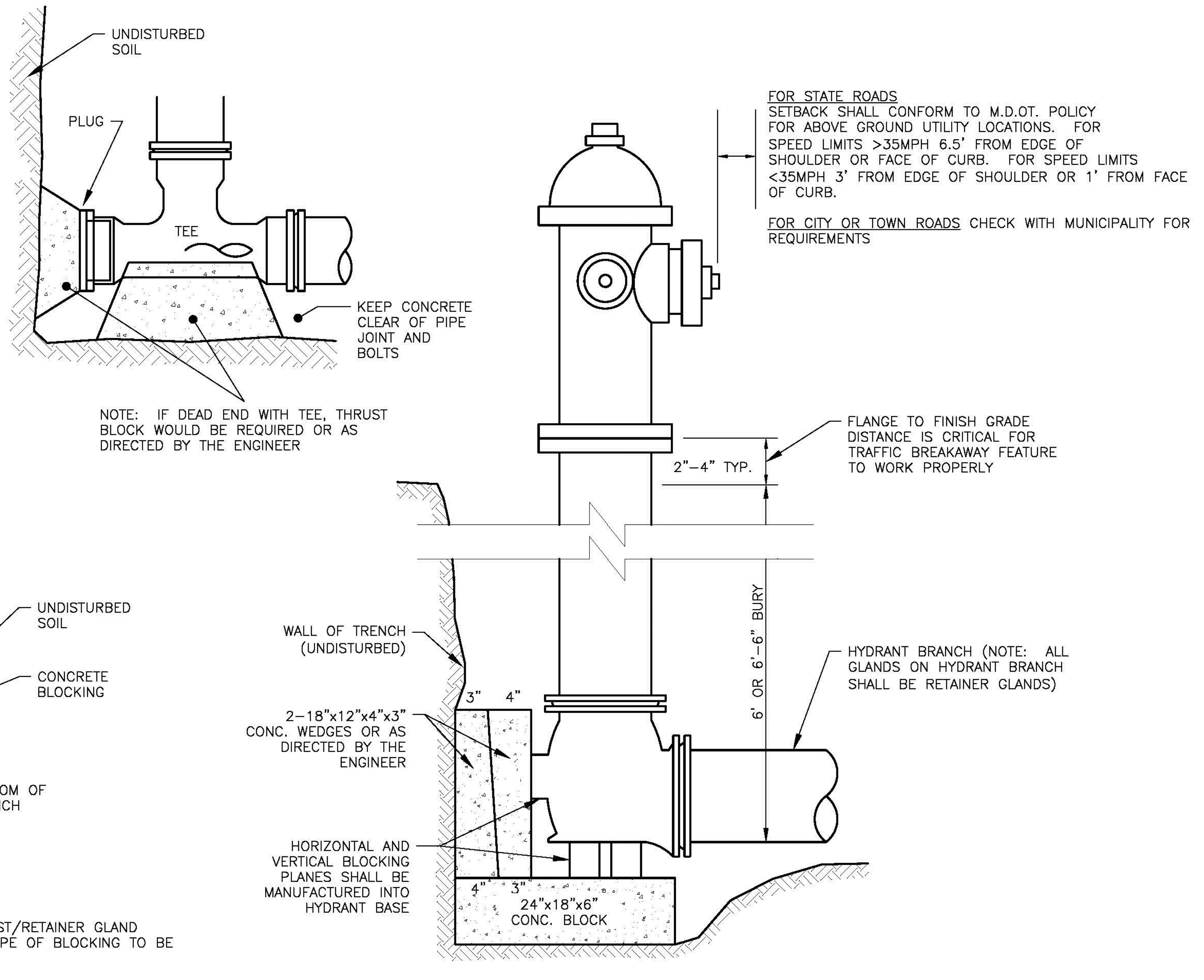


TYPICAL AIR VALVE (1")



NOTE: SEE THRUST/RETAINER GLAND SCHEDULE FOR TYPE OF BLOCKING TO BE USED ON BENDS

STANDARD BEND BLOCKING



NOTE: IF DEAD END WITH TEE, THRUST BLOCK WOULD BE REQUIRED OR AS DIRECTED BY THE ENGINEER

FOR STATE ROADS
SETBACK SHALL CONFORM TO M.D.OT. POLICY FOR ABOVE GROUND UTILITY LOCATIONS. FOR SPEED LIMITS >35MPH 6.5' FROM EDGE OF SHOULDER OR FACE OF CURB. FOR SPEED LIMITS <35MPH 3' FROM EDGE OF SHOULDER OR 1' FROM FACE OF CURB.

FOR CITY OR TOWN ROADS CHECK WITH MUNICIPALITY FOR REQUIREMENTS

TYPICAL HYDRANT INSTALLATION DETAIL

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	No changes this sheet Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

PORTLAND WATER DISTRICT
STANDARD DETAILS 1

Cumberland Crossing
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

CHRISTOPHER S. BELANGER
9098
6-15-2020

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FIELD WK:	SCALE:	SHEET:
DRN BY:	JOB #: 109	C33
CH'D BY:	SS:	
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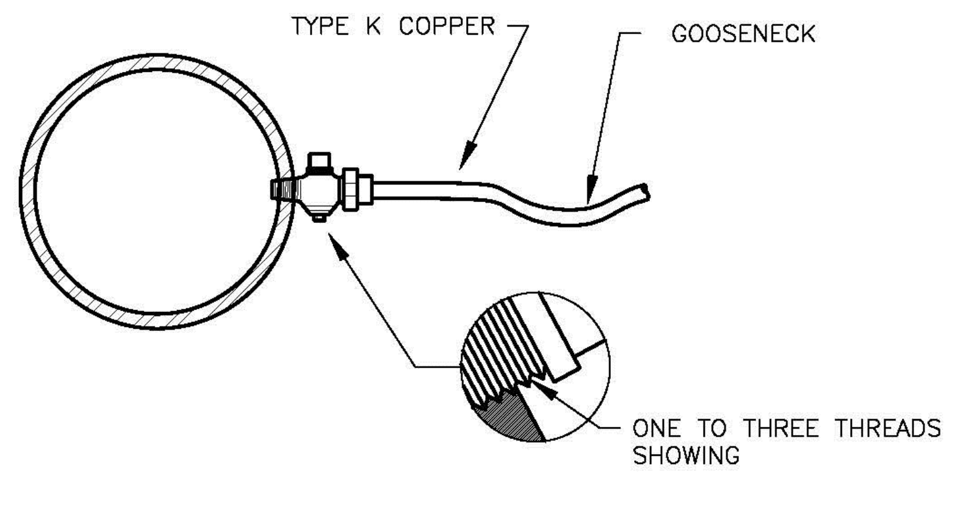
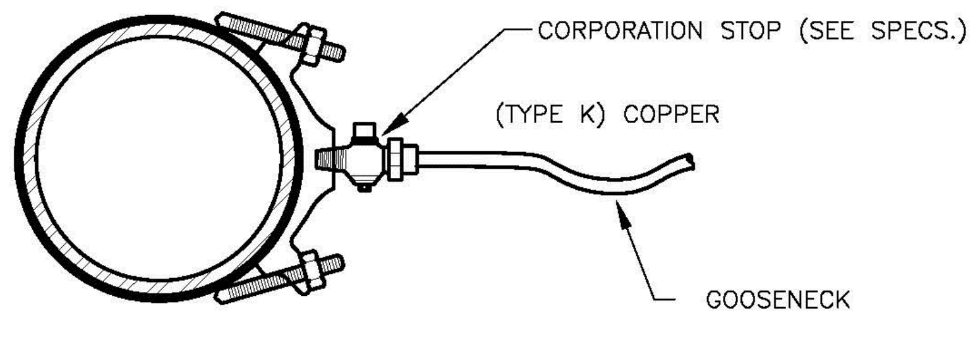
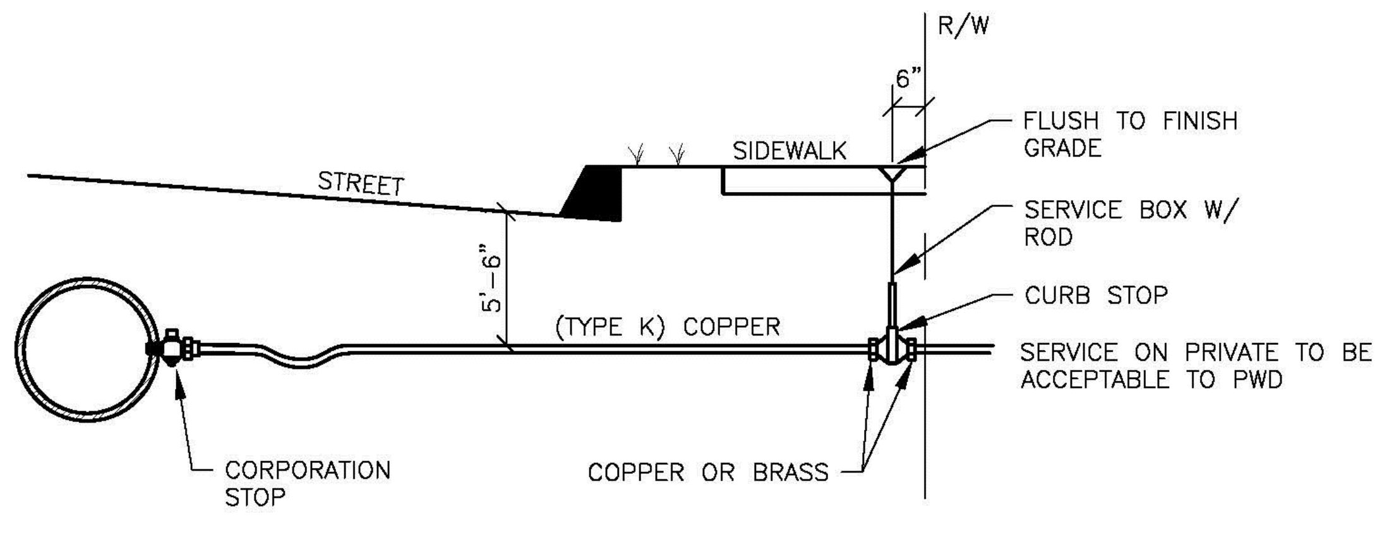


