NORWAY PLAINS ASSOCIATES, INC.

LAND SURVEYORS • SEPTIC SYSTEM DESIGNERS • CIVIL ENGINEERS

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April 2, 2020

Seth Creighton, Chief Planner
Department of Planning and Development
Second Floor, City Hall
31 Wakefield Street
Rochester, NH 03867-1917

Re: Case #110-10-R1-20, Proposed Subdivision; Technical Review Group Response.

Dear Seth:

The following is a summary of action taken to address the comments from the March 28, 2020 TRG letter for the proposed major subdivision for Golden Oaks Development, LLC located on Eastern Avenue. To expedite the review process; I have maintained the same order as the letter we received.

DPW Comments:

Stormwater

1. Since there is no rain garden at lot 10-15, it appears that stormwater may flow towards lot 10-14. Provide an explanation of what happens to stormwater in this area.
   - The existing topography is such, that all of the runoff from this lot development will flow towards the roadside ditch line and ultimately end up in Infiltration Basin #1. The proposed development was accounted for in the drainage analysis.
2. The emergency spillway is at the same elevation as the inlet of the outfall pipe at both infiltration basins, should the emergency spillway be higher that the outfall? Revise or provide explanation
   - The elevations of the outlet structures were lowered by 0.25 feet such that stormwater would flow into the outlet structure before reaching the elevation of the emergency spillways. Even with the lower outlet rim elevations, the stormwater levels within both basins do not reach the elevation of the outlet structure. Thus, the net results do not change the stormwater rates or volumes from the initial report.
3. Add anti-seep collars to outfall pipes in both infiltration basins.
   - The proposed pipe table has been revised to require anti-seep collars on these two pipes.
   - The Infiltration Basin Profiles on sheet C-9 have been revised to depict the collars.
   - A detail of the anti-seep collar has been added to Sheet C-8 of the plan set.
4. Are there any flow control orifices on the outlet control structure? Are they needed?
   - The infiltration basins have been sized to retain all of the stormwater directed towards them and rely on infiltration into the ground. Thus, there are not flow control orifices on the outlet structures.
5. On sheet 3, complete the table for proposed drain pipes. Only 4 pipes are shown.
   - The proposed pipes were listed for all of the other pipes within the Drainage Structure Tables. That being said, the were moved over into the Drainage Pipe table as requested.
6. On Sheet 3, drain pipe "H" appears to have little or no cover over the top of the 24" pipe near the basin.
   - The earthen maintenance path over the pipe was raised and the outlet end at the forebay was lowered to provide more cover.

7. On Sheet 3, drain pipe "M" appears to have little or no cover over the top of the 15" from DMH #1 to the basin.
    - The elevation of the maintenance path was raised to provide more cover over the pipe.
8. Make the Basin #1 access/maintenance path 10' wide the entire way. Provide detail to show all access paths to have 6" crushed gravel travel surface.
    - The maintenance path has been revised to 10 feet wide.
    - A detail has been added to Sheet C-5 of the plan set. The detail calls for 6" of Crushed Gravel over 9" of Bank-run Gravel.
9. Provide a construction detail for the drain manhole.
    - A pre-cast Drain Manhole detail has been added Sheet C-8 of the plan set.

Water

1. Add a 5' high fiberglass marker to the hydrant detail per City standards.
    - The hydrant detail has been revised to add the fiberglass marker per the detail located within the Standards for Infrastructure Design dated August 2018.

Sewer

1. The NHDES specifies a minimum pipe size of 3" for low pressure systems with more than 11 service connections. Please revise drawings and details.
    - Env-Wq 704.07(e); Table 704-3 states that for number of connections served by a pressure sewer pipe of between 11 and 30, the minimum pipe size, in inches, shall be 3. However, it is our understanding that this is applicable to pressure sewer systems which contains sewage (solids). For this project, the system is designed for only pumping effluent from the homes, thus a smaller diameter pipe is allowable.
    - This office has received NHDES approval for similar sized projects (Clark Road, Town of Wolfeboro) where the force main is 2" in diameter.
    - Given the limited total head for the proposed project, it would require very large pumps to maintain operational velocity of at least 2 feet per second in a 3" pipe.
    - Thus, the plans have not been revised to increase the pipe diameter to 3".
2. Provide design for pipe and pumps at maximum flow (all pumps on street pumping simultaneously).
    - See the attached report for specifics about the low-pressure sewer system design.
    - This report will be provided to the NHDES with the Sewer Discharge Permit application.
3. Provide a note for the HDPE pressure main that all pipe sections shall be joined by thermal heat fusion. Connections or transitions to non-HDPE components shall be made with fittings approved for HDPE connections. The welding technician shall be experienced in HDPE heat fusion welding with minimum of 500 hours of welding experience. The intent of this note is to make sure that the HDPE pipe is continuously welded in a professional manner and not pieced together with stainless steel clamps.
    - A note has been added to the Force Main Sewer Pipe Trench Detail as requested.
4. Revise note #11 on sheet C-7 (notes on right side of sheet).
    - Note #11 has been revised to correctly list "City of Rochester"
5. Add 3" wyes to the force main to allow jet cleaning access.
    - The wyes are still listed as 2". See aforementioned response #1.
6. All sewer valves shall open right and box covers to stamped "Sewer".
    - The Pump Discharge Line Connection detail has been revised as required.

General

1. Sheet C-5: on the paved sidewalk detail, revise the reference to NHDOT paving items, should be 403.11, not 304.11.
    - This detail has been corrected.
2. Sheet C-5: revise the sidewalk details to match the City subdivision standards, section 6.2.4.4, for sidewalks and sidewalks crossing driveways (pavement and gravel thicknesses).
    - This detail has been revised to match the City standards.

3. Revise the loam thickness to be 6" in all City ROWs and easements.
    - The Typical Roadway Cross Sections and Sidewalk Details have been revised to require 6" of loam within the ROW.
4. Add a sign to the table on Sheet C-5 for contractor to construct. Sign shall be the typical private to be public subdivision sign. Refer to planning department for specifications.
    - The Sign Schedule has been amended to include this sign.

<u>Assessing Dept. Comments:</u>

1. This land is not in Current Use.
    - No action required.

2. All of the previous parcel numbers that were assigned to this subdivision are still suitable. Our office will review the addresses that were assigned previously with the updated curb cut plan and make any revisions, if necessary.
    - No Action Required.

<u>Planning Dept. Comments:</u>

1) Please submit a street name application form.
    - A street name application will be submitted, although we believe the applicant wishes to keep the proposed roadway name as "Freedom Drive".

2) Work with DPW to get the details for a standard street sign (street name). The sign must include a removable topper/cap that reads "Private". Add these details to the plan.
    - A "Private" sign was added to the Sign Schedule on Sheet C-5.

3) Please move the drain line to the edge of Lot 6, or entirely outside of Lot 6 so that there is more unobstructed land on that lot (nearly ½ of this lot is proposed to be a drainage easement area, that's not something we will support, we will however support additional wetland buffer impacts to relocate this drain line).
    - The drainage pipe was shifted easterly as much as possible to provide more "buildable area" on Lot 6 while still maintaining adequate slope in the pipe to drain to the stormwater management system.
    - The land area on Lot 6 which is not incumbered by the drainage easement, wetlands and wetland buffers and building setback is more than 9,800 square feet. This exceeds the minimum land area for a parcel in R-1 zoning district (10,000 sf) once the building setbacks are applied.
    - The wetland buffer impact did increase by about 1,000 square feet, but there is no direct impact to the wetlands.

4) The creation of a non-conforming lot (lot 110-0, "Open Space") is not permitted. Subdivision Regulation 5.2 states that lots are to adhere to Zoning Ordinance requirements and any remnants of lots below usable size are to be added to adjacent lots instead of remaining as unusable parcels. The City is not interested in being liable for six acres of unusable land, and this open space of this makeup (drainage and wetlands) are not valuable to the residents and would necessitate the need for a permanent HOA. Open space is also not required for this subdivision.

a) Please reconfigure lots accordingly.
- The overall subdivision was revised to eliminate the "Open Space" lot. As such Lots 10-5, through 10-8 were modified.
- Lot 10-5 land area increased in land area.
- Lot 10-6 land area increased and is shaped to accommodate the stormwater management system on the lot.
- Lots 10-7 & 10-8 were increased in the size of the lots.

b) Please add an easement for the water course (wetland between Lots 6 and 7), per Subdivision Regulation 5.7.2.
- Although the wetlands bisect the parent property, there is not a defined channel that would be classified as a water course. The proposed culvert under the roadway acts more as an

equalizer for the existing hydrology. Seasonal runoff generally flows in both directions from the proposed crossing. Thus, we do not believe an easement is warranted.

- Drainage easements have been added at the headwalls for the proposed culvert to allow maintenance of the culvert and headwalls.

5) Please address the following via the General Notes on Sheet S-1, and then add all General Notes to Sheet S-2:

a) Subdivision Regulation 5.7 and 6.1 requires pins/monuments be set at easement bounds, property corners, etc…. Please revise General Note 2 so that is states generally where pins/monuments are supposed to be set. And note that they need to be set before the road can be considered for City acceptance, and all lot pins and pins for easements on lots be set before a Certificate of Occupancy is issued for said lot. Also note that a letter from a NH Licensed Land Surveyor stating pins/monuments have been set must be submitted to the Planning Dept. on a lot by lot basis, and a Certificate of Occupancy (CO) will not be issued for the let requesting a CO without this letter; a similar letter is required before asking for street acceptance and/or close-out of project/surety.

- This note has been revised accordingly.
- All of the notes are on both S-1 and S-2 of the recording plans.

b) Add a note stating that structures and sewerage are not allowed in easement areas. (Subdivision Regulation 5.7.3).

- Note #22 has been added to the plan set.

c) Add a note stating all utilities must be underground (Subdivision Regulation 5.12)

- Note #20 has been added to the plan set.

d) Clarify General Note # 5 so that it is clear the orange snow fence is to be placed at the wetland buffer.

- Note #16 (previously General Note #5) has been revised as requested.

e) Clarify General Note #6 to state that the buffer markers are available for purchase from the Planning Dept.

- Note #17 (previously General Note #6) has been amended as requested.

f) Add a note stating that individual effluent pump systems will likely be required. These will be at the lot owner's expense and will be the lot owner's responsibility.

- Note #21 has been added to the plan set.

g) Street trees are required per Subdivision Regulation 5.13. Please note that each lot is to have one street tree and call out minimum planting size, list advisable tree species. Note that tree is to be located on the front property line.

- Note #24 has been added to the plan set, which requires a minimum of one street tree per lot to be planted on the property line. Furthermore, the note indicates the size and species of the tree to be planted (or preserved).

h) Add a note that a small informational sign is to be installed at the infiltration ponds; signs are simply to state that these are stormwater management areas and are not to be maintained but not altered. The purpose of this condition and sign is to make sure homeowners know these areas are off-limits.

- Note #14 has been added to the plan set.

6) Please Show easement areas on Sheet S-1 and S-1. We want the recorded plans to clearly illustrate the restricted areas to anyone considering purchasing a lot.

- The proposed drainage easements are depicted on both S-1 and S-2, along with sheet S-3 which has the bearing and distances and area for the easements.

7) Propose a tree in the cul-de-sac, to the northern edge, so that when it matures it shades the road but is away from the drain line.

- A proposed shade tree has been added to the cul-de-sac.

8) Sheet S-2 shows a match line at the top of the sheet, and the match line references Sheet S-1. There is actually no sheet in the plan set that shows the other portion of this match line. Please correct.

- An insert has been added to sheet S-2 for the rest of proposed lot 10-8.

9) The road and drainage must be privately maintained unless the City accepts the street. Please create an Operations and Maintenance manual and draft HOA document outlining draft responsibilities for the road and drainage.

- We are working with the applicant on the draft HOA documents which will contain provisions for the operations and maintenance of the infrastructure, including the stormwater management systems, and the roadway.

10) Add a tree planting detail to the planet.

- A tree planting detail has been added to Sheet C-5.

11) Because the Registry of Deeds shows the old subdivision lots that were previously approved, yet failed to be built/vested, a lot consolidation application is needed. All of the lots will need to be consolidated into one lot first and recorded as such at the Registry of Deeds. Please submit Lot Consolidation application. This must be processed and recorded before the subdivision plan is recorded.

- A Lot Consolidation Form will be submitted once the subdivision has a conditional approval from the City and all State Permit have been approved.

12) Please work with your surveyor/legal counsel to add a note on the plans to be recorded that addresses roads and their dedication and acceptance with regards to abutting lots. What we are looking for is language that when will address our concern that if lots are conveyed without some language that excludes fee to the centerline than ownership/fee is to the centerline. We need language that guarantees the City will get ownership upon street acceptance, and not only get an easement / right-of-way.

- We will work with the applicant's legal counsel and Joel Runnals on the wording of the ROW.

13) These lots will be subject to Impact Fees.

- Note #25 has been added to the recording plans with this requirement.

If you have any questions regarding the revisions made to this plan set, the design itself or any supplemental material submitted to satisfy the conditions of approval, please feel free to call or email me.

Sincerely,

NORWAY PLAINS ASSOCIATES, INC.

By:____________________________________

Scott A. Lawler, P.E., Project Engineer

Cc: Golden Oaks Development, LLC
Arthur Taylor LLC

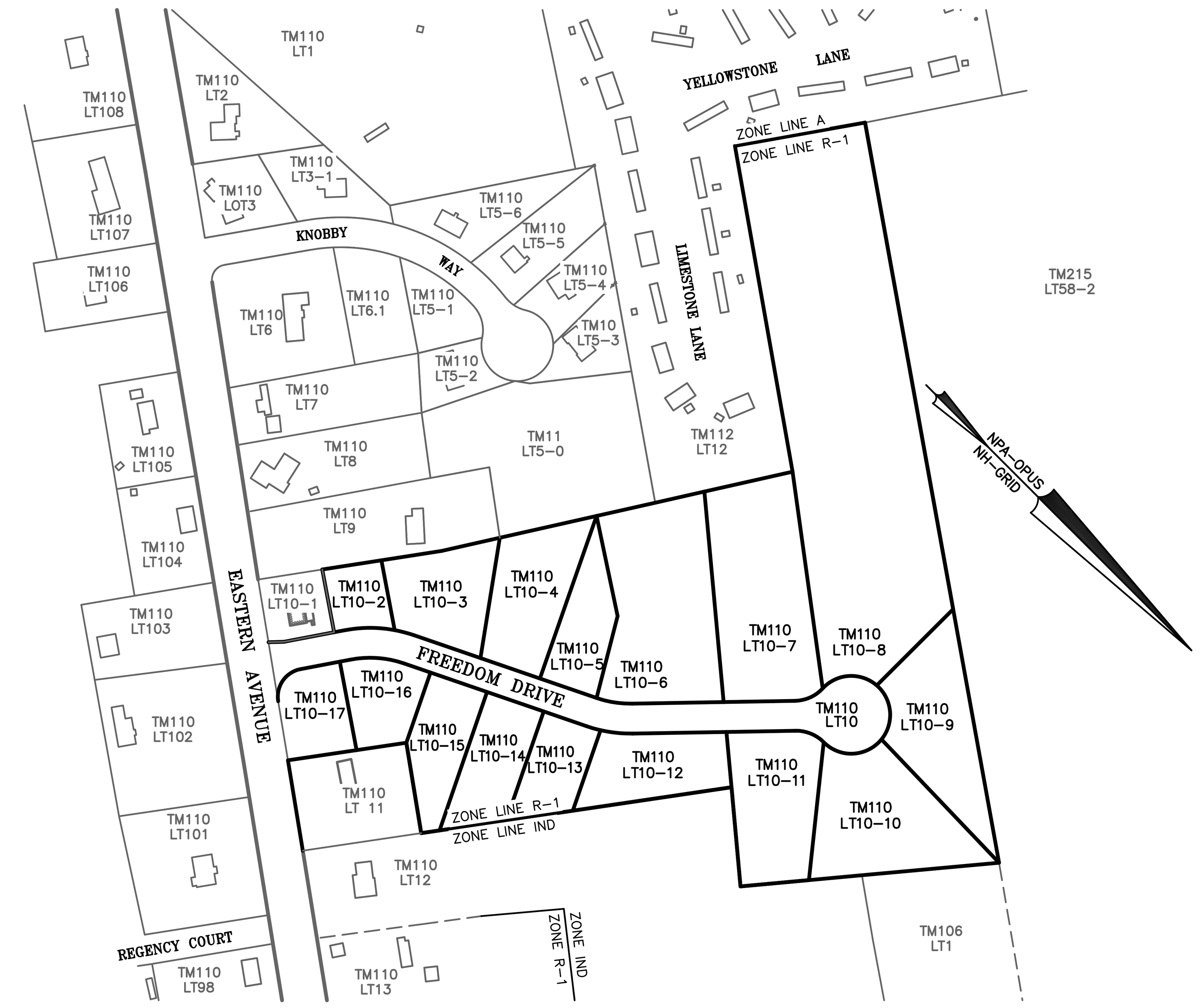
PROPOSED 16 LOT SUBDIVISION

FREEDOM DRIVE

PREPARED FOR

GOLDEN OAKS DEVELOPMENT, LLC

MARCH 2020



OVERALL SITE
1" = 200'

STATE AND FEDERAL PERMITS:
STATE OF NEW HAMPSHIRE PERMIT NUMBERS:

NHDES ALTERATION OF TERRAIN:	REQUIRED
NHDES WETLANDS PERMIT:	REQUIRED
NHDES DAM PERMIT:	NOT REQUIRED
NHDES SUBDIVISION PERMIT:	NOT REQUIRED
NHDES SUBSURFACE SYSTEMS PERMIT:	NOT REQUIRED
NHDES WASTEWATER PERMIT:	REQUIRED
NHDOT DRIVEWAY/ENTRANCE PERMIT:	NOT REQUIRED

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES):
NPDES PERMITS ARE ONLY REQUIRED FOR PROJECTS MEETING THE DISTURBED AREA CRITERIA BELOW AND HAVING A POINT SOURCE STORMWATER DISCHARGE FROM THE SITE TO AN ADJACENT WETLAND OR WATER BODY (I.E. CULVERT, SWALE, ETC. OUTLETING TO A WETLAND, CREEK, STREAM OR RIVER).

NPDES PERMIT: REQUIRED

NPDES PERMITS CONSIST OF A NOTICE OF INTENT (NOI) FILED WITH THE ENVIRONMENTAL PROTECTION AGENCY AT LEAST 14 DAYS PRIOR TO CONSTRUCTION COMMENCING AND A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) BEING PREPARED, KEPT ON SITE AND FOLLOWED BY THE CONTRACTOR.

FOR STATUS OF THIS PERMIT, CONTACT THE PROJECT GENERAL CONTRACTOR.

CIVIL ENGINEERS
NORWAY PLAINS ASSOCIATES, INC.
2 CONTINENTAL BOULEVARD
ROCHESTER, NEW HAMPSHIRE 03867
(603) 335-3948

DEVELOPER
GOLDEN OAKS DEVELOPMENT, LLC
35 JENKINS ROAD
LEE, NH 03861

OWNER
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123

**FINAL APPROVAL BY
ROCHESTER PLANNING BOARD**

CERTIFIED BY: ____________________ DATE: __________

SHEET INDEX

FILE NO. 166
PLAN NO.C-3043
DWG. NO.19138/S-1
F.B. NO. "33" "CEK"

LAND SURVEYORS — CIVIL ENGINEERS

LEGEND

N 57°43'10" W 99.69'	PROPERTY LINE
	LIMITS OF JURISDICTIONAL WETLANDS
	DRAINAGE EASEMENT
	EXISTING STONEWALLS
	EXISTING MONUMENT
	EXISTING WETLANDS
	PROPOSED MONUMENT

ABREVIATION LEGEND:
DHF – DRILL HOLE FOUND
DHCF – DRILL HOLE WITH IDENTIFICATION CAP FOUND
FND – FOUND
RBF – REBAR FOUND
ROW – RIGHT OF WAY
SSF – STEEL STAKE FOUND
TAB – IDENTIFICATION DISK FOUND
(+2") – DENOTES HEIGHT OF THE MONUMENT
TM – TAX MAP & LOT NUMBER
SCRD – STRAFFORD COUNTY REGISTRY OF DEEDS

MONUMENT IDENTIFICATION INSCRIPTIONS:
"NPA" – NORWAY PLAINS ASSOCIATES

ABUTTERS IN FIELDSTONE VILLAGE

112–0012–0033
JAMES & JOAN COLLINS
21 YELLOWSTONE LN
ROCHESTER, NH 03867

112–0012–0034
SONJIA TAINTER & ROSE ROGERS
15 YELLOWSTONE LN
ROCHESTER, NH 03867

112–0012–0035
REGAN & MICHELLE LAMBERT
11 YELLOWSTONE LN
ROCHESTER, NH 03867

112–0012–0036
MANDY & MICHELLE DANIEL–CARR
7 YELLOWSTONE LN
ROCHESTER, NH 03867

112–0012–0037
PAUL & ELIZABETH STYVES
3 YELLOWSTONE LN
ROCHESTER, NH 03867

112–0012–0038
ROBERT & KAYLA PEACH
46 LIMESTONE LN
ROCHESTER, NH 03867

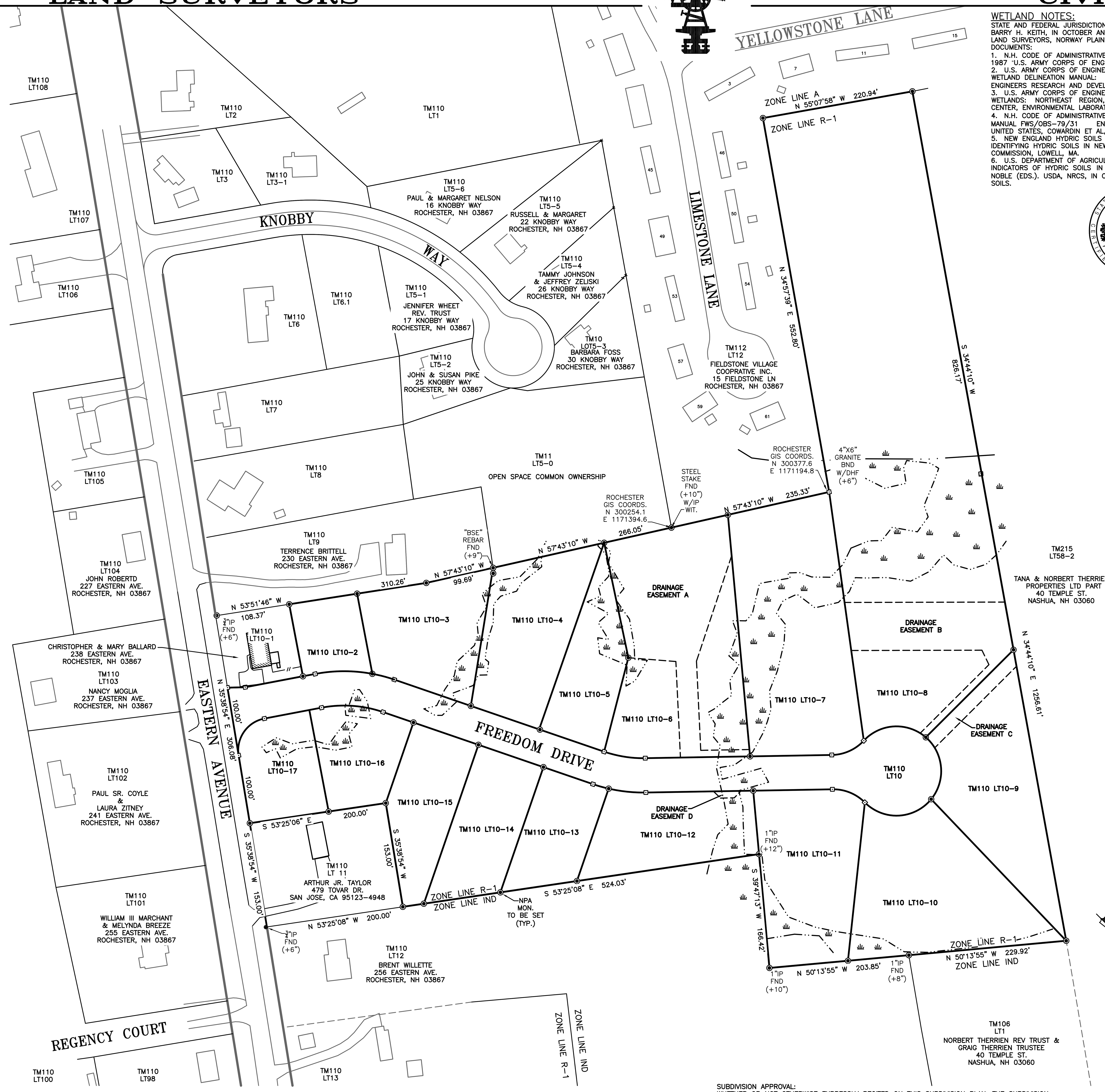
112–0012–0039
RODNEY & JR. & CARMEN LEARY
50 LIMESTONE LN
ROCHESTER, NH 03867

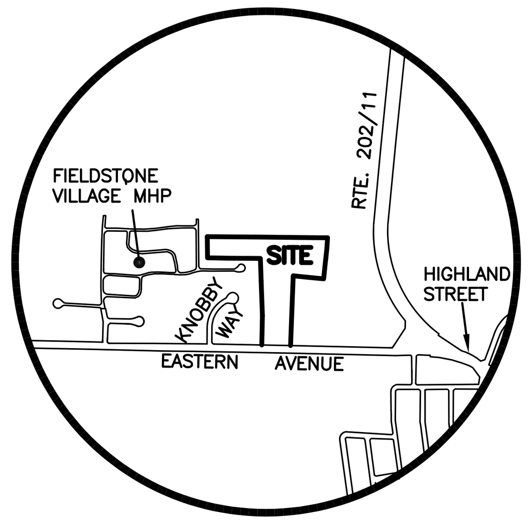
112–0012–0040
JOSE & PHYLLIS MANRIQUE
54 LIMESTONE LN
ROCHESTER, NH 03867

112–0012–0042
MARK BARTON
61 LIMESTONE LN
ROCHESTER, NH 03867

112–0012–0043
ANTHONY & MICHELE NASUTI
59 LIMESTONE LN
ROCHESTER, NH 03867

112–0012–0044
TRACI GLIDDEN & MARY PALMER
57 LIMESTONE LN
ROCHESTER, NH 03867





LOCUS
N.T.S

WETLAND NOTES:
STATE AND FEDERAL JURISDICTIONAL WETLANDS WERE DELINEATED BY N.H. CERTIFIED WETLAND SCIENTIST, BARRY H. KEITH, IN OCTOBER AND NOVEMBER 2019. WETLANDS MAPPING WAS DONE BY N.H. LICENSED LAND SURVEYORS, NORWAY PLAINS ASSOCIATES, INC., IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
1. N.H. CODE OF ADMINISTRATIVE RULES (ENV–WT 301.01) WITH THE TECHNIQUES OUTLINED IN THE 1987 "U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y–87–1."
2. U.S. ARMY CORPS OF ENGINEERS. 2009. "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY ERDC/EL TR–09–19."
3. U.S. ARMY CORPS OF ENGINEERS. 2012. "NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST REGION, U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY.
4. N.H. CODE OF ADMINISTRATIVE RULES (ENV–WT 301.02) WITH THE U.S. FISH AND WILDLIFE SERVICE MANUAL FWS/OBS–79/31 ENTITLED "CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES, COWARDIN ET AL, 1979."
5. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2004. 3RD ED., "FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND." NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
6. U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE. 2010. "FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0." L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

STATE OF NEW HAMPSHIRE
BARRY H. KEITH
No. 087
CERTIFIED WETLAND SCIENTIST

I HEREBY CERTIFY THAT THIS PLAN, PREPARED UNDER MY DIRECTION, IS THE RESULT OF A SURVEY MADE ON THE GROUND AS PER RECORD DESCRIPTIONS AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE PLAN CLOSURE EXCEEDS 1:10,000.

STATE OF NEW HAMPSHIRE
No. 865
JOEL D. RUNNALS
LICENSED LAND SURVEYOR
SIGNATURE

JOEL D. RUNNALS, L.L.S. 865 DATE

NOTES:
1. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE THE SUBJECT PARCELS INTO 16 RESIDENTIAL LOTS.
2. TOTAL PARCEL AREA:
MAP 110, LOT 10–00 (OPEN SPACE) AND LOTS 10–2 THRU 10–17 (HOUSE LOTS), LOT 10–18 (ROAD RIGHT OF WAY) = 17.16 ACRES.
3. PARCELS ARE ZONED RESIDENTIAL–1 DISTRICT (R–1)
4. MINIMUM LOT REQUIREMENTS: (R–1 WITH CITY WATER & SEWER)
LOT SIZE = 10,000 SF
FRONTAGE = 100'
5. BUILDING SETBACKS: FY. = 10', SY. = 10', RY. = 20'
6. THE PROPOSED LOTS WILL BE SERVICED BY THE MUNICIPAL WATER AND SEWER SYSTEM.
7. THE PROPOSED LOTS ARE NOT LOCATED WITHIN THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP 33017C0204D DATED 5/17/05.
8. FOR MORE INFORMATION ABOUT THIS SUBDIVISION CONTACT THE ROCHESTER PLANNING DEPARTMENT, 33 WAKEFIELD STREET, ROCHESTER, NH 03867. (603) 335–1338.
9. STATE OF NEW HAMPSHIRE PERMIT NUMBERS;
WETLANDS AND NON–SITE SPECIFIC PERMIT: PENDING
WASTEWATER CONNECTION PERMIT: PENDING
ALTERATION OF TERRAIN PERMIT: PENDING
10. ALL CONSTRUCTION MUST BE OUTSIDE THE 50 FOOT WETLANDS BUFFER, UNLESS OTHERWISE NOTED ON THE APPROVED PLANS.
11. ALL LOT CORNERS AND DRAINAGE EASEMENTS SHALL BE MARKED WITH CAPPED IRON MARKERS AND THE RIGHT OF WAY POINT CURVATURE AND POINT TANGENT SHALL BE MARKED WITH GRANITE BOUNDS. THESE SHALL BE SET PRIOR BEFORE THE ROADWAY CANE BE CONSIDERED FOR CITY ACCEPTANCE AND ALL LOT PINS AND PINS FOR EASEMENTS ON LOTS BE SET BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED FOR SAID LOT. A LETTER FROM A NH LICENSED LAND SURVEYOR STATING PINS/MONUMENTS HAVE BEEN SET MUST BE SUBMITTED TO THE PLANNING DEPARTMENT ON A LOT BY LOT BASIS, AND A CERTIFICATE OF OCCUPANCY (CO) WILL NOT BE ISSUED FOR THE LOT REQUESTING A CERTIFICATE OF OCCUPANCY WITHOUT THIS LETTER; A SIMILAR LETTER IS REQUIRED BEFORE ASKING FOR STREET ACCEPTANCE AND/OR CLOSE–OUT OF PROJECT/SURETY.
12. THERE IS A 50 FOOT BUFFER REQUIREMENT FROM WETLANDS UNDER THE CITY OF ROCHESTER ZONING ORDINANCE AS SHOWN ON THIS PLAN SET. THERE MAY BE NO ENCROACHMENT WITHIN THESE BUFFERS EXCEPT AS PERMITTED UNDER THE ORDINANCE.
13. THE ROAD, UTILITIES AND DRAINAGE MUST BE PRIVATELY MAINTAINED UNLESS THE CITY ACCEPTS THE STREET.
14. SMALL INFORMATIONAL SIGNS TO BE INSTALLED AT THE INFILTRATION PONDS; SIGNS SHALL STATE THAT THESE ARE STORMWATER MANAGEMENT AREAS AND ARE TO BE MAINTAINED BUT NOT ALTERED, AND SHALL BE OFF–LIMITS.
15. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMIT FOR THIS SUBDIVISION, THE DEVELOPER SHALL POST: A) CONSTRUCTION ZONE SIGNS PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS; AND B) STREET ACCEPTANCE SIGNS WITH THE FOLLOWING LANGUAGE AT ALL ENTRY POINTS TO THE SUBDIVISION: "POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOUR OWN RISK. (PER ORDER OF PLANNING BOARD)". THE LOCATION AND DESIGN OF THE SIGNS SHALL BE AS STIPULATED BY THE PUBLIC WORKS DEPARTMENT, BUT IN NO CASE SHALL THEY BE LESS THAN 2'X4'. THE SIGNS SHALL BE ERECTED PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.
16. AN ORANGE CONSTRUCTION FENCE MUST BE PLACED AT THE WETLAND BUFFER ON ALL LOTS THAT INCLUDES WETLAND BUFFERS PRIOR TO START OF CONSTRUCTION FOR ALL LOTS THAT CONTAIN WETLAND BUFFERS.
17. BUFFER MARKERS MUST BE INSTALLED ALONG THE OUTER EDGE OF THE WETLAND BUFFER ON ALL LOTS THAT CONTAIN A WETLAND BUFFER. THE MARKER MUST BE INSTALLED AT THE TIME THAT THE ORANGE CONSTRUCTION FENCE IS REMOVED. THE MARKER MUST BE IN PLACE IN ORDER FOR THE CERTIFICATE OF OCCUPANCY FOR THAT LOT TO BE ISSUED. THE BUFFER MARKERS ARE AVAILABLE FOR PURCHASE FROM THE PLANNING DEPARTMENT.
18. ALL PROPOSED DRIVEWAYS SHALL BE PLACED IN A LOCATION THAT WILL PROVIDE THE REQUIRED STOPPING SIGHT DISTANCE FOR THE POSTED SPEED LIMIT AS REQUIRED BY THE DEPARTMENT OF PUBLIC WORKS.
19. THERE WERE NO VERNAL POOLS WITHIN THE PROPOSED SUBDIVISION LOTS.
20. ALL UTILITIES MUST BE UNDERGROUND.
21. ALL LOTS SHALL HAVE INDIVIDUAL SEPTIC TANK WITH PUMP CHAMBER AND AN EFFLUENT PUMP THAT WILL TIE INTO THE FORCE MAIN LOCATED WITHIN THE PROPOSED RIGHT–OF–WAY. THE COST OF INSTALLATION AND MAINTENANCE OF THE SEPTIC TANK AND EFFLUENT PUMPS WILL BE THE RESPONSIBILITY OF THE INDIVIDUAL LOT OWNERS.
22. NO STRUCTURES OR SANITARY SEWERAGE INFRASTRUCTURE ARE ALLOWED WITHIN THE DRAINAGE EASEMENTS.
23. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMIT FOR THIS SUBDIVISION, THE DEVELOPER SHALL POST: A) CONSTRUCTION ZONE SIGNS PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS; AND B) STREET ACCEPTANCE SIGNS WITH THE FOLLOWING LANGUAGE AT ALL ENTRY POINTS TO THE SUBDIVISION: "POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOUR OWN RISK. (PER ORDER OF PLANNING BOARD)". THE LOCATION AND DESIGN OF THE SIGNS SHALL BE AS STIPULATED BY THE PUBLIC WORKS DEPARTMENT, BUT IN NO CASE SHALL THEY BE LESS THAN 2'X4'. THE SIGNS SHALL BE ERECTED PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.
24. PRIOR TO DEDICATION OF THE STREETS TO THE CITY THERE SHALL BE AT LEAST ONE STREET TREE (DECIDUOUS SHADE TREES) ON THE FRONT PROPERTY LINE. NEWLY PLANTED TREES MUST BE SUITABLE TO THE SITE CONDITIONS AND OF NURSERY STOCK WITH A DIAMETER AT FOUR FOOT BREAST HEIGHT OF AT LEAST 2 INCHES. ONE OF THE FOLLOWING SPECIES MUST BE USED UNLESS OTHERWISE APPROVED BY THE PLANNING DEPARTMENT: MAPLE, WHITE OAK, SCARLET OAK, LINDEN, THORNLESS HONEYLOCUST, MARSHALL SEEDLESS ASH, EUROPEAN HORNBEAM, CALLERY PEAR (NOT BRADFORD), CHINESE ELM, AND JAPANESE ZELKOVA.
25. ALL LOTS WILL BE SUBJECT TO IMPACT FEES TO BE DETERMINED AT THE ISSUANCE OF A BUILDING PERMIT.

TAX MAP 110 – LOT 10–00,
LOTS 10–2 THRU 10–18
OWNER OF RECORD:
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123–4948
BK 3434, PG 903

OVERALL SUBDIVISION PLAN
TAX MAP 110, LOT 10–00 & LOTS 10–2 THRU 10–18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.
MARCH 2020

GRAPHIC SCALE
80 0 40 80 160 240
(IN FEET)
1 INCH = 80 FEET
(SHEET 1 OF 3 FOR RECORDING)

S–1

SUBDIVISION APPROVAL:
WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SUBDIVISION PLAN, THE SUBDIVISION APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS, AND SPECIFICATIONS OF THE CITY OF ROCHESTER LAND SUBDIVISION REGULATIONS, AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED IN ANY PARTICULAR, BELOW. NON– ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FROM SUBDIVISION APPROVAL.

FINAL APPROVAL BY
ROCHESTER PLANNING BOARD

CERTIFIED BY:______________ DATE:________

FILE NO. 166
PLAN NO. C–3043
DWG. NO. 19138/S–1
F.B. NO. "33" "CEK"

REFERENCE PLANS:

1. "SUBDIVISION PLAN EASTERN AVENUE TAX MAP 110 – LOT 10 ROCHESTER, NH FOR ARTHUR TAYLOR, JR." DATED NOVEMBER 2005 BY NORWAY PLAINS ASSOC., INC. AND RECORDED AT STRAFFORD COUNTY REGISTRY OF DEEDS, PLAN 87–76.