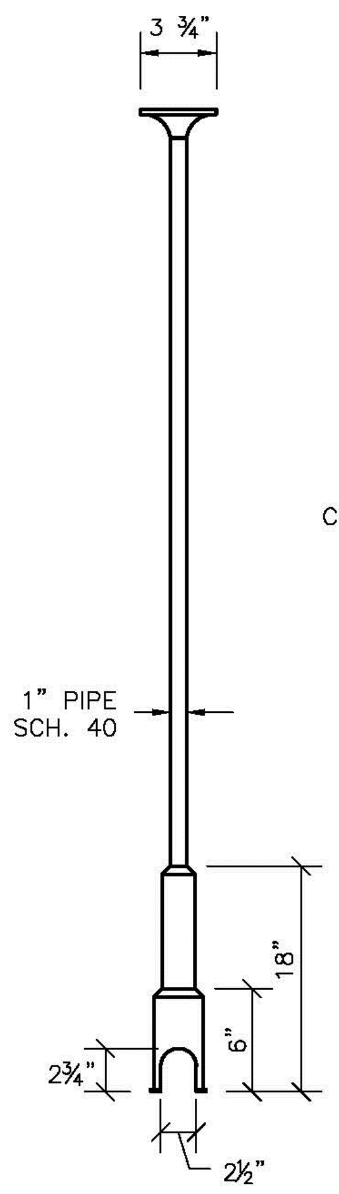
SERVICE TAP
(3/4" AND 1" C.C. THREAD)

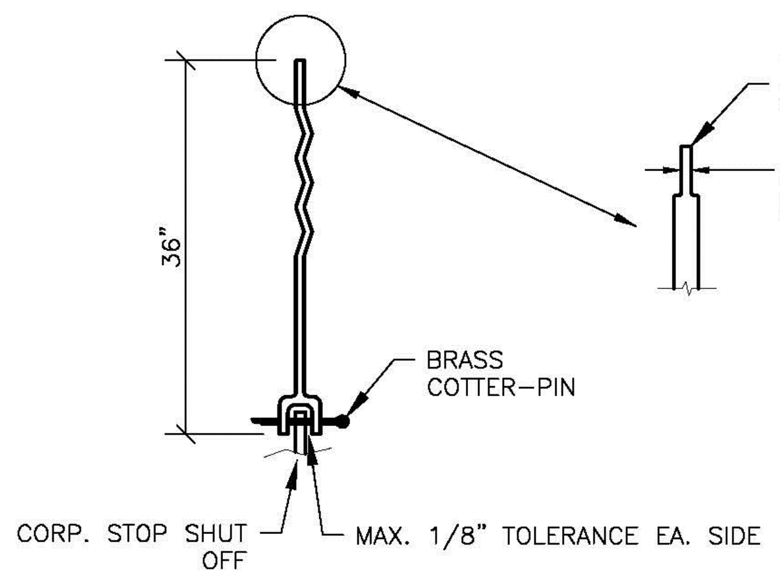


SERVICE SADDLE
(1-1/2" AND 2" C.C. THREAD)



TYPICAL SERVICE CONNECTION

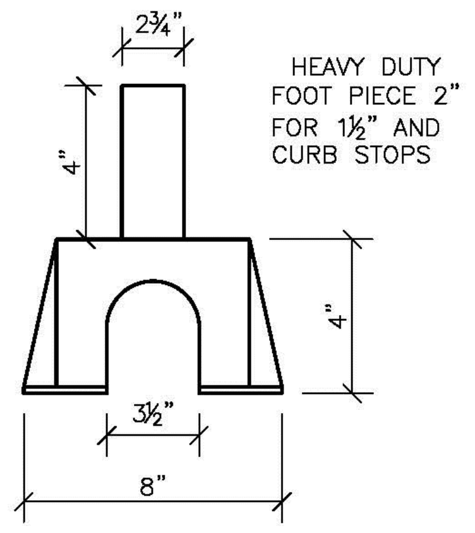




SERVICE ROD

COVER

STANDARD FOOT PIECE 1" FOR ¾" AND CURB/STOPS

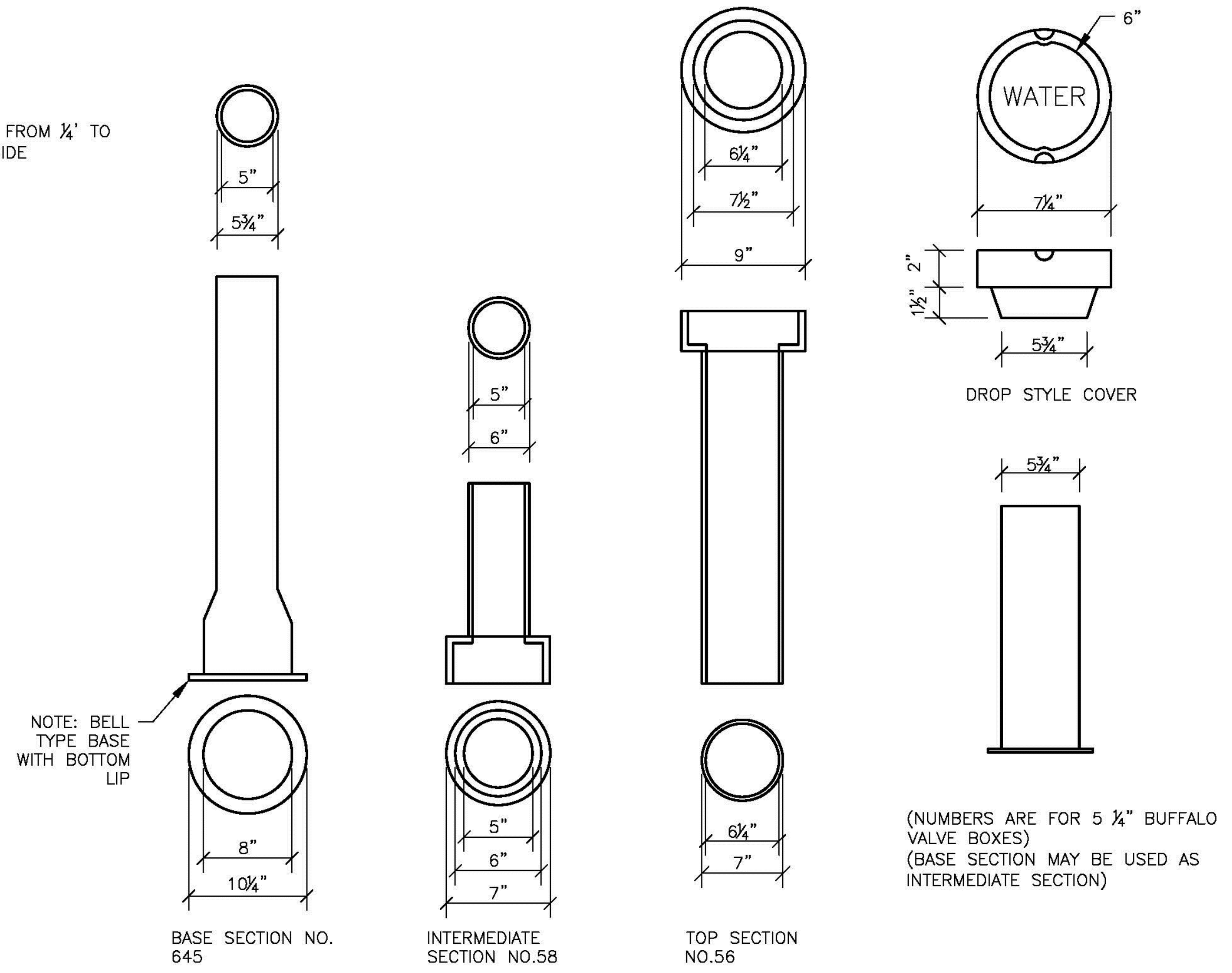


HEAVY DUTY FOOT PIECE 2" FOR 1½" AND CURB STOPS

SERVICE BOX

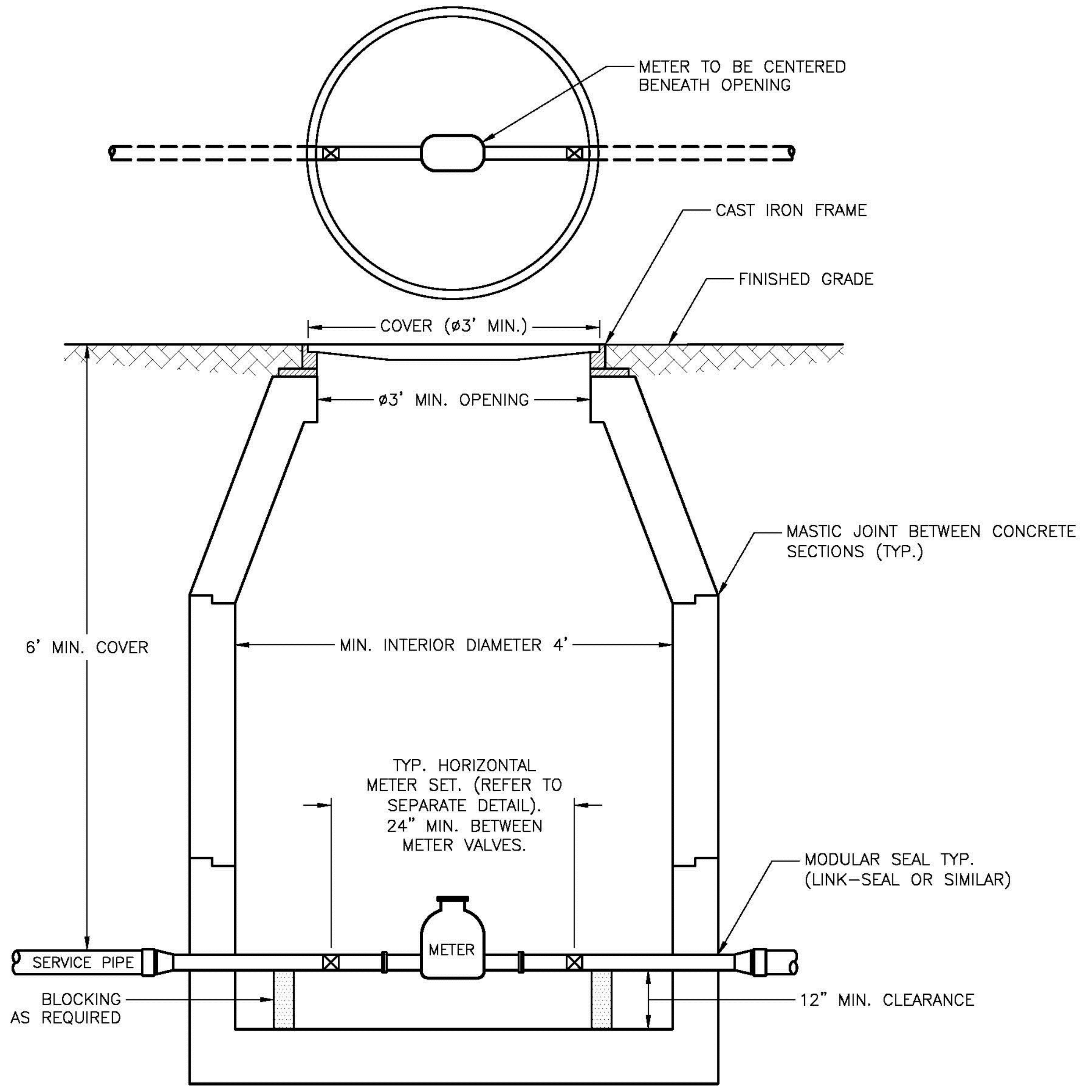
FOOT PIECE

NOTE: ANY EXTENSION OF SERVICE BOX REQUIRES:
1. 1" FEMALE IRON PIPE COUPLING
2. 1" THREADED PIPE (THIS IS TO BE A NON-WELDED, TWO PIECE ARRANGEMENT. SLIP ON ADAPTERS ARE NOT PERMISSIBLE.)



(NUMBERS ARE FOR 5 ¼" BUFFALO VALVE BOXES)
(BASE SECTION MAY BE USED AS INTERMEDIATE SECTION)

VALVE BOX & COVER



TYPICAL SMALL METER PIT
(⅝" TO 2" METER)

METER PIT AND COVER NOTES

1. THE METER PIT SHALL BE SUPPLIED AND INSTALLED BY THE CUSTOMER AND LOCATED ON PRIVATE PROPERTY BETWEEN 10' AND 20' FROM THE PROPERTY LINE.

2. THE METER PIT SHALL BE MADE OF PRECAST CONCRETE OF SUFFICIENT SIZE TO PROVIDE 5.5' MINIMUM GROUND COVER FROM FINISHED GRADE TO THE TOP OF THE SERVICE PIPE. ANY SEAMS BETWEEN CONCRETE SECTIONS SHALL BE SEALED WITH MASTIC JOINT. ALL OPENINGS IN THE CONCRETE FOR SERVICE PIPING SHALL BE SEALED WITH A MODULAR SEAL (LINK-SEAL OR SIMILAR).

3. THE INTERIOR OF THE METER PIT SHALL BE A MINIMUM OF 4' IN DIAMETER, AND THE METER PIT OPENING SHALL BE A MINIMUM OF 30" IN DIAMETER WITH A CAST IRON FRAME. THE METER PIT COVER SHALL BE CAST IRON, 32" MINIMUM IN DIAMETER, AND BE EITHER PERMANENTLY LABELED "WATER" OR HAVE NO LABEL. ANY STEEL PLATE MATERIAL SHALL BE COATED WITH A RUST INHIBITOR PAINT.

4. WALL-MOUNTED LADDER RUNGS SHALL NOT BE INSTALLED WITHIN METER PIT.

5. ALL PIPING INSIDE AND EXTENDING THROUGH THE METER PIT SHALL BE MADE OF COPPER, WITH A MINIMUM OF 6" CLEARANCE FROM THE METER PIT FLOOR. BLOCKING SHALL BE INSTALLED AS REQUIRED TO SUPPORT THE PIPE.

6. CUSTOMER SHALL ENSURE THE METER PIT AND COVER ARE PROPERLY RATED FOR TRAFFIC FLOW, IF APPLICABLE.

METER NOTES

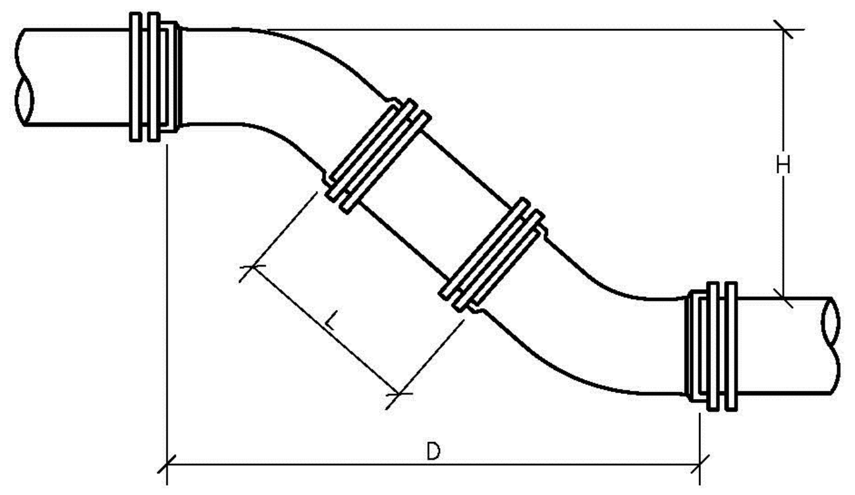
7. ONLY PWD PERSONNEL ARE AUTHORIZED TO INSTALL WATER METERS. PWD PERSONNEL ARE ADDITIONALLY AUTHORIZED TO OPERATE METER VALVES AS NEEDED FOR INSTALLATION AND MAINTENANCE.

8. PWD WILL SUPPLY THE WATER METER. ALL OTHER FITTINGS, INCLUDING A METER RESETTER FOR 1" OR SMALLER METERS, SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER.

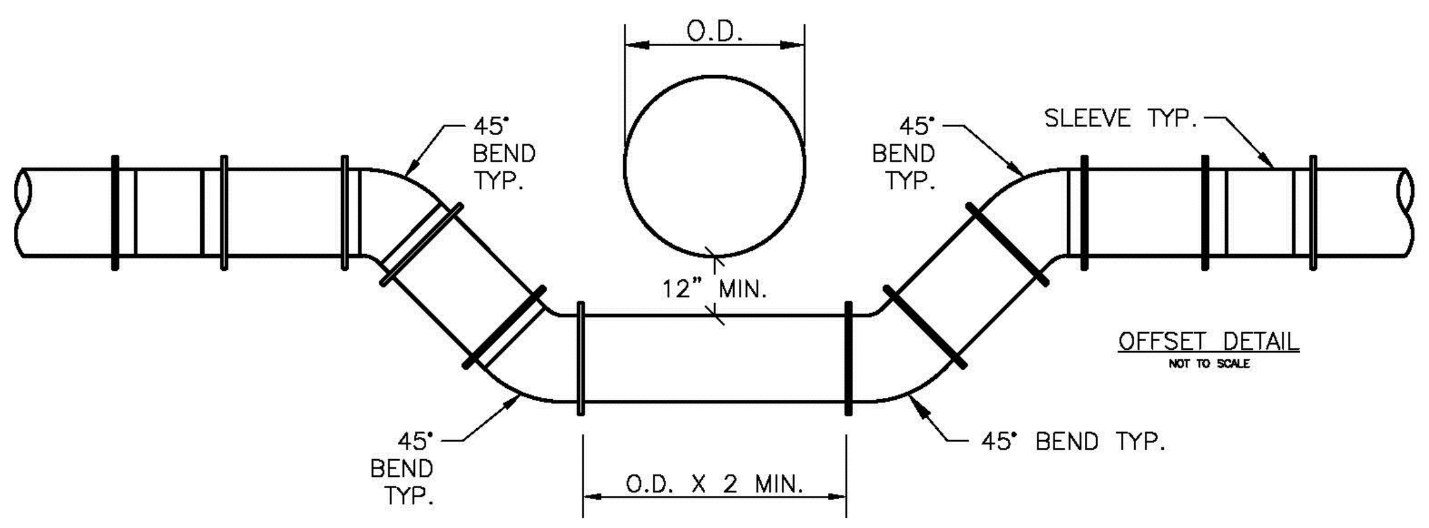
9. FOR 1.5" AND 2" METERS, CUSTOMER SHALL INSTALL A FLANGED METER SPOOL PIECE, SUPPLIED BY PWD AT NO ADDITIONAL CHARGE, PRIOR TO METER SET. THE METER SPOOL WILL BE MADE AVAILABLE FOR CUSTOMER PICKUP AT PWD CUSTOMER SERVICE, 225 DOUGLASS STREET, PORTLAND DURING NORMAL BUSINESS HOURS.