31 MOONEY STREET, ALTON, N.H. 603–875–3948 — NORWAY PLAINS ASSOCIATES, INC. — 2 CONTINENTAL BLVD., ROCHESTER, N.H. 603–335–3948

LAND SURVEYORS — CIVIL ENGINEERS

LEGEND

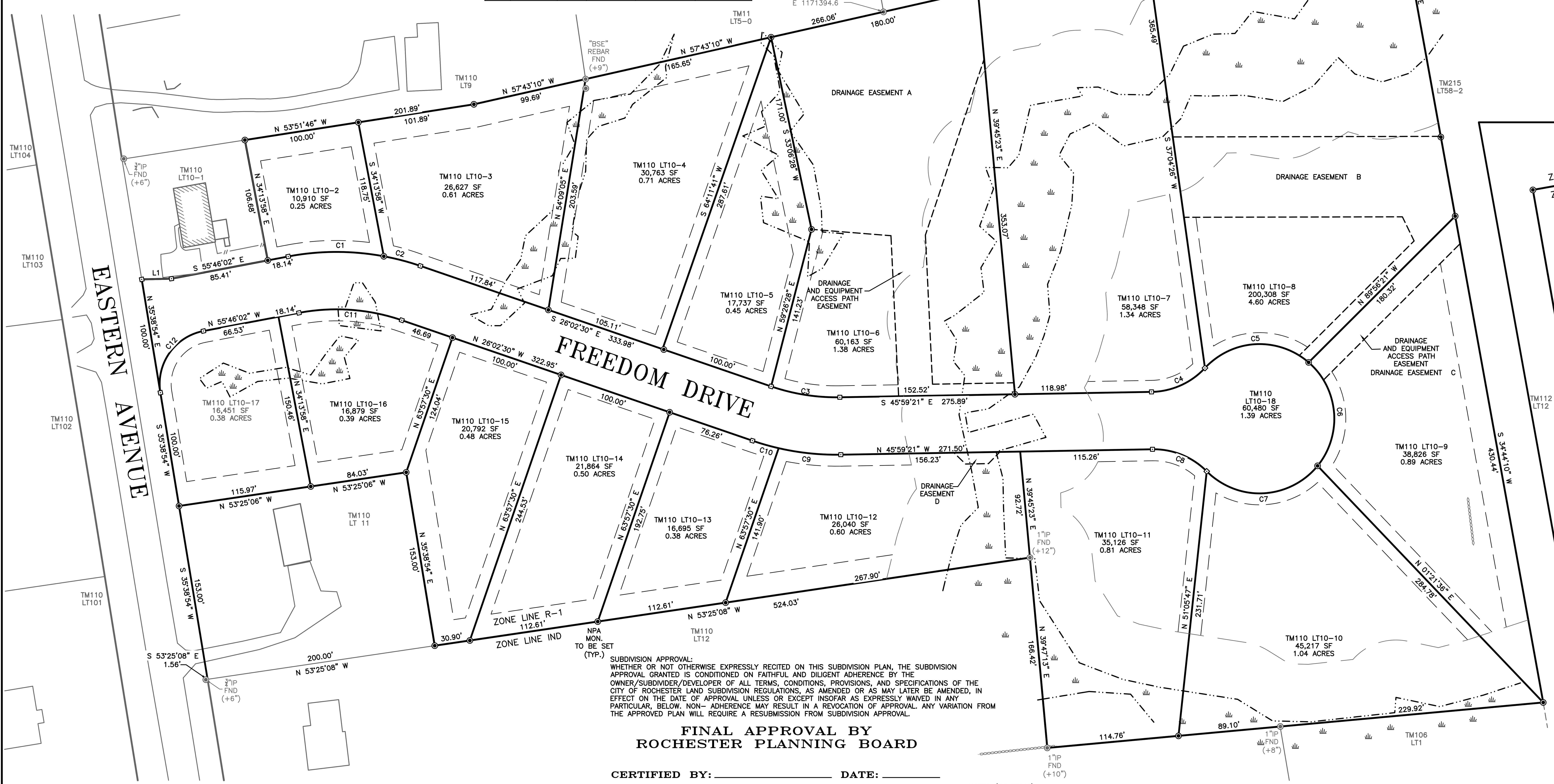
- N 57°43'10" W / 99.69' — PROPERTY LINE
- LIMITS OF JURISDICTIONAL WETLANDS
- 50' WETLANDS BUFFER
- DRAINAGE EASEMENT
- BUILDING SETBACK LINES
- EXISTING STONEWALLS
- EXISTING MONUMENT
- EXISTING WETLANDS
- PROPOSED MONUMENT

ABREVIATION LEGEND:
DHF – DRILL HOLE FOUND
DHCF – DRILL HOLE WITH IDENTIFICATION CAP FOUND
FND – FOUND
RBF – REBAR FOUND
ROW – RIGHT OF WAY
SSF – STEEL STAKE FOUND
TAB – IDENTIFICATION DISK FOUND
(+2") – DENOTES HEIGHT OF THE MONUMENT
TM – TAX MAP & LOT NUMBER
SCRD – STRAFFORD COUNTY REGISTRY OF DEEDS

MONUMENT IDENTIFICATION INSCRIPTIONS:
"NPA" – NORWAY PLAINS ASSOCIATES

LINE	BEARING	DISTANCE
L1	N 46°20'38" W	25.87'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	83.72'	225.00'	21°19'11"	N 45°06'26" W	83.24'
C2	33.01'	225.00'	8°24'21"	N 30°14'41" W	32.98'
C3	52.22'	150.00'	19°56'50"	S 36°00'56" E	51.96'
C4	52.40'	65.00'	46°11'13"	S 69°04'57" E	50.99'
C5	100.01'	65.00'	88°09'09"	N 48°05'59" W	90.43'
C6	100.01'	65.00'	88°09'09"	N 40°03'10" E	90.43'
C7	108.99'	65.00'	96°04'08"	N 47°50'12" W	96.66'
C8	52.40'	65.00'	46°11'13"	S 22°53'44" E	50.99'
C9	78.33'	225.00'	19°56'50"	N 36°00'55" W	77.94'
C10	19.37'	200.00'	5°32'59"	N 28°49'00" W	19.36'
C11	90.79'	175.00'	29°43'31"	N 40°54'16" W	89.78'
C12	72.50'	46.89'	88°35'04"	S 79°56'26" W	65.49'

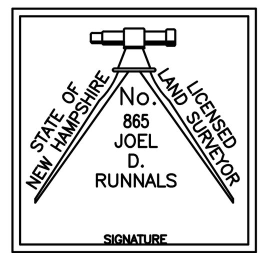


SUBDIVISION APPROVAL:
WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SUBDIVISION PLAN, THE SUBDIVISION APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS, AND SPECIFICATIONS OF THE CITY OF ROCHESTER LAND SUBDIVISION REGULATIONS, AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED IN ANY PARTICULAR, BELOW. NON– ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FROM SUBDIVISION APPROVAL.

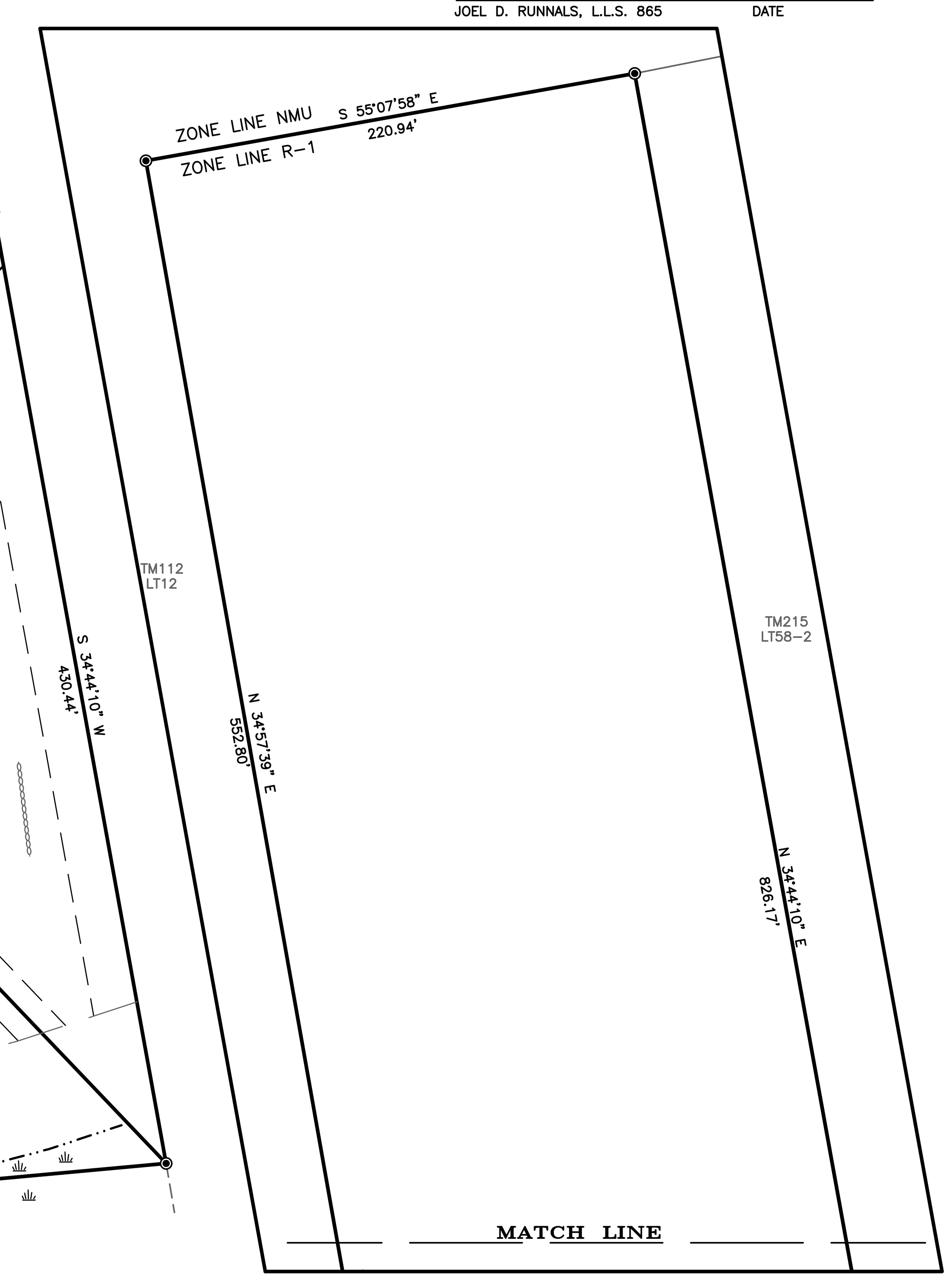
FINAL APPROVAL BY ROCHESTER PLANNING BOARD

CERTIFIED BY: ____________________ DATE: __________

I HEREBY CERTIFY THAT THIS PLAN, PREPARED UNDER MY DIRECTION, IS THE RESULT OF A SURVEY MADE ON THE GROUND AS PER RECORD DESCRIPTIONS AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE PLAN CLOSURE EXCEEDS 1:10,000.



JOEL D. RUNNALS, L.L.S. 865 DATE

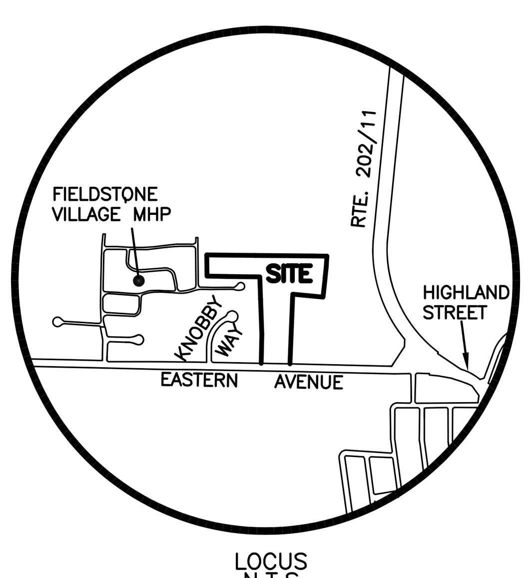


INSERT

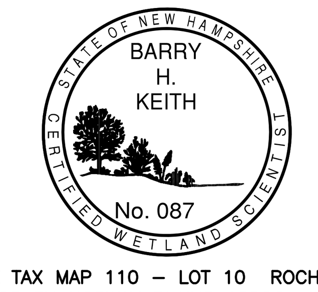
WETLAND NOTES:

STATE AND FEDERAL JURISDICTIONAL WETLANDS WERE DELINEATED BY N.H. CERTIFIED WETLAND SCIENTIST, BARRY H. KEITH, IN OCTOBER AND NOVEMBER 2019. WETLANDS MAPPING WAS DONE BY N.H. LICENSED LAND SURVEYORS, NORWAY PLAINS ASSOCIATES, INC., IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:

1. N.H. CODE OF ADMINISTRATIVE RULES (ENV–WT 301.01) WITH THE TECHNIQUES OUTLINED IN THE 1987 "U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y–87–1."
2. U.S. ARMY CORPS OF ENGINEERS. 2009. "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY ERDC/EL TR–09–19."
3. U.S. ARMY CORPS OF ENGINEERS. 2012. "NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST REGION, U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY.
4. N.H. CODE OF ADMINISTRATIVE RULES (ENV–WT 301.02) WITH THE U.S. FISH AND WILDLIFE SERVICE MANUAL FWS/OBS–79/31 ENTITLED "CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES, COWARDIN ET AL, 1979."
5. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2004. 3RD ED., "FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND." NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
6. U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE. 2010. "FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0." L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.



LOCUS
N.T.S



NOTES:
1. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE THE SUBJECT PARCELS INTO 16 RESIDENTIAL LOTS.
2. TOTAL PARCEL AREA:
MAP 110, LOT 10–00 (OPEN SPACE) AND LOTS 10–2 THRU 10–17 (HOUSE LOTS), LOT 10–18 (ROAD RIGHT OF WAY) = 17.16 ACRES.
3. PARCELS ARE ZONED RESIDENTIAL–1 DISTRICT (R–1)
4. MINIMUM LOT REQUIREMENTS: (R–1 WITH CITY WATER & SEWER)
LOT SIZE = 10,000 SF
FRONTAGE = 100'
5. BUILDING SETBACKS: FY. = 10', SY. = 10', RY. = 20'
6. THE PROPOSED LOTS WILL BE SERVICED BY THE MUNICIPAL WATER AND SEWER SYSTEM.
7. THE PROPOSED LOTS ARE NOT LOCATED WITHIN THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP 33017C0204D DATED 5/17/05.
8. FOR MORE INFORMATION ABOUT THIS SUBDIVISION CONTACT THE ROCHESTER PLANNING DEPARTMENT, 33 WAKEFIELD STREET, ROCHESTER, NH 03867. (603) 335–1338.
9. STATE OF NEW HAMPSHIRE PERMIT NUMBERS;
WETLANDS AND NON–SITE SPECIFIC PERMIT: PENDING
WASTEWATER CONNECTION PERMIT: PENDING
ALTERATION OF TERRAIN PERMIT: PENDING
10. ALL CONSTRUCTION MUST BE OUTSIDE THE 50 FOOT WETLANDS BUFFER, UNLESS OTHERWISE NOTED ON THE APPROVED PLANS.
11. ALL LOT CORNERS AND DRAINAGE EASEMENTS SHALL BE MARKED WITH CAPPED IRON MARKERS AND THE RIGHT OF WAY POINT CURVATURE AND POINT TANGENT SHALL BE MARKED WITH GRANITE BOUNDS. THESE SHALL BE SET PRIOR BEFORE THE ROADWAY CANE BE CONSIDERED FOR CITY ACCEPTANCE AND ALL LOT PINS AND PINS FOR EASEMENTS ON LOTS BE SET BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED FOR SAID LOT. A LETTER FROM A NH LICENSED LAND SURVEYOR STATING PINS/MONUMENTS HAVE BEEN SET MUST BE SUBMITTED TO THE PLANNING DEPARTMENT ON A LOT BY LOT BASIS, AND A CERTIFICATE OF OCCUPANCY (CO) WILL NOT BE ISSUED FOR THE LOT REQUESTING A CERTIFICATE OF OCCUPANCY WITHOUT THIS LETTER; A SIMILAR LETTER IS REQUIRED BEFORE ASKING FOR STREET ACCEPTANCE AND/OR CLOSE–OUT OF PROJECT/SURETY.
12. THERE IS A 50 FOOT BUFFER REQUIREMENT FROM WETLANDS UNDER THE CITY OF ROCHESTER ZONING ORDINANCE AS SHOWN ON THIS PLAN SET. THERE MAY BE NO ENCROACHMENT WITHIN THESE BUFFERS EXCEPT AS PERMITTED UNDER THE ORDINANCE.
13. THE ROAD, UTILITIES AND DRAINAGE MUST BE PRIVATELY MAINTAINED UNLESS THE CITY ACCEPTS THE STREET.
14. SMALL INFORMATIONAL SIGNS TO BE INSTALLED AT THE INFILTRATION PONDS; SIGNS SHALL STATE THAT THESE ARE STORMWATER MANAGEMENT AREAS AND ARE TO BE MAINTAINED BUT NOT ALTERED, AND SHALL BE OFF–LIMITS.

NOTES (CONTINUE):
15. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMIT FOR THIS SUBDIVISION, THE DEVELOPER SHALL POST: A) CONSTRUCTION ZONE SIGNS PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS; AND B) STREET ACCEPTANCE SIGNS WITH THE FOLLOWING LANGUAGE AT ALL ENTRY POINTS TO THE SUBDIVISION: "POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOUR OWN RISK. (PER ORDER OF PLANNING BOARD)". THE LOCATION AND DESIGN OF THE SIGNS SHALL BE AS STIPULATED BY THE PUBLIC WORKS DEPARTMENT, BUT IN NO CASE SHALL THEY BE LESS THAN 2'X4'. THE SIGNS SHALL BE ERECTED PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.
16. AN ORANGE CONSTRUCTION FENCE MUST BE PLACED AT THE WETLAND BUFFER ON ALL LOTS THAT INCLUDES WETLAND BUFFERS PRIOR TO START OF CONSTRUCTION FOR ALL LOTS THAT CONTAIN WETLAND BUFFERS.
17. BUFFER MARKERS MUST BE INSTALLED ALONG THE OUTER EDGE OF THE WETLAND BUFFER ON ALL LOTS THAT CONTAIN A WETLAND BUFFER. THE MARKER MUST BE INSTALLED AT THE TIME THAT THE ORANGE CONSTRUCTION FENCE IS REMOVED. THE MARKER MUST BE IN PLACE IN ORDER FOR THE CERTIFICATE OF OCCUPANCY FOR THAT LOT TO BE ISSUED. THE BUFFER MARKERS ARE AVAILABLE FOR PURCHASE FROM THE PLANNING DEPARTMENT.
18. ALL PROPOSED DRIVEWAYS SHALL BE PLACED IN A LOCATION THAT WILL PROVIDE THE REQUIRED STOPPING SIGHT DISTANCE FOR THE POSTED SPEED LIMIT AS REQUIRED BY THE DEPARTMENT OF PUBLIC WORKS.
19. THERE WERE NO VERNAL POOLS WITHIN THE PROPOSED SUBDIVISION LOTS.
20. ALL UTILITIES MUST BE UNDERGROUND.
21. ALL LOTS SHALL HAVE INDIVIDUAL SEPTIC TANK WITH PUMP CHAMBER AND AN EFFLUENT PUMP THAT WILL TIE INTO THE FORCE MAIN LOCATED WITHIN THE PROPOSED RIGHT–OF–WAY. THE COST OF INSTALLATION AND MAINTENANCE OF THE SEPTIC TANK AND EFFLUENT PUMPS WILL BE THE RESPONSIBILITY OF THE INDIVIDUAL LOT OWNERS.
22. NO STRUCTURES OR SANITARY SEWERAGE INFRASTRUCTURE ARE ALLOWED WITHIN THE DRAINAGE EASEMENTS.
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25. ALL LOTS WILL BE SUBJECT TO IMPACT FEES TO BE DETERMINED AT THE ISSUANCE OF A BUILDING PERMIT.

REFERENCE PLANS:
1. "SUBDIVISION PLAN EASTERN AVENUE TAX MAP 110 – LOT 10 ROCHESTER, NH FOR ARTHUR TAYLOR, JR." DATED NOVEMBER 2005 BY NORWAY PLAINS ASSOC., INC. AND RECORDED AT STRAFFORD COUNTY REGISTRY OF DEEDS, PLAN 87–76.

FILE NO. 166
PLAN NO. C–3043
DWG. NO. 19138/S–1
F.B. NO. "33" "CEK"

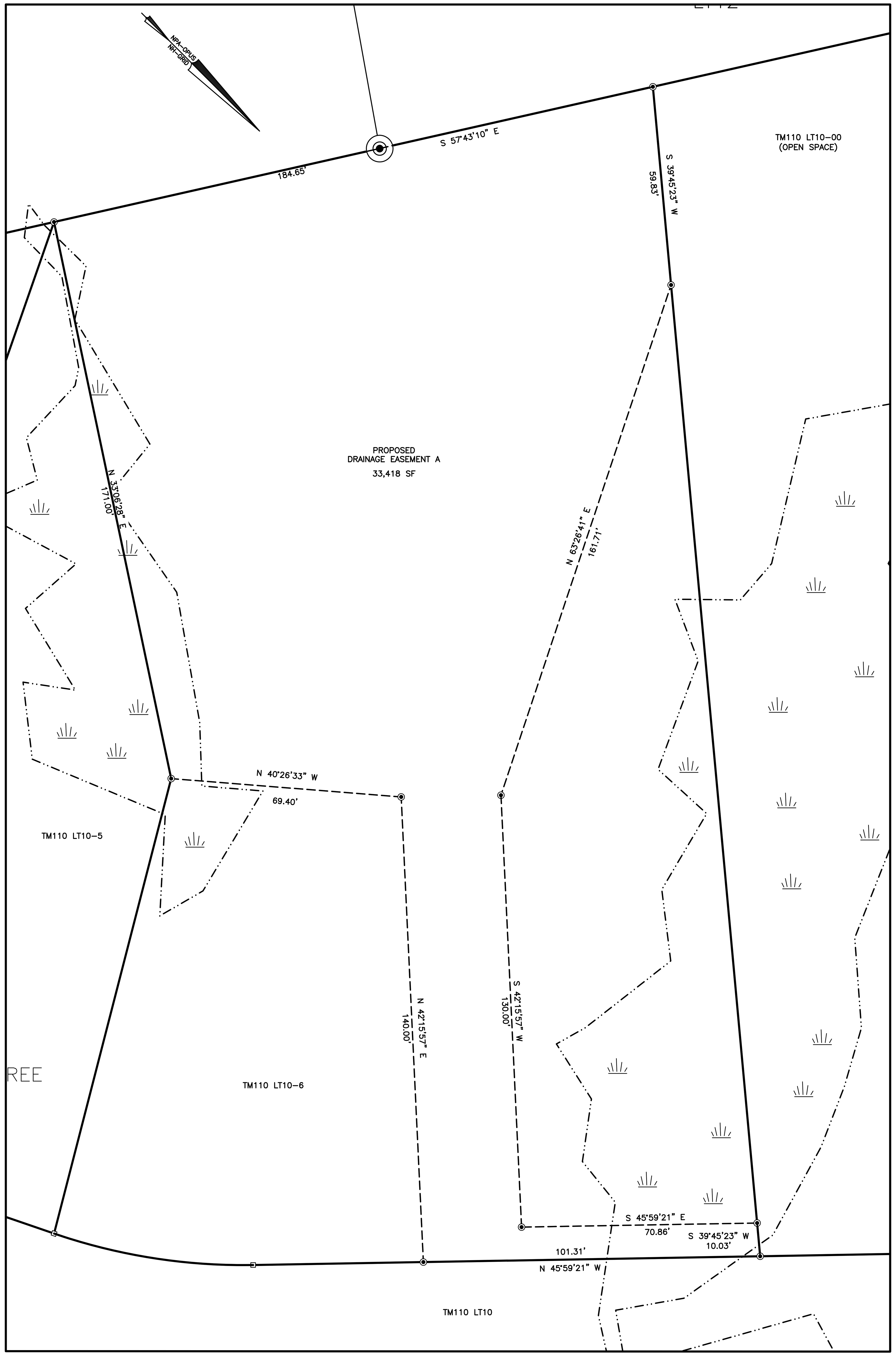
TAX MAP 110 – LOT 10–00,
LOTS 10–2 THRU 10–18
OWNER OF RECORD:
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123–4948
BK 3434, PG 903

SUBDIVISION PLAN
TAX MAP 110, LOT 10–00 & LOTS 10–2 THRU 10–18
FREEDOM DRIVE
ROCHESTER, NH

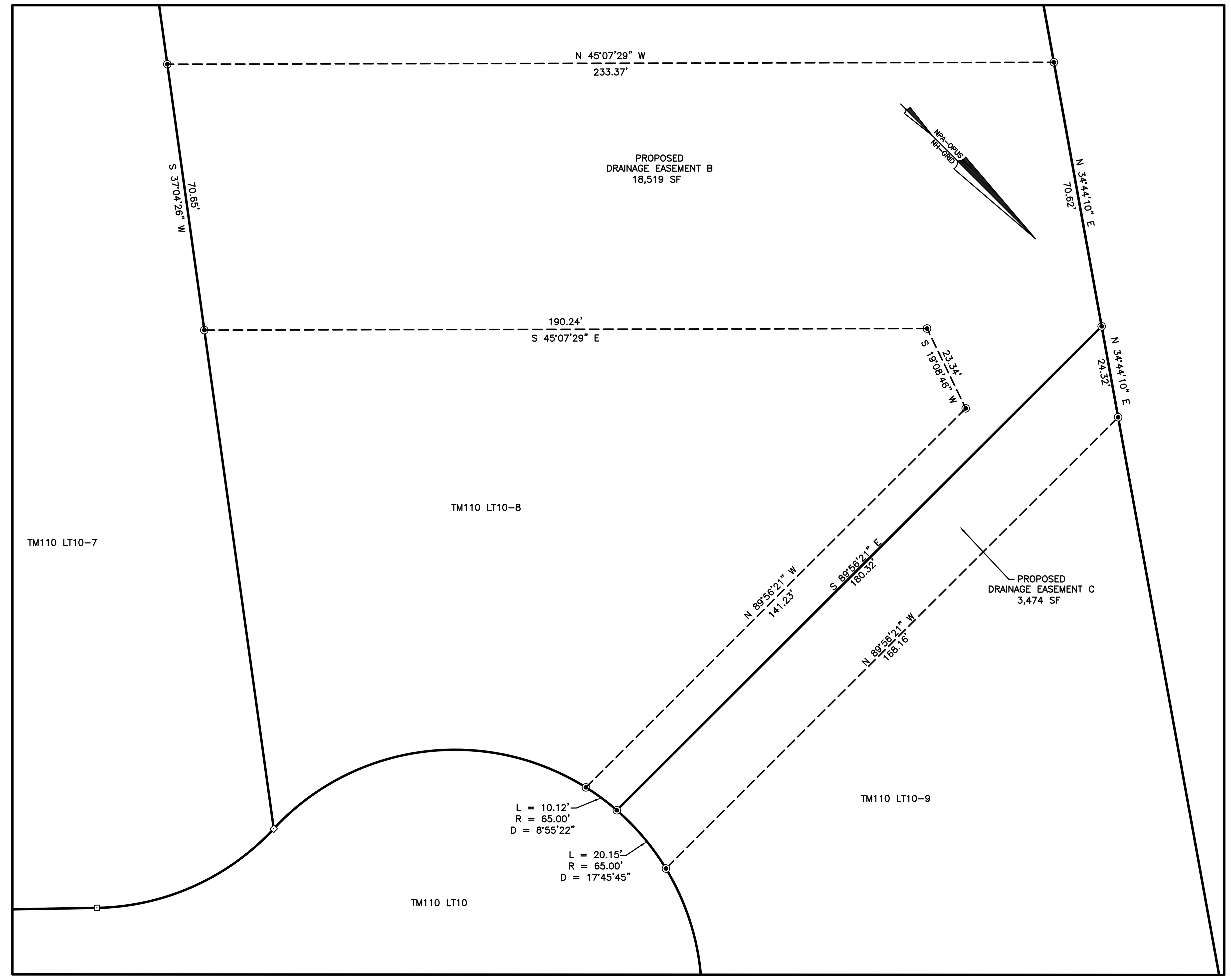
PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.
MARCH 2020

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 INCH = 50 FEET

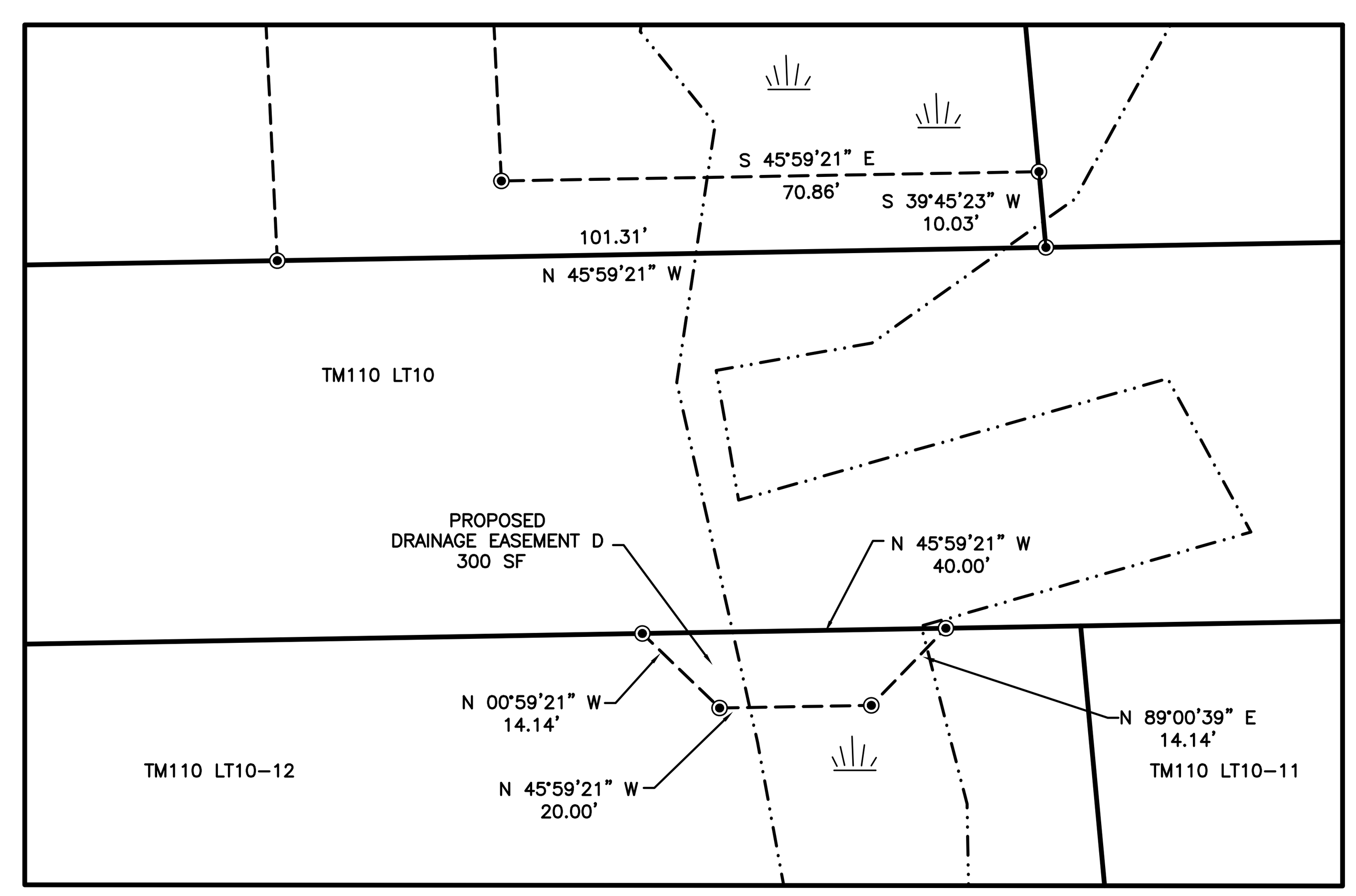
(SHEET 2 OF 3 FOR RECORDING) S–2



SCALE : 1 INCH = 20 FEET



SCALE : 1 INCH = 20 FEET



SCALE : 1 INCH = 20 FEET

FINAL APPROVAL BY
ROCHESTER PLANNING BOARD

CERTIFIED BY:________________ DATE:__________

TAX MAP 110 – LOT 10-00,
LOTS 10-2 THRU 10-18
OWNER OF RECORD:
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123-4948
BK 3434, PG 903

EASEMENT PLAN
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 INCH = 20 FEET

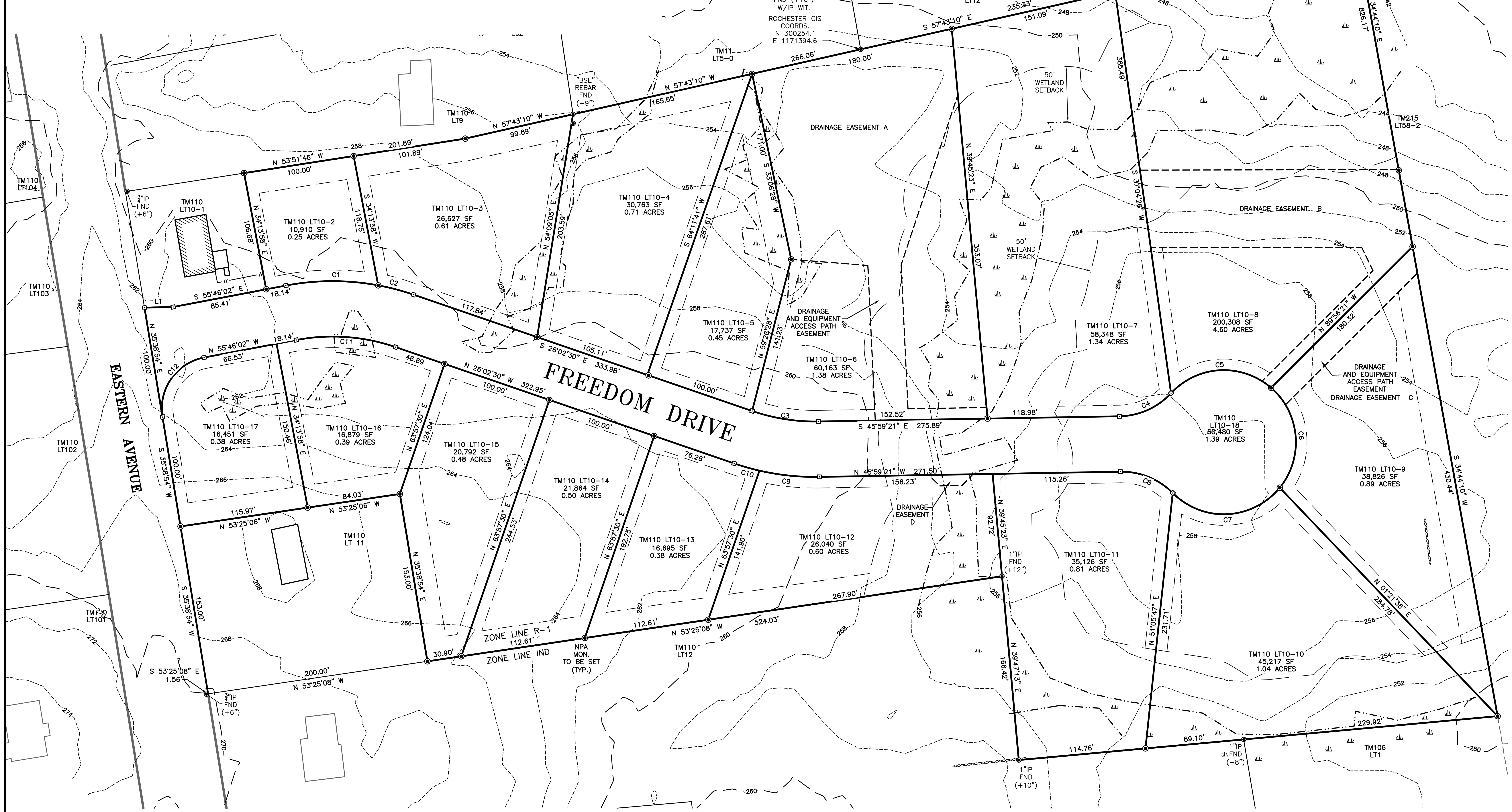
FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

(SHEET 3 OF 3 FOR RECORDING) S-3

LEGEND

N 57°43'10" W 99.69'	PROPERTY LINE
	LIMITS OF JURISDICTIONAL WETLANDS
	EXISTING STONEWALLS
	EXISTING MONUMENT
	EXISTING WETLANDS
	PROPOSED MONUMENT

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.



NOTES:

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2. TOTAL PARCEL AREA:
   MAP 110, LOT 10-00 (OPEN SPACE) AND LOTS 10-2 THRU 10-17 (HOUSE LOTS), LOT 10-18 (ROAD RIGHT OF WAY) = 17.16 ACRES.
3. PARCELS ARE ZONED RESIDENTIAL-1 DISTRICT (R-1)
4. MINIMUM LOT REQUIREMENTS: (R-1 WITH CITY WATER & SEWER)
   LOT SIZE = 10,000 SF
   FRONTAGE = 100'
5. BUILDING SETBACKS: FY. = 10', SY. = 10', RY. = 20'
6. THE PROPOSED LOTS WILL BE SERVICED BY THE MUNICIPAL WATER AND SEWER SYSTEM.
7. THE PROPOSED LOTS ARE NOT LOCATED WITHIN THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP 33017C0204D DATED 5/17/05.
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   WETLANDS AND NON-SITE SPECIFIC PERMIT: PENDING
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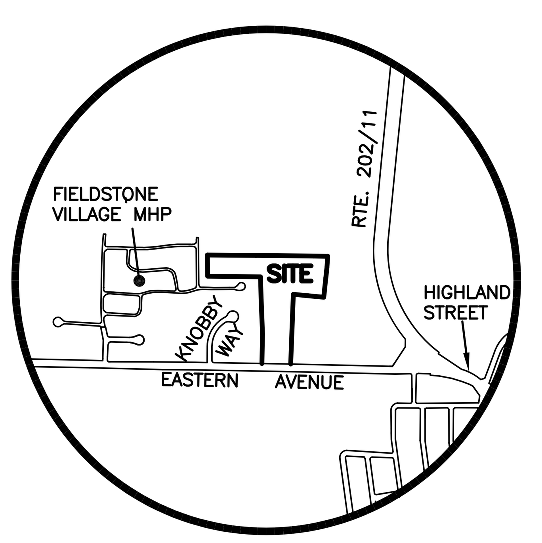
20. ALL UTILITIES MUST BE UNDERGROUND.
21. ALL LOTS SHALL HAVE INDIVIDUAL SEPTIC TANK WITH PUMP CHAMBER AND AN EFFLUENT PUMP THAT WILL TIE INTO THE FORCE MAIN LOCATED WITHIN THE PROPOSED RIGHT-OF-WAY. THE COST OF INSTALLATION AND MAINTENANCE OF THE SEPTIC TANK AND EFFLUENT PUMPS WILL BE THE RESPONSIBILITY OF THE INDIVIDUAL LOT OWNERS.
22. NO STRUCTURES OR SANITARY SEWERAGE INFRASTRUCTURE ARE ALLOWED WITHIN THE DRAINAGE EASEMENTS.
23. PRIOR TO THE ISSUANCE OF ANY BUILDING PERMIT FOR THIS SUBDIVISION, THE DEVELOPER SHALL POST: A) CONSTRUCTION ZONE SIGNS PER THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS; AND B) STREET ACCEPTANCE SIGNS WITH THE FOLLOWING LANGUAGE AT ALL ENTRY POINTS TO THE SUBDIVISION: "POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOUR OWN RISK. (PER ORDER OF PLANNING BOARD)". THE LOCATION AND DESIGN OF THE SIGNS SHALL BE AS STIPULATED BY THE PUBLIC WORKS DEPARTMENT, BUT IN NO CASE SHALL THEY BE LESS THAN 2'X4'. THE SIGNS SHALL BE ERECTED PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.
24. PRIOR TO DEDICATION OF THE STREETS TO THE CITY THERE SHALL BE AT LEAST ONE STREET TREE (DECIDUOUS SHADE TREES) ON THE FRONT PROPERTY LINE. NEWLY PLANTED TREES MUST BE SUITABLE TO THE SITE CONDITIONS AND OF NURSERY STOCK WITH A DIAMETER AT FOUR FOOT BREAST HEIGHT OF AT LEAST 2 INCHES. ONE OF THE FOLLOWING SPECIES MUST BE USED UNLESS OTHERWISE APPROVED BY THE PLANNING DEPARTMENT: MAPLE, WHITE OAK, SCARLET OAK, LINDEN, THORNLESS HONEYLOCUST, MARSHALL SEEDLESS ASH, EUROPEAN HORNBEAM, CALLERY PEAR (NOT BRADFORD), CHINESE ELM, AND JAPANESE ZELKOVA.
25. ALL LOTS WILL BE SUBJECT TO IMPACT FEES TO BE DETERMINED AT THE ISSUANCE OF A BUILDING PERMIT.