10. CUSTOMER WILL INSTALL TWO BALL VALVES AT LEAST 24" APART FOR METER INSTALLATION, ALLOWING FOR THE WATER METER TO BE CENTERED UNDER THE METER PIT OPENING. THE BALL VALVES SHALL BE SOLDERED IN PLACE.

11. THE METER PIT MAY HOUSE UP TO TWO 5/8", 3/4" OR 1" METERS WITH PRIOR APPROVAL FROM PWD.



	6" PIPE		8" PIPE		12" PIPE	
H	D	L	D	L	D	L
12"	1' 6-1/2"	0' 10-1/2"	1' 7-1/2"	0' 9-1/2"	1' 11-1/2"	0' 5-1/2"
13"	1' 7-1/2"	0' 11-7/8"	1' 8-1/2"	0' 10-7/8"	2' 0-1/2"	0' 6-7/8"
14"	1' 8-1/2"	1' 1-5/16"	1' 9-1/2"	1' 0-5/16"	2' 1-1/2"	0' 8-5/16"
15"	1' 9-1/2"	1' 2-11/16"	1' 10-1/2"	1' 1-11/16"	2' 2-1/2"	0' 9-11/16"
16"	1' 10-1/2"	1' 4-1/8"	1' 11-1/2"	1' 3-1/8"	2' 3-1/2"	0' 11-1/8"
17"	1' 11-1/2"	1' 5-9/16"	2' 0-1/2"	1' 4-9/16"	2' 4-1/2"	1' 0-9/16"
18"	2' 0-1/2"	1' 6-15/16"	2' 1-1/2"	1' 5-15/16"	2' 5-1/2"	1' 1-15/16"
19"	2' 1-1/2"	1' 8-3/8"	2' 2-1/2"	1' 7-3/8"	2' 6-1/2"	1' 3-3/8"
20"	2' 2-1/2"	1' 9-13/16"	2' 3-1/2"	1' 8-13/16"	2' 7-1/2"	1' 4-13/16"
21"	2' 3-1/2"	1' 11-3/16"	2' 4-1/2"	1' 10-3/16"	2' 8-1/2"	1' 6-3/16"
22"	2' 4-1/2"	2' 0-5/8"	2' 5-1/2"	1' 11-5/8"	2' 9-1/2"	1' 7-5/8"
23"	2' 5-1/2"	2' 2"	2' 6-1/2"	2' 1"	2' 10-1/2"	1' 9"
24"	2' 6-1/2"	2' 3-7/16"	2' 7-1/2"	2' 2-7/16"	2' 11-1/2"	1' 10-7/16"
25"	2' 7-1/2"	2' 4-7/8"	2' 8-1/2"	2' 3-7/8"	3' 0-1/2"	1' 11-7/8"
26"	2' 8-1/2"	2' 6-1/4"	2' 9-1/2"	2' 5-1/4"	3' 1-1/2"	2' 1-1/4"
27"	2' 9-1/2"	2' 7-11/16"	2' 10-1/2"	2' 6-11/16"	3' 2-1/2"	2' 2-11/16"
28"	2' 10-1/2"	2' 9-1/8"	2' 11-1/2"	2' 8-1/8"	3' 3-1/2"	2' 4-1/8"
29"	2' 11-1/2"	2' 10-1/2"	3' 0-1/2"	2' 9-1/2"	3' 4-1/2"	2' 5-1/2"
30"	3' 0-1/2"	2' 11-15/16"	3' 1-1/2"	2' 10-15/16"	3' 5-1/2"	2' 6-15/16"
31"	3' 1-1/2"	3' 1-5/16"	3' 2-1/2"	3' 0-5/16"	3' 6-1/2"	2' 8-5/16"
32"	3' 2-1/2"	3' 2-3/4"	3' 3-1/2"	3' 1-3/4"	3' 7-1/2"	2' 9-3/4"
33"	3' 3-1/2"	3' 4-3/16"	3' 4-1/2"	3' 3-3/16"	3' 8-1/2"	2' 11-3/16"
34"	3' 4-1/2"	3' 5-9/16"	3' 5-1/2"	3' 4-9/16"	3' 9-1/2"	3' 0-9/16"
35"	3' 5-1/2"	3' 7"	3' 6-1/2"	3' 6"	3' 10-1/2"	3' 2"
36"	3' 6-1/2"	3' 8-7/16"	3' 7-1/2"	3' 7-7/16"	3' 11-1/2"	3' 3-7/16"
37"	3' 7-1/2"	3' 9-13/16"	3' 8-1/2"	3' 8-13/16"	4' 0-1/2"	3' 4-13/16"
38"	3' 8-1/2"	3' 11-1/4"	3' 9-1/2"	3' 10-1/4"	4' 1-1/2"	3' 6-1/4"
39"	3' 9-1/2"	4' 0-11/16"	3' 10-1/2"	3' 11-11/16"	4' 2-1/2"	3' 7-11/16"
40"	3' 10-1/2"	4' 2-1/16"	3' 11-1/2"	4' 1-1/16"	4' 3-1/2"	3' 9-1/16"
41"	3' 11-1/2"	4' 3-1/2"	4' 0-1/2"	4' 2-1/2"	4' 4-1/2"	3' 10-1/2"
42"	4' 0-1/2"	4' 4-7/8"	4' 1-1/2"	4' 3-7/8"	4' 5-1/2"	3' 11-7/8"
43"	4' 1-1/2"	4' 6-5/16"	4' 2-1/2"	4' 5-5/16"	4' 6-1/2"	4' 1-5/16"
44"	4' 2-1/2"	4' 7-3/4"	4' 3-1/2"	4' 6-3/4"	4' 7-1/2"	4' 2-3/4"
45"	4' 3-1/2"	4' 9-1/8"	4' 4-1/2"	4' 8-1/8"	4' 8-1/2"	4' 4-1/8"
46"	4' 4-1/2"	4' 10-9/16"	4' 5-1/2"	4' 9-9/16"	4' 9-1/2"	4' 5-9/16"
47"	4' 5-1/2"	4' 11-15/16"	4' 6-1/2"	4' 10-15/16"	4' 10-1/2"	4' 6-15/16"
48"	4' 6-1/2"	5' 1-3/8"	4' 7-1/2"	5' 0-3/8"	4' 11-1/2"	4' 8-3/8"
49"	4' 7-1/2"	5' 2-13/16"	4' 8-1/2"	5' 1-13/16"	5' 0-1/2"	4' 9-13/16"
50"	4' 8-1/2"	5' 4-3/16"	4' 9-1/2"	5' 3-3/16"	5' 1-1/2"	4' 11-3/16"
51"	4' 9-1/2"	5' 5-5/8"	4' 10-1/2"	5' 4-5/8"	5' 2-1/2"	5' 0-5/8"
52"	4' 10-1/2"	5' 7-1/16"	4' 11-1/2"	5' 6-1/16"	5' 3-1/2"	5' 2-1/16"
53"	4' 11-1/2"	5' 8-7/16"	5' 0-1/2"	5' 7-7/16"	5' 4-1/2"	5' 3-7/16"
54"	5' 0-1/2"	5' 9-7/8"	5' 1-1/2"	5' 8-7/8"	5' 5-1/2"	5' 4-7/8"
55"	5' 1-1/2"	5' 11-5/16"	5' 2-1/2"	5' 10-5/16"	5' 6-1/2"	5' 6-5/16"



OFFSET DETAIL
NOT TO SCALE

NOTE: DIMENSIONS APPLICABLE FOR SIGMA COMPACT BENDS. FOR TYLER COMPACT BENDS, ADD 1/2" TO "D" DIMENSION AND SUBTRACT 1/2" FROM "L" DIMENSION. FOR OTHER FITTINGS REFER TO MANUFACTURER'S RECOMMENDATIONS.

TYPICAL MAIN OFFSET

3.	6-15-2020	No changes, re-submit to Town and DEP	CSB
2.	2-24-2020	Respond to Town Comments Re-submit to Town	CSB
1.	12-18-2019	Submit to Town and Maine DEP	CSB

PORTLAND WATER DISTRICT
STANDARD DETAILS 2

Cumberland Crossing - Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, Maine

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
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FIELD WK:	SCALE:	SHEET:
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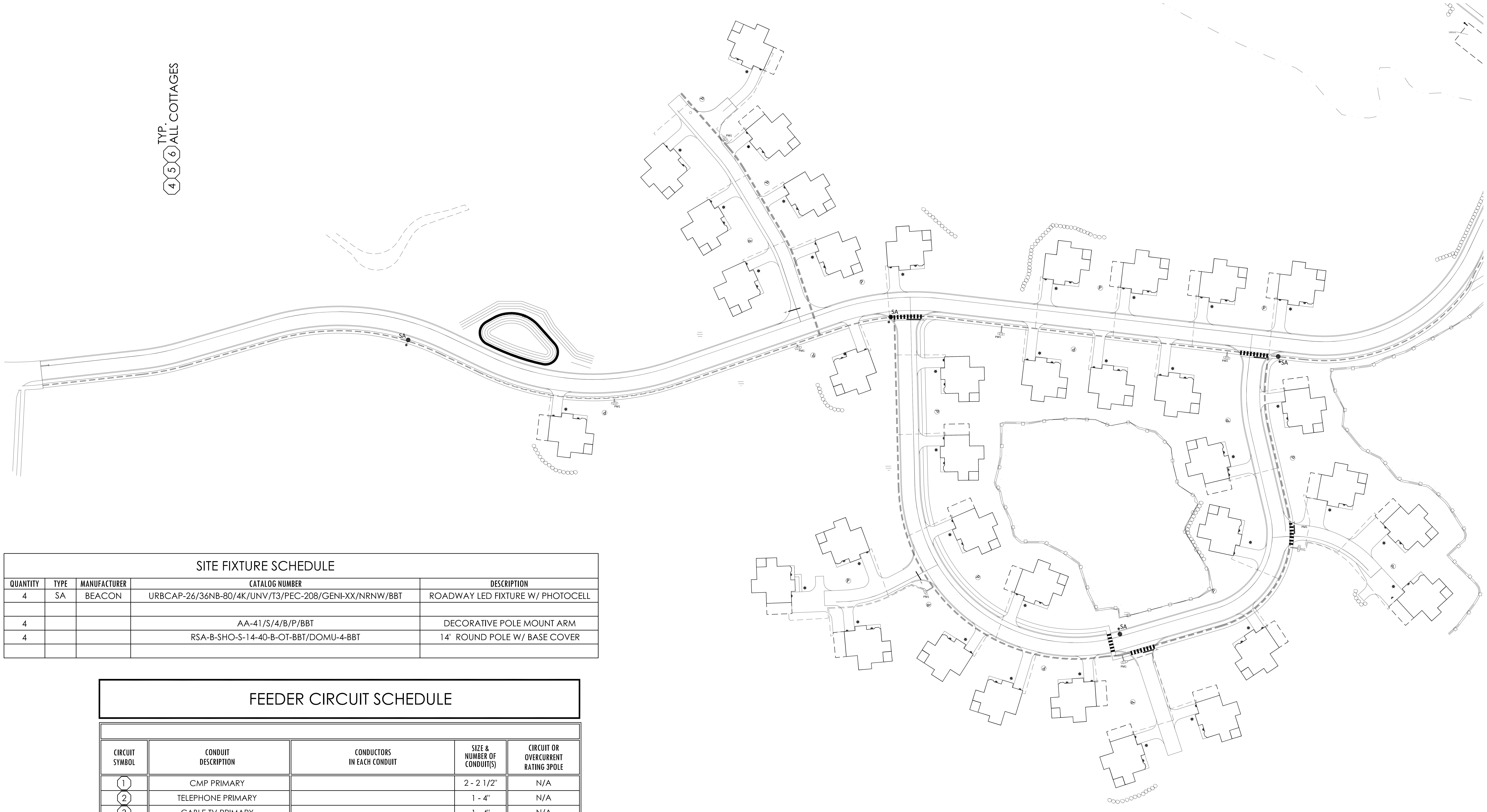


SITE FIXTURE SCHEDULE

QUANTITY	TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION
4	SA	BEACON	URBCAP-26/36NB-80/4K/UNV/T3/PEC-208/GENI-XX/NRNW/BBT	ROADWAY LED FIXTURE W/ PHOTOCELL
4			AA-41/S/4/B/P/BBT	DECORATIVE POLE MOUNT ARM
4			RSA-B-SHO-S-14-40-B-OT-BBT/DOMU-4-BBT	14' ROUND POLE W/ BASE COVER

FEEDER CIRCUIT SCHEDULE

CIRCUIT SYMBOL	CONDUIT DESCRIPTION	CONDUCTORS IN EACH CONDUIT	SIZE & NUMBER OF CONDUIT(S)	CIRCUIT OR OVERCURRENT RATING 3POLE
①	CMP PRIMARY		2 - 2 1/2"	N/A
②	TELEPHONE PRIMARY		1 - 4"	N/A
③	CABLE TV PRIMARY		1 - 4"	N/A
④	BUILDING SECONDARY POWER	2-#4/0 & 1-#2/0 URD ALUMINUM	1 - 2 1/2"	N/A
⑤	TELEPHONE SECONDARY		1 - 2"	N/A
⑥	CABLE TV SECONDARY		1 - 2"	N/A
⑦	SITE LIGHTING	2-#8 & 1-#10 THHN COPPER	1 - 1"	N/A

GENERAL NOTES:

△ PROVIDE AN EXTRA CONDUIT FOR TELEPHONE & CABLE TV AT PRIMARY ROAD CROSSINGS.

Anthony Mancini, Inc.
179 SHERIDAN ST.
PORTLAND, ME 04101
P: (207)774-5829 F: (207)772-1686
E: info@mancinielectric.com
"We appreciate Your Business."

NO.	DATE	DESCRIPTION

PROJECT NAME & ADDRESS:

Oceanview at Cumberland
291 Tuttle Road
Cumberland, Maine

SHEET NAME:

Site - Phase Two

Checked By: G.MANCINI
Drawn By: A.AMES
Date: 03.13.2020
Scale: 1' = 60'-0"

SHEET:

SE-1

SITE FIXTURE SCHEDULE

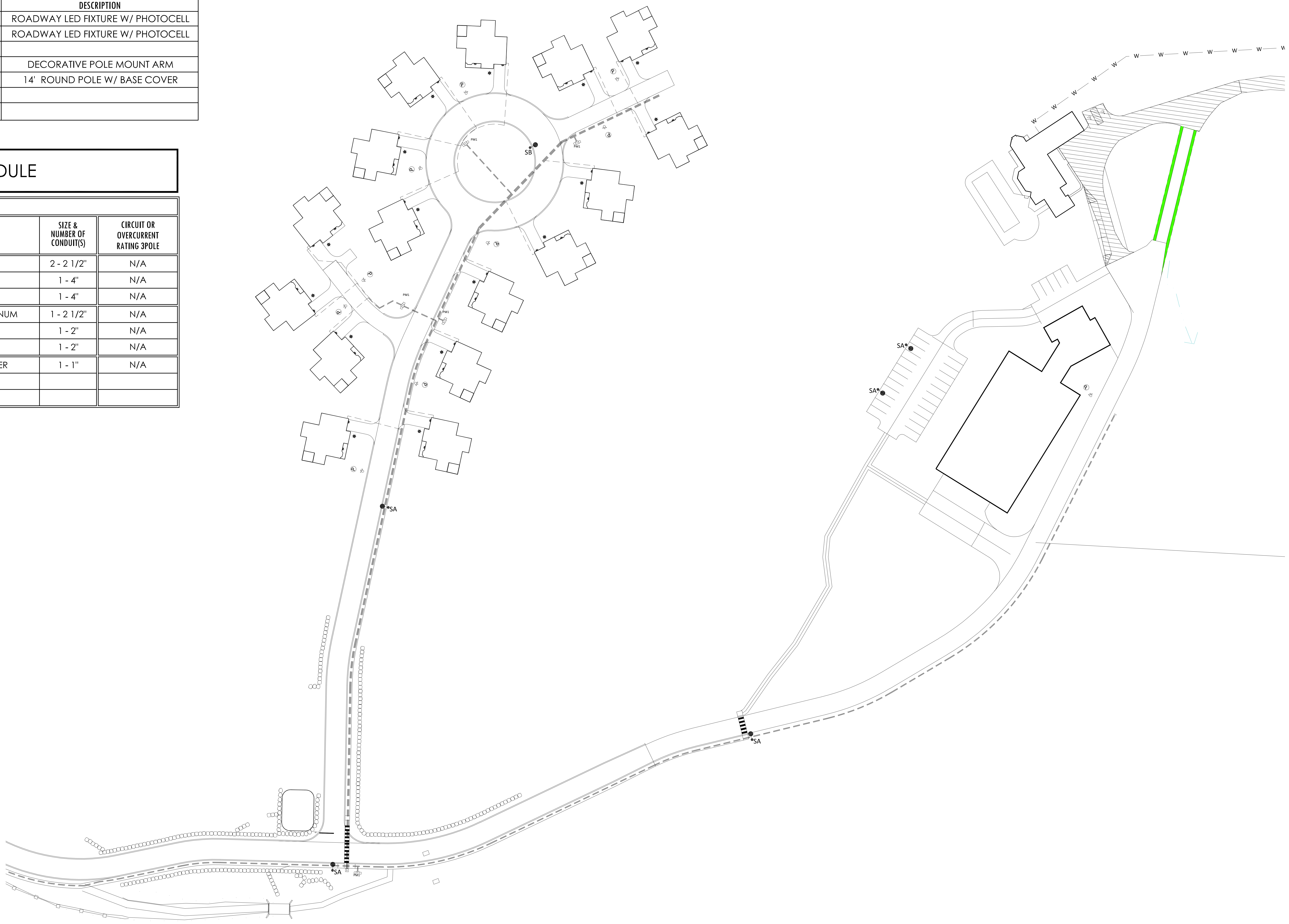
QUANTITY	TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION
4	SA	BEACON	URBCAP-26/36NB-80/4K/UNV/T3/PEC-208/GENI-XX/NRNW/BBT	ROADWAY LED FIXTURE W/ PHOTOCELL
1	SB	BEACON	URBCAP-26/36NB-80/4K/UNV/T5W/PEC-208/GENI-XX/NRNW/BBT	ROADWAY LED FIXTURE W/ PHOTOCELL
5			AA-41/S/4/B/P/BBT	DECORATIVE POLE MOUNT ARM
5			RSA-B-SHO-S-14-40-B-OT-BBT/DOMU-4-BBT	14' ROUND POLE W/ BASE COVER

FEEDER CIRCUIT SCHEDULE

CIRCUIT SYMBOL	CONDUIT DESCRIPTION	CONDUCTORS IN EACH CONDUIT	SIZE & NUMBER OF CONDUIT(S)	CIRCUIT OR OVERCURRENT RATING 3POLE
1	CMP PRIMARY		2 - 2 1/2"	N/A
2	TELEPHONE PRIMARY		1 - 4"	N/A
3	CABLE TV PRIMARY		1 - 4"	N/A
4	BUILDING SECONDARY POWER	2-#4/0 & 1-#2/0 URD ALUMINUM	1 - 2 1/2"	N/A
5	TELEPHONE SECONDARY		1 - 2"	N/A
6	CABLE TV SECONDARY		1 - 2"	N/A
7	SITE LIGHTING	2-#8 & 1-#10 THHN COPPER	1 - 1"	N/A

GENERAL NOTES:

⚠ PROVIDE AN EXTRA CONDUIT FOR TELEPHONE & CABLE TV AT PRIMARY ROAD CROSSINGS.