LINE	BEARING	DISTANCE
L1	N 46°20'38" W	25.87'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	83.72'	225.00'	21°19'11"	N 45°06'26" W	83.24'
C2	33.01'	225.00'	8°24'21"	N 30°14'41" W	32.98'
C3	52.22'	150.00'	19°56'50"	S 36°00'56" E	51.96'
C4	52.40'	65.00'	46°11'13"	S 69°04'57" E	50.99'
C5	100.01'	65.00'	88°09'09"	N 48°05'59" W	90.43'
C6	100.01'	65.00'	88°09'09"	N 40°03'10" E	90.43'
C7	108.99'	65.00'	96°04'08"	N 47°50'12" W	96.66'
C8	52.40'	65.00'	46°11'13"	S 22°53'44" E	50.99'
C9	78.33'	225.00'	19°56'50"	N 36°00'55" W	77.94'
C10	19.37'	200.00'	5°32'59"	N 28°49'00" W	19.36'
C11	90.79'	175.00'	29°43'31"	N 40°54'16" W	89.78'
C12	72.50'	46.89'	88°35'04"	S 79°56'26" W	65.49'



LOCUS
N.T.S

TAX MAP 110 – LOT 10–00,
LOTS 10–2 THRU 10–18
OWNER OF RECORD:
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123–4948
BK 3434, PG 903

TOPOGRAPGHIC PLAN
TAX MAP 110, LOT 10–00 & LOTS 10–2 THRU 10–18 FREEDOM DRIVE ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 INCH = 50 FEET

SUBDIVISION APPROVAL:
WHETHER OR NOT OTHERWISE EXPRESSLY RECITED ON THIS SUBDIVISION PLAN, THE SUBDIVISION APPROVAL GRANTED IS CONDITIONED ON FAITHFUL AND DILIGENT ADHERENCE BY THE OWNER/SUBDIVIDER/DEVELOPER OF ALL TERMS, CONDITIONS, PROVISIONS, AND SPECIFICATIONS OF THE CITY OF ROCHESTER LAND SUBDIVISION REGULATIONS, AS AMENDED OR AS MAY LATER BE AMENDED, IN EFFECT ON THE DATE OF APPROVAL UNLESS OR EXCEPT INSOFAR AS EXPRESSLY WAIVED IN ANY PARTICULAR, BELOW. NON– ADHERENCE MAY RESULT IN A REVOCATION OF APPROVAL. ANY VARIATION FROM THE APPROVED PLAN WILL REQUIRE A RESUBMISSION FROM SUBDIVISION APPROVAL.

FINAL APPROVAL BY
ROCHESTER PLANNING BOARD

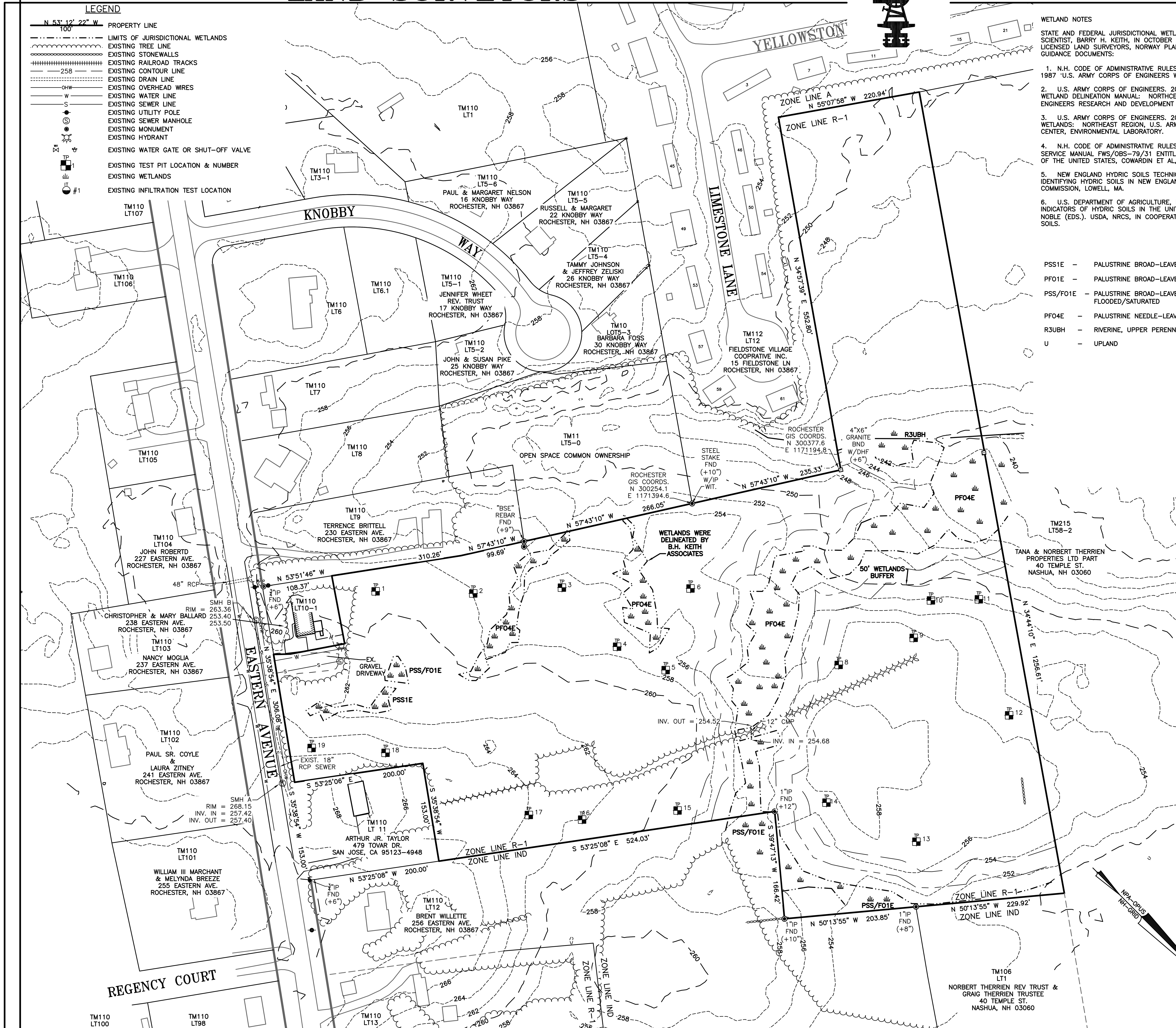
CERTIFIED BY:________________ DATE:__________

FILE NO. 166
PLAN NO.C–3043
DWG. NO. 19138/S–1
F.B. NO. "33" "CEK"

REFERENCE PLANS:

1. "SUBDIVISION PLAN EASTERN AVENUE TAX MAP 110 – LOT 10 ROCHESTER, NH FOR ARTHUR TAYLOR, JR." DATED NOVEMBER 2005 BY NORWAY PLAINS ASSOC., INC. AND RECORDED AT STRAFFORD COUNTY REGISTRY OF DEEDS, PLAN 87–76.

S–4



WETLAND NOTES

STATE AND FEDERAL JURISDICTIONAL WETLANDS WERE DELINEATED BY N.H. CERTIFIED WETLAND SCIENTIST, BARRY H. KEITH, IN OCTOBER AND NOVEMBER 2019. WETLANDS MAPPING WAS DONE BY N.H. LICENSED LAND SURVEYORS, NORWAY PLAINS ASSOCIATES, INC., IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:

1. N.H. CODE OF ADMINISTRATIVE RULES (ENV-WT 301.01) WITH THE TECHNIQUES OUTLINED IN THE 1987 "U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1."

2. U.S. ARMY CORPS OF ENGINEERS. 2009. "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY ERDC/EL TR-09-19."

3. U.S. ARMY CORPS OF ENGINEERS. 2012. "NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHEAST REGION, U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER, ENVIRONMENTAL LABORATORY.

4. N.H. CODE OF ADMINISTRATIVE RULES (ENV-WT 301.02) WITH THE U.S. FISH AND WILDLIFE SERVICE MANUAL FWS/OBS-79/31 ENTITLED "CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES, COWARDIN ET AL, 1979."

5. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2004. 3RD ED., "FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND." NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.

6. U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE. 2010. "FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 7.0." L.M. VASILAS, G.W. HURT, AND C.V. NOBLE (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

WETLAND LEGEND

PSS1E – PALUSTRINE BROAD-LEAVED DECIDUOUS SCRUB-SHRUB, SEASONALLY FLOODED/SATURATED

PFO1E – PALUSTRINE BROAD-LEAVED DECIDUOUS FORESTED, SEASONALLY FLOODED/SATURATED

PSS/FO1E – PALUSTRINE BROAD-LEAVED DECIDUOUS SCRUB-SHRUB/FORESTED, SEASONALLY FLOODED/SATURATED

PFO4E – PALUSTRINE NEEDLE-LEAVED EVERGREEN FORESTED, SEASONALLY FLOODED/SATURATED

R3UBH – RIVERINE, UPPER PERENNIAL, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED

U – UPLAND

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING SITE FEATURE ON THE SUBJECT PARCEL AND ABUTTING PARCELS.

2. TOTAL PARCEL AREA: MAP 110, LOT 10-0(OPEN SPACE) AND LOTS 10-2 THRU 10-7 (HOUSE LOTS) AND LOT 10-18 (ROAD RIGH-OF-WAY) = 17.16 ACRES OR 747,489.6 SQ.FT.

3. THE PARCEL IS ZONED RESIDENTIAL-1 DISTRICT (R-1)

4. MINIMUM LOT REQUIREMENTS:
LOT SIZE = 10,000 SF
FRONTAGE = 100'

5. BUILDING SETBACKS: FY. = 10', SY. = 10', RY. = 20'

6. THE PROPOSED LOTS WILL BE SERVICED BY THE MUNICIPAL WATER AND SEWER SYSTEM.

7. THE PROPOSED LOTS ARE NOT LOCATED WITHIN THE 100 YEAR FLOOD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP 33017C0204D DATED 5/17/05.

8. ORIENTATION: HORIZONTAL DATUM IS NAVD83 AND VERTICAL DATUM IS NGVD29

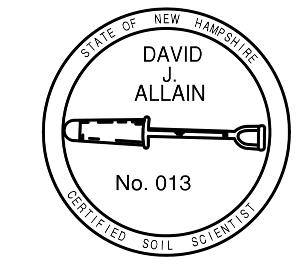
9. FOR MORE INFORMATION ABOUT THIS SUBDIVISION CONTACT THE ROCHESTER PLANNING DEPARTMENT, 33 WAKEFIELD STREET, ROCHESTER, NH 03867. (603) 335-1338.

SOIL NOTES:
SEE SHEET D-1 SITE SPECIFIC SOILS PLAN FOR SOIL BOUNDARY

A. THIS SITE-SPECIFIC SOIL MAP WAS COMPLETED IN MARCH 2020 BY DAVID J. ALLAIN, NH CERTIFIED SOIL SCIENTIST #13, ROUND POND SOIL SURVEY, 374 POND HILL ROAD, BARRINGTON NH 03825. "SITE-SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT", VERSION 5.0, DECEMBER 2017, SSSNNE SPECIAL PUBLICATION NO.3 WAS USED AS A REFERENCE AND GUIDE IN DEVELOPING THIS MAP. "THE DISTURBED SOIL MAPPING SUPPLEMENT FOR NEW HAMPSHIRE DES AOT SITE SPECIFIC SOIL MAPS", DECEMBER 2017 WAS ALSO CONSIDERED TO COMPLY WITH THE SOIL MAPPING REQUIREMENTS OF RSA 485 A:17 AND NHDES ENV-WQ 1500, ALTERATION OF TERRAIN (AOT) PROGRAM. THE SOILS WERE IDENTIFIED USING THE "NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND" PREPARED BY THE USDA NRCS, DURHAM NH, ISSUE #10, JANUARY 2011.

B. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR USE IN PLANNING AND CONSTRUCTING INFILTRATION STRUCTURES OR PRACTICES CONSISTENT WITH NHDES ALTERATION OF TERRAIN PROGRAM REQUIREMENTS PER ENV-WQ 1500 RULES. THIS MAP WAS PRODUCED BY A NH CERTIFIED SOIL SCIENTIST AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE.

SEE SHEET D-1 SITE SPECIFIC SOILS PLAN FOR SOIL BOUNDARY
SEE SHEET C-13 FOR TEST PIT DATA



TAX MAP 110 – LOTS
10-0, 10-2 THRU 10-18
OWNER OF RECORD:
ARTHUR TAYLOR, LLC.
479 TOVAR DRIVE
SAN JOSE, CA 95123-4948
BK 1400, PG 649

EXISTING FEATURES PLAN

TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

GRAPHIC SCALE
80 0 40 80 160 320
(IN FEET)
1 INCH = 80 FEET

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

FINAL APPROVAL BY
ROCHESTER PLANNING BOARD

CERTIFIED BY: ______________ DATE: ________

E-1

Drawing Location: M:\2019\19138\DWGS\19138 S-1.dwg
Thu, 02 Apr 2020 - 6:10pm

LAND SURVEYORS — CIVIL ENGINEERS

STATE OF NEW HAMPSHIRE
SCOTT A. LAWLER No.10026
LICENSED PROFESSIONAL ENGINEER

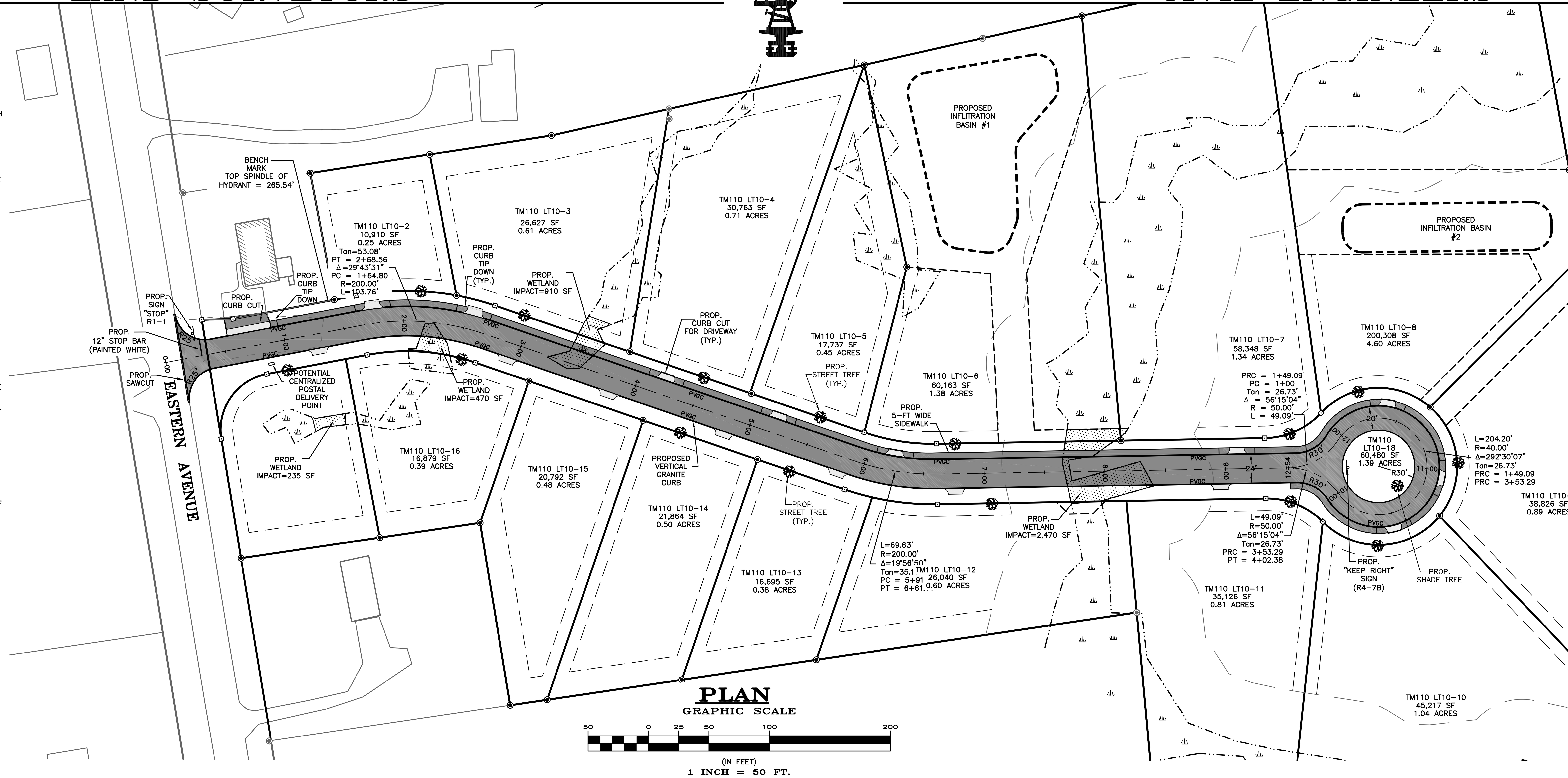
REVISIONS:
04/01/20 - REVISE SUBDIVISION LOT LAYOUT AND DRAINAGE EASEMENTS

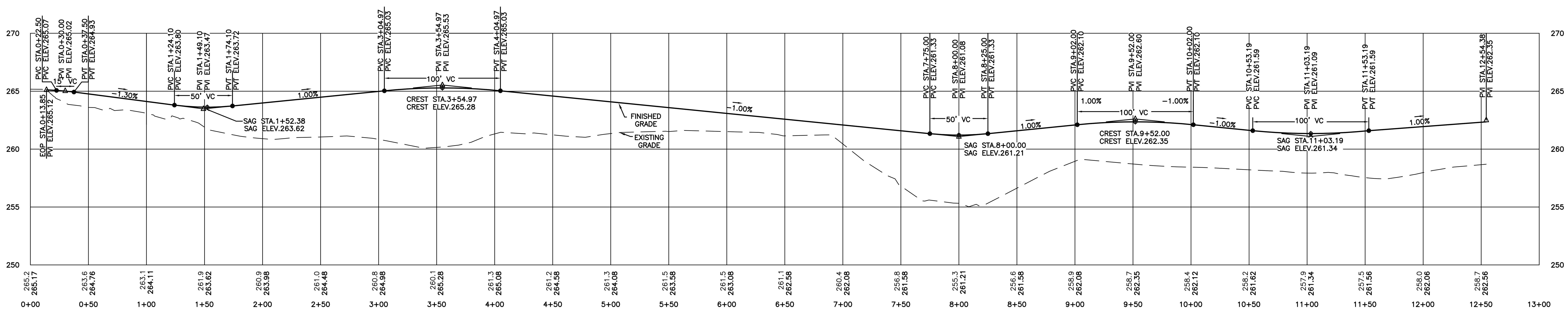
LEGEND

- PROPERTY LINE
- JURISDICTIONAL WETLANDS
- EXISTING TREE LINE

OVERALL CONSTRUCTION AND GENERAL NOTES:

1. ALL CONSTRUCTION ACTIVITY RELATED TO THE DEVELOPMENT OF THIS SITE IS RESTRICTED TO THE HOURS OF 7:00 A.M. TO 6:00 P.M., MONDAY THROUGH FRIDAY AND 8:00 A.M. TO 6:00 P.M. ON SATURDAY.
2. ALL LOT CORNERS AND DRAINAGE EASEMENTS SHALL BE MARKED WITH CAPPED IRON MARKERS OR APPROPRIATE MONUMENTATION AFTER THE CONSTRUCTION OF THE ROAD IS COMPLETE.
3. ALL UTILITIES MUST BE UNDERGROUND, INCLUDING UTILITIES EXTENDED ONTO THE SITE FROM EXISTING POLES NEAR THE SITE. HOWEVER, IF THE ONLY POLE NEARBY IS ACROSS THE STREET, ONE ADDITIONAL POLE MAY BE PLACED ON/NEAR THE PROPERTY TO ALLOW FOR OVERHEAD EXTENSION OF WIRES ACCESS THE STREET. UTILITIES EXTENDED FROM ANY SUCH NEW POLE MUST BE UNDERGROUND. THE APPLICANT MAY WORK WITH THE CITY STAFF AS APPROPRIATE TO ADDRESS THIS REQUIREMENT.
4. AN ORANGE CONSTRUCTION FENCE MUST BE PLACED ON ALL LOTS THAT INCLUDES WETLAND BUFFERS PRIOR TO START OF CONSTRUCTION FOR ALL LOTS THAT CONTAIN WETLAND BUFFERS.
5. THE SIGHT DISTANCE AT THE ENTRANCE TO THE SUBDIVISION WILL BE ADEQUATE. NO IMPEDIMENT IS CREATED BY THE ALIGNMENT OR GRADE OF FREEDOM DRIVE OR THE GRADE PROPOSED ENTRANCE.
6. THE INFILTRATION BASINS SHALL BE INSPECTED PRIOR TO ROADWAY ACCEPTANCE. ANY EROSION SHALL BE FIXED AND ANY SEDIMENT SHALL BE REMOVED AND VEGETATION REESTABLISHED ON THE INFILTRATION BASIN BOTTOM. THE INFILTRATION BASIN BOTTOM SHALL BE AT DESIGN ELEVATION AS SPECIFIED IN THE DETAILS ON SHEET C-3 AND C-9 OF THIS PLAN SET.
7. LOAM STOCKPILES SHALL BE SEEDED IN ACCORDANCE WITH THE SEEDING NOTES ON SHEET C-12. IF STORED MORE THAN 30 DAYS. SILT FENCE SHALL BE INSTALLED AT THE DOWN GRADIENT SIDE OF THE LOAM STOCKPILE AS SHOWN IN THE PLAN VIEW AROUND AT LEAST ONE HALF THE CIRCUMFERENCE OF THE PILE.
8. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
9. THE CITY RESERVES THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES IF ANY OFF SITE IMPACTS ARE FOUND DURING CONSTRUCTION.
10. PRIOR TO ISSUANCE OF ANY BUILDING PERMIT FOR THIS SUBDIVISION, THE DEVELOPER SHALL POST:
    A.) CONSTRUCTION ZONE SIGNS PER THE MANUAL OF UNIFORMED TRAFFIC CONTROL DEVICES STANDARDS.
    B.) A STREET ACCEPTANCE SIGN AT THE ENTRANCE WHICH READS "POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOU OWN RISK (PER THE ORDER OF PLANNING BOARD)" THE LOCATION AND DESIGN OF THIS SIGN SHALL BE AS STIPULATED BY THE PUBLIC WORKS DEPARTMENT, BUT IN NO CASE SHALL IT BE LESS THAN 2'X4' AND IT SHALL BE ERECTED PRIOR TO ISSUANCE OF ANY BUILDING PERMIT.
11. FOR MORE INFORMATION ABOUT THIS SUBDIVISION, CONTACT THE CITY OF ROCHESTER PLANNING DEPARTMENT; 31 WAKEFIELD STREET, ROCHESTER, 03867, (603) 335-1338.
12. ACCESS INTO THE SITE FOR FIRE APPARATUS MUST BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PROCESS. THIS IS THE SOLE RESPONSIBILITY OF THE APPLICANT/DEVELOPER TO MAINTAIN THIS ACCESS. PLEASE CONTACT THE FIRE DEPARTMENT AT (603) 330-7182 WITH ANY QUESTIONS ABOUT ACCESS REQUIREMENTS.
13. BUFFER MARKERS MUST BE INSTALLED ALONG THE OUTER EDGE OF THE WETLAND BUFFER ON ALL LOTS THAT CONTAIN A WETLAND BUFFER. THE MARKER MUST BE INSTALLED AT THE TIME THAT THE ORANGE CONSTRUCTION FENCE IS REMOVED. THE MARKER MUST BE IN PLACE IN ORDER FOR THE CERTIFICATE OF OCCUPANCY FOR THAT LOT TO BE ISSUED.
14. THIS DEVELOPMENT MUST BE IN COMPLIANCE WITH ALL APPLICABLE LAW - INCLUDING ALL PERTINENT PROVISIONS OF THE CITY OF ROCHESTER SUBDIVISION REGULATIONS - UNLESS OTHERWISE WAIVED."
15. ALL ROADWAY SIGNS SHALL BE INSTALLED AT THE DEVELOPER'S EXPENSE.





SCALE 1"= 50' (HORIZ.)
1"= 5' (VERT.)

DIG SAFE
1-888-344-7233 CALL TOLL FREE

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

FILE NO. 166
PLAN NO.C-3043
DWG. NO.19138/S-1
F.B. NO. "33" "CEK"

ROAD PLAN AND PROFILE
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

C-1

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

2 Continental Blvd., Rochester, N.H. 603-335-3948

Drawing Location: M:\2019\19138\DWGS\19138 S-1.dwg
Thu, 02 Apr 2020 - 6:11pm

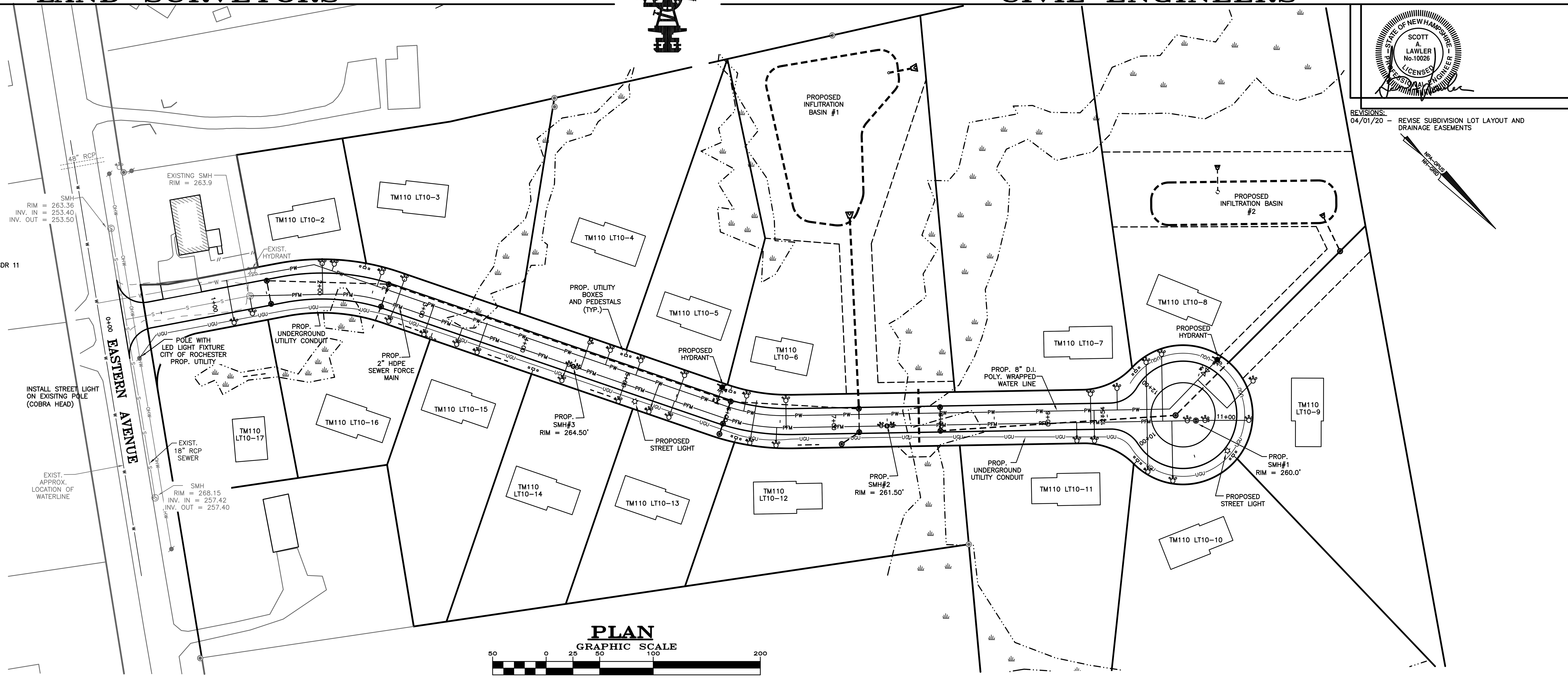
LEGEND

- PROPERTY LINE
- JURISDICTIONAL WETLANDS
- EXISTING OVERHEAD WIRES
- EXISTING WATER MAIN
- EXISTING GRAVITY SEWER MAIN
- EXISTING SEWER FORCE MAIN
- EXISTING UNDERGROUND ELECTRIC WIRES
- EXISTING UNDERGROUND UTILITY WIRES
- EXISTING GAS PIPE
- EXISTING DRAIN LINE
- EXISTING HYDRANT
- EXISTING WATER GATE OR SHUT-OFF VALVE
- EXISTING UTILITY POLE
- EXISTING SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING LIGHT POLES
- PROPOSED DRAIN LINE
- PROPOSED WATER SERVICE
- PROPOSED SEWER LINE
- PROPOSED SEWER FORCE MAIN PIPE HDPE SDR 11
- PROPOSED PROPANE GAS LINE
- PROPOSED UNDERGROUND UTILITY WIRES
- PROPOSED HYDRANT
- PROPOSED WATER VALVE
- PROPOSED WATER SHUT-OFF VALVE
- PROPOSED SEWER SHUT-OFF VALVE
- PROPOSED UTILITY POLE
- PROPOSED SEWER MANHOLE
- PROPOSED DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED LIGHT POLES
- PROPOSED BUILDING LIGHT FIXTURES

SCOTT A. LAWLER No.10026 LICENSED PROFESSIONAL ENGINEER — STATE OF NEW HAMPSHIRE

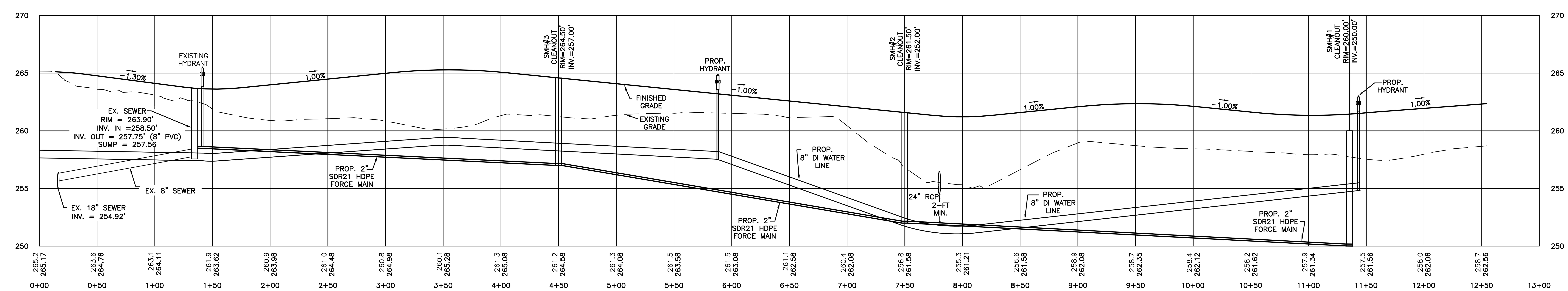
REVISIONS:
04/01/20 – REVISE SUBDIVISION LOT LAYOUT AND DRAINAGE EASEMENTS

DIG SAFE
1-888-344-7233 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM



GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 INCH = 50 FT.

NOTES:
1) CONSTRUCTION WILL CONFORM TO THE FOLLOWING UTILITIES STANDARDS AND SPECIFICATION:
   A) SANITARY SEWER DISPOSAL – NHDES
   B) ELECTRIC DISTRIBUTION – EVERSOURCE
   C) TELEPHONE – FAIRPOINT
   D) CABLE – ATLANTIC BROADBAND
   E) WATER – CITY OF ROCHESTER, STANDARDS
2) ALL PROPOSED ON-SITE UTILITIES SHALL BE INSTALLED UNDERGROUND.
3) ALL WATER SHUT-OFF VALVES SHALL BE PAINTED BLUE AND STAMPED "WATER".
4) ALL SEWER SHUT-OFF VALVE SHALL BE PAINTED GREEN AND STAMPED "SEWER".



SCALE 1"= 50' (HORIZ.)
1"= 5' (VERT.)

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UTILITY PLAN & PROFILE
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

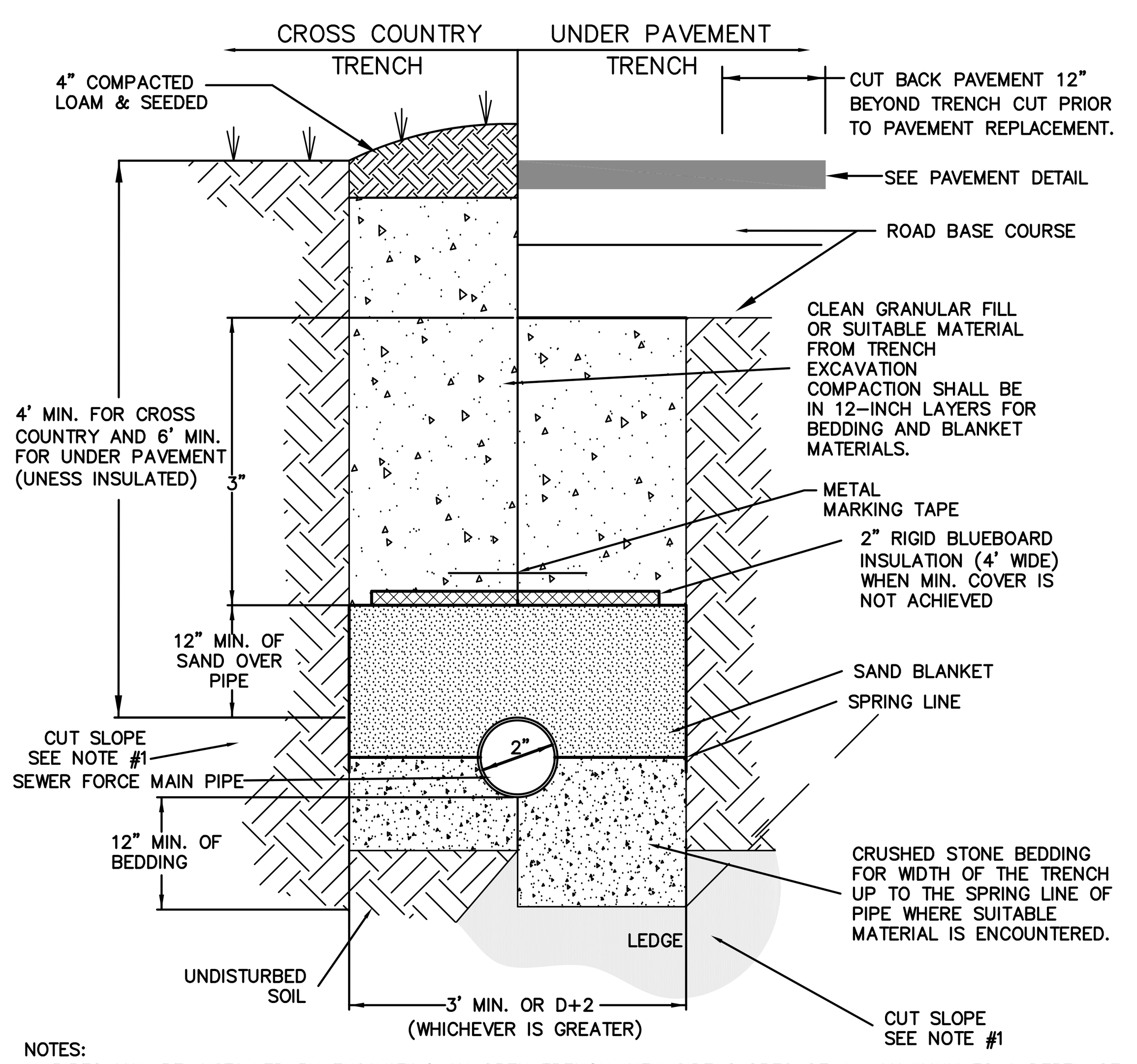
PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.
MARCH 2020

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

C-2

STATE OF NEW HAMPSHIRE SCOTT A. LAWLER No.10026 LICENSED PROFESSIONAL ENGINEER

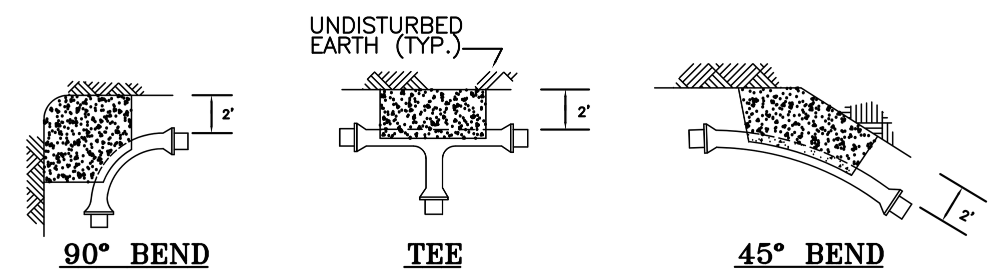
REVISIONS:
04/01/20 – REVISE NOTES AND SEWER CURB STOP DETAIL. ADD PUMP INFORMATION.