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PROJECT NAME & ADDRESS:

Oceanview at Cumberland
291 Tuttle Road
Cumberland, Maine

SHEET NAME:

Site - Phase Two

Checked By: G.MANCINI
Drawn By: A.AMES
Date: 03.13.2020
Scale: 1" = 60'-0"

SHEET:

SE-2

This document and any attachments are considered:
BUSINESS CONFIDENTIAL
PROTECTED CRITICAL INFRASTRUCTURE INFORMATION

THIS DRAWING SHALL BE REVISED ON THE CADD SYSTEM ONLY

GPS COORDINATES DMS

//MAINE.MAPS.ARCGIS.COM

1.	43.80043	-70.231088
2.	43.797331	-70.225914
3.	43.794633	-70.236415
4.	43.792707	-70.232669

X Primary Riser
▲ ○ Transformer Foundation
J ○ Junction Box
--- Primary UG
~ Secondary UG

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Customer:OCEANVIEW AT CUMBERLAND LLC
277 TUTTLE ROAD, CUMBERLAND, MAINE

Site Plan Produced By: BELANGER ENGINEERING
Address / Phone / Email:63 SECOND AVENUE
AUGUSTA, MAINE 04330
TEL:207-622-1462

Sheet Title: CUMBERLAND CROSSING PHASE 2 OVERALL PLAN
Revision #:N/A Date:12-18-19 Drawn By:N/A

PROPRIETARY

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Notification# 10300642168

NO.	REVISION	DATE	BY	CK	P.E. STAMPED BY	P. E. No.
		/ /				
		/ /				
		/ /				
		/ /				
		/ /				
		/ /				
0	INITIAL DRAWING RELEASE	04/22/20	AJP	MLR	MLR	13430

Professional Engineer Seal
4/22/2020
MARSHALL LINWOOD RIPLEY
13430

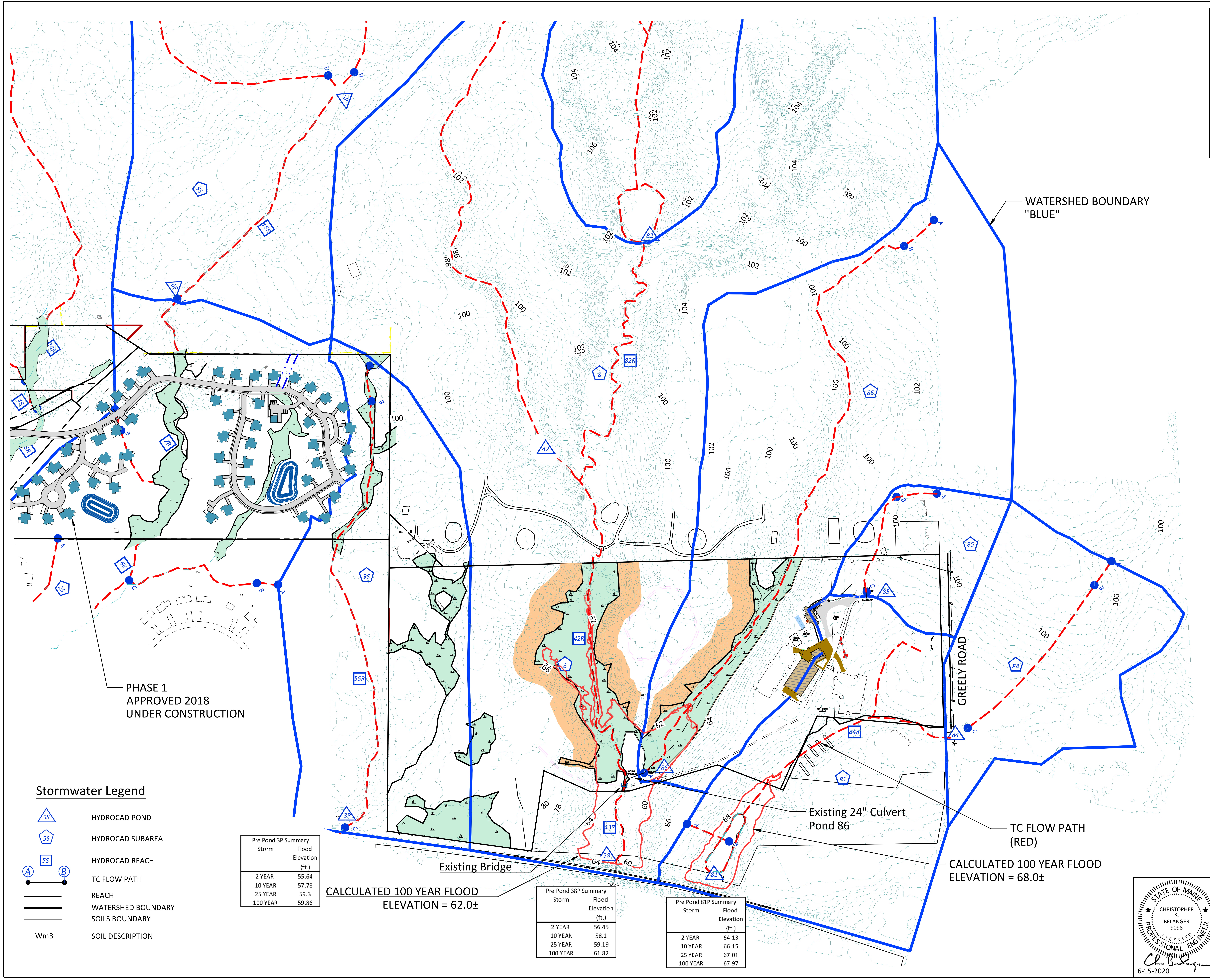
DESIGNED MLR/
DRAWN AJP
CHECKED MLR/
APPROVED MLR
REVIEWED MLR

CUMBERLAND CROSSING
OFF POLE #76 GREELY ROAD
CUMBERLAND, MAINE
UNDERGROUND ELECTRICAL LAYOUT

CENTRAL MAINE POWER COMPANY
DISTRIBUTION DEPARTMENT
CENTRAL MAINE POWER
SCALE 1" =100' DATE 04/22/2020

905–5118
REV. 0

FILE NAME: 905-5118.dgn



Pre Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.64
10 YEAR	57.78
25 YEAR	59.3
100 YEAR	59.86

Pre Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

Pre Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

Pre Development Watershed Areas for Cumberland Crossing Phase 2 - 12-18-2019

Subarea	Total Area sf	Total Area acres	Existing Impervious acres	Existing Lawn acres	Existing Woods/Field Undeveloped acres	Existing Developed Area acres
3s	1527053.00	35.06	0.00	4.00	31.06	4.00
8s	8026815.00	184.27	10.00	74.27	100.00	84.27
9s	3778966.00	86.75	13.00	23.75	50.00	36.75
10s	17683291.00	405.95	5.00	31.95	369.00	36.95
11s	10903205.00	250.30	5.00	123.30	122.00	128.30
81s	1354195.00	31.09	1.59	11.18	18.32	12.77
82s	2338359.00	53.68	2.00	7.68	44.00	9.68
83s	1363923.00	31.31	3.50	21.81	6.00	25.31
84s	890506.00	20.44	1.59	11.18	7.67	12.77
85s	358484.00	8.23	0.39	5.00	2.84	5.39
86s	2478341.00	56.89	2.36	54.53	0.00	56.89
	50703138.00	1163.98	44.43	368.65	750.90	413.08

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.57	-9%
100 YEAR	242.48	234.44	-3%

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.39	-28%
10 YEAR	25.22	20.78	-21%
25 YEAR	42.47	28.36	-50%
50 YEAR	64.8	42.3	-53%
100 YEAR	85.78	56.55	-52%

PRE DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

- COMMERCIAL PROJECTS
- RESIDENTIAL SUBDIVISIONS
- TOWN AND STATE APPROVALS
- SITE PLANNING & DESIGN
- STORMWATER MANAGEMENT
- ROAD AND UTILITY DESIGN
- EROSION CONTROL PLANS

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Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=200'	SHEET: PRE
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

PRE DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

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CHRISTOPHER S. BELANGER 9098

12-18-2019

FIELD WK:	SCALE: 1"=500'	SHEET:
DRN BY:	JOB #:	PRE3
CH'D BY:	SS:	
DATE: 12-18-2019	FILE:	

CALCULATED 100 YEAR FLOOD
ELEVATION = 68.0±

Pre Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.13
10 YEAR	66.15
25 YEAR	67.01
100 YEAR	67.97