NOTES:
1. PIPES MAY BE INSTALLED BY EXCAVATING AN OPEN TRENCH WITH SIDE SLOPES OF 1:1 MAXIMUM TO A DEPTH OF 4–FT. INTALLATIONS DEEPER THAN 4–FT REQUIRE THE USE OF A TRENCH BOX.
2. PIPE MATERIALS SHALL BE AS SPECIFIED ON THE DESIGN PLAN.
3. HDPE PRESSURE MAIN PIPE SECTIONS SHALL BE JOINED BY THERMAL HEAT FUSION. CONNECTIONS OR TRANSITIONS TO NON–HDPE COMPONENTS SHALL BE MADE WITH FITTINGS APPROVED FOR HDPE CONNECTIONS. THE WELDING TECHNICIAN SHALL BE EXPERIENCED IN HDPE HEAT FUSION WELDING WITH MINIMUM OF 500 HOURS OF WELDING EXPERIENCE.
4. SAND BLANKET MAY BE OMITTED FOR REINFORCED CONCRETE PIPE.
5. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, THE SHEETING SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE AND AT LEAST 3 FEET BELOW FINISHED GRADE.
6. THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100 PERCENT PASSES A ½–INCH SIEVE AND A MAXIMUM OF 15 PERCENT PASSES A #200 SIEVE.
7. TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING:
(1) DEBRIS;
(2) PIECES OF PAVEMENT;
(3) ORGANIC MATTER;
(4) TOP SOIL;
(5) WET OR SOFT MUCK;
(6) PEAT OR CLAY;
(7) EXCAVATED LEDGE MATERIAL;
(8) ROCKS OVER 6 INCHES IN THE LARGEST DIMENSION; AND
(9) ANY MATERIAL NOT APPROVED BY THE ENGINEER.

FORCE MAIN SEWER PIPE TRENCH INSTALLATION DETAIL

NOT TO SCALE

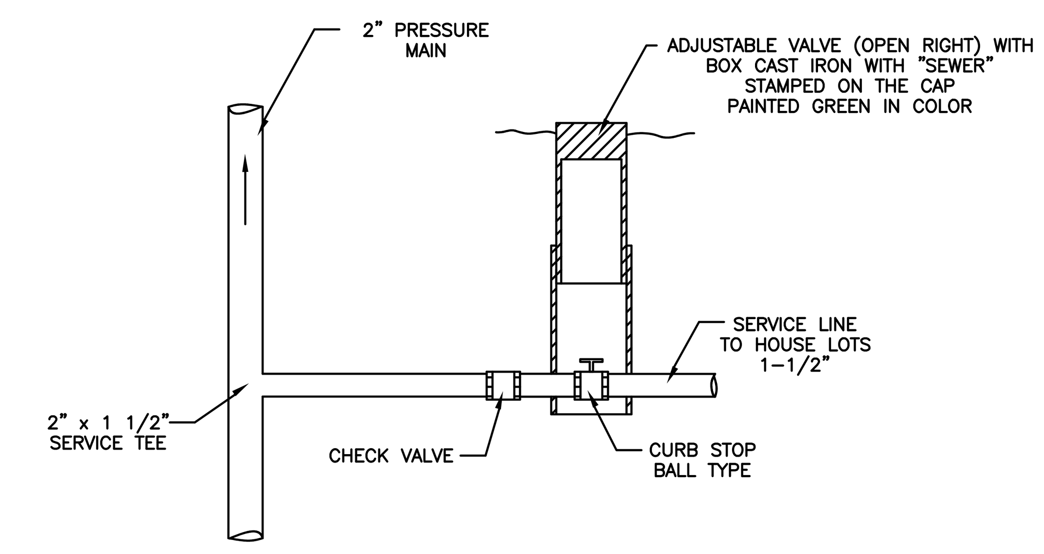


MINIMUN THRUST BLOCK BEARING AREA REQ'D AGAINST UNDISTURBED MATERIAL (SQ. FT.)					
PIPE SIZE	90 BEND	TEE	PLUG	45 BEND	22 1/2"& SMALLER
2"	5	4	3	2	2

NOTE: SIZE OF THRUST BLOCKS MAY BE INCREASED BY THE ENGINEER TO MEET SOIL CONDITIONS FOUND DURING CONSTRUCTION.

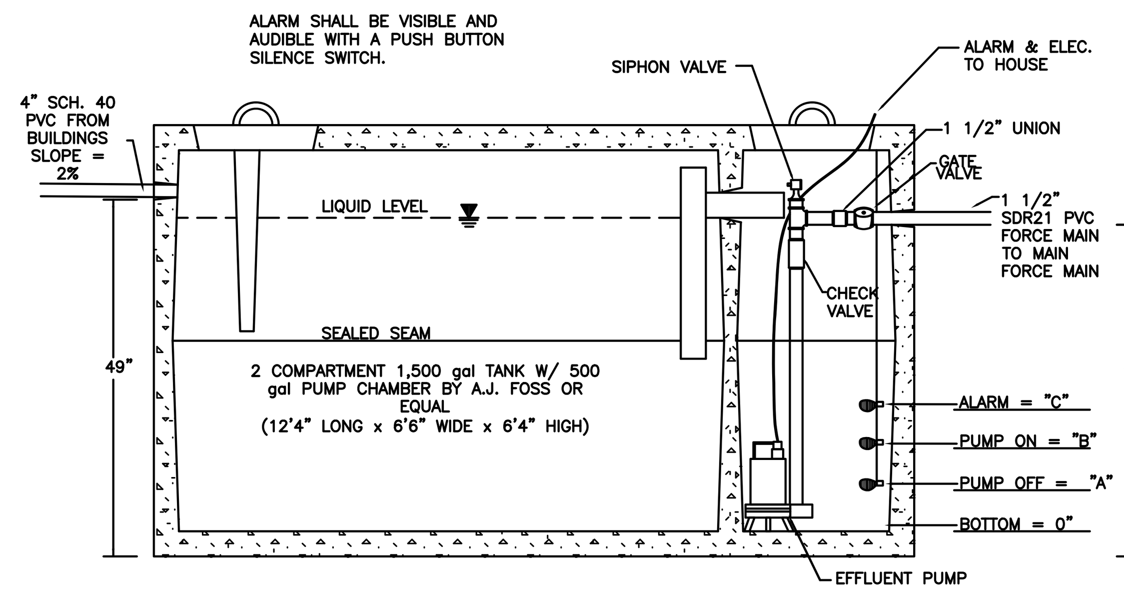
SEWER MAIN THRUST BLOCK DETAILS

NOT TO SCALE



PUMP DISCHARGE LINE CONNECTION TO MAIN DETAIL

NOT TO SCALE

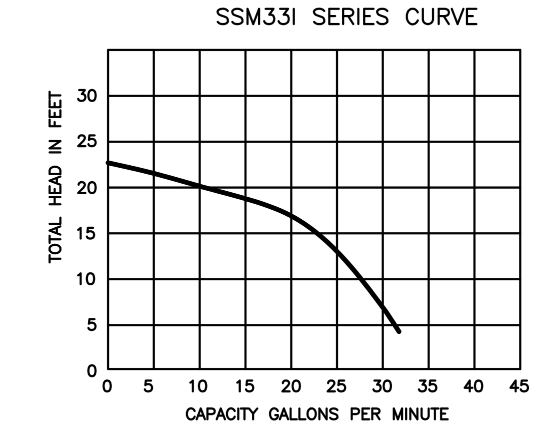


SEPTIC TANK & PUMP DETAIL

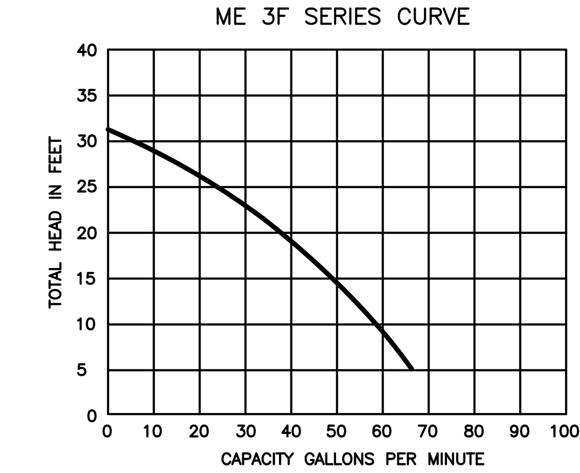
NOT TO SCALE

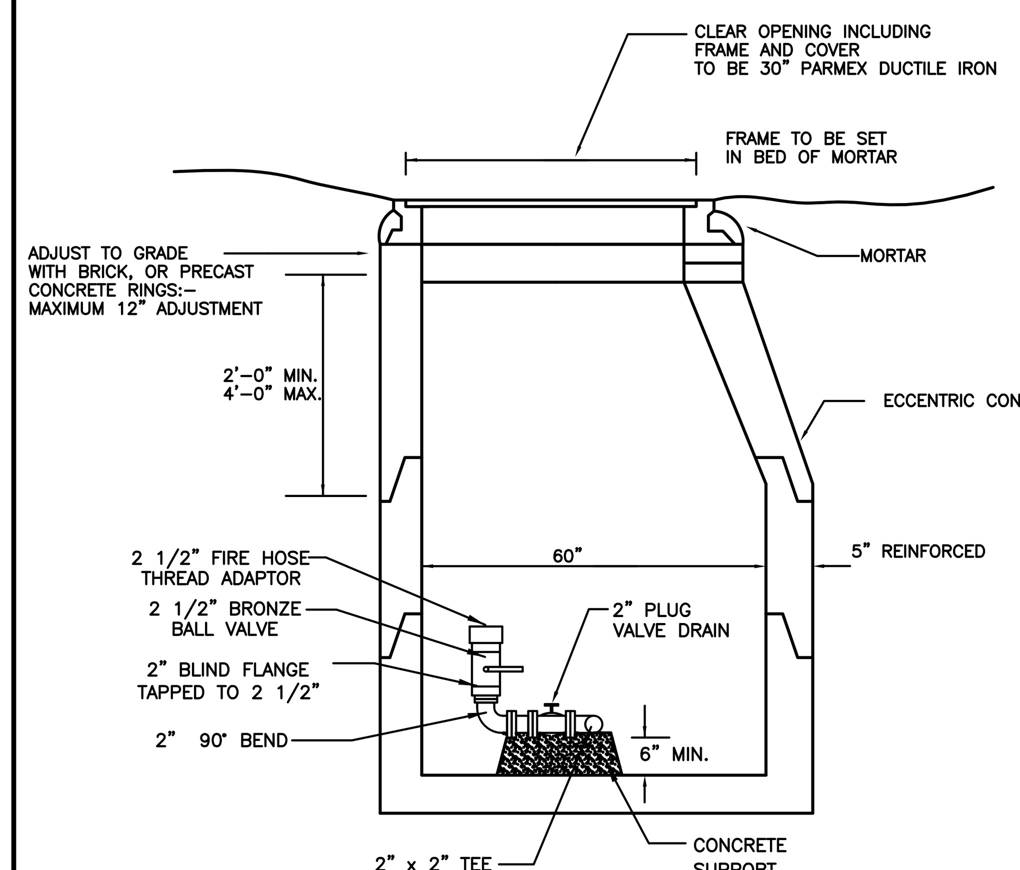
NOTES:
1. INSTALL 2" PVC VENT FROM THE PUMP CHAMBER TO THE HOUSE.
2. INSTALL THE GATE VALVE ON A 45 DEGREE FROM VERTICAL.
3. ALL PUMPING SYSTEMS ELCTRICAL COMPONENTS SHALL COMPLY WITH NEC AND NFPA REQUIREMENTS AND MEET ALL CITY OF ROCHESTER REQUIREMENTS.
4. PUMPS SHALL BE SIZED TO PROVIDE A MINIMUM VELOCITY WITHIN ALL OF THE FORCE MAIN PIPES OF 2 FEET PER SECOND.
5. THE CONTRACTOR SHALL PROVIDE ENGINEERED PUMP SPECIFICATIONS AND SEPTIC TANK SIZING TO THE ROCHESTER DEPARTMENT OF PUBLIC WORKS FOR APPROVAL PRIOR TO INSTALLATION.

SSM33I SERIES CURVE

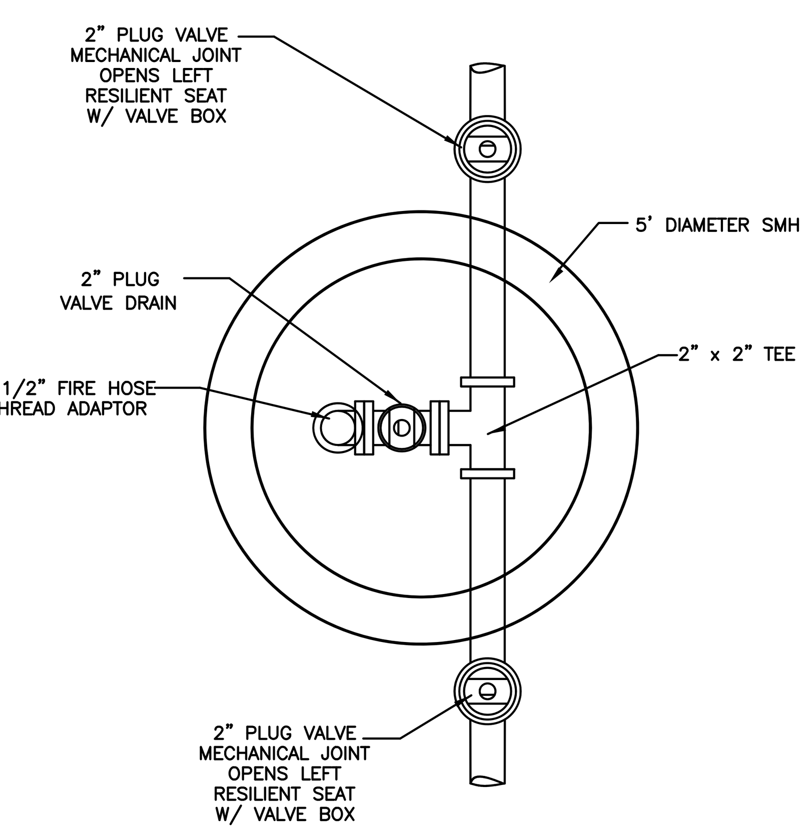


ME 3F SERIES CURVE





ELEVATION VIEW



PLAN VIEW

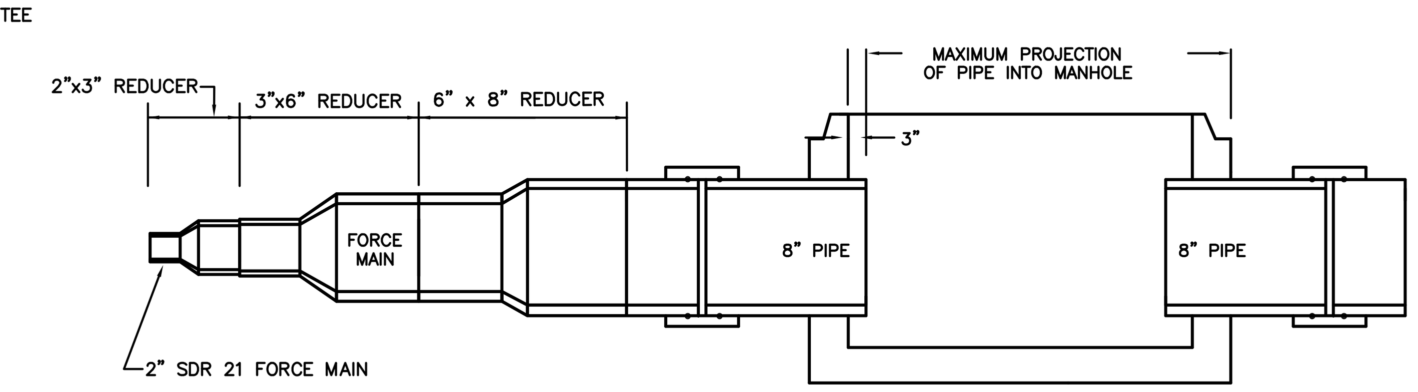
CLEANOUT MANHOLE DETAIL

NOT TO SCALE

MORTAR USED IN MANHOLE CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING:
MORTAR SHALL BE COMPOSED OF TYPE II PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION.
PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE AS SHOWN BELOW;

HYDRATED LIME	SAND	TYPE II PORTLAND CEMENT
NONE	4.5 PARTS	1.5 PARTS
0.5 PARTS	4.5 PARTS	1 PART

CEMENT SHALL BE TYPE II PORTLAND CEMENT THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C150/C150M STANDARD IN EFFECT AT THE TIME THE CEMENT WAS MANUFACTURED.
HYDRATED LIME SHALL BE TYPE S THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C207 STANDARD IN EFFECT AT THE TIME THE HYDRATED LIME WAS PROCESSED.
SAND SHALL CONSIST OF INERT NATURAL SAND THAT IS CERTIFIED BY ITS SUPPLIER AS CONFORMING TO THE ASTM C33 STANDARD IN EFFECT AT THE TIME THE SAND IS PROCESSED BY "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES"



SEWER MANHOLE CONNECTION

NOT TO SCALE

NOTES:
1. THE FLUSHING MANHOLE CONSTRUCTION SHALL MEET ALL DESIGN REQUIREMENTS OF A SANITARY MANHOLES. SEE NOTES THIS SHEET.
2. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARREL SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER–TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC–LIKE SEALANT.
3. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
   (1) ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
   (2) CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
   (3) ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
   (4) NON–SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
4. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP–PROOFING COATING.
5. PRECAST BASES SHALL BE PLACED ON A 6–INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO THE ASTM C33/C33M NO. 67 STONE STANDARD IN EFFECT WHEN THE STONE IS PROCESSED BY THE MANUFACTURER, AVAILABLE AS NOTED IN APPENDIX D. THE EXCAVATION SHALL BE DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING THE BASE OR POURING CONCRETE.
6. CONCRETE FOR MANHOLES AND CONCRETE GRADE RINGS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AA CONCRETE IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATIONS "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
7. REINFORCING FOR CONCRETE MANHOLES AND CONCRETE GRADE RINGS SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
8. PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL BE CERTIFIED BY THEIR MANUFACTURER(S) AS CONFORMING TO THE ASTM C478 STANDARD IN EFFECT AT THE TIME THE BARREL SECTIONS, CONES, AND BASES ARE MANUFACTURED.
9. FOR THE POWER SOURCE FOR THE ALARM SYSTEM SHALL BE THE MAIN LINE POWER WITH A BACK UP BATTERY SYSTEM, WHICH SHALL BE CONNECTED AUTOMATICALLY SHOULD MAIN POWER FAILURE.
10. A CONNECTION FOR A PORTABLE GENERATOR HOOK–UP SHALL BE PROVIDED FOR EACH HOUSE LOT.

NOTES:
1. IT IS INTENTION OF THE CITY OF ROCHESTER PUBLIC WORKS DEPARTMENT THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAK PROOF QUALITIES CONSIDERED NECESSARY BY THE PUBLIC WORKS DEPARTMENT FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS, WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH OR WITHOUT REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED CONCRETE.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
4. VACUUM LEAKAGE TESTING (ASTM C1244) SHALL BE PERFORMED FOR ALL MANHOLES, LOW–PRESSURE AIR TESTING (ASTM F1417) AND DEFELECTION TRETING USING A 'GO/NO GO' MANDREL FOR ALL SANITARY SEWERS, IN ACCORDANCE WITH THE NHDES SEWER REGULATIONS AND THE CITY OF ROCHESTER DEPARTMENT OF PUBLIC WORKS REQUIREMENTS.
5. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. BRICK MASONRY CONFORM WITH ASTM C32. INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETED
6. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30–INCH CLEAR OPENING. A 3–INCH (MINIMUM HEIGHT) LETTER "SEWER" FOR SEWERS OR "DRAIN" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
SEWER MANHOLE FRAME AND COVER: PAMREX 32" D.I. MANHOLE FRAME AND COVER SEWER – E.J.PRESCOTT PRODUCT# 62113–32–S. IMMEDIATELY FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN, OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.
7. BEDDING: MIN. 6" OF 3/4" CRUSHED STONE (12" IN LEDGE) FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33:
   100% PASSING 1 INCH SCREEN
   90–100% PASSING 3/4 INCH SCREEN
   20–55% PASSING 3/8 INCH SCREEN
   0–10% PASSING #4 SIEVE
   0–5% PASSING #8 SIEVE
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, CRUSHED STONE MIN. 3/4" SHALL BE USED.
8. CONCRETE FOR DROP SUPPORT SHALL CONFORM TO THE REQUIREMENT FOR CLASS A (3000#) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE: 1 INCH.
9. FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:
   RCP & CI PIPE – ALL SIZES – 48"
   AC & VC PIPE – UP THROUGH 12" DIA. – 18" SEE NOTE 9.A.
   AC & VC PIPE – LARGER THAN 12" DIA. – 36"
   DI PIPE– NONE REQUIRED
   PVC (ASTM 3034) – UP THROUGH 15" DIA. – NONE REQUIRED
   PVC (ASTM F 679) –LARGER THAN 15" DIA. – 48" TO 60"
   PVC (ASTM F 789) – ALL SIZES – 48" TO 60"
   9. UNDER SEVERE CONDITIONS WHEN DIFFERENTIAL SETTING CANNOT BE CONTROLLED WITHIN NORMAL LIMITS, VARIATIONS IN THE STUB LENGTH MAY BE NECESSARY. OTHER PLASTIC PIPES SHALL BE REVIEWED ON A CASE BY CASE BASIS.
10. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.
11. MANHOLE STEPS SHALL NOT BE PROVIDED WITHIN THE MANHOLES AS DIRECTED BY THE CITY OF ROCHESTER.
12. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 4 INCHES.
13. PIPE AND JOINT MATERIALS P.V.C. (POLY VINYL CHLORIDE) PIPE: ALL P.V.C. PIPE AND FITTINGS SHALL CONFORM TO THE MOST RECENT REQUIREMENTS OF ASTM SPECIFICATIONS FOR TYPE PSM POLY VINYL CHLORIDE (P.V.C.) SEWER PIPE AND FITTINGS, DESIGNATION D–3034 AND ASTM SPECIFICATIONS FOR SEWER PIPE, JOINTS USING ELASTOMERIC SEALS, DESIGNATION D–3212. MANUFACTURER'S CERTIFICATE OF COMPLIANCE SHALL BE FURNISHED TO THE ENGINEER, PRIOR TO INSTALLATION METHODS OF SHIPPING AND STORAGE ON SITE SHALL BE SUCH AS TO AVOID INJURY TO THE PIPE. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB. MINIMUM "PIPE STIFFNESS" (F/Y) AT 7 1/2° DEFLECTION SHALL BE 45 PSI FOR SIZE WHEN TESTED IN ACCORDANCE WITH ASTM METHODS OF TEST D–2412, "EXTERNAL LOADING PROPERTIES OF PLASTIC PIPE BY PARALLEL – PLATE LOADING." ALL P.V.C. PIPE SHALL BE TYPE SDR–35 (A MEASURE OF THICKNESS AND RIGIDITY) AND SHALL HAVE ELASTOMERIC GASKET JOINTS. SOLVENT CEMENT JOINTS SHALL NOT BE ALLOWED. P.V.C. USED FOR FORCE MAINS SHALL CONFORM TO ASTM D–2241 AND D–1784 (CLASS 1254–B). A SAFETY FACTOR OF 2.5 SHALL BE USED FOR PRESSURE RATING DETERMINATION WITH A STANDARD DIMENSION RATIO (SDR) NO HIGHER THAN 21.
14. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE
15. JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIAL USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.
16. TEES OR WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS INSTRUCTIONS USING A BOLTED, CLAMPED, OR EPOXY–CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER. DOES (NOT APPLY TO INSTALLATIONS WHERE TEES & WYES ARE USED.)
17. PIPE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED, AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AS SPECIFIED IN NOTE 10. BEDDING AND RE–FILL FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH THE APPROPRIATE MECHANICAL DEVICES. THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
18. TESTING. THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS (PRIOR TO BACKFILLING)
   A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND, WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.
   C. DRY FLUORESCENCE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWNSTREAM MANHOLE. LEAKAGE OBSERVED IN ANY OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON–ACCEPTANCE AND THE PIPE SHALL BE DUG–UP IF NECESSARY AND RE–LAID SO AS TO ASSURE WATER–TIGHTNESS.
19. ILLEGAL CONNECTION: NOTHING BUT SANITARY WASTE FLOW FROM THE HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS OR SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE, OR GROUND WATER, SHALL NOT BE PERMITTED.
20. HOUSE AND WATER SERVICE SHOULD NOT BE LAID IN THE SAME TRENCH AS SEWER SERVICE, BUT WHEN NECESSARY, SHALL BE PLACED ABOVE AND TO THE SIDE OF THE HOUSE SEWER AS SHOWN.
21. BEDDING: MIN. 3/4" CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33.6
   100% PASSING 1 INCH SCREEN
   90–100% PASSING 3/4 INCH SCREEN
   20–55% PASSING 3/8 INCH SCREEN
   0–10% PASSING #4 SIEVE
   0–5% PASSING #8 SIEVE
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, MIN. 3/4" CRUSHED STONE SHALL BE USED.
22. LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY": DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.
23. CONCRETE: CONCRETE SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI.) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WATER WORKS AND HIGHWAYS STANDARD SPECIFICATIONS AS FOLLOWS:
   CEMENT: 6.0 BAGS/C.Y.
   WATER: 5.75 GALLONS/BAG OF CEMENT
   AGGREGATE: 11/2" MAX.
24. CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4', A CHIMNEY SHALL BE CONSTRUCTED FOR THE HOUSE CONNECTION. 25– ALL DRAINAGE AND SEWER STRUCTURES INCLUDING FRAMES AND GRATES SHALL BE H–20 LOADING. 26– ALL SEWER CONSTRUCTION SHALL BE CONSTRUCTED TO NHDES AND THE CITY OF ROCHESTER STANDARDS & SPECIFICATIONS
27. HORIZONTAL JOINTS: BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE COMMISSION, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATER TIGHTNESS UPON AN ELASTOMERIC OR MASTIC–LIKE GASKET.
28. PIPE TO MANHOLE JOINTS: SHALL BE ONLY AS APPROVED BY THE COMMISSION AND IN GENERAL, WILL DEPEND FOR WATER TIGHTNESS UPON EITHER AN APPROVED NON–SHRINKING MORTAR OR ELASTOMERIC SEALANT.
29. FOR BITUMASTIC TYPE JOINTS: THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY APPROVED BITUMASTIC SEALANTS: RAM–NEK KENT SEAL NO.2 EZ
30. THE CONTRACTOR SHALL NOTIFY DIG–SAFE 1–888–344–7233 PRIOR TO CONSTRUCTION.

LOW PRESSURE SEWER & SEPTIC TANK DETAILS

TAX MAP 110, LOT 10–00 & LOTS 10–2 THRU 10–18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS LLC.

MARCH 2020

C-7

FILE NO. 166
PLAN NO.C–3043
DWG. NO. 19138/S–1
F.B. NO. "33" "CEK"

LAND SURVEYORS — CIVIL ENGINEERS

LEGEND

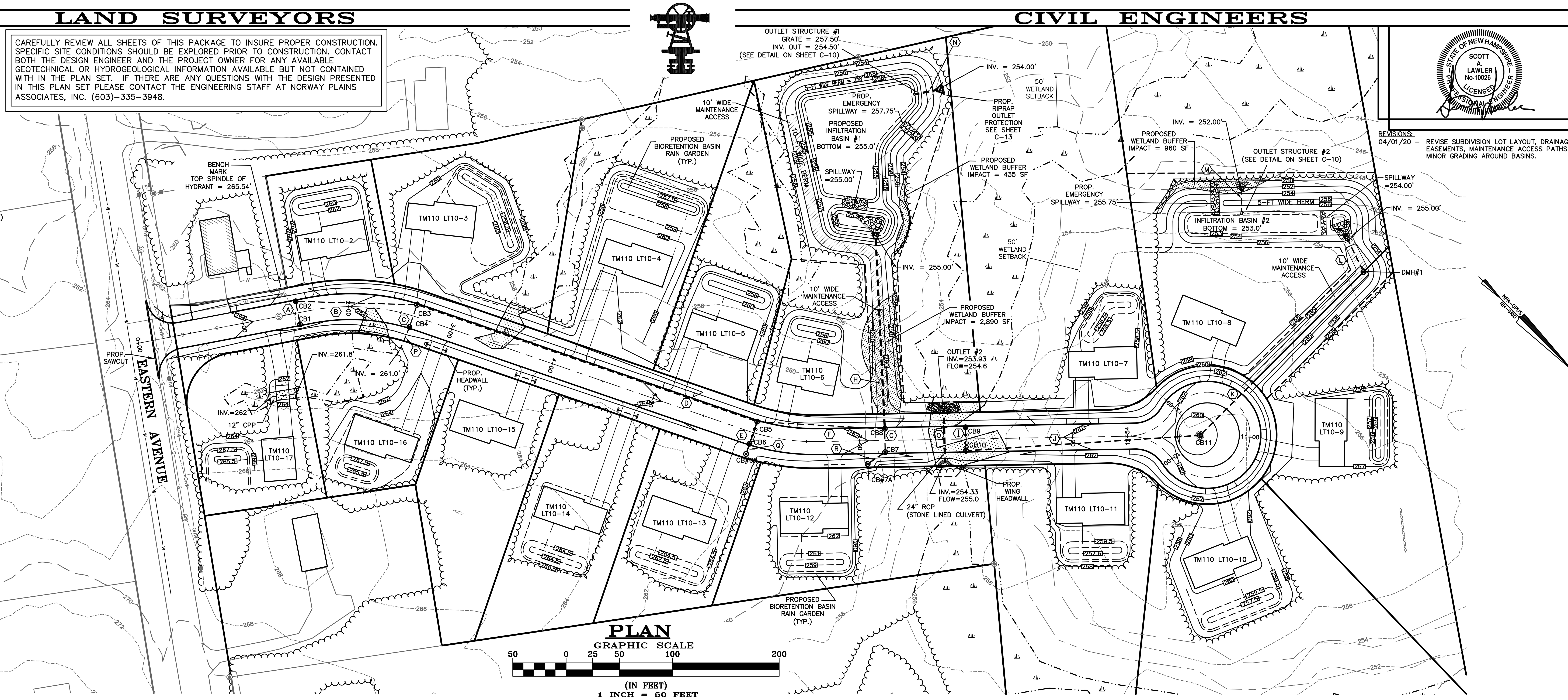
	PROPERTY LINE
	JURISDICTIONAL WETLANDS
	EXISTING TREE LINE
	EXISTING DRAIN LINE
232	EXISTING CONTOUR LINE
TP #8	EXISTING TEST PIT
E234.1'	EXISTING SPOT GRADE
P234.25'	PROPOSED SPOT GRADE
	PROPOSED TREE LINE
	PROPOSED DRAIN LINE
232	PROPOSED CONTOUR LINE
	PROPOSED CATCH BASIN
	PROPOSED FLARED END SECTION (FES)
CPP	CORRUGATED POLYETHINE PIPE
RCP	REINFORCE CONCRETE PIPE
CB	CATCH BASIN
PSGC	SLOPE GRANITE CURB
	PROPOSED OUTLET PROTECTION
	PROPOSED HOUSE

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

NOTES:
1. LOTS 10-2 THRU 10-7 AND LOTS 10-9 THRU 10-14 AND LOT 10-16 AND 10-17 HOUSES ROOF RUNOFF DIRECTED TO BIORETENTION BASIN BY GUTTER OR DRIP EDGE.
2. BASINS AND SWALE SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
3. TEMPORARY WATER DIVERSION (SWALE AND BASINS) MUST BE USED AS NECESSARY UNTIL AREA ARE STABILIZED.
4. WETLAND BUFFERS LINES BY SURVEY LOCATED AND MARKED WITH ORANGE SNOW FENCE PRIOR TO ANY ONSITE ACTIVITY.
5. THE INNER 25-FOOT WETLAND BUFFER SHALL BE POSED WITH WETLAND CONSERVATION TAGS EVERY 100-FEET. TAGS ARE AVAILABLE FOR PURCAHSE FROM THE PLANNING DEPARTMENT.

SCOTT A. LAWLER No.10026 — STATE OF NEW HAMPSHIRE — LICENSED PROFESSIONAL ENGINEER

REVISIONS:
04/01/20 – REVISE SUBDIVISION LOT LAYOUT, DRAINAGE EASEMENTS, MAINTENANCE ACCESS PATHS AND MINOR GRADING AROUND BASINS.



PLAN

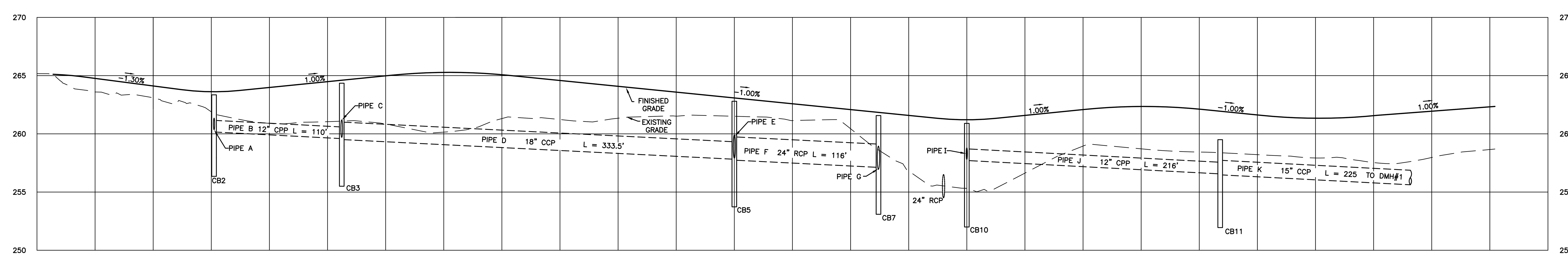
GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 INCH = 50 FEET

PROPOSED RAIN GARDEN

LOT	BOTTOM	BERM
LOT 10-2	260.0	262.0'
LOT 10-3	258.5'	260.5'
LOT 10-4	257.0'	259.0'
LOT 10-5	258.0'	260.0'
LOT 10-6	258.0'	260.0'
LOT 10-7	256.5'	258.5'
LOT 10-9	255.5'	257.5'
LOT 10-10	257.5'	259.5'
LOT 10-11	257.6'	259.5'
LOT 10-12	259.0'	261.0'
LOT 10-13	262.5'	264.5'
LOT 10-14	264.5'	266.5'
LOT 10-16	265.5'	267.5'
LOT 10-17	265.5'	267.5'



	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	7+50	8+00	8+50	9+00	9+50	10+00	10+50	11+00	11+50	12+00	12+50	13+00
Existing	265.2	263.6	263.1	261.9	260.9	261.0	260.8	260.1	261.3	261.2	261.3	261.5	261.5	261.1	260.4	256.8	255.3	256.6	258.9	258.7	258.4	258.2	257.9	257.5	258.0	258.7	
Finished	265.17	264.76	264.11	263.62	263.98	264.48	264.98	265.28	265.08	264.58	264.08	263.58	263.08	262.58	262.08	261.58	261.21	261.58	262.08	262.35	262.12	261.62	261.34	261.56	262.06	262.56	

PROFILE

SCALE 1" = 50' (HORIZ.) 1" = 5' (VERT.)

DIG SAFE — UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM — ME-NH-VT-MA 1-888-344-7233 CALL TOLL FREE

PROPOSED DRAINAGE STRUCTURES

(1) CB#1 4'Ø
STA. 1+52.38 R
RIM = 263.35'
INV. = 260.35' TO CB#2
SUMP = 256.35'

(2) CB#2 4'Ø
STA. 1+52.38 L
RIM = 263.35'
INV. IN = 260.25' FROM CB#2
INV. OUT = 260.15' TO CB#3
SUMP = 256.15'

(3) CB#3 4'Ø
STA. 2+62.23 L
RIM=264.35'
INV. IN = 259.60' FROM CB#2
INV. IN = 259.70' FROM CB#4
INV. OUT = 259.50' TO CB#5
SUMP = 255.50'

(4) CB#4 4'Ø
STA. 2+62.23 R
RIM = 264.35'
INV. IN = 259.90' FROM PIPE P
INV. OUT = 259.80' TO CB#3
(WITH ELIMINATOR)
SUMP = 255.80'

(5) CB#5 4'Ø
STA. 6+00 L
RIM = 262.80'
INV. IN = 257.83' FROM CB#3
INV. IN = 257.91' FROM CB#6
INV. OUT = 257.73' TO CB#7
SUMP = 253.73'

(6) CB#6 4'Ø
STA. 6+00 R
RIM = 262.80'
INV. IN = 258.10' FROM CB#6A
INV. OUT = 258.00' TO CB#5
(WITH ELIMINATOR)
SUMP = 255.80'

(6A) CB#6A 4'Ø
RIM = 260.20' (BEE HIVE GRATE)
INV. OUT = 258.15' TO CB#6
(WITH ELIMINATOR)
SUMP = 254.15'
L = 5' (PIPE Q) 18" CPP

(7) CB#7 4'Ø
STA. 7+24 R
RIM = 261.57'
INV. IN = 257.13' FROM CB#7A
INV. OUT = 257.03' TO CB#8
SUMP = 253.03'

(7A) CB#7A 4'ø
RIM = 259.0' (BEE HIVE GRATE)
INV. OUT = 257.22' TO CB#7 ELIMINATOR
SUMP = 257.22'
L = 16' (PIPE R) 15" CPP

(8) CB#8 4'Ø
STA. 7+24 L
RIM = 261.57'
INV. IN = 257.13' FROM CB#5
INV. IN = 256.94' FROM CB#7
INV. OUT = 256.84' TO FOREBAY
(WITH ELIMINATOR)
SUMP = 252.84'

(9) CB#9 4'Ø
STA. 8+00 L
RIM = 260.90'
INV. OUT = 257.90' TO CB#10
SUMP = 253.90'

(10) CB#10 4'Ø
STA. 8+00 R
RIM = 260.90'
INV. IN = 257.80' FROM CB#9
INV. OUT = 257.70' TO CB#11
SUMP = 253.70'

(11) CB#11 4'Ø
LOW POINT IN CUL-DE-SAC
RIM = 259.50' (BEE HIVE GRATE)
INV. IN = 256.57' FROM CB#10
INV. OUT = 256.47' TO DMH#1
(WITH ELIMINATOR)
SUMP = 252.47'

(12) DMH#1 4'Ø
RIM = 260.00'
INV. IN = 255.30' FROM CB#10
INV. OUT = 255.20' TO FOREBAY

PROPOSED DRAINAGE PIPES

(A) PROP. PIPE A	12" RCP	L =18.0'	
(B) PROP. PIPE B	12" CPP	L = 110.0'	
(C) PROP. PIPE C	18" CPP	L = 18.0'	
(D) PROP. PIPE D	18" CPP	L = 333.5'	
(E) PROP. PIPE E	24" CPP	L =18.0'	
(F) PROP. PIPE F	24" RCP	L = 116.0'	
(G) PROP. PIPE G	18" CPP	L = 18.0'	
(H) PROP. PIPE H	24" CPP	L = 176.0'	
(I) PROP. PIPE I	12" RCP	L =18.0'	
(J) PROP. PIPE J	12" CPP	L = 216.0'	
(K) PROP. PIPE K	15" CPP	L = 213.0'	
(L) PROP. PIPE L	15" CPP	L = 33'	
(M) PROP. PIPE M	12" CPP	L = 20.0'	ANTI-SEEP COLLAR
(N) PROP. PIPE N	12" CPP	L = 20.0'	ANTI-SEEP COLLAR
(O) PROP. PIPE O	24" RCP	L = 50.0'	
(P) PROP. PIPE P	12" CPP	L = 20.0'	
(Q) PROP. PIPE Q	15" CPP	L = 8.0'	
(R) PROP. PIPE R	15" CPP	L = 16.0'	

GRADING & DRAINAGE PLAN & PROFILE
TAX MAP 110, LOT 10-00, LOTS 10-2 THRU LOT 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:

GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

C-3

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

31 Mooney Street, Alton, N.H. 603-875-3948

NORWAY PLAINS ASSOCIATES, INC.

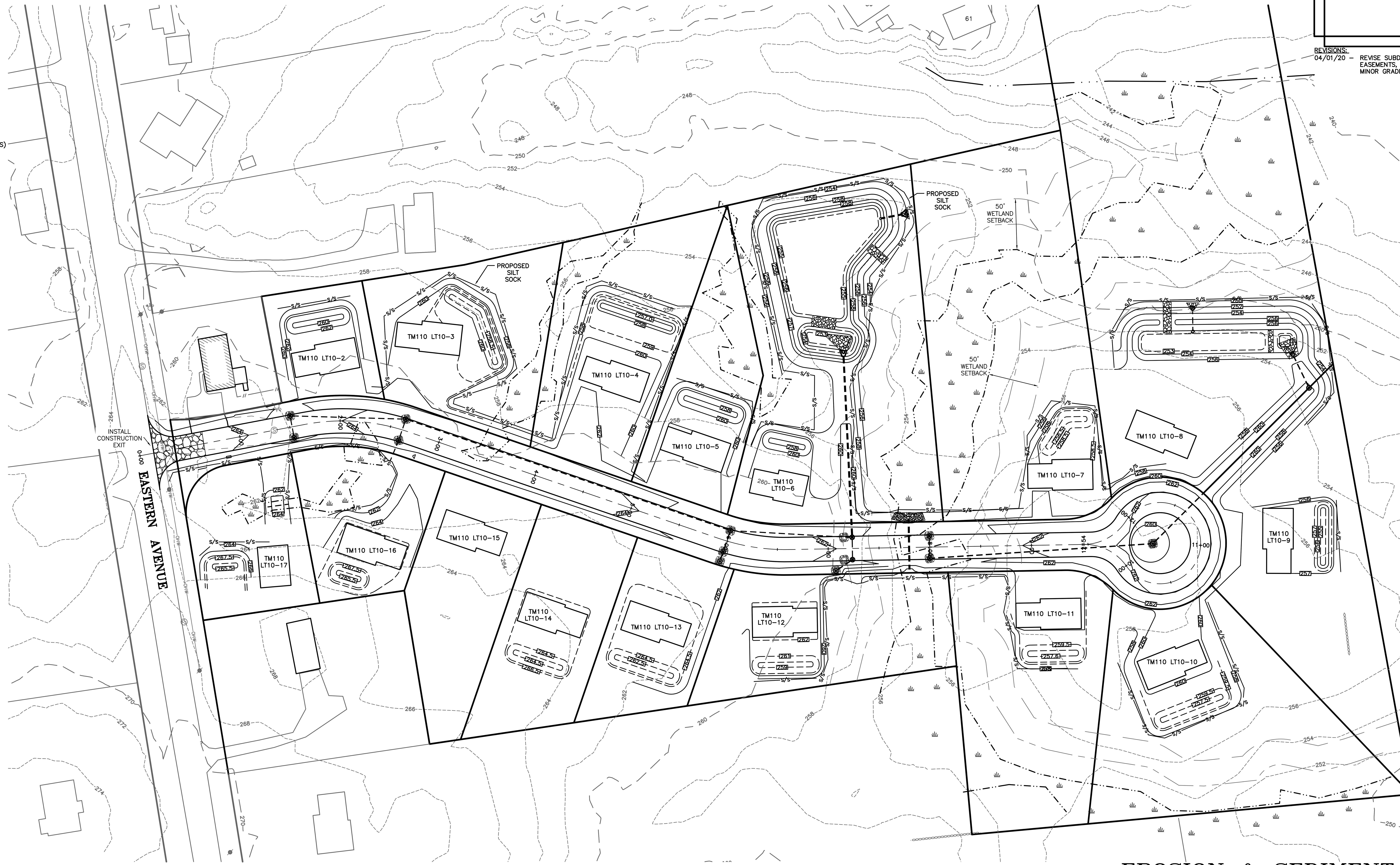
2 Continental Blvd., Rochester, N.H. 603-335-3948

LAND SURVEYORS — CIVIL ENGINEERS

LEGEND

- PROPERTY LINE
- JURISDICTIONAL WETLANDS
- EXISTING TREE LINE
- EXISTING DRAIN LINE
- 232 EXISTING CONTOUR LINE
- EXISTING CATCH BASIN
- PROPOSED TREE LINE
- PROPOSED DRAIN LINE
- 234 PROPOSED CONTOUR LINE
- S/F PROPOSED SILTATION FENCE
- S/S PROPOSED SILTATION SOCK
- PROPOSED CATCH BASIN
- PROPOSED DRAIN MANHOLE
- PROPOSED FLARED END SECTION (FES)
- PROPOSED TEMPORARY CATCH BASIN FILTERS WITH GEOSYNTHETIC SEDIMENT TRAP
- PROPOSED TEMPORARY STABILIZED CONSTRUCTION EXIT
- PROPOSED TEMPORARY STONE CHECK DAMS

REVISIONS:
04/01/20 – REVISE SUBDIVISION LOT LAYOUT, DRAINAGE EASEMENTS, MAINTENANCE ACCESS PATHS AND MINOR GRADING AROUND BASINS.



EROSION & SEDIMENTATION CONTROL PLAN

TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

GRAPHIC SCALE

50 0 25 50 100 200

1 INCH = 50 FEET

C-4

DIG SAFE — 1-888-344-7233 CALL TOLL FREE — UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM — ME-NH-VT-MA-RI

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

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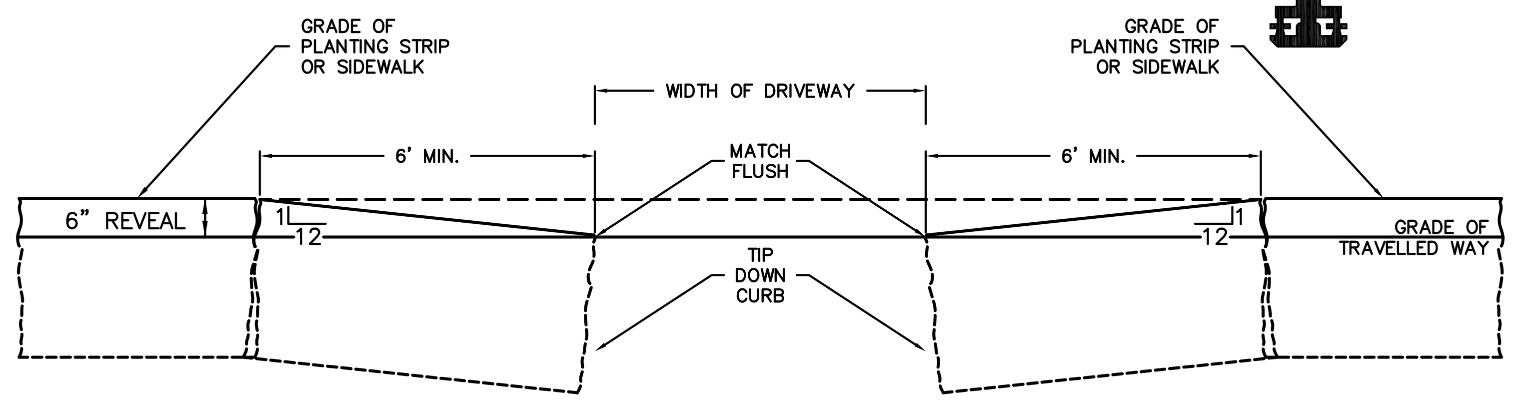
STATE OF NEW HAMPSHIRE SCOTT A. LAWLER No.10026 LICENSED PROFESSIONAL ENGINEER

REVISIONS:
04/01/20 – REVISE SIGN, TYPICAL CROSS SECTION AND SIDEWALK DETAILS. ADD MAINTENANCE PATH AND TREE PLANTING DETAIL.

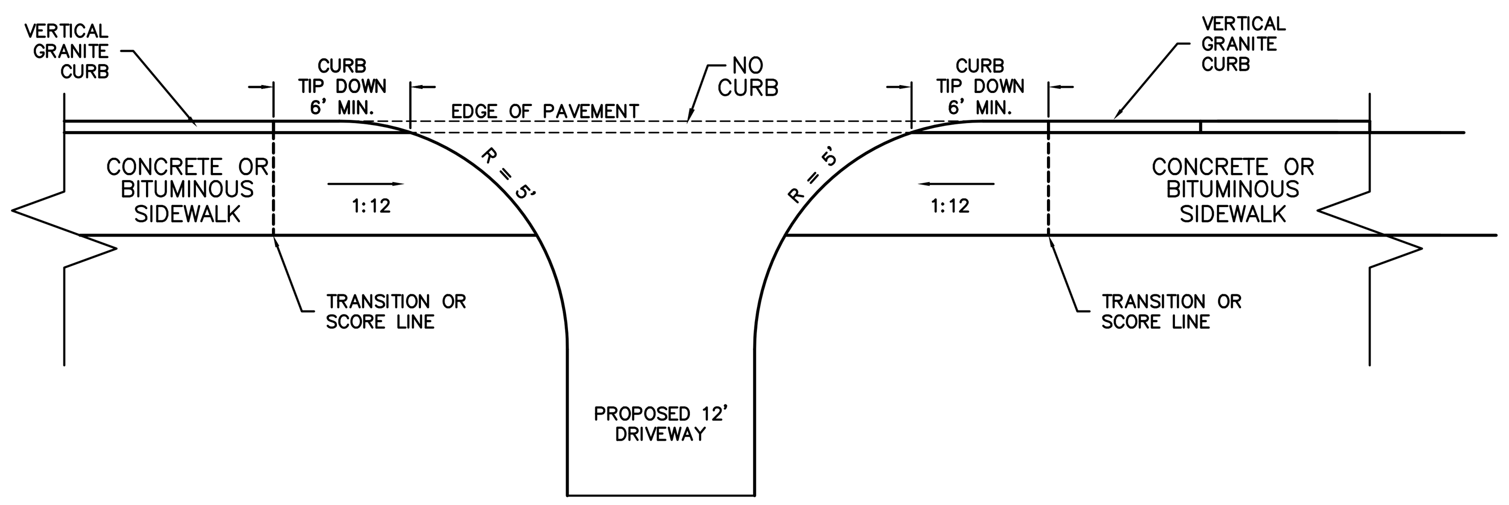
ITEM NO.	SIGN SIZE HEIGHT	SIGN SIZE WIDTH	TEXT	NO. SIGNS REQ'D
R1-1	30"	30"	STOP	1
R4-7b	30"	24"	KEEP RIGHT	1
W14-1	30"	30"	DEAD END	1
ROCHESTER STREET SIGN WITH REMOVABLE "PRIVATE" TOPPER	4" 9"	8" 24"	PRIVATE FREEDOM DRIVE	1 1
ROCHESTER SUBDIVISION SIGN	24"	48"	POSTED. THIS SUBDIVISION IS UNDER CONSTRUCTION. THESE STREETS HAVE NOT YET BEEN ACCEPTED BY THE CITY OF ROCHESTER AND ARE NOT ELIGIBLE FOR CITY SERVICES. TRAVEL AT YOUR OWN RISK. (PER ORDER OF PLANNING BOARD)	1

NOTES:
1. ALL SIGNS SHALL BE PER "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

SIGN SCHEDULE
NOT TO SCALE

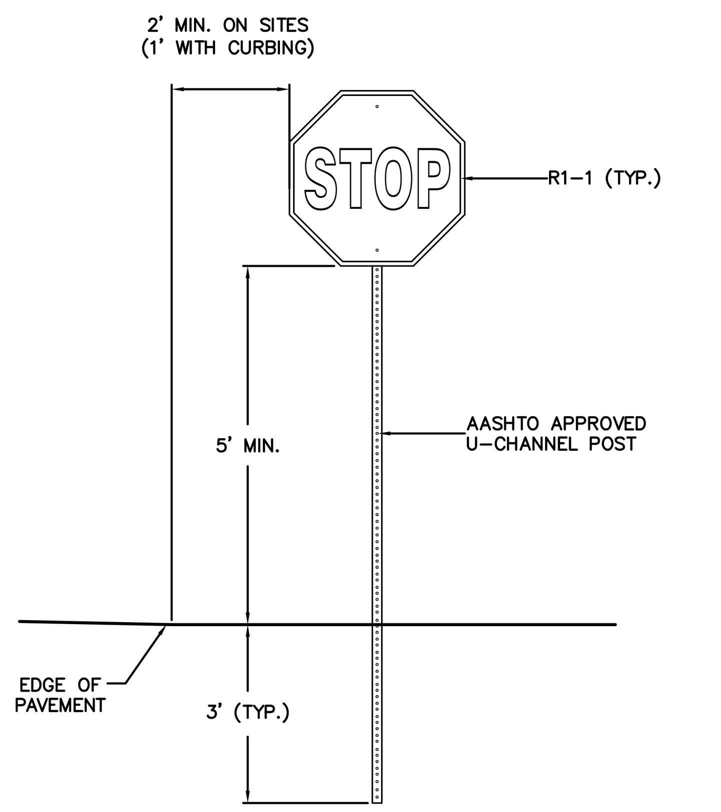


TIP-DOWN PROFILE



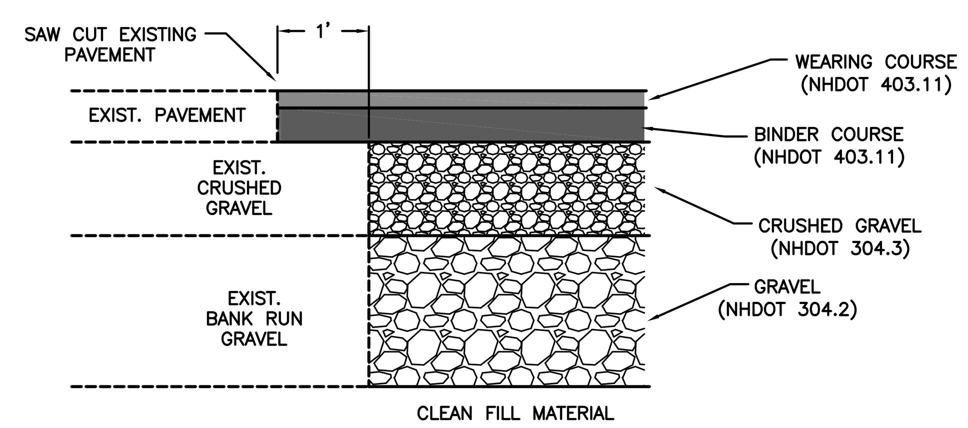
PLAN VIEW

CURB TIP-DOWN PLAN & PROFILE DETAIL
NOT TO SCALE



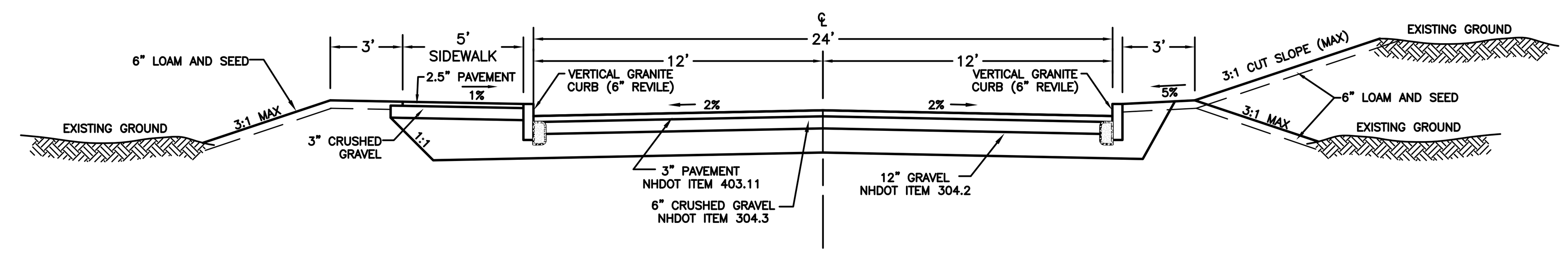
NOTES:
1. SIGN POST SHALL BE AASHTO APPROVED U-CHANNEL OR OTHER PER ASSHTO "SPECIFICATIONS FOR STRUCTURAL SUPPORT OF HIGHWAY SIGNS, LUMINARIES AND SIGNALS", LATEST EDITION.
2. SIGNS SHALL BE MOUNTED 5 FT FROM GROUND TO BOTTOM EDGE WHERE PARKING AND PARKING LOT MOVEMENTS TAKE PLACE.
3. SIGNS SHALL BE PLACED SO THAT NEAREST EDGE IS 2 FT. FROM EDGE OF PAVEMENT UNLESS CURBED.

TYPICAL TRAFFIC SIGN
NOT TO SCALE

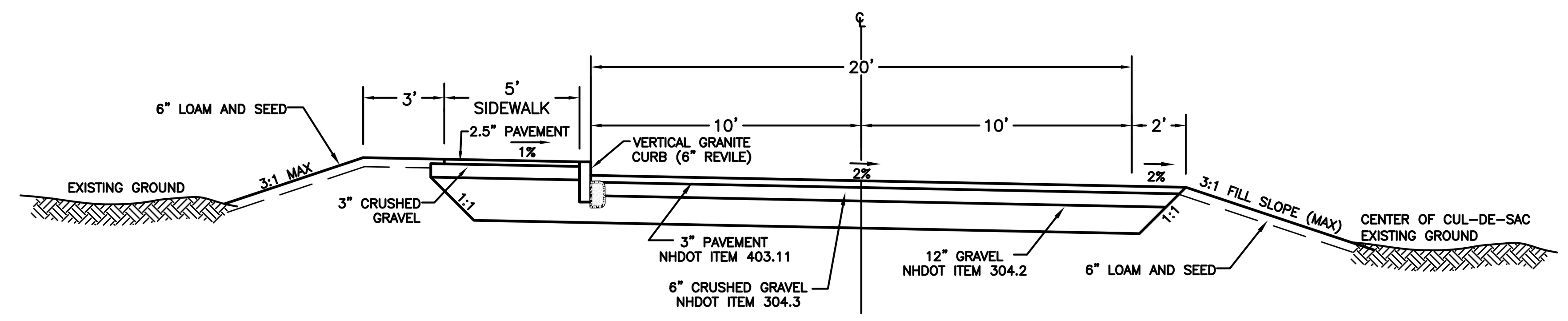


PAVEMENT SAWCUT NOTES:
1. SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED.
2. INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
3. PLACE BINDER COURSE.
4. GRIND OR SAWCUT EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
5. TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.

TYPICAL PAVEMENT SAWCUT DETAIL
NOT TO SCALE

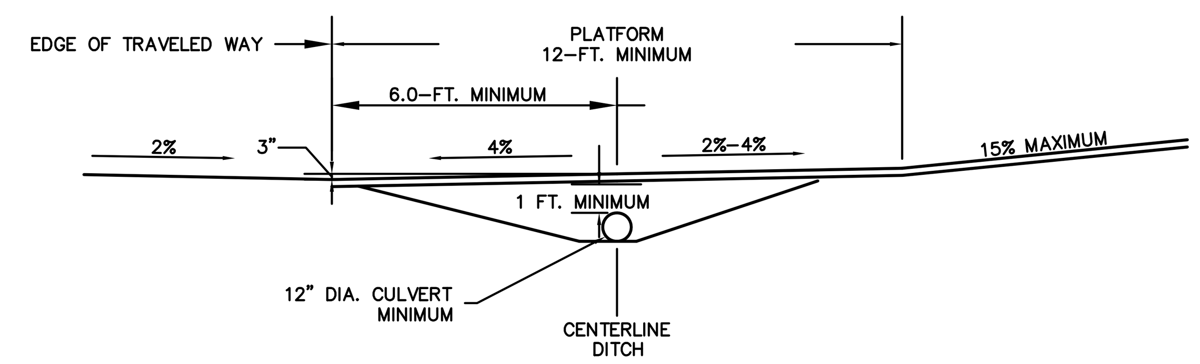


ROADWAY CROSS-SECTION
1" = 5'



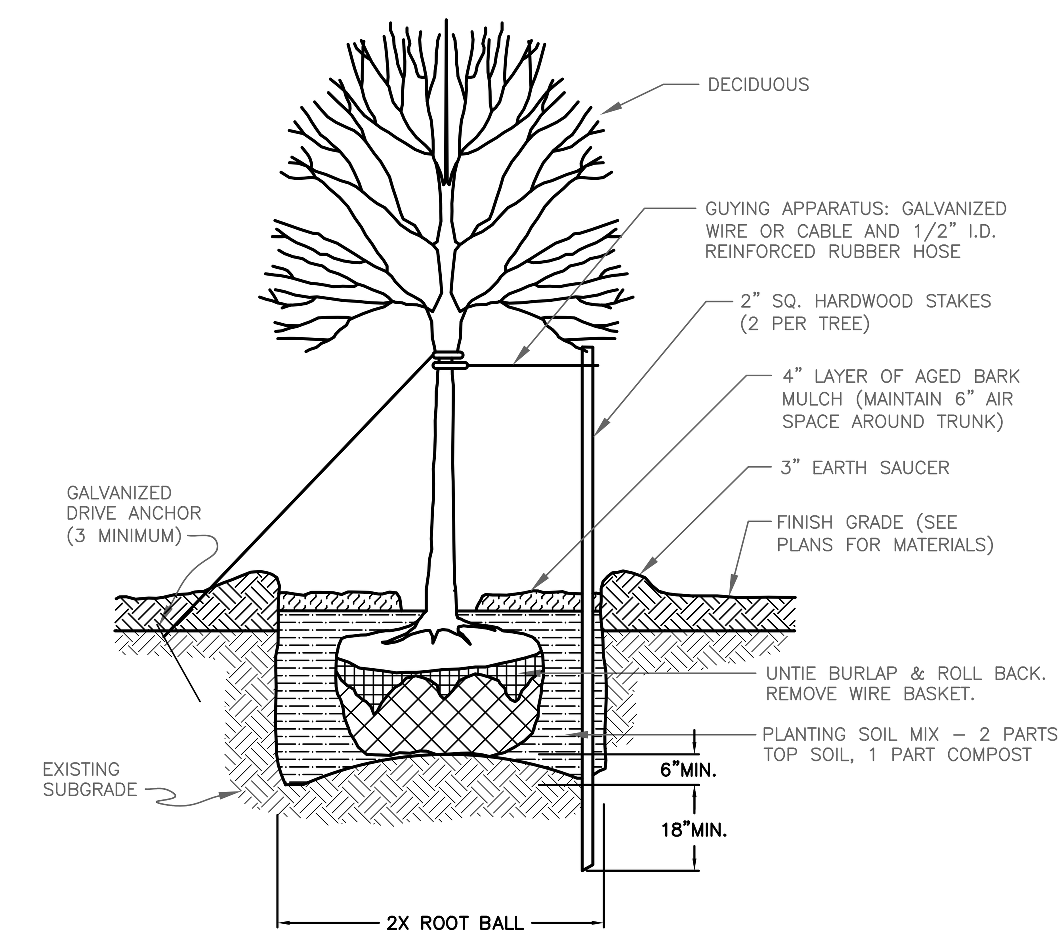
CUL-DE-SAC CROSS-SECTION
1" = 5'

PAVEMENT NOTES:
1. PLACE COMMON FILL IN 12 INCH LIFTS. COMPACT COMMON FILL TO 95% MAXIMUM PROCTOR DENSITY.
2. PLACE GRAVEL IN MAXIMUM 8 INCH LIFTS. COMPACT TO 95% MAXIMUM PROCTOR DENSITY.
3. PLACE CRUSHED GRAVEL IN MAXIMUM 8 INCH LIFTS. COMPACT TO 95% MAXIMUM PROCTOR DENSITY.
4. PAVEMENT MUST BE INSTALLED IN TWO COURSES, A BINDER COURSE AND A WEARING COURSE.

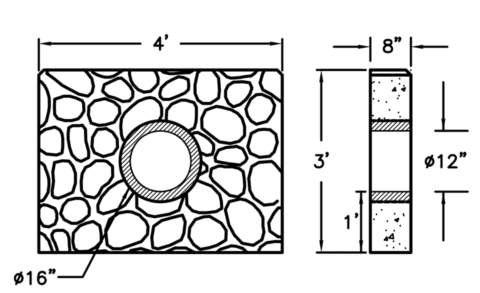


TYPICAL DRIVE IN CUT SECTION
NOT TO SCALE

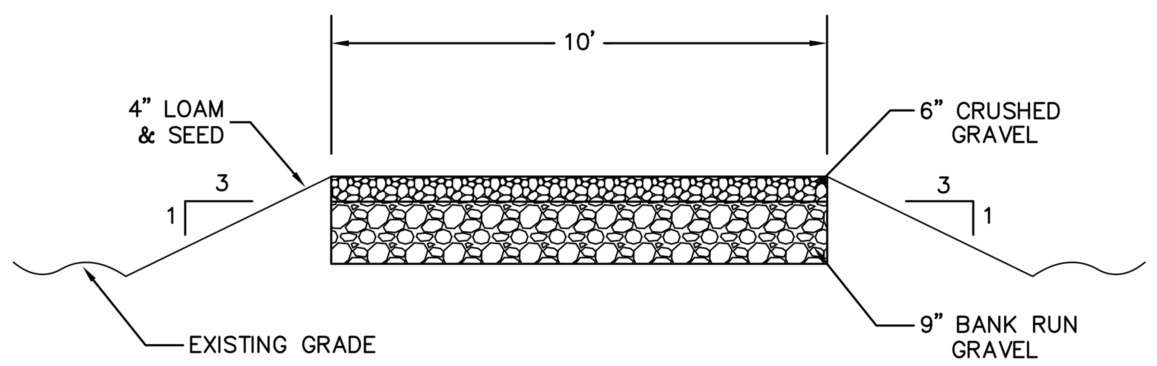
DRIVEWAY NOTES:
1. THE OWNER OF THE LOT WILL BE RESPONIBLE FOR OBTAINING A DRIVEWAY PERMIT FROM ROCHESTER PUBLIC WORKS.
2. DRIVEWAY CULVERTS SHALL BE 12"ø MIN. AND SHALL EXTEND 5 FEET BEYOND BOTH SIDES OF THE DRIVEWAY UNLESS CONCRETE HEADWALLS ARE PROVIDED.
3. GRADES BEYOND PLATFORM SHALL NOT EXCEED 15% NOR SHALL THEY BE LESS THAN 0.5%
4. THE ALGEBRAIC DIFFERENCE BETWEEN TWO ADJACENT GRADE CHANGES SHOULD NOT EXCEED 10%
5. DITCHES ARE RECOMMENDED FOR UNCURBED DRIVEWAYS IN CUT SLOPES.
6. USE RUBBLE MASONRY OR PRECAST HEADWALLS OR SLOPE END SECTIONS ON CULVERT PIPES.



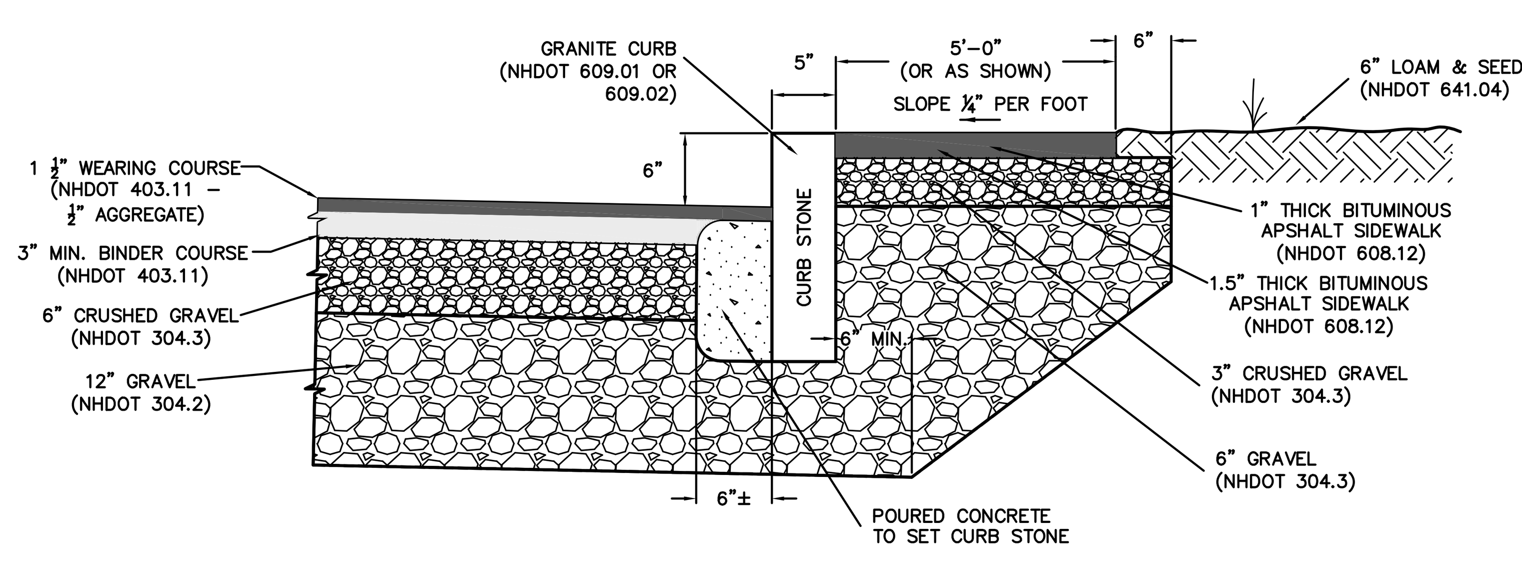
TREE PLANTING DETAIL
NOT TO SCALE



TYPICAL DRIVE HEADWALL
NOT TO SCALE



MAINTENANCE PATH CROSS-SECTION
NOT TO SCALE



PAVED SIDEWALK WITH GRANITE CURB DETAIL
NOT TO SCALE

ROADWAY DETAILS
TAX MAP 110, LOT 10-00 &
LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

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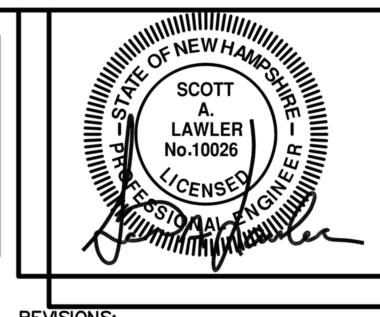
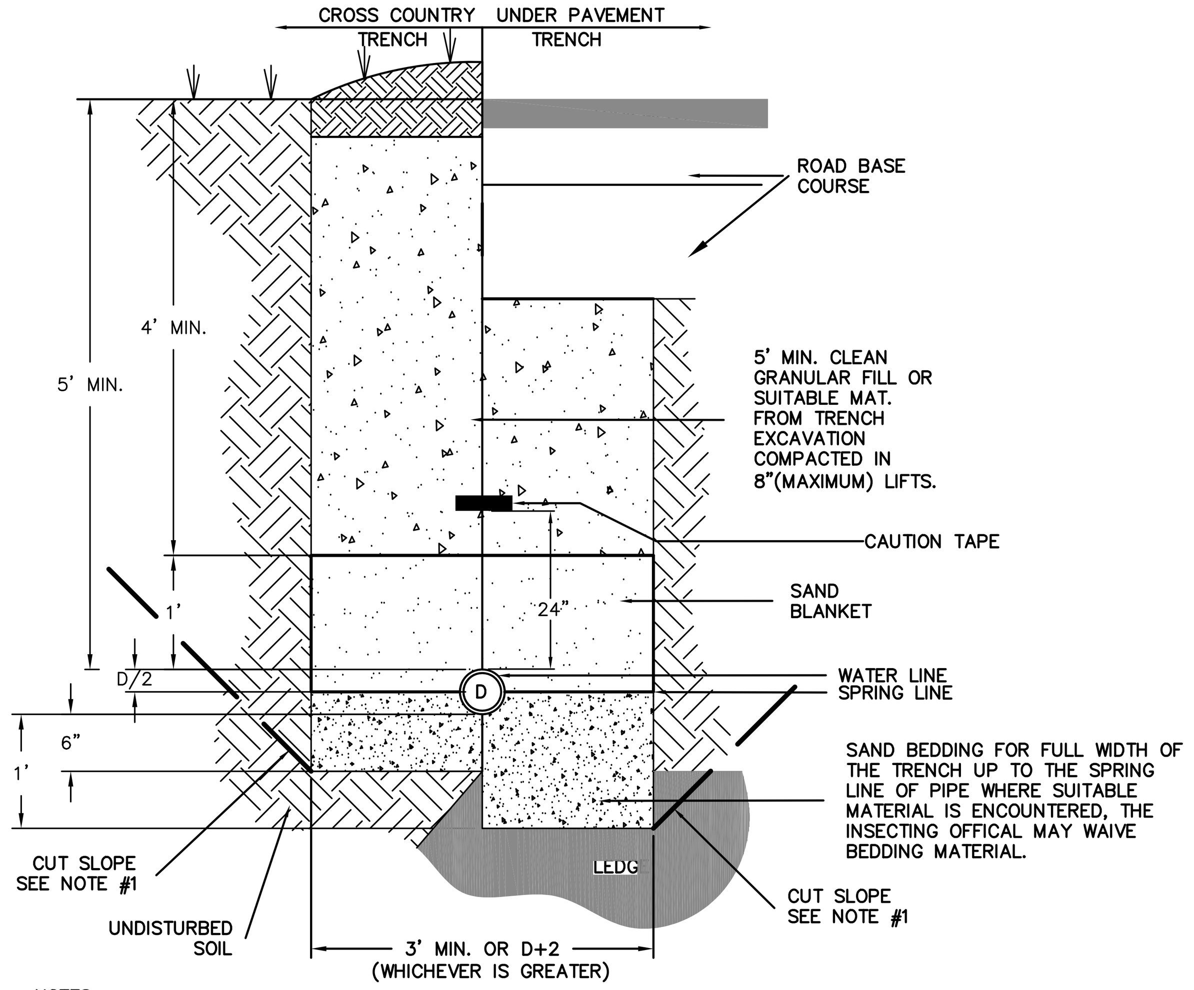


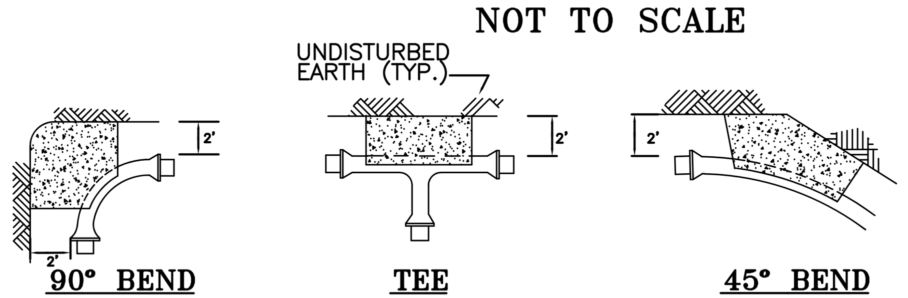
REVISIONS:
04/01/20 – REVISE HYDRANT DETAIL.



NOTES:
1. PIPES MAY BE INSTALLED BY EXCAVATING AN OPEN TRENCH WITH SIDE SLOPES OF 1:1 MAXIMUM TO A DEPTH OF 4-FT. INTALLATIONS DEEPER THAN 4-FT REQUIRE THE USE OF A TRENCH BOX.
2. PIPE MATERIALS SHALL BE AS SPECIFIED ON THE DESIGN PLAN.
3. SAND BLANKET MAY BE OMITTED FOR REINFORCED CONCRETE PIPE.

WATER PIPE TRENCH INSTALLATION DETAIL

NOT TO SCALE



MINIMUN THRUST BLOCK BEARING AREA REQ'D AGAINST UNDISTURBED MATERIAL (SQ. FT.)					
PIPE SIZE	90 BEND	TEE	PLUG	45 BEND	22-1/2"& SMALLER
6"	5	4	3	2	2
8"	10	8	6	6	3
12"	24	18	8	12	8

NOTE: SIZE OF THRUST BLOCKS MAY BE INCREASED BY THE ENGINEER TO MEET SOIL CONDITIONS FOUND DURING CONSTRUCTION.