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.61	-9%
100 YEAR	242.48	239.47	-1%

Existing 5'X6'
Box Culvert
Under Railroad
inv. = 55.10
out=53.70
Hydrocad Pond 38

Pre Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.45
10 YEAR	58.1
25 YEAR	59.19
100 YEAR	61.82

PRE DEVELOPMENT 100 YEAR FLOOD PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED
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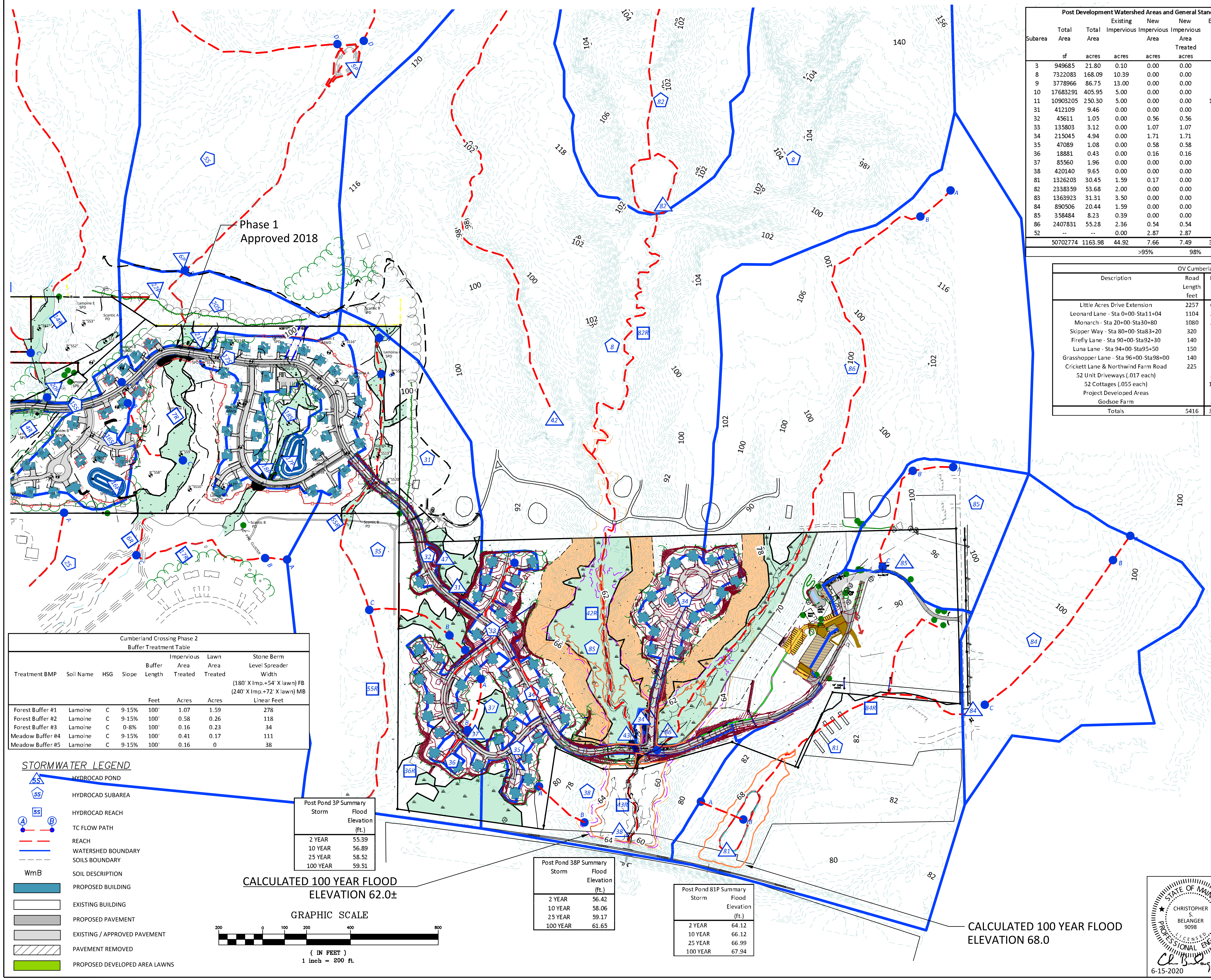
FIELD WK:	SCALE: 1"=60'	SHEET: PRE 100
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



Post Development Watershed Areas and General Standard Calculations for Cumberland Senior Housing - Phase 2 Greely Road - 6-15-2020											
Subarea	Total Area	Total Area	Existing Impervious	New Impervious Area	New Impervious Area Treated	Existing Lawn	New Lawn	New Developed Area	New Developed Area Treated	Existing Woods/Field Undeveloped	Treatment BMP
	sf	acres	acres	acres	acres	acres	acres	acres	acres	acres	
3	949685	21.80	0.10	0.00	0.00	4.62	1.67	1.67	0.00	15.41	No treatment
8	7322083	168.09	10.39	0.00	0.00	78.00	1.56	1.56	1.56	78.14	100' wetland and stream buffer
9	3778966	86.75	13.00	0.00	0.00	23.75	0.00	0.00	0.00	50.00	No changes
10	17683291	405.95	5.00	0.00	0.00	31.95	0.00	0.00	0.00	369.00	No changes
11	10903205	250.30	5.00	0.00	0.00	123.30	0.00	0.00	0.00	122.00	No changes
31	412109	9.46	0.00	0.00	0.00	0.00	0.43	0.43	0.00	8.51	Zero Treatment
32	45611	1.05	0.00	0.56	0.56	0.00	0.49	1.05	1.05	0.00	Filter Pond Sta 45+00 Lt.
33	135803	3.12	0.00	1.07	1.07	0.00	1.59	2.66	2.66	0.32	279' Forested Buffer #1 - BMP 5.2
34	215045	4.94	0.00	1.71	1.71	0.00	2.31	4.02	4.03	0.86	Focal Point System
35	47089	1.08	0.00	0.58	0.58	0.00	0.36	0.94	0.94	0.00	119' Forrested Buffer #2 - BMP 5.2
36	18881	0.43	0.00	0.16	0.16	0.00	0.22	0.38	0.38	0.00	41' Forrested Buffer #3 - BMP 5.2
37	85560	1.96	0.00	0.00	0.00	0.00	0.72	0.72	0.00	1.24	No treatment
38	420140	9.65	0.00	0.00	0.00	0.00	0.89	0.89	0.00	8.76	No treatment
81	1326203	30.45	1.59	0.17	0.00	11.01	0.00	0.17	0.00	17.68	No treatment
82	2338359	53.68	2.00	0.00	0.00	7.68	0.00	0.00	0.00	44.00	No changes
83	1363923	31.31	3.50	0.00	0.00	21.81	0.00	0.00	0.00	3.20	No changes
84	890506	20.44	1.59	0.00	0.00	18.85	0.00	0.00	0.00	0.00	No changes
85	358484	8.23	0.39	0.00	0.00	7.84	0.00	0.00	0.00	0.00	No changes
86	2407831	55.28	2.36	0.54	0.54	51.30	1.03	1.57	1.57	0.05	100' Stream Buffer and 97' Forested Buffer #4
52	--	--	0.00	2.87	2.87	0.00	0.00	2.87	2.87	--	Roof Dripline BMP
	50702774	1163.98	44.92	7.66	7.49	380.11	11.27	18.93	15.06	719	
				>95%	98%	✓		>80%	80%	✓	

OV Cumberland Phase 2 Impervious Area Summary 6-15-2020							
Description	Road Length	New Impervious Area		New Lawn Area		New Developed Area		Comments
	feet	s.f.	acres	s.f.	acres	s.f.	acres	
Little Acres Drive Extension	2257	66211	1.52					@22', curb, 5' sidewalk
Leonard Lane - Sta 0+00-Sta11+04	1104	24288	0.56					@22', curb, 5' sidewalk, 30' sac
Monarch - Sta 20+00-Sta30+80	1080	28750	0.66					@22', curb, 5' sidewalk
Skipper Way - Sta 80+00-Sta83+20	320	5760	0.13					18', no curb
Firefly Lane - Sta 90+00-Sta92+30	140	4140	0.10					18', no curb
Luna Lane - Sta 94+00-Sta95+50	150	2700	0.06					18', no curb
Grasshopper Lane - Sta 96+00-Sta98+00	140	3600	0.08					18' no curb
Crickett Lane & Northwind Farm Road	225	4050	0.09					18' no curb
52 Unit Driveways (.017 each)		38507	0.88					'32'X24' = 768 S.F. = 0.017 ACRES
52 Cottages (.055 each)		124800	2.87					2400 s.f. (includes second garage)
Project Developed Areas				459874	10.56	793607	18.22	Developed Area excludes Farm
Godsoe Farm		30927	0.71		0.00	30927	0.71	Farm Area
Totals	5416	333733	7.66	459874	10.56	824534	18.93	

FLOODING STANDARD RESULTS POND 38P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.57	-9%
100 YEAR	242.48	234.44	-3%

FLOODING STANDARD RESULTS POND 81P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 3P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.39	-28%
10 YEAR	25.22	20.78	-21%
25 YEAR	42.47	28.36	-50%
50 YEAR	64.8	42.3	-53%
100 YEAR	85.78	56.55	-52%

Cumberland Crossing Phase 2 Buffer Treatment Table							
Treatment BMP	Soil Name	HSG	Slope	Buffer Length	Impervious Area Treated	Lawn Area Treated	Stone Berm Level Spreader Width (180' X Imp.+54' X lawn) FB (240' X Imp.+72' X lawn) MB
				Feet	Acres	Acres	Linear Feet
Forest Buffer #1	Lamoine	C	9-15%	100'	1.07	1.59	278
Forest Buffer #2	Lamoine	C	9-15%	100'	0.58	0.26	118
Forest Buffer #3	Lamoine	C	0-8%	100'	0.16	0.23	34
Meadow Buffer #4	Lamoine	C	9-15%	100'	0.41	0.17	111
Meadow Buffer #5	Lamoine	C	9-15%	100'	0.16	0	38

Post Pond 3P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	55.39
10 YEAR	56.89
25 YEAR	58.52
100 YEAR	59.51

Post Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.42
10 YEAR	58.06
25 YEAR	59.17
100 YEAR	61.65

Post Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

CALCULATED 100 YEAR FLOOD
ELEVATION 62.0±

CALCULATED 100 YEAR FLOOD
ELEVATION 68.0

STORMWATER LEGEND

5S	HYDROCAD POND
5S	HYDROCAD SUBAREA
5S	HYDROCAD REACH
A ●— —● B	TC FLOW PATH
— —	REACH
—	WATERSHED BOUNDARY
- - - -	SOILS BOUNDARY
WmB	SOIL DESCRIPTION
■	PROPOSED BUILDING
□	EXISTING BUILDING
■	PROPOSED PAVEMENT
■	EXISTING / APPROVED PAVEMENT
▨	PAVEMENT REMOVED
🟩	PROPOSED DEVELOPED AREA LAWNS

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

POST DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
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Email: cbelanger@roadrunner.com
Ph 207-622-1462, Cell 207-242-5713

FIELD WK:	SCALE: 1"=200'	SHEET: POST
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	

FLOODING STANDARD RESULTS POND 3P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	12.04	9.39	-28%
10 YEAR	25.22	20.78	-21%
25 YEAR	42.47	28.36	-50%
50 YEAR	64.8	42.3	-53%
100 YEAR	85.78	56.55	-52%

Post Pond 3P Summary

Storm	Flood Elevation (ft.)
2 YEAR	55.39
10 YEAR	56.89
25 YEAR	58.52
100 YEAR	59.51

STORMWATER LEGEND

5S	HYDROCAD POND
5S	HYDROCAD SUBAREA
5S	HYDROCAD REACH
A ●— —● B	TC FLOW PATH
— —	REACH
——	WATERSHED BOUNDARY
– – – –	SOILS BOUNDARY
WmB	SOIL DESCRIPTION
🟦	PROPOSED BUILDING
☐	EXISTING BUILDING
▩	PROPOSED PAVEMENT
▒	EXISTING / APPROVED PAVEMENT
▨	PAVEMENT REMOVED
🟩	PROPOSED DEVELOPED AREA LAWNS

FLOODING STANDARD RESULTS POND 38P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.57	-9%
100 YEAR	242.48	234.44	-3%

Post Pond 38P Summary

Storm	Flood Elevation (ft.)
2 YEAR	56.42
10 YEAR	58.06
25 YEAR	59.17
100 YEAR	61.65

FLOODING STANDARD RESULTS POND 81P

Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

Post Pond 81P Summary

Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

STATE OF MAINE
CHRISTOPHER S. BELANGER
9098
LICENSED PROFESSIONAL ENGINEER
6-15-2020

POST DEVELOPMENT DRAINAGE PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

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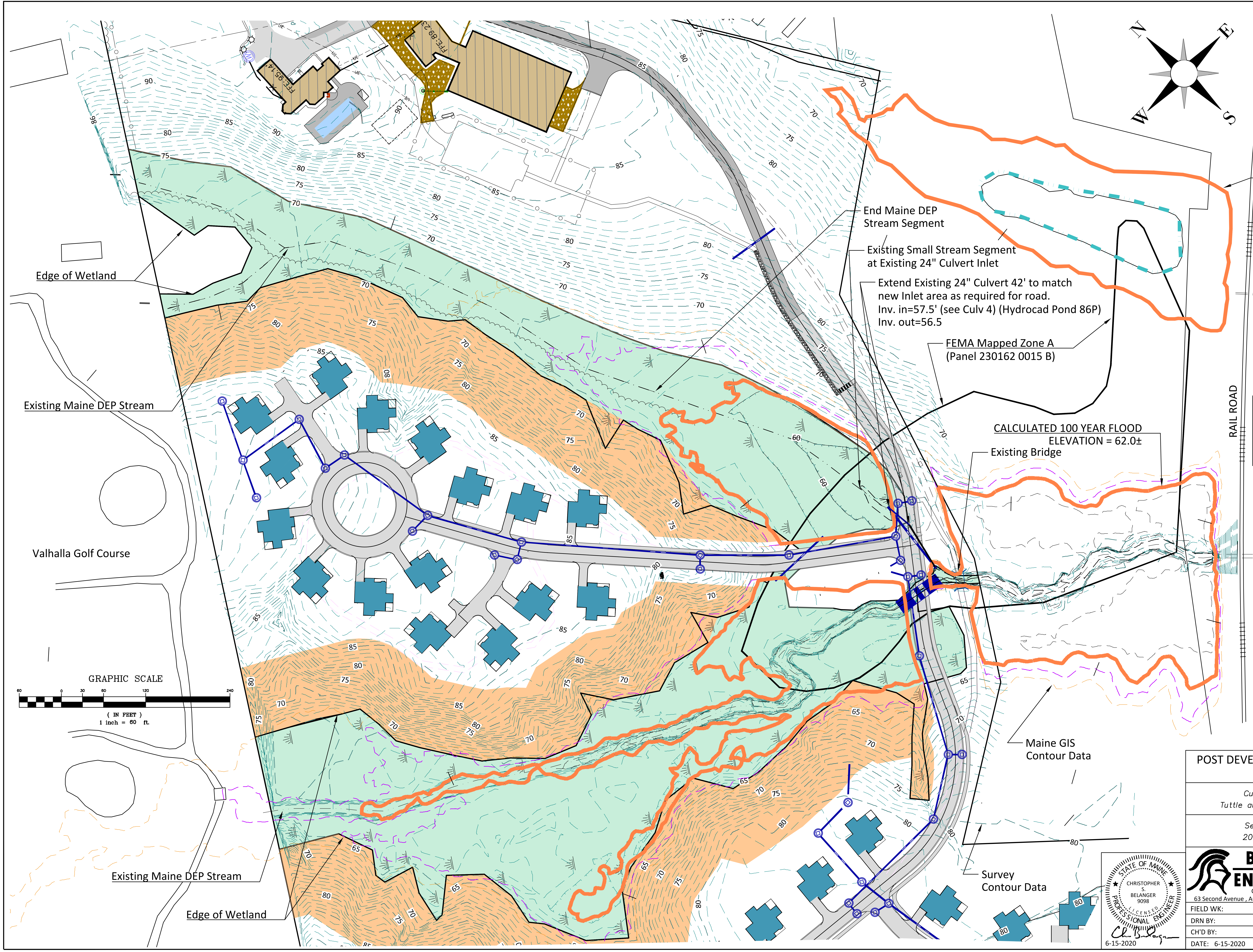
- EROSION CONTROL PLANS

FIELD WK:	SCALE: 1"=100'	SHEET:
DRN BY:	JOB #:	POST2
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	



Edge of Wetland

Existing Maine DEP Stream

Valhalla Golf Course

Existing Maine DEP Stream

Edge of Wetland

End Maine DEP
Stream Segment

Existing Small Stream Segment
at Existing 24" Culvert Inlet

Extend Existing 24" Culvert 42' to match
new Inlet area as required for road.
Inv. in=57.5' (see Culv 4) (Hydrocad Pond 86P)
Inv. out=56.5

FEMA Mapped Zone A
(Panel 230162 0015 B)

CALCULATED 100 YEAR FLOOD
ELEVATION = 62.0±

Existing Bridge

Maine GIS
Contour Data

Survey
Contour Data

CALCULATED 100 YEAR FLOOD
ELEVATION = 68.0±

Post Pond 81P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	64.12
10 YEAR	66.12
25 YEAR	66.99
100 YEAR	67.94

FLOODING STANDARD RESULTS POND 81P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	15.27	15.11	-1%
10 YEAR	28.06	27.57	-2%
25 YEAR	52.21	51.54	-1%
50 YEAR	71.76	70.92	-1%
100 YEAR	92.03	90.88	-1%

FLOODING STANDARD RESULTS POND 38P			
Storm	PRE C.F.S.	POST C.F.S.	DIFFERENCE %
2 YEAR	25.26	24.49	-3%
10 YEAR	83.43	81.71	-2%
25 YEAR	125.6	124.83	-1%
50 YEAR	178.55	163.57	-9%
100 YEAR	242.48	234.44	-3%

Existing 5'X6'
Box Culvert
Under Railroad
inv. = 55.10
out=53.70
Hydrocad Pond 38

Post Pond 38P Summary	
Storm	Flood Elevation (ft.)
2 YEAR	56.42
10 YEAR	58.06
25 YEAR	59.17
100 YEAR	61.76

POST DEVELOPMENT 100 YEAR FLOOD PLAN

Cumberland Crossing – Phase 2
Tuttle and Greely Roads, Cumberland, Maine

Seacoast Management Company
20 Blueberry Lane, Falmouth, ME

CHRISTOPHER S. BELANGER 9098
6-15-2020

BELANGER ENGINEERING
CONSULTING ENGINEERS
63 Second Avenue , Augusta, Maine 04330

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FIELD WK:	SCALE: 1"=60'	SHEET: Post100
DRN BY:	JOB #:	
CH'D BY:	SS:	
DATE: 6-15-2020	FILE:	