WATER MAIN THRUST BLOCK DETAILS

NOT TO SCALE

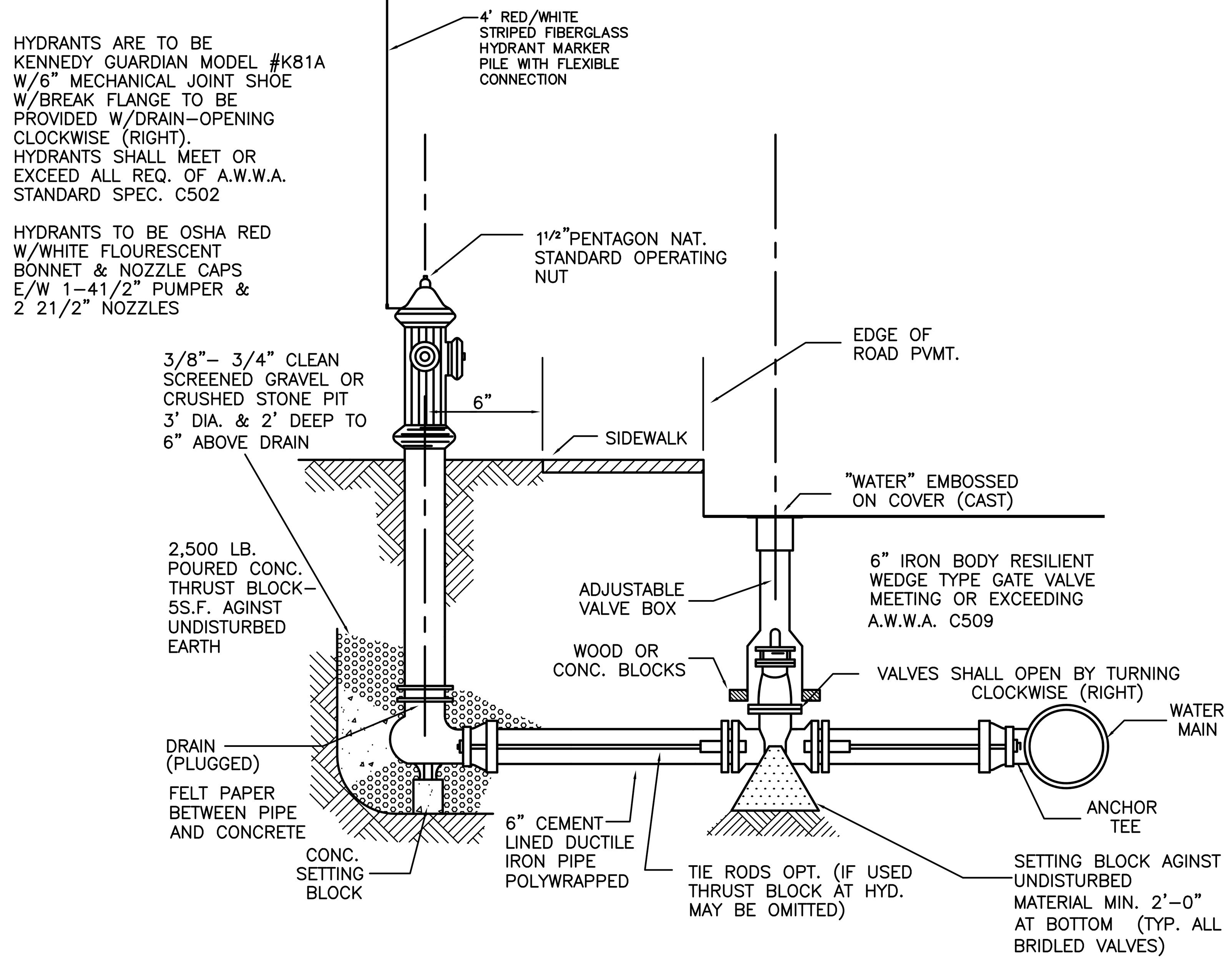
DUCTILE IRON MECHANICAL RETRAINED LENGTH (FEET)																				
PIPE DIAMETER (INCHES)	BENDS																DEAD END			
	11 1/4°				22 1/2°				45°				90°							
	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi
2"	0	0	1	1	0	1	1	1	1	1	2	3	2	4	5	7	4	8	12	17
6"	0	0	1	1	1	1	2	2	1	2	3	4	3	5	8	10	6	12	18	23
8"	0	1	1	1	1	1	2	3	1	3	4	6	3	7	10	13	8	15	23	31
10"	0	1	1	2	1	2	2	3	2	3	5	7	4	8	12	16	9	19	28	37
12"	0	1	1	2	1	2	3	4	2	4	6	8	5	9	14	19	11	22	33	44
	TEE*								REDUCER											
	SAME SIZE				ONE SIZE SMALLER				ONE SIZE SMALLER				TWO SIZE SMALLER							
	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi	50 psi	100 psi	150 psi	200 psi				
2"	1	1	1	1	1	1	1	1	1	3	4	5	–	–	–	–				
6"	1	1	1	4	1	1	1	1	3	6	9	12	4	8	12	16				
8"	1	1	3	11	1	1	1	1	3	6	10	13	6	11	17	22				
10"	1	1	8	17	1	1	1	6	3	6	10	13	6	11	17	23				
12"	1	2	13	24	1	1	4	13	5	11	16	22	6	12	18	23				

* BASED ON A MINIMUM ATTACHED PIPE ALONG RUN (Lr) = 5 FEET

MECHANICAL RESTRAINED LENGTH SCHEDULE

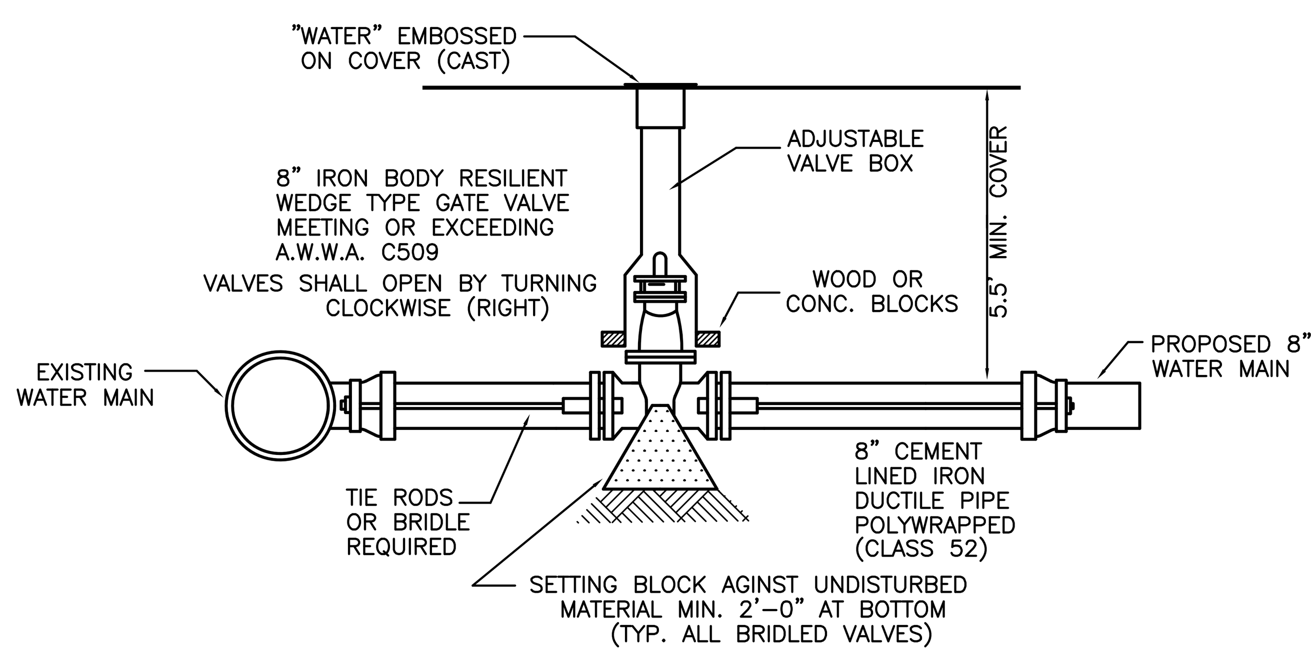
NOT TO SCALE

NOTES:
1. PIPE IS BURIED TO A DEPTH OF 6 FEET WITH A MINIMUM OF 4 INCHES OF COMPACTED GRANULAR MATERIAL UNDER THE PIPE TO THE SPRING LINE OF THE PIPE.
2. THE EXISTING SOIL IS POORLY GRADED GRAVEL AND GRAVEL SAND MIXTURE WITH LITTLE TO NO FINES.
3. ALL CALCULATIONS ARE BASED ON A FACTOR OF SAFETY OF 1.5 TO 1.
4. ALL CALCULATIONS ARE BASED ON THE "RESTRAINED LENGTH CALCULATION PROGRAM" BY EBAA IRON, INC., RELEASE 3.1.



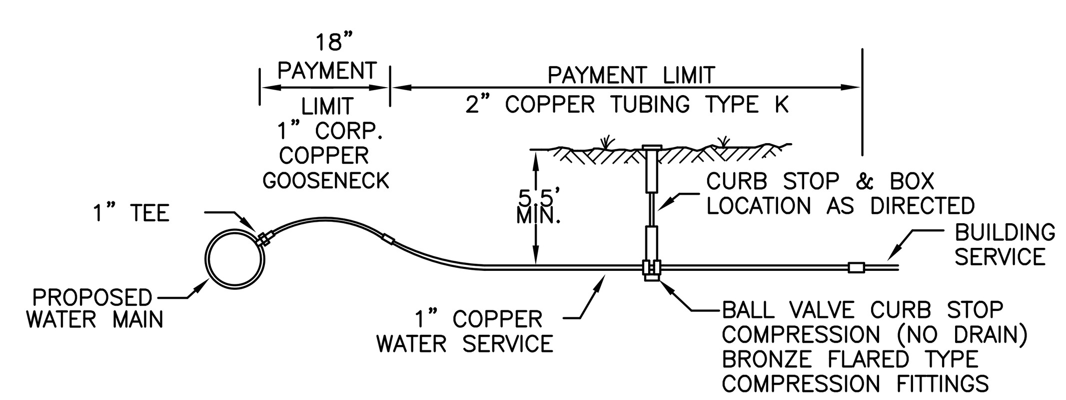
TYPICAL HYDRANT SECTION

NOT TO SCALE



WATER MAIN CONNECTION

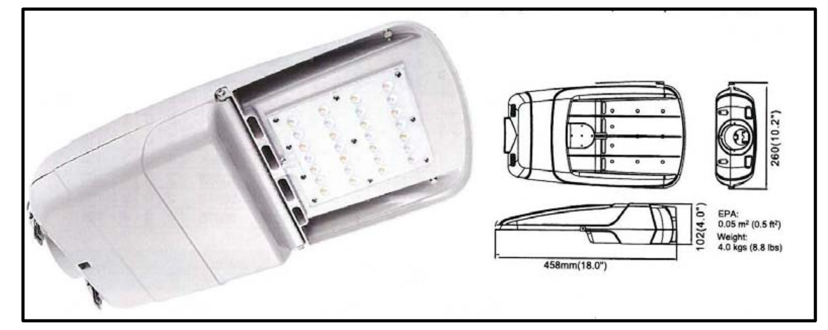
NOT TO SCALE



NOTE: SERVICE LINE SHALL BE TYPE K COPPER CONFORMING TO ASTM-D88

TYPICAL DOMESTIC SERVICE CONNECTION

NOT TO SCALE



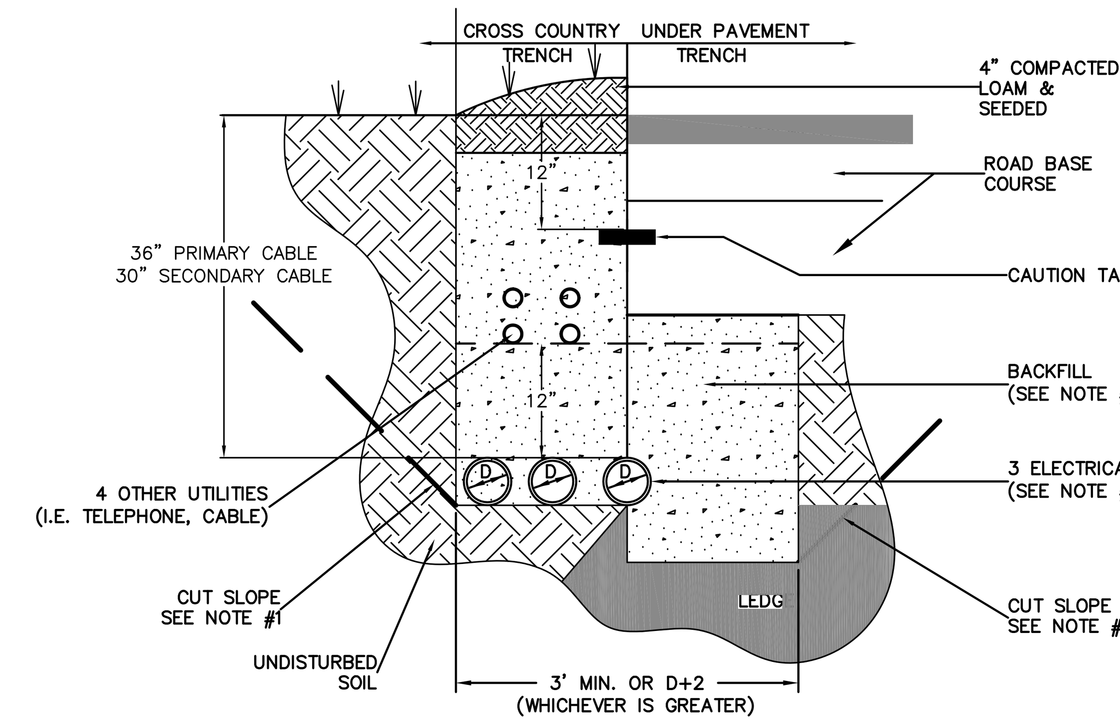
CITY OF ROCHESTER LIGHT FIXTURE

NOT TO SCALE

NOTES:
1. PROPOSED COBRA HEAD LIGHT SHALL BE MOUNTED ON THE PROPOSED UTILITY POLE AT THE ENTRANCE OF THE PROPOSED ROADWAY. COORDINATE INSTALLATION WITH EVERSOURCE UTILITY COMPANY.
2. THE PROPOSED COBRA HEAD STYLE LIGHT FIXTURE SHALL BE AN AFFINITY MODLE S800-25W-30K-CCT-10V WITH WHITE HEADS.
3. CONTRACTOR SHALL CONTACT THE CITY OF ROCHESTER PUBLIC WORKS DEPARTMENT PRIOR TO ORDERING AND INSTALLING THE FIXTURE TO VERIFY THE FIXTURE SPECIFICATIONS.

GENERAL UTILITY NOTES

1.) CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888 344-7233) 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
2.) ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS AND ELEVATIONS.
3.) THESE PLAN SHOWS ONLY THOSE FEATURES THAT WERE VISUALLY APPARENT ON THE DATE OF THE SURVEY. THE ABSENCE OF SUBSURFACE STRUCTURES, UTILITIES, ETC. FROM THIS PLAN, BUT IN EXISTENCE IS NOT INTENDED OR IMPLIED.
4.) ANY UTILITY POLES THAT NEED TO BE RELOCATED SHALL BE COORDINATED WITH EVERSOURCE OR VERIZON, WHOM EVER HAS CONTROL OVER THEM.
5.) PROPOSED UTILITIES ARE TO BE UNDERGROUND. COORDINATE LOCATION OF UNDERGROUND UTILITIES AND TRANSFORMER PADS WITH PSNH AND OTHER PERTINENT UTILITY COMPANIES.
6.) WATER AND SEWER LINES SHALL BE INSTALLED A MINIMUM OF 10-FT APART HORIZONTALLY.
7.) WHERE SEWER AND WATER LINES MUST CROSS, SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM 9-FT HORIZONTALLY FROM THE WATER LINE AND A VERTICAL SEPARATION OF 18-INCHES SHALL BE MAINTAINED.
8.) SEWER PIPE JOINTS SHALL BE TESTED WITH ZERO LEAKAGE AT 25 POUNDS PER SQUARE INCH FOR GRAVITY SEWER AND AT 1-1/2 TIMES WORKING PRESSURE FOR ALL FORCE MAINS.
9.) WATERLINE CONSTRUCTION:
A.) ALL PROPOSED WATER LINE MATERIAL USED SHALL MEET ROCHESTER WATER DEPARTMENT AND ROCHESTER ENGINEERING DEPARTMENT SPECIFICATIONS. WATER LINES SHALL BE A.W.W.A C 151, CLASS 52, CEMENT LINED, DUCTILE IRON PIPE.
B.) PROPOSED WATER GATE VALVES SHALL BE MANUFACTURED BY KENNEDY OF AMERICAN FLOW CONTROL, RESILIENT SEAT TYPE.
C.) ALL WATER LINES SHALL BE BURIED A MINIMUM OF 5'.
D.) IF 5' OF COVER IS NOT AVAILABLE WATER LINE SHALL BE INSULATED AS SHOWN IN THE "SHALLOW COVER TRENCH DETAIL FOR INSULATED WATER PIPE".
E.) ALL WATER FITTINGS SHALL BE CLASS 52.
F.) PROPOSED WATER GATE VALVE SHALL OPEN CLOCKWISE (RIGHT).
10.) WORK TO CONNECT INTO THE WATER OR SEWER MAINS REQUIRES A PERMIT FROM THE ROCHESTER PUBLIC WORKS DEPARTMENT. CONTRACTORS ARE TO BE PRE-QUALIFIED.



NOTES:
1. ALL NON-METALLIC CONDUIT AND FITTINGS SHALL BE ELECTRICAL GRADE, SCHEDULE 40 PVC, AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEMA TC2-1990 AND BE UL LISTED. ONLY GRAY-COLORED CONDUIT WILL BE ACCEPTED. ANY PVC CONDUIT NOT HAVING THE PROPER NEMA AND UL MARKINGS WILL NOT BE ACCEPTED. ALL STEEL CONDUITS SHALL CONFORM TO ASTM A120 AND BE RIGID GALVANIZED STEEL. ALL PVC JOINTS MUST BE CEMENTED. STEEL FITTINGS SHALL BE SEALED WITH COMPOUND.
2. ALL 90 DEGREE SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES. ALL STEEL SWEEPS WITHIN 18" OF THE SURFACE SHALL BE PROPERLY GROUNDED.
3. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE PSNH DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING CABLE PULLING.
4. THE CONDUIT SHALL CROSS PAVED AREAS AT APPROXIMATELY 90 DEGREES.
5. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY PSNH. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6-INCH LAYERS.
6. A SUITABLE PULL STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE PSNH IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
7. ROUTING OF THE CONDUIT AND INSPECTION PRIOR TO BACKFILL WILL BE PROVIDED BY PSNH. INSTALLATION OF THE CONDUIT WILL BE DONE BY THE CONTRACTOR. THE PSNH SUPERVISOR MUST BE NOTIFIED 2 BUSINESS DAYS PRIOR TO BACKFILLING THE TRENCH. IN THE EVENT THAT A CABLE CANNOT BE SUCCESSFULLY PULLED THROUGH THE COMPLETED CONDUIT SYSTEM DUE TO A CONSTRUCTION ERROR, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND REPAIR THE INVOLVED CONDUIT. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL RESULTING EXPENSES.
8. NORMAL CONDUIT SIZES FOR PSNH ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY.
9. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE THE NATIONAL ELECTRIC CODE.
10. CONDUIT MAY BE INSTALLED BY EXCAVATING AN OPEN TRENCH WITH SIDE SLOPES OF 1:1 MAXIMUM TO A DEPTH OF 4-FT. INSTALLATIONS DEEPER THAN 4-FT REQUIRE THE USE OF A TRENCH BOX.

ELECTRICAL & UNDERGROUND UTILITY TRENCH INSTALLATION DETAIL

NOT TO SCALE

UTILITY DETAILS
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

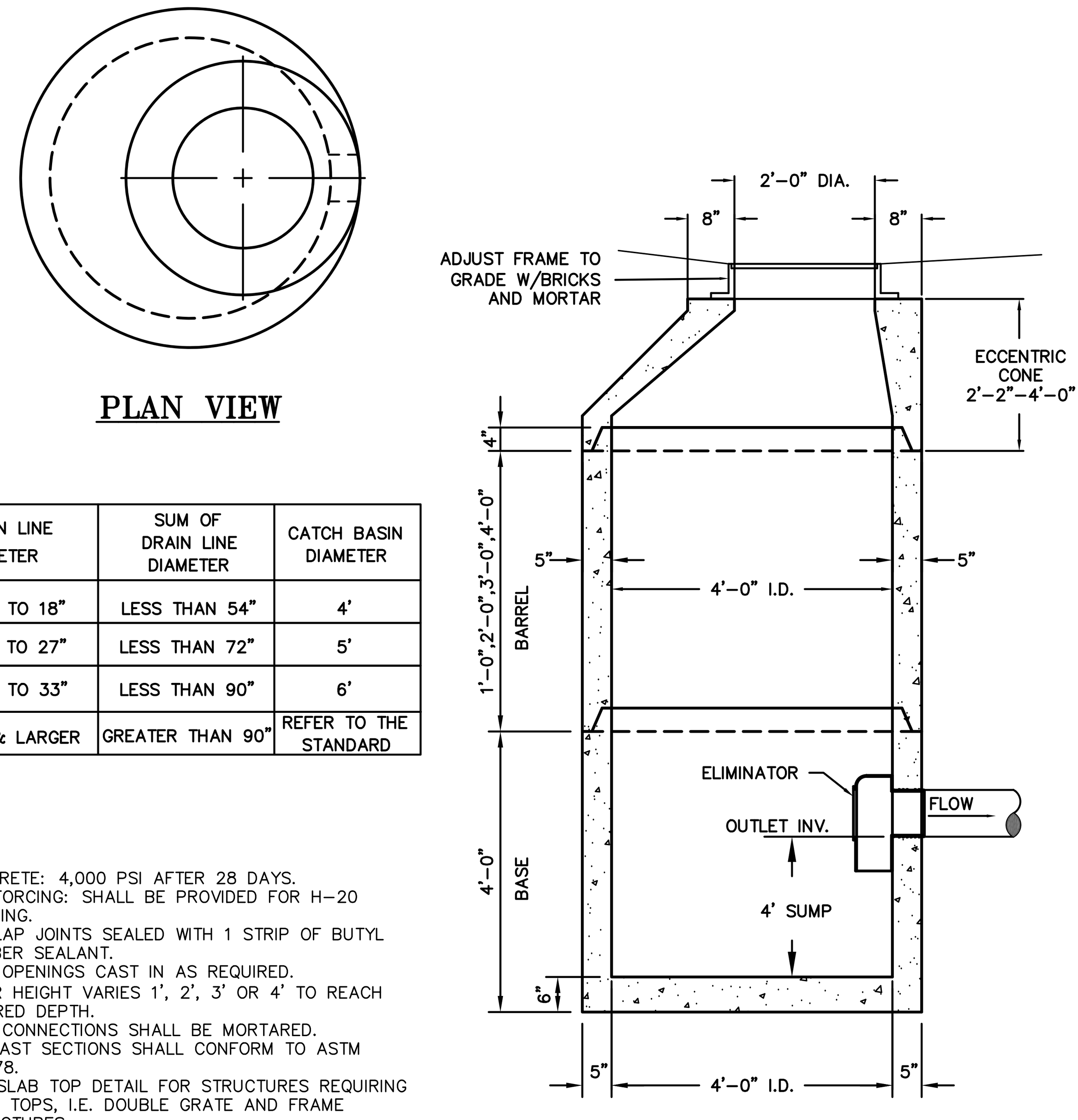
C-6

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

STATE OF NEW HAMPSHIRE — SCOTT A. LAWLER No.10026 — LICENSED PROFESSIONAL ENGINEER

REVISIONS:
04/01/20 – ADD ANTI-SEEP COLLAR AND DRAIN MANHOLE DETAILS.

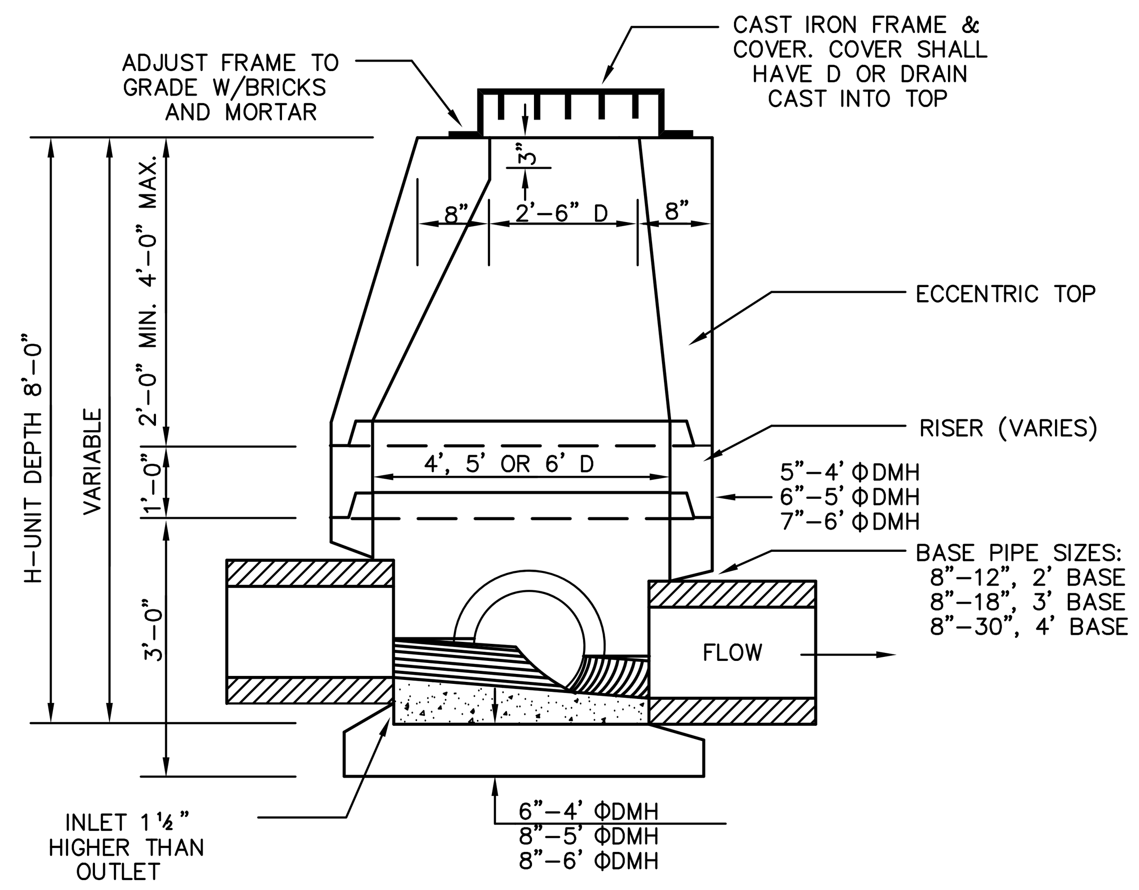


DRAIN LINE DIAMETER	SUM OF DRAIN LINE DIAMETER	CATCH BASIN DIAMETER
15" TO 18"	LESS THAN 54"	4'
21" TO 27"	LESS THAN 72"	5'
30" TO 33"	LESS THAN 90"	6'
36" & LARGER	GREATER THAN 90"	REFER TO THE STANDARD

NOTES:
1. CONCRETE: 4,000 PSI AFTER 28 DAYS.
2. REINFORCING: SHALL BE PROVIDED FOR H-20 LOADING.
3. SHIPLAP JOINTS SEALED WITH 1 STRIP OF BUTYL RUBBER SEALANT.
4. PIPE OPENINGS CAST IN AS REQUIRED.
5. RISER HEIGHT VARIES 1', 2', 3' OR 4' TO REACH DESIRED DEPTH.
6. PIPE CONNECTIONS SHALL BE MORTARED.
7. PRECAST SECTIONS SHALL CONFORM TO ASTM C-478.
8. SEE SLAB TOP DETAIL FOR STRUCTURES REQUIRING SLAB TOPS, I.E. DOUBLE GRATE AND FRAME STRUCTURES.

PRE-CAST REINFORCED CATCH BASIN

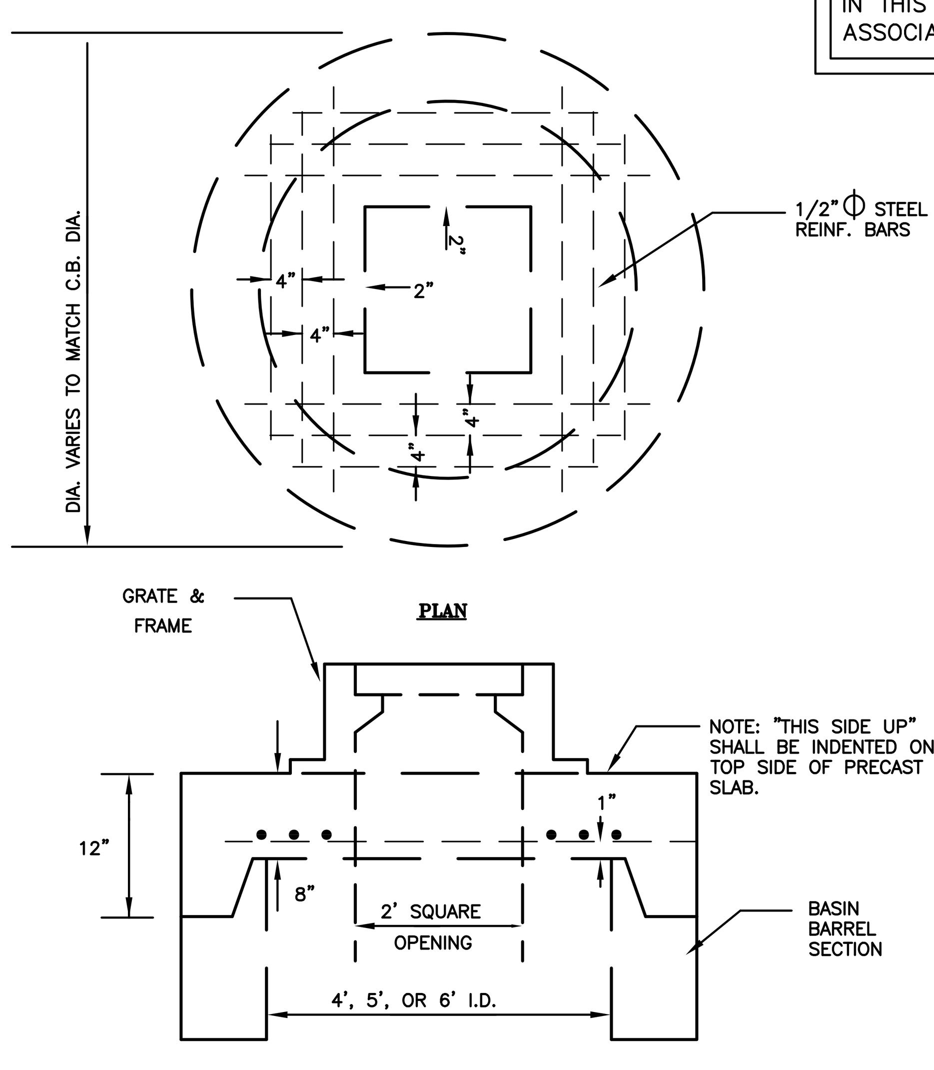
NOT TO SCALE



NOTES:
1. CONCRETE SHALL BE 4,000 PSI MIN. STRENGTH
2. RISER HEIGHT VARIES 1', 2', 3' OR 4' TO REACH DESIRED DEPTH

PRE-CAST REINFORCED DRAIN MANHOLE

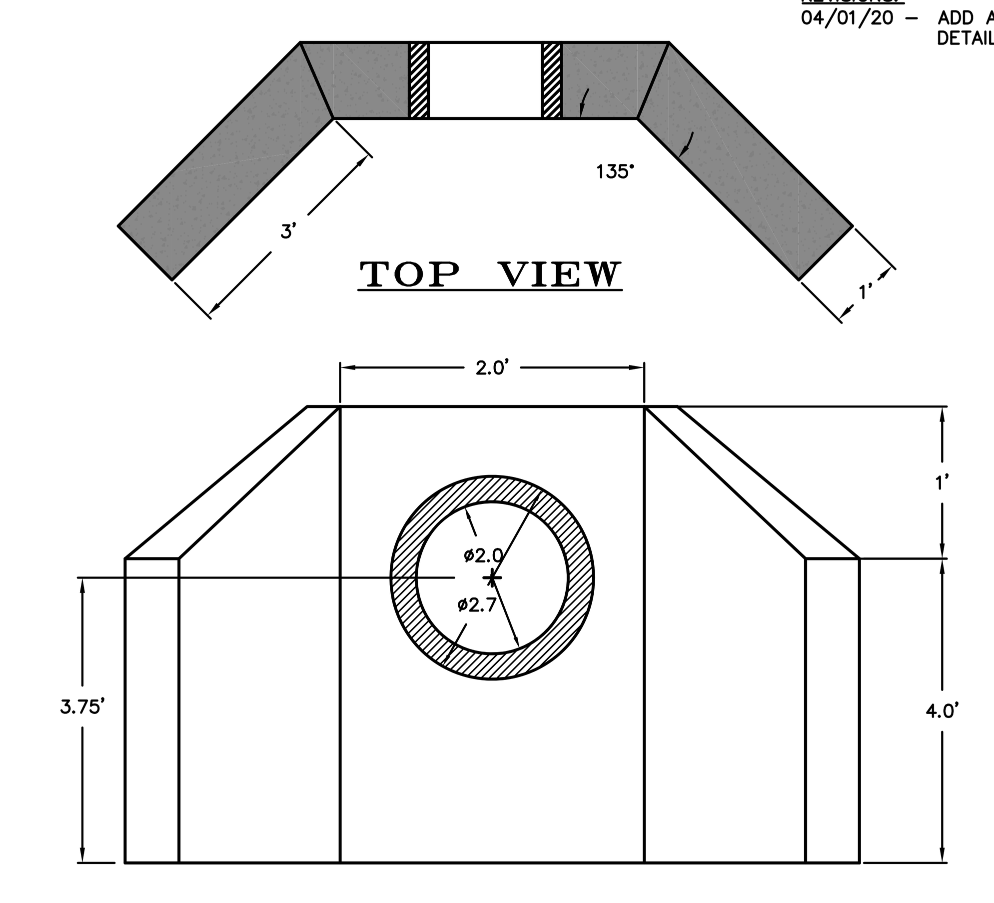
NOT TO SCALE



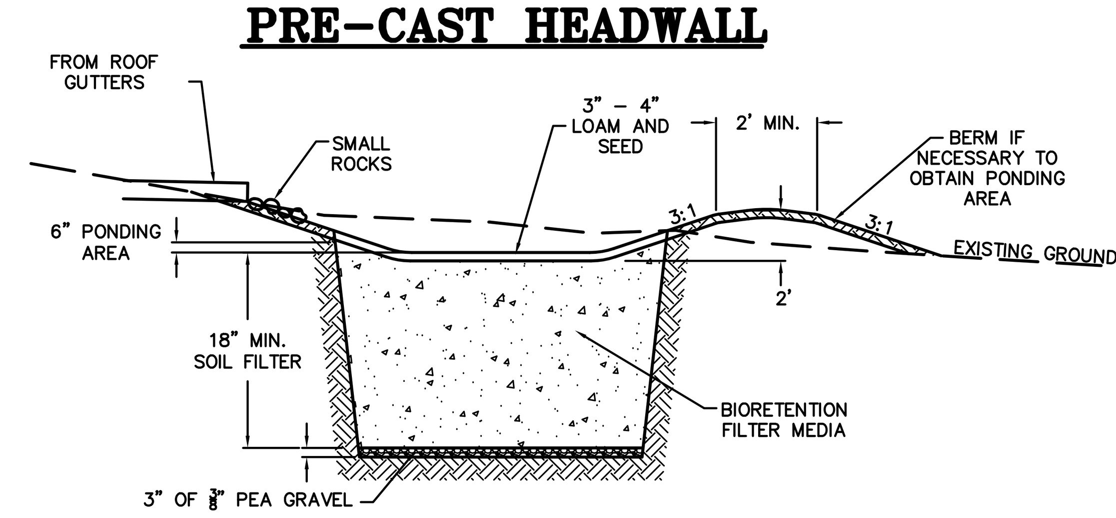
NOTE:
1. SLAB TO BE PLACED IN LIEU OF TAPERED SECTION WHERE PIPE WOULD OTHERWISE ENTER INTO TAPERED SECTION OF THE STRUCTURE AND WHERE PERMITTED.
2. SLAB TOP MAY BE CASTED WITH MINIMUM OR NO INTERLOCKING CHANNEL. HOWEVER, THE CONTRACTOR MUST ENSURE THE SLAB TOP IS FIRMLY ATTACHED TO THE STRUCTURE.

REINFORCED CONCRETE SLAB COVER

NOT TO SCALE



PRE-CAST HEADWALL

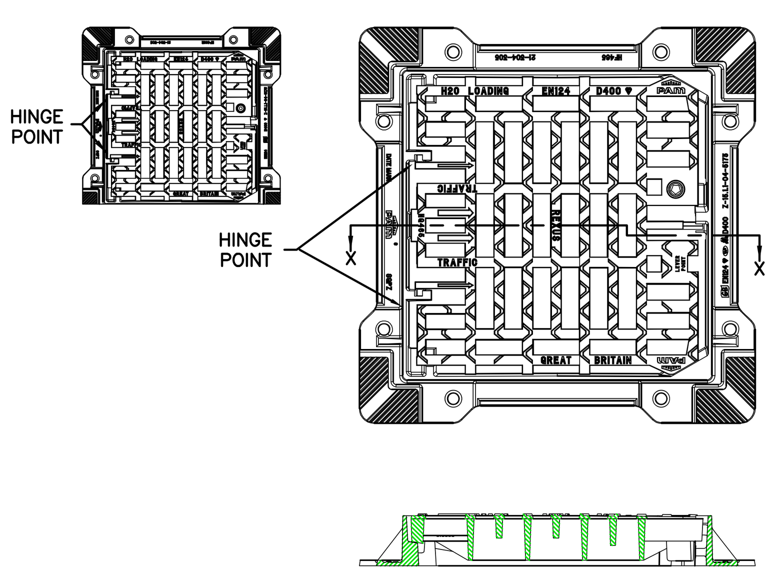


RAIN GARDEN DETAIL

NOT TO SCALE

VEGETATED RESIDENTIAL RAIN GARDEN CONSTRUCTION AND MAINTENANCE NOTES FOR LOTS 10-2 THR 10-7 AND LOTS 10-9 THRU 10-14 AND LOTS 10-16 AND 10-17:
1. RAIN GARDEN AREAS SHOULD BE LOCATED CLOSE TO THE SOURCE OF RUNOFF.
2. DO NOT PLACE RAIN GARDEN SYSTEMS INTO SERVICE UNTIL THE BASIN AND THE ADJACENT AREAS ARE FULLY ESTABLISHED.
3. SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENTS EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION AS WARRANTED BY SUCH INSPECTION.
4. TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
5. AT LEAST ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF THE RAIN GARDEN DOES NOT DRAIN WITHIN 72 HOUSE FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITIONS OF THE GARDEN TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.

BIORETENTION FILTER MEDIA			
COMPONENT MATERIAL	PERCENT OF MIXTURE BY VOLUME	GRADATION OF MATERIAL: SIEVE NO.	GRADATION OF MATERIAL: PERCENT BY WEIGHT PASSING STANDARD SIEVE
FILTER MEDIA OPTION A			
ASTM C-33 CONCRETE SAND	50 TO 55		
LOAMY SAND TOPSOIL, WITH FINES AS INDICATED	20 TO 30	200	15 TO 25
MODERATELY FINE SHREDDY BARK OR WOOD FIBERS MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
FILTER MEDIA OPTION B			
MODERATELY FINE SHREDDY BARK OR WOOD FIBERS MULCH, WITH FINES AS INDICATED	20 TO 30	200	< 5
LOAMY COURSE SAND	70 TO 80	10	85 TO 100
		20	70 TO 100
		60	15 TO 40
		200	8 TO 15

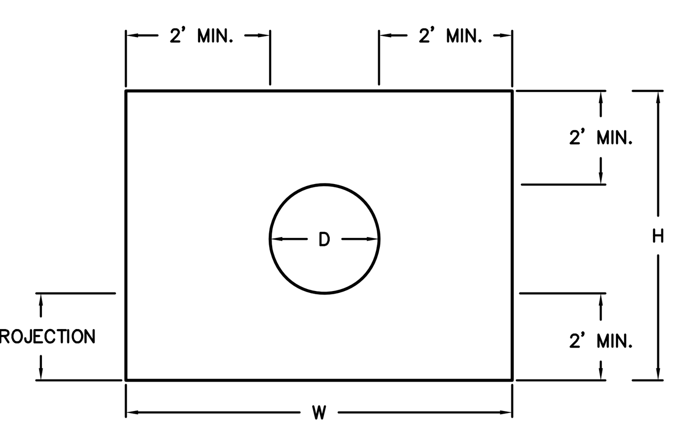


24" REXUS DI CB F & GRATE 62114 CB3R

NOT TO SCALE

D	W	H
12	10'	6'
18	10.25'	6'
24	12'	7.5'
30	12'	7.5'

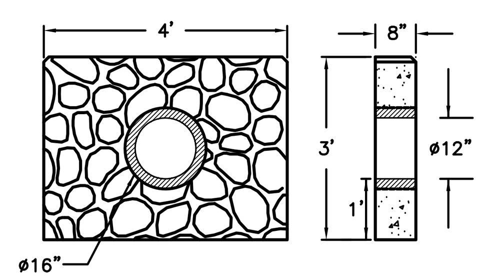
COLLAR DIMENSION TABLE



INSTALLATION NOTES:
1. ANTI-SEEP COLLARS SHALL BE MADE PLASTIC IF BEING USED WITH PLASTIC PIPE. ANTI-SEEP COLLARS SHALL BE GALVINIZED SHEET STEEL IF BEING USED WITH CORRUGATED METAL PIPE AND SHALL BE POURED CONCRETE IF BEING USED WITH REINFORCED CONCRETE PIPE.
2. ANTI-SEEP COLLAR SHALL BE WATERPROOF AND HAVE A WATERPROOF CONNECTION TO THE OUTLET PIPE.
3. A NUMBER OF ANTI-SEEP COLLARS SHALL BE PLACED ALONG THE PIPE IN A SPACING THAT INCREASES THE PIPE LENGTH BY 15%.

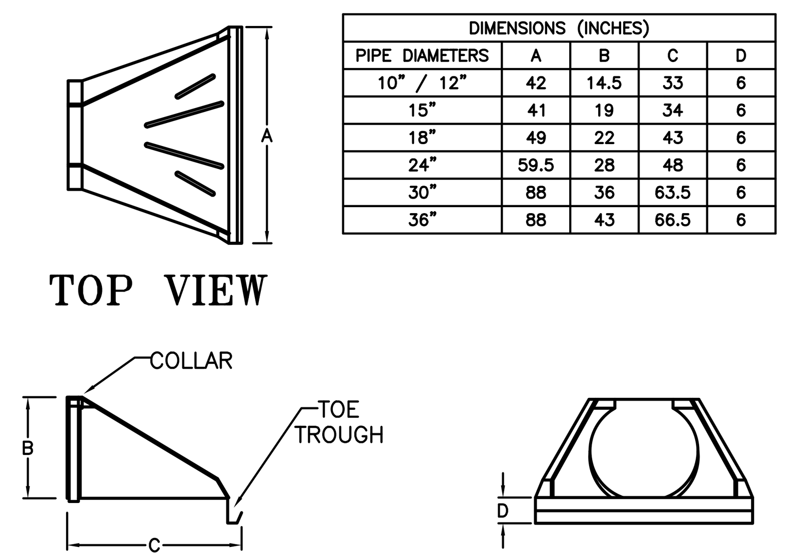
ANTI-SEEP COLLAR DETAIL

NOT TO SCALE



TYPICAL DRIVE HEADWALL

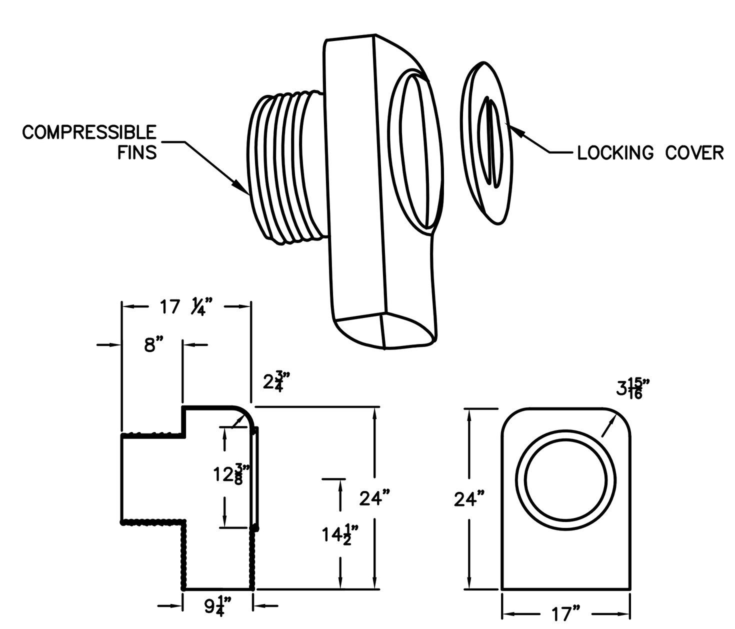
NOT TO SCALE



DIMENSIONS (INCHES)				
PIPE DIAMETERS	A	B	C	D
10" / 12"	42	14.5	33	6
15"	41	19	34	6
18"	49	22	43	6
24"	59.5	28	48	6
30"	88	36	63.5	6
36"	88	43	66.5	6

FLAIRED END SECTION DETAIL

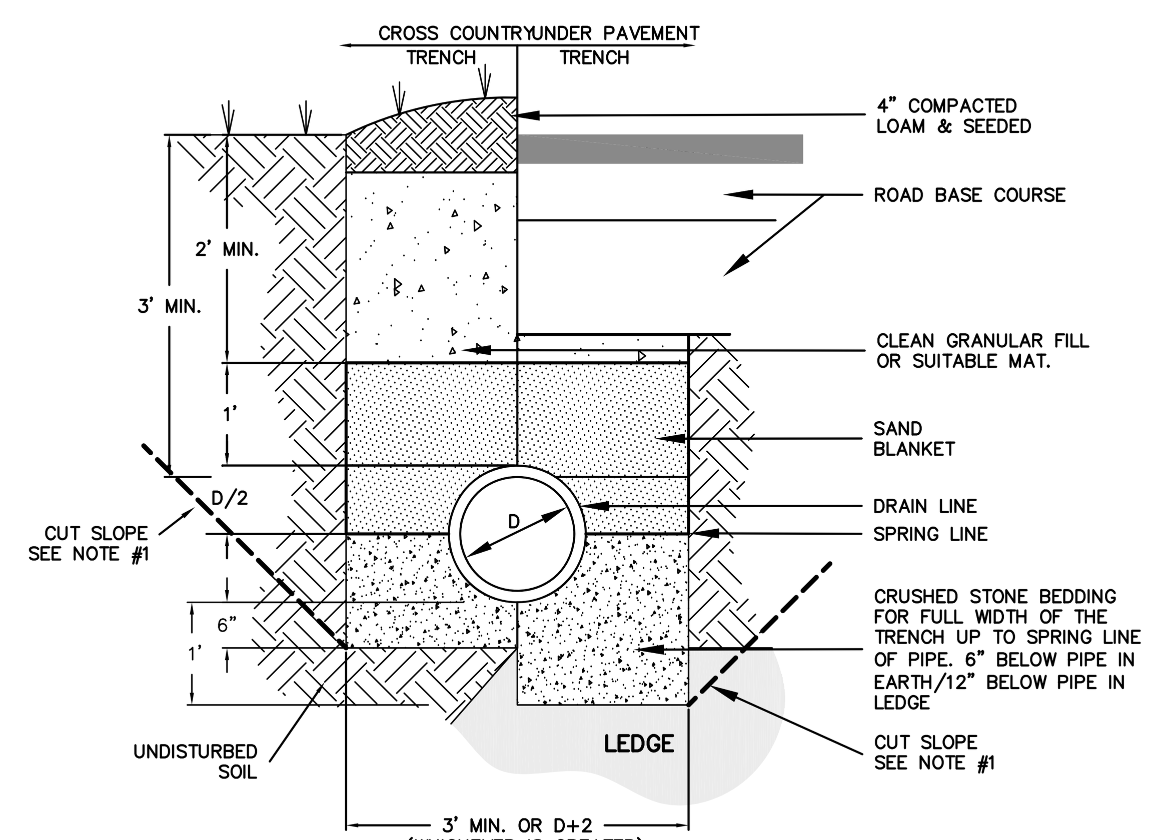
NOT TO SCALE



ELIMINATOR CATCH BASIN OIL AND DEBRIS TRAP DETAIL

NOT TO SCALE

NOTES:
1. HOOD SHALL BE "THE ELIMINATOR" OIL & FLOATING DEBRIS TRAP AS MANUFACTURED BY GROUND WATER RESCUE, INC., QUINCY, MA., TEL. 617-773-1128 ON THE WEB @ WWW.KLEANSTREAM.COM
2. AVAILABLE IN 8", 10", 12", 15" AND 18" DIAMETERS.



NOTES:
1. PIPES MAY BE INSTALLED BY EXCAVATING AN OPEN TRENCH WITH SIDE SLOPES OF 1:1 MAXIMUM TO A DEPTH OF 4-FT. INTALLATIONS DEEPER THAN 4-FT REQUIRE THE USE OF A TRENCH BOX.
2. PIPE MATERIALS SHALL BE AS SPECIFIED ON THE DESIGN PLAN.
3. SAND BLANKET MAY BE OMITTED FOR REINFORCED CONCRETE PIPE.

DRAINAGE PIPE TRENCH INSTALLATION DETAIL

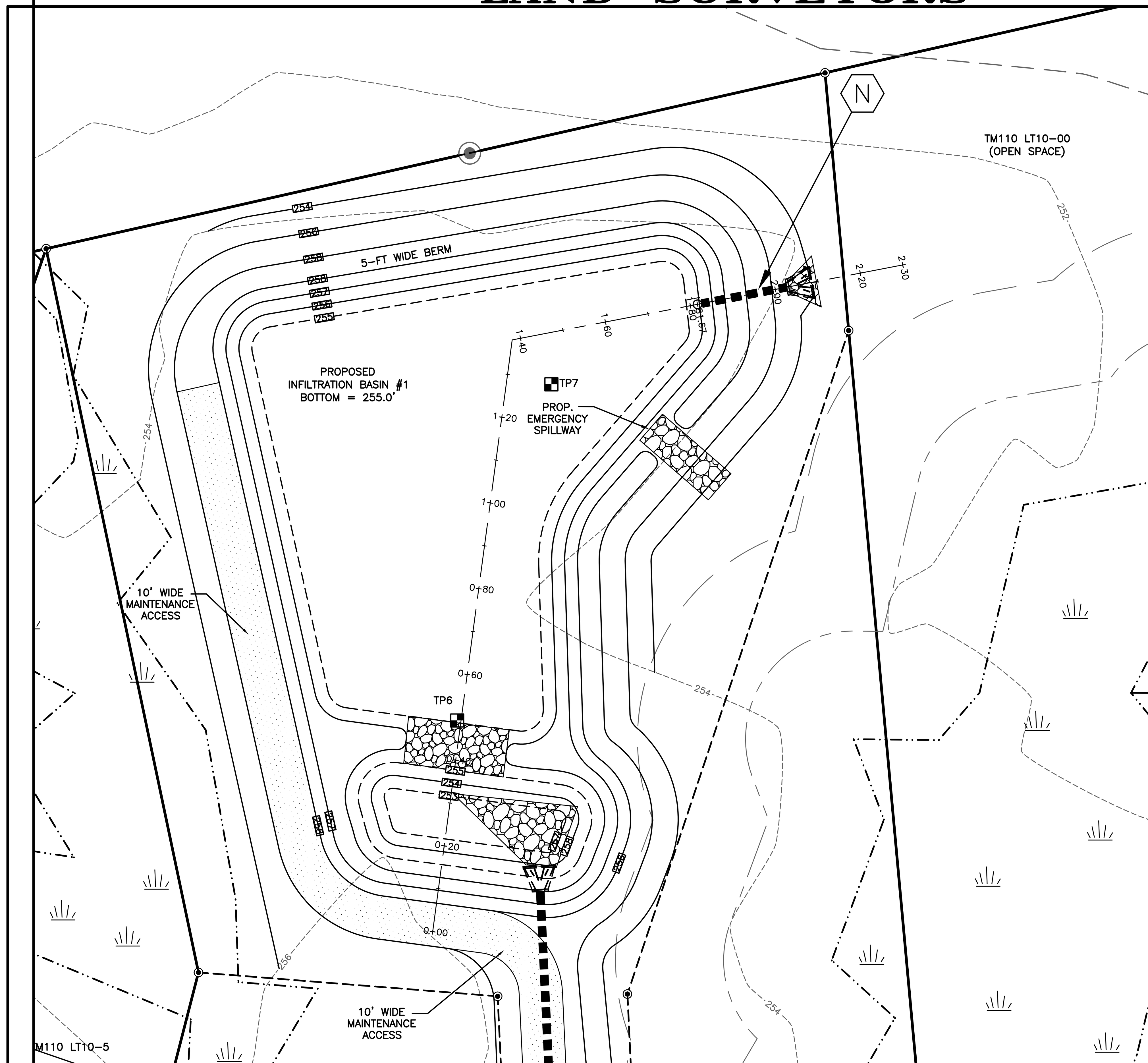
NOT TO SCALE

DRAINAGE DETAILS
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

C-8

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

LAND SURVEYORS — CIVIL ENGINEERS



INFILTRATION BASIN #1

1" = 20'

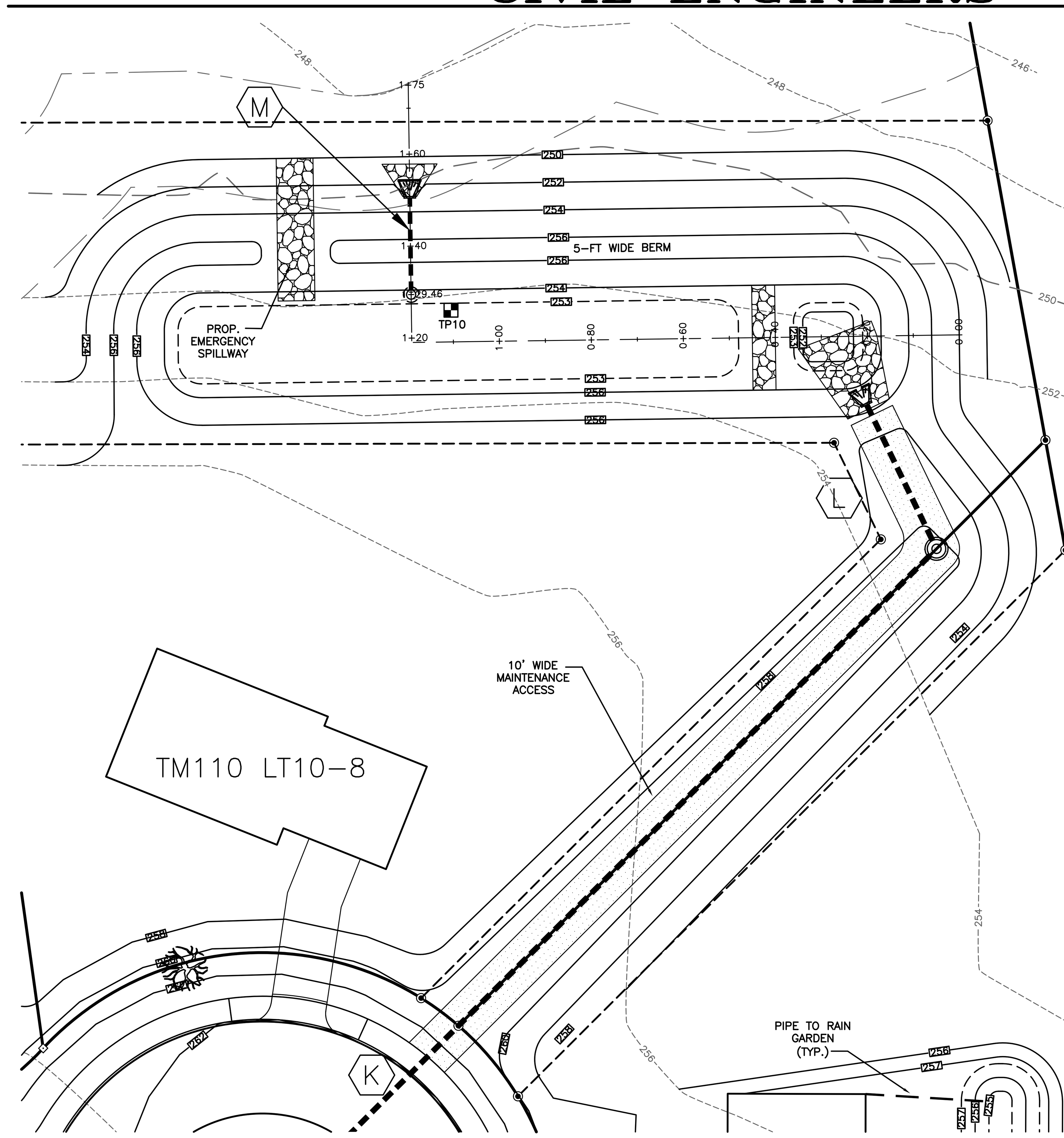
INFILTRATION BASIN NOTES

SPECIFICATIONS:

1. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION BASIN.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION BASIN.
3. AFTER THE BASIN IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHALL BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
4. VEGETATION SHALL BE ESTABLISHED IMMEDIATELY AFTER FINIAL GRADING IS COMPLETED.
5. CONSTRUCT THE INFILTRATION BASIN TO THE GRADES DEPICTED ON THE PLAN AND CROSS-SECTION.
6. LOAM AND SEED ONLY THE SLOPES OF THE INFILTRATION BASIN AS PRESCRIBED IN THE "PERMANENT VEGETATION" NOTES FOUND ON SHEET C-12. SEED MIXTURE = A
7. DO NOT PLACE INFILTRATION SYSTEMS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

MAINTENANCE REQUIREMENTS:

1. INSPECT PRETREATMENT MEASURES (I.E. SEDIMENT FOREBAY(S), HOODED CATCH BASINS, ETC.) AT LEAST TWICE A YEAR AND AFTER EVERY STORM GREATER THAN 2.5 INCHES OF RAIN OVER A 24-HOUR PERIOD.
2. INSPECT INFILTRATION SURFACE BI-ANNUALLY. ONCE IN THE SPRING PRIOR TO MAY 15 AND ONCE IN THE FALL PRIOR TO OCTOBER 15.
3. INSPECT INFILTRATION SURFACE AFTER ANY RAINFALL EVENT OF 2.5-INCHES OR GREATER IN A 24-HOUR PERIOD.
4. REMOVE AND DISPOSE OF ACCUMULATED SEDIMENT BASED ON INSPECTION. REPAIR AREA OF REMOVAL AS NECESSARY TO RESTORE INFILTRATION CAPACITY.
5. PERFORM MAINTENANCE AND REHABILITATION BASED ON INSPECTIONS.
6. REMOVE DEBRIS (IF ANY) FROM INFILTRATION BASIN INLET BASED ON INSPECTION.
7. CONDUCT PERIODIC MOWING OF THE INFILTRATION BASIN SLOPES AND EMBANKMENTS (MINIMUM TWICE A YEAR) TO ELIMINATE WOODY GROWTH FROM THE EMBANKMENTS AND BOTTOM. MOWING THE INFILTRATION BASIN EMBANKMENTS WHEN MOWING THE REST OF THE SITE IS RECOMMENDED.
8. IF THE INFILTRATION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL (I.E. PROFESSIONAL ENGINEER, CERTIFIED SOILS SCIENTIST, ETC.) SHALL ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE INFILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE INFILTRATION SURFACE.



INFILTRATION BASIN #2

1" = 20'

STATE OF NEW HAMPSHIRE
SCOTT A. LAWLER
No.10026
LICENSED
PROFESSIONAL ENGINEER

REVISIONS:

04/01/20 – REVISE SUBDIVISION LOT LAYOUT, DRAINAGE EASEMENTS, MAINTENANCE ACCESS PATHS AND MINOR GRADING AROUND BASINS.

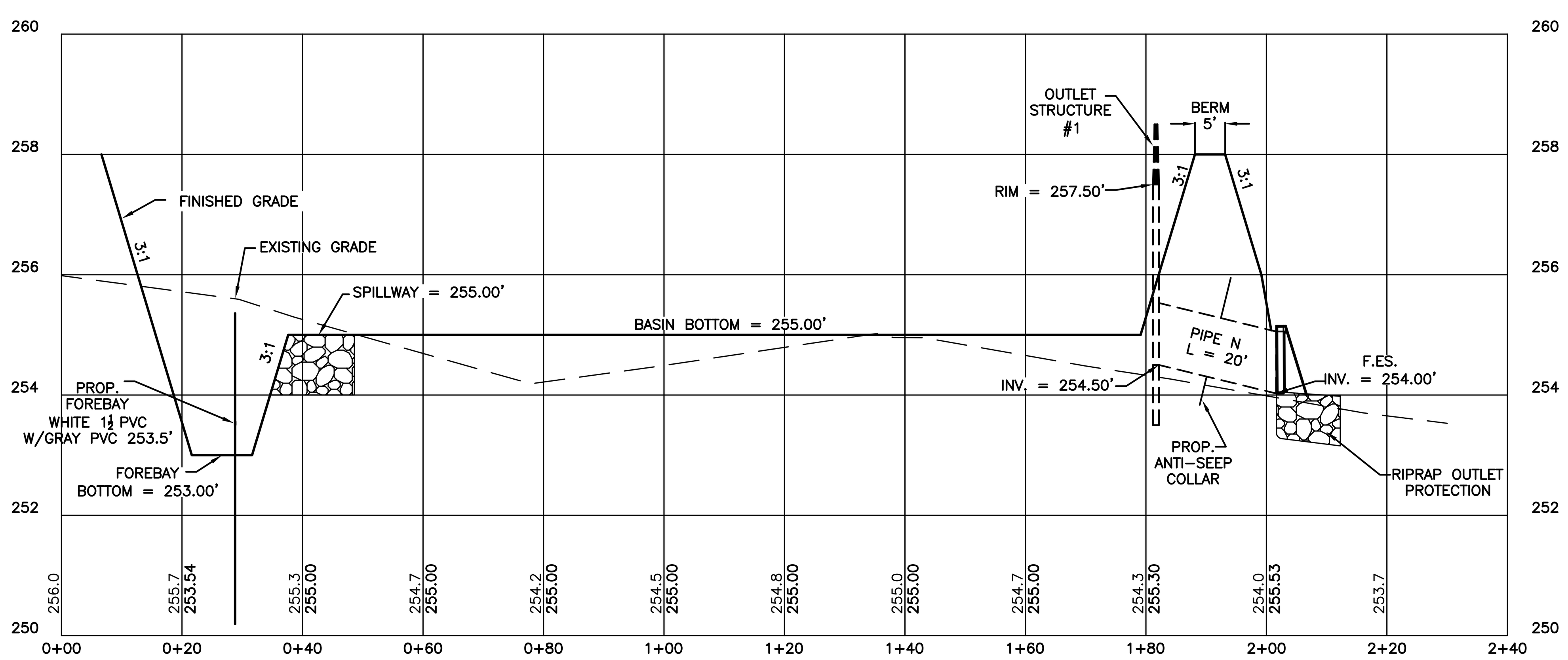
TEST PIT DATA:

THE SOILS ON THE REFERENCED PROPERTY WERE EXAMINED BY DAVID J. ALLAIN CSS#13 ON FEBRUARY 24 AND 28, 2020 TO PROPERLY ADDRESS DRAINAGE AND REGULATORY REQUIREMENTS. THE SOIL PROFILES WERE EXAMINED AND RECORDED USING NRCS, SSSNNE AND NHDES CRITERIA AS FOLLOWS:

TP# 6 (2-24-2020)
0-3 10YR3/2 SANDY LOAM, GRANULAR, FRIABLE.
3-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 38" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
38-58" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 38", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 7 (2-24-2020)
0-2 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-7" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
7- 30" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
30-62" 10YR 5/3 LOAMY SANDS, MASSIVE, GRANULAR, FRIABLE, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 30", OBSERVED WATER AT 58", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

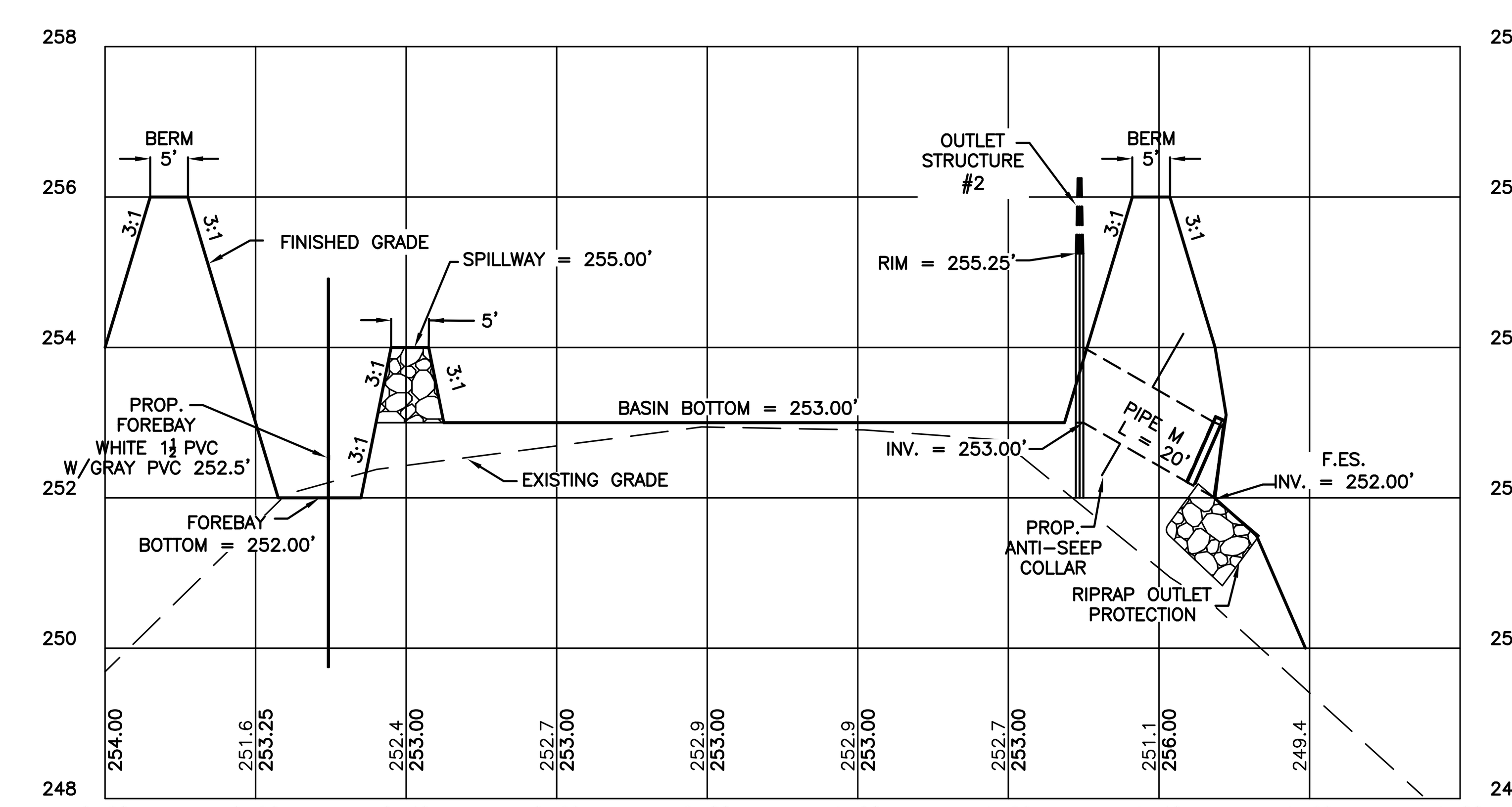
TP# 10 (2-24-2020)
0-2 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 30" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE,
30-58" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 30", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.



PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 2'

INFILTRATION BASIN #1



PROFILE

HORIZONTAL: 1" = 20'
VERTICAL: 1" = 2'

INFILTRATION BASIN #2

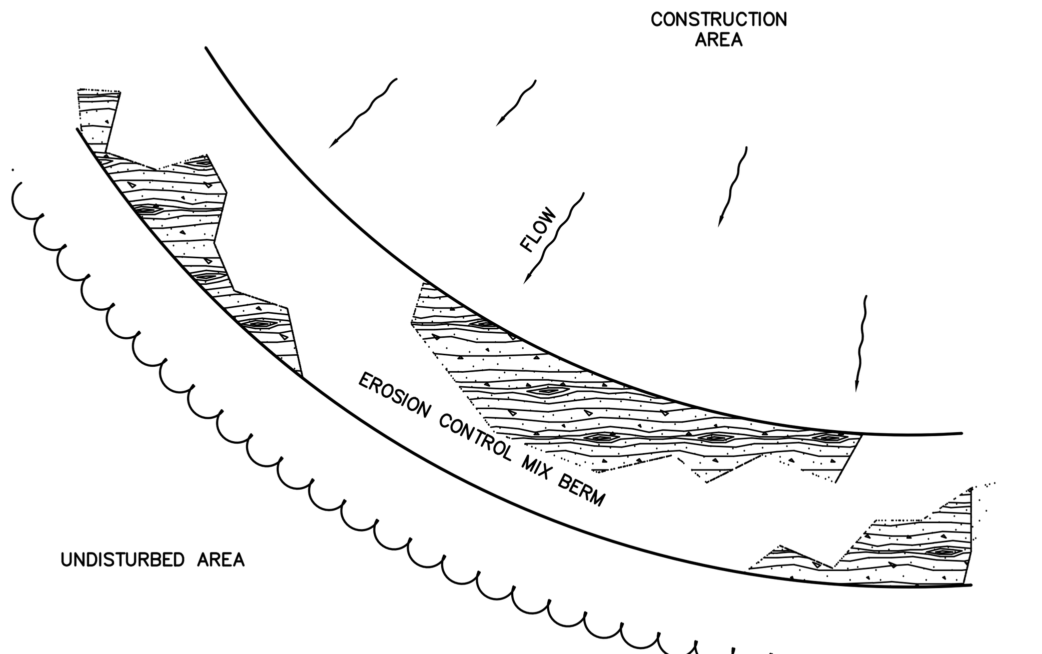
CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

FILE NO. 166
PLAN NO. C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

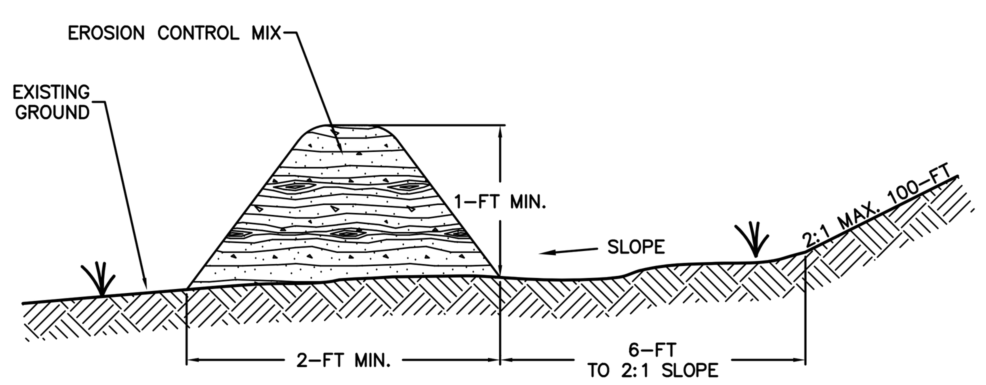
INFILTRATION BASIN PLAN & PROFILE
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

C-9

REVISIONS:
04/01/20 – REVISE RIM ELEVATIONS OF THE OUTLET STRUCTURES.



EROSION CONTROL MIX BERM CROSS-SECTION



EROSION CONTROL MIX BERM CROSS-SECTION

MAINTENANCE REQUIREMENTS:
1. EROSION CONTROL MIX BERMS SHOULD BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
2. EROSION CONTROL MIX BERMS SHOULD BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM.
3. IF THERE ARE SIGNS OF BREACHING OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, THE EROSION CONTROL MIX BERMS SHOULD BE REPLACED WITH OTHER MEASURES TO INTERCEPT AND TRAP SEDIMENT (SUCH AS A DIVERSION BERM DIRECTING RUNOFF TO A SEDIMENT TRAP OR BASIN).
4. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT.
5. SEDIMENT DEPOSITS MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) OF THE HEIGHT OF THE BARRIER.
6. EROSION CONTROL MIX BERMS SHOULD BE RESHAPED OR REAPPLIED AS NEEDED.
7. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIER IS NO LONGER REQUIRED SHOULD BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

CONSTRUCTION SPECIFICATIONS:
1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF OF THE PROJECT SITE.
2. EROSION CONTROL MIX MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS.
3. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.
4. COMPOSITION OF THE EROSION CONTROL MIX SHOULD BE AS FOLLOWS:
   A. EROSION CONTROL MIX SHALL BE A WELL GRADED MIXTURE OF PARTICLE SIZES FREE OF REFUSE, PHYSICAL CONTAMINANTS, MATERIAL TOXIC TO PLANT GROWTH AND MAY NOT CONTAIN ROCKS LESS THAN 4-INCHES IN DIAMETER;
   B. ORGANIC MATTER = 25–65% DRY WEIGHT BASIS
   C. PARTICLES PASSING BY WEIGHT:

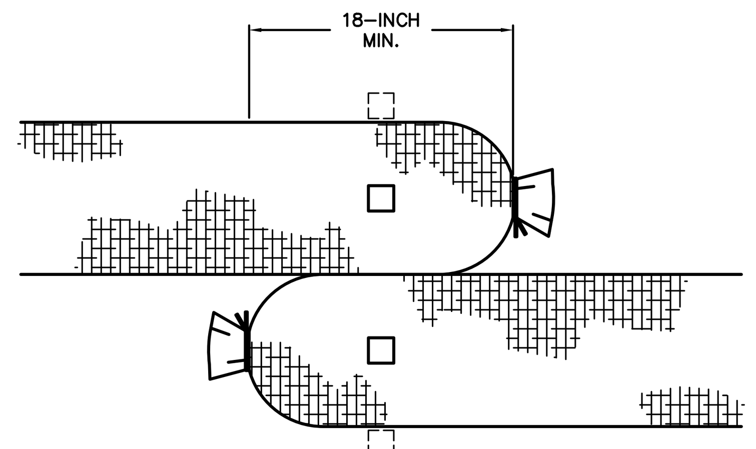
SCREEN:	PASSING BY WEIGHT:
3-INCH	100%
1-INCH	90–100%
3/4-INCH	70–100%
1/4-INCH	30–75%

   E. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
   F. THE MIX SHOULD CONTAIN NO SILTS, CLAYS OR FINE SANDS.
   G. SOLUBLE SALTS CONTENT < 4.0 mmhos/cm
   H. pH OF THE MIX SHOULD BE BETWEEN 5.0 AND 8.0
5. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR.
6. IT MAY BE NECESSARY TO CUT TALL GRASSES AND WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES IN THE BARRIER THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
7. THE BARRIER MUST BE A MINIMUM OF 12-INCHES TALL AS MEASURED ON THE UPHILL SIDE OF THE BARRIER.
8. THE BARRIER MUST BE A MINIMUM OF 2-FT WIDE.

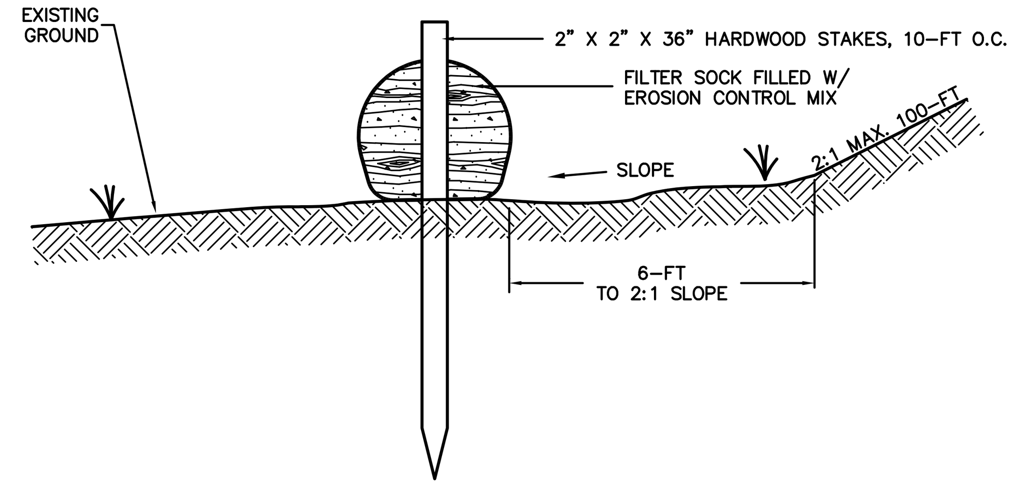
EROSION CONTROL MIX BERM DETAIL

NOT TO SCALE

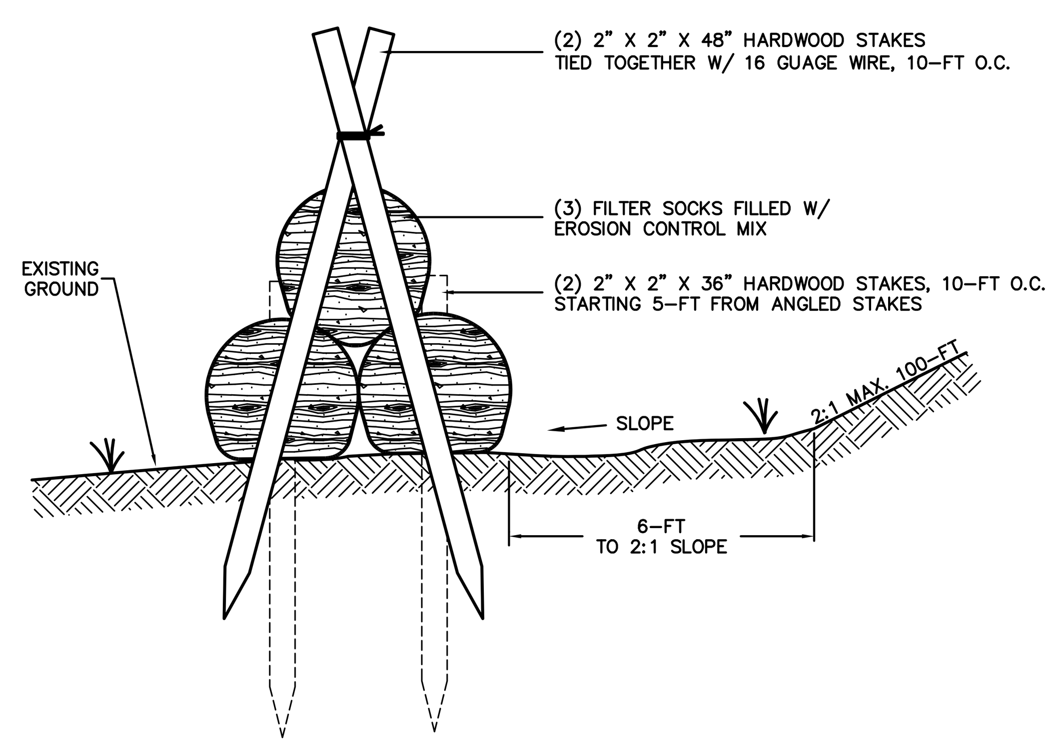
OR



FILTER SOCK CONNECTION PLAN VIEW



FILTER SOCK CROSS-SECTION



HEAVY DUTY PYRAMID FILTER SOCK CROSS-SECTION

CONTINUOUS CONTAINED BERM (FILTER SOCK ALTERNATIVE):
1. AN ALTERNATIVE PRODUCT, THE CONTINUOUS CONTAINED BERM (OR "FILTER SOCK") CAN BE AN EFFECTIVE SEDIMENT BARRIER AS IT ADDS CONTAINMENT AND STABILITY TO A BERM OF EROSION CONTROL MIX.
2. IN THE EVENT THAT USE OF CONTINUOUS CONTAINED BERM IS DESIRED, THE PRODUCT SELECTED SHOULD BE REVIEWED AND APPROVED BY THE DESIGN ENGINEER.
3. INSTALLATION OF CONTINUOUS CONTAINED BERMS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE MANUFACTURER.

MAINTENANCE REQUIREMENTS:
1. FILTER SOCK MAINTENANCE SHALL FOLLOW THE SAME SCHEDULE AS EROSION CONTROL MIX BERMS.

CONSTRUCTION SPECIFICATIONS:
1. COMPOSITION OF THE EROSION CONTROL MIX SHALL EITHER BE THE SAME AS EROSION CONTROL MIX BERM MATERIAL OR AS SPECIFIED BY THE FILTER SOCK MANUFACTURER.
2. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR.
3. IT MAY BE NECESSARY TO CUT TALL GRASSES AND WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES IN THE BARRIER THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.
4. FILTER SOCK DIAMETER (HEIGHT) SHALL BE PER THE MANUFACTURER RECOMMENDATION FOR THE AREA OF INSTALLATION.

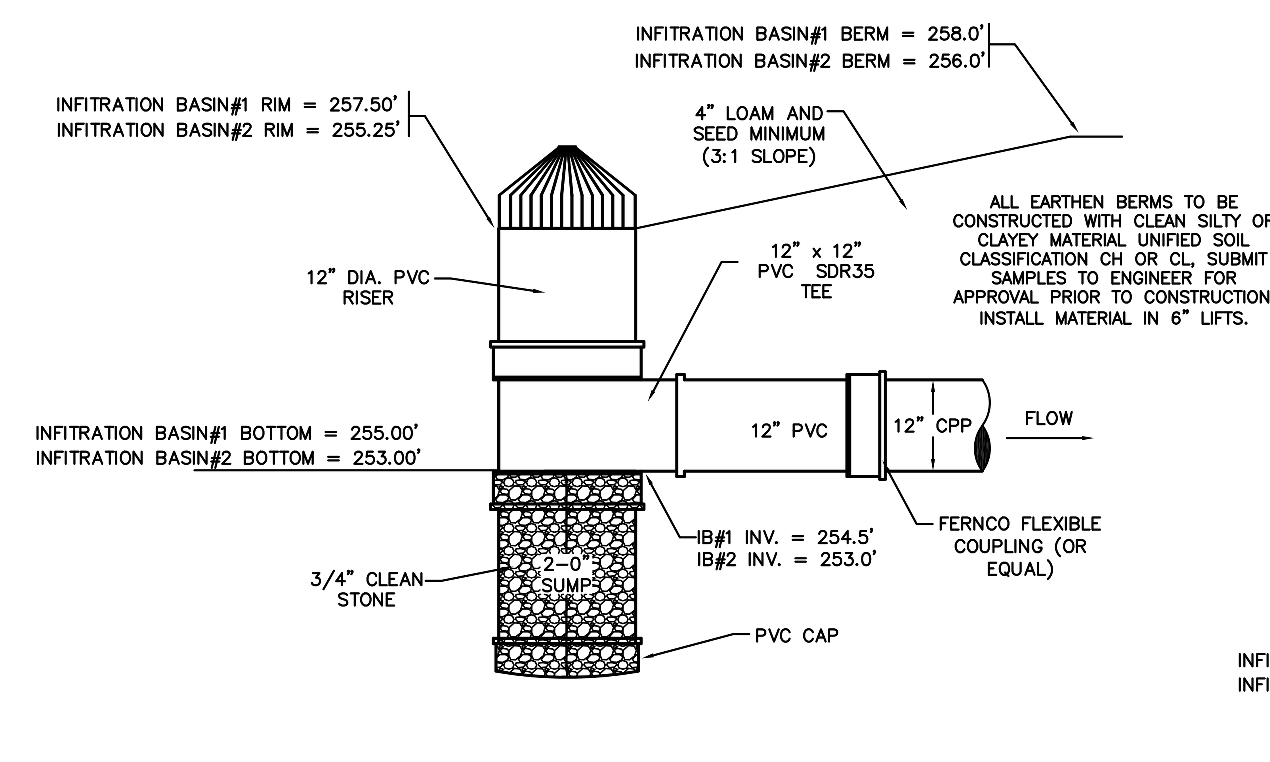
CONTINUOUS CONTAINED BERM "FILTER SOCK" DETAIL

NOT TO SCALE

SPECIFICATIONS:
1. CONSTRUCT THE SEDIMENT FOREBAY TO THE GRADES DEPICTED ON THE PLAN AND CROSS-SECTION.
2. LOAM AND SEED THE SLOPES AND BOTTOM OF THE SEDIMENT FOREBAY AS PRESCRIBED IN THE "PERMANENT VEGETATION" NOTES FOUND ON SHEET C-12. SEED MIXTURE = A

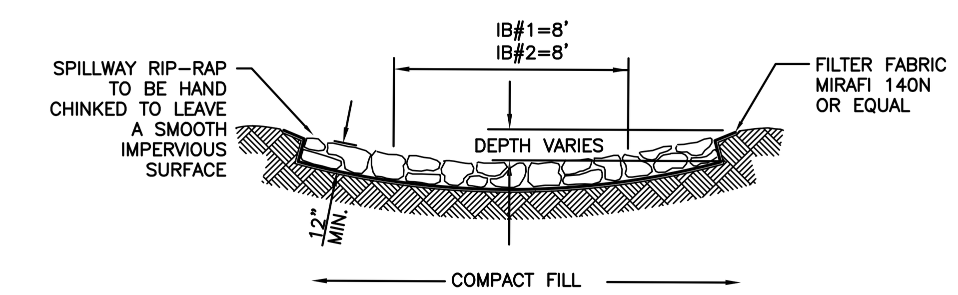
MAINTENANCE REQUIREMENTS:
1. INSPECT SEDIMENT FOREBAY BI-ANNUALLY. ONCE IN THE SPRING PRIOR TO MAY 15 AND ONCE IN THE FALL PRIOR TO OCTOBER 15.
2. CONDUCT PERIODIC MOWING OF THE SEDIMENT FOREBAY SLOPES AND EMBANKMENTS (MINIMUM TWICE A YEAR) TO ELIMINATE WOODY GROWTH FROM THE EMBANKMENTS AND BOTTOM. MOWING THE SEDIMENT FOREBAY EMBANKMENTS WHEN MOWING THE REST OF THE SITE IS RECOMMENDED.
3. REMOVE DEBRIS FROM THE OUTLET STRUCTURE OF THE SEDIMENT FOREBAY (I.E. STONE CHECK DAM) AT LEAST ONCE ANNUALLY.
4. REMOVE AND DISPOSE OF ACCUMULATED SEDIMENT BASED ON INSPECTION. WHEN SEDIMENT HAS REACHED THE RED MARK ON THE SEDIMENT STAFF GAGE INSTALLED IN THE FOREBAY, REMOVE SEDIMENT AND DISPOSE OF IT OFF-SITE IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.
   ELEVATION OF RED CLEANOUT MARK ON STAFF GAUGE FOREBAY #1=253.5'
   ELEVATION OF RED CLEANOUT MARK ON STAFF GAUGE FOREBAY #2=252.5'

SEDIMENT FOREBAY

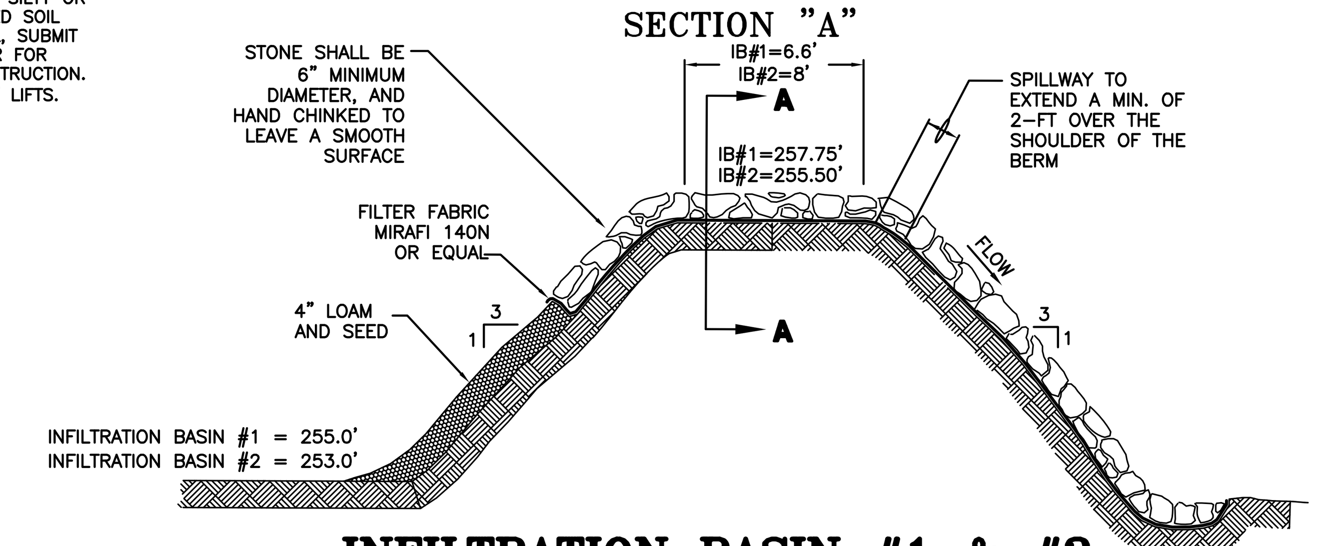


INFILTRATION BASIN #1 & #2 OUTLET STANDPIPE DETAIL

NOT TO SCALE

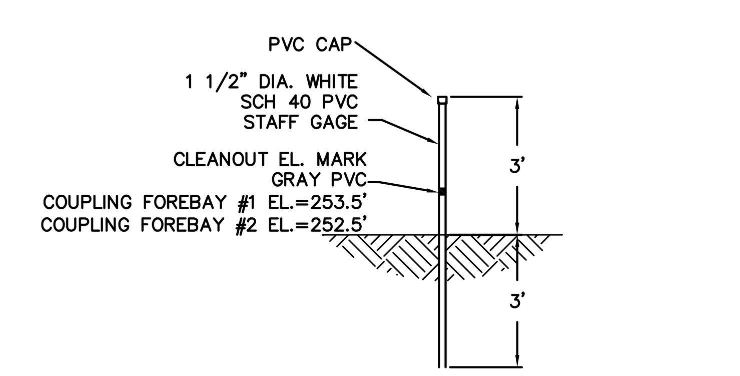


SECTION "A"



INFILTRATION BASIN #1 & #2 EMERGENCY SPILLWAY DETAIL

NOT TO SCALE



INFILTRATION BASIN #1 & #2 SEDIMENT FOREBAY GAUGE DETAIL

NOT TO SCALE

NOTES:
1. STAFF GAGE TO BE SCHEDULE 40 WHITE PVC DRIVEN OR PLACED IN GROUND A MINIMUM 3-FT.
2. CLEANOUT MARK ON STAFF TO BE GRAY PVC COUPLING SET 6-INCHES FROM BOTTOM OF BASIN.

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

INFILTRATION BASIN DETAIL SHEET AND SILT SOCK AND EARTH BERM DETAIL
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

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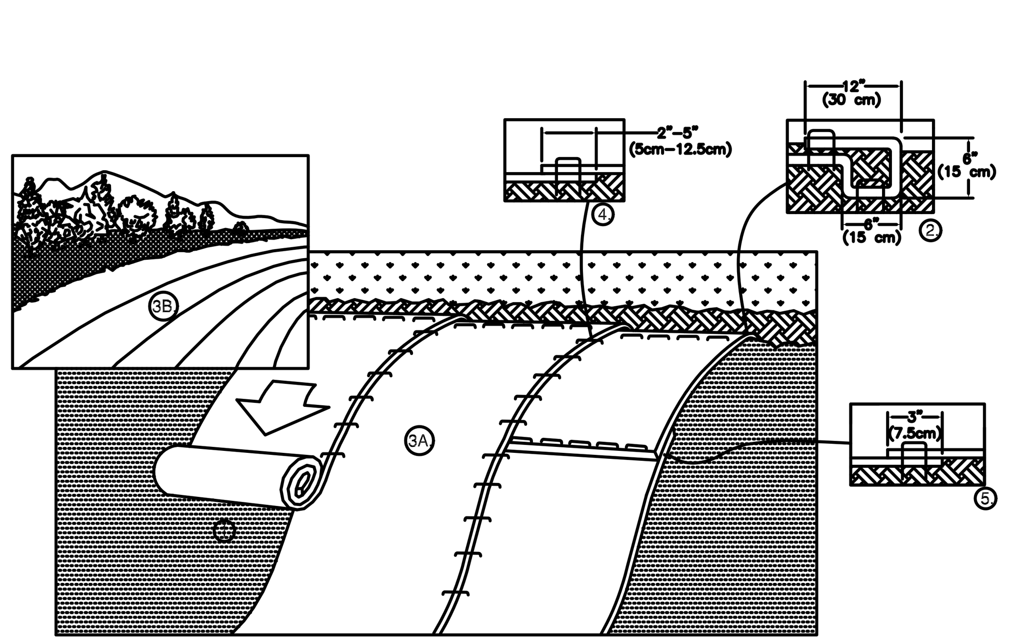


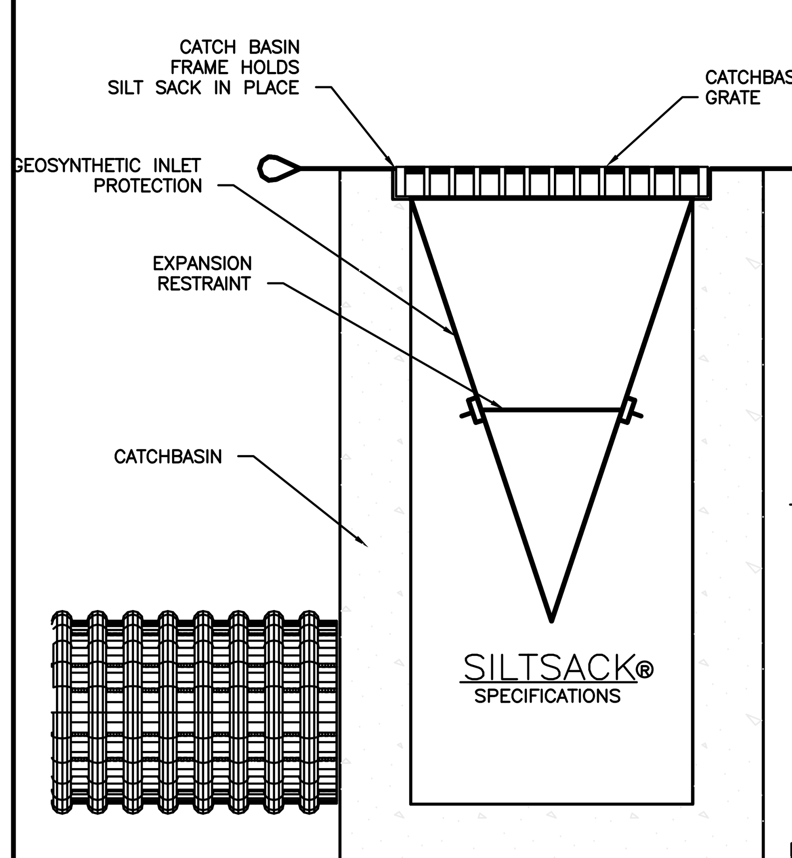
SLOPE INSTALLATION

MAINTENANCE REQUIREMENTS:
1. ALL BLANKET AND MATS SHALL BE INSPECTED WEEKLY DURING THE CONSTRUCTION PERIOD, AND AFTER ANY RAINFALL EVENT EXCEEDING 1/2 INCH IN A 24-HOUR PERIOD.
2. ANY FAILURE SHALL BE REPAIRED IMMEDIATELY. IF WASHOUT OF THE SLOPE, DISPLACEMENT OF THE MAT, OR DAMAGE TO THE MAT OCCURS, THE AFFECTED SLOPE SHALL BE REPAIRED AND RESEEDED, AND THE AFFECTED AREA OF MAT SHALL BE RE-INSTALLED.

CONSTRUCTION SPECIFICATIONS:
1. MANUFACTURE'S INSTALLATION INSTRUCTIONS:
   A. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
      NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
   B. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
   C. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHALL BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
   D. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
   E. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
      NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
2. SITE PREPARATION:
   A. PROPER SITE PREPARATION IS ESSENTIAL TO ENSURE COMPLETE CONTACT OF THE PROTECTION MATTING WITH THE SOIL.
   B. GRADE AND SHAPE AREA IF INSTALLATION.
   C. REMOVE ALL ROCKS, CLODS, TRASH, VEGETATIVE OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED BLANKETS WILL HAVE DIRECT CONTACT WITH THE SOIL.
   D. PREPARE SEEDBED BY LOOSENING 2-3 INCHES OF TOPSOIL ABOVE FINAL GRADE.
   E. INCORPORATE AMENDMENTS, SUCH AS LIME AND FERTILIZER, INTO SOIL ACCORDING TO SOIL TEST AND THE SEEDING PLAN.
3. SEEDING:
   A. SEED AREA BEFORE BLANKET INSTALLATION FOR EROSION CONTROL AND REVEGETATION. SEEDING AFTER MAT INSTALLATION IS OFTEN SPECIFIED FOR TURF REINFORCEMENT APPLICATIONS. WHEN SEEDING PRIOR TO BLANKET INSTALLATION, ALL CHECK SLOTS AND OTHER AREAS DISTURBED DURING INSTALLATION MUST BE RESEEDED.
   B. WHEN SOIL FILLING IS SPECIFIED, SEED THE MATTING AND THE ENTIRE DISTURBED AREA AFTER INSTALLATION AND PRIOR TO FILLING THE MAT WITH SOIL.

TEMPORARY EROSION CONTROL BLANKET DETAIL

NOT TO SCALE



REGULAR FLOW SILTSACK®

(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

NOTES:

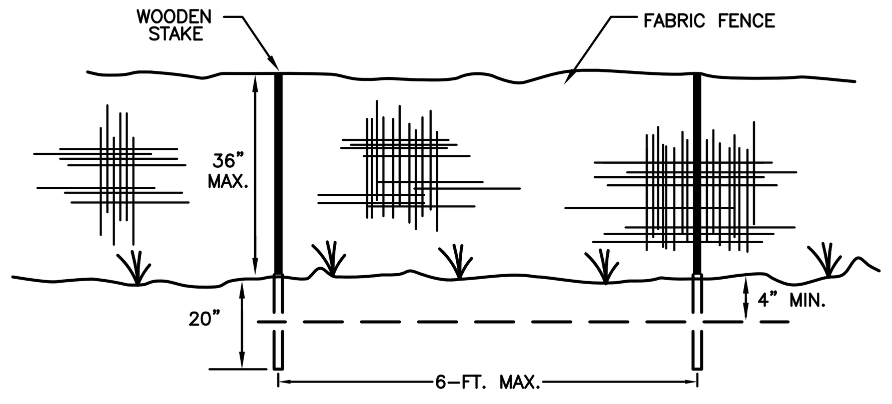
1. GEOSYNTHETIC SEDIMENT FILTER TRAP SHALL BE 'REGULAR FLOW SILTSACK®' OR APPROVED EQUAL. SPECIFICATIONS FOR SILTSACK® ARE DETAILED.

2. FILTER TRAPS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.

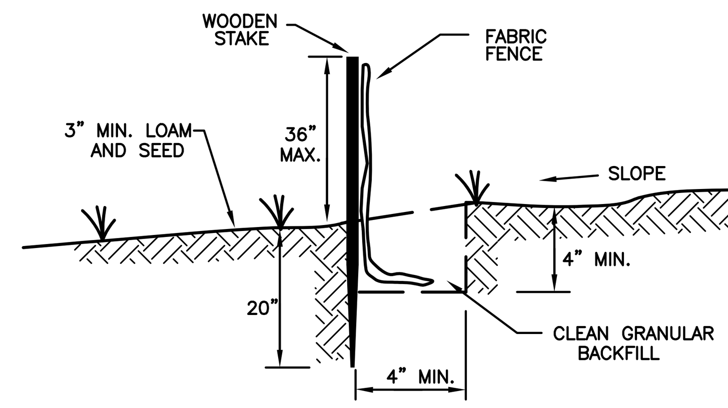
3. INSTALL SILT SACKS IN CATCH BASIN UPON INSTALLATION OF STRUCTURE.

CATCH BASIN GEOSYNTHETIC SEDIMENT TRAP

NOT TO SCALE



PROFILE



CROSS-SECTION

MAINTENANCE REQUIREMENTS:
1. FENCES SHALL BE INSPECTED AND MAINTAINED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALLS;
2. SEDIMENT DEPOSITION SHALL BE REMOVED, AT A MINIMUM, WHEN DEPOSITION ACCUMULATES TO ONE-HALF THE HEIGHT OF THE FENCE, AND MOVED TO AN APPROPRIATE LOCATION SO THE SEDIMENT IS NOT READILY TRANSPORTED BACK TOWARD THE SILT FENCE.
3. SILT FENCES SHALL BE REPAIRED IMMEDIATELY IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES OF THE BARRIER, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHALL BE REPLACED WITH A TEMPORARY CHECK DAM.
4. SHALL THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY; THE FABRIC SHALL BE REPLACED PROMPTLY.
5. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE PREPARED AND SEEDED.
6. IF THERE IS EVIDENCE OF END FLOW ON PROPERLY INSTALLED BARRIERS, EXTEND BARRIERS UPHILL OR CONSIDER REPLACING THEM WITH OTHER MEASURES, SUCH AS TEMPORARY DIVERSIONS AND SEDIMENT TRAPS.
7. SILT FENCES HAVE A USEFUL LIFE OF ONE SEASON. ON LONGER CONSTRUCTION PROJECTS, SILT FENCE SHALL BE REPAIRED PERIODICALLY AS REQUIRED TO MAINTAIN EFFECTIVENESS.

CONSTRUCTION SPECIFICATIONS:
1. FENCES SHALL BE USED IN AREAS WHERE EROSION WILL OCCUR ONLY IN THE FORM OF SHEET EROSION AND THERE IS NO CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY ABOVE THE FENCE. SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA ABOVE THE FENCE SHALL BE LESS THAN 1 ACRE PER 100 LINEAR FEET OF FENCE;
3. THE MAXIMUM LENGTH OF SLOPE ABOVE THE FENCE SHALL BE 100 FEET;
4. THE MAXIMUM SLOPE ABOVE THE FENCE SHALL BE 2:1;
5. FENCES SHALL BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSELY AS POSSIBLE, AND
   A. THE ENDS OF THE FENCE SHALL BE FLARED UPSLOPE;
   B. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 4 INCHES IN DEPTH AND INCHES IN WIDTH IN A TRENCH EXCAVATED INTO THE GROUND, OR IF SITE CONDITIONS INCLUDE FROZEN GROUND, LEDGE, OR THE PRESENCE OF HEAVY ROOTS, THE BASE OF THE FABRIC SHALL BE EMBEDDED WITH A MINIMUM THICKNESS OF 8 INCHES OF 3/4-INCH STONE;
   C. THE SOIL SHALL BE COMPACTED OVER THE EMBEDDED FABRIC;
   D. SUPPORT POSTS SHALL BE SIZED AND ANCHORED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS WITH MAXIMUM POST SPACING OF 6 FEET;
   E. ADJOINING SECTIONS OF THE FENCE SHALL BE OVERLAPPED BY A MINIMUM OF 6 INCHES (24 INCHES IS PREFERRED), FOLDED AND STAPLED TO A SUPPORT POST. IF METAL POSTS ARE USED, FABRIC SHALL BE WIRE-TIED DIRECTLY TO THE POSTS WITH THREE DIAGONAL TIES.
6. SILT FENCING SHALL NOT BE STAPLED OR NAILED TO TREES.
7. THE FILTER FABRIC SHALL BE A PERVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.
8. THE FILTER FABRIC SHALL CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 DEGREES FAHRENHEIT TO 120 DEGREES FAHRENHEIT.
9. POSTS FOR SILT FENCES SHALL BE EITHER 4-INCH DIAMETER WOOD OR 1.33 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHALL HAVE, PROJECTIONS FOR FASTENING WIRE TO THEM. POSTS SHALL BE PLACED ON THE DOWN SLOPE SIDE OF THE FABRIC.
10. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES AS HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.
11. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY; FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.
12. A MANUFACTURED SILT FENCE SYSTEM WITH INTEGRAL POSTS MAY BE USED.
13. POST SPACING SHALL NOT EXCEED 6 FEET.
14. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UP GRADIENT FROM THE BARRIER.
15. THE STANDARD STRENGTH OF FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE POST, AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
16. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
17. SILT FENCE MAY BE INSTALLED BY "SLICING" USING MECHANICAL EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PROCEDURE. THE SLICING METHOD USES AN IMPLEMENT TOWED BEHIND A TRACTOR TO "PLOW" OR SLICE THE SILT FENCE MATERIAL INTO THE SOIL. THE SLICING METHOD MINIMALLY DISRUPTS THE SOIL UPWARD AND SLIGHTLY DISPLACES THE SOIL, MAINTAINING THE SOIL'S PROFILE AND CREATING AN OPTIMAL CONDITION FOR SUBSEQUENT MECHANICAL COMPACTION.
18. SILT FENCES SHALL BE INSTALLED WITH "SMILES" OR "J-HOOKS" TO REDUCE THE DRAINAGE AREA THAT ANY SEGMENT WILL IMPOUND.
19. THE ENDS OF THE FENCE SHALL BE TURNED UPHILL.
20. SILT FENCES PLACED AT THE TOE OF A SLOPE SHALL BE SET AT LEAST 6 FEET FROM THE TOE M ALLOW SPACE FOR SHALLOW PONDING AND TO ALLOW FOR MAINTENANCE ACCESS WITHOUT DISTURBING THE SLOPE.
21. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

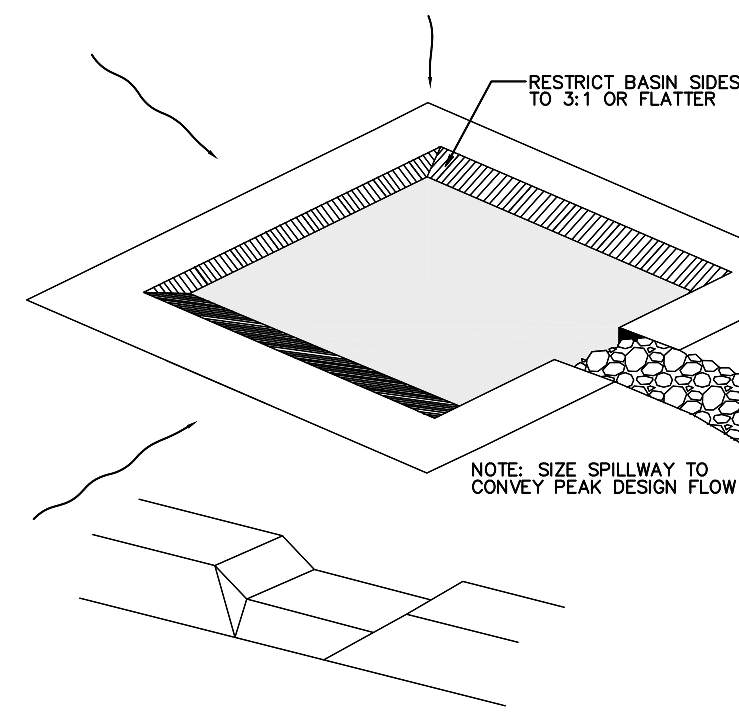
SILTATION CONTROL FENCE DETAIL

NOT TO SCALE

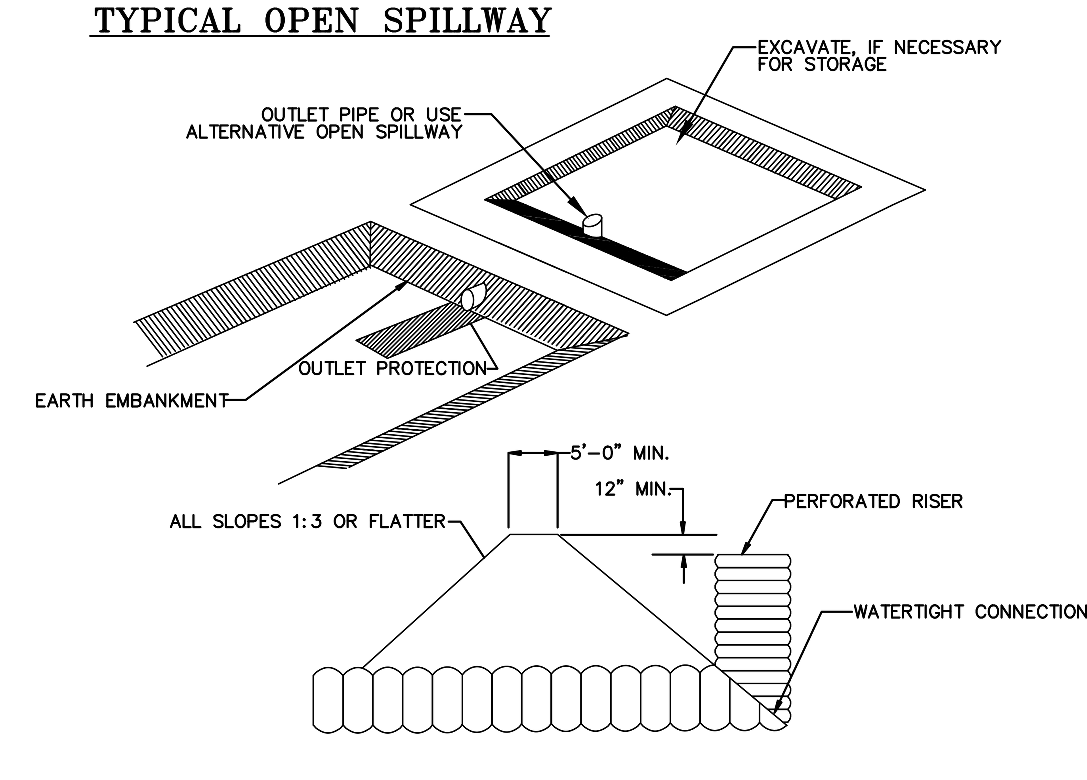
TEMPORARY VEGETATION SEEDING RECOMMENDATIONS

SPECIES	PER ACRE BUSHELS (BU) OR POUNDS (LBS.)	PER 1,000-SF	REMARKS
WINTER RYE	2.5 BU OR 112 LBS.	2.5 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	2.5 BU OR 80 LBS.	2.0 LBS.	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15 FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYE GRASS	40 LBS.	1.0 LB.	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15 AND SEPTEMBER 15. COVER THE SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYE GRASS	30 LBS.	0.7 LBS.	BEST FOR FALL SEEDING. SEED FROM AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.

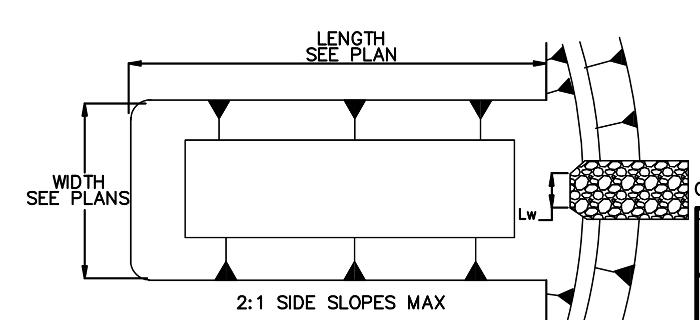
SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLE 4-1
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)



TYPICAL OPEN SPILLWAY

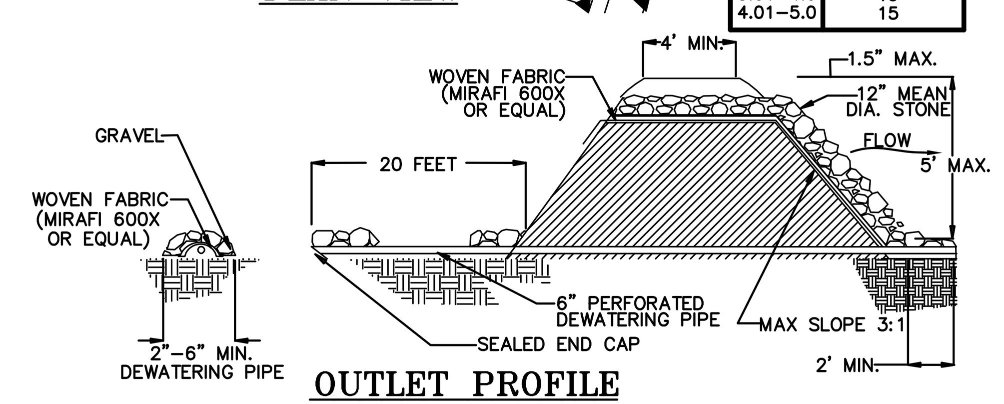


EMBANKMENT SECTION THRU RISER

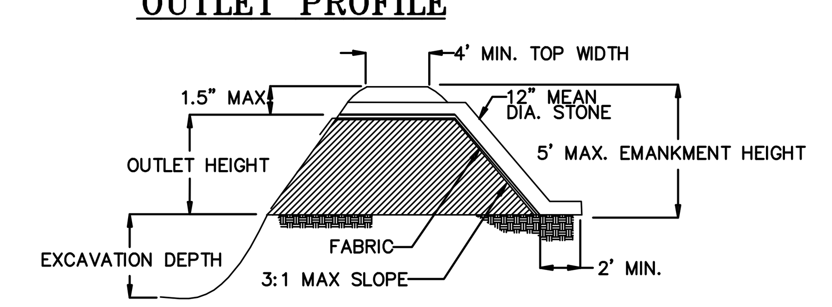


PLAN VIEW

TRIBUTARY AREA (ACRES)	LENGTH OF SPILLWAY WEIP Lw (FT)
0-1.0	50
1.01-2.0	37
2.01-3.0	30
3.01-4.0	19
4.01-5.0	15



OUTLET PROFILE



ALTERNATE OUTLET PROFILE

SEDIMENT TRAP

TEMPORARY VEGETATION:

SPECIFICATIONS:
SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHALL BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHALL INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR O THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

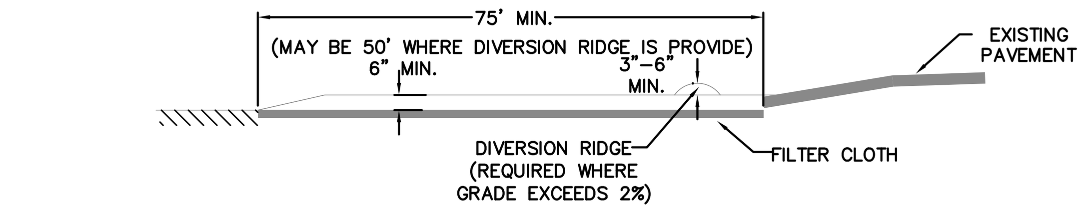
SEEDBED PREPARATION:
1. STONES AND TRASH SHALL BE REMOVED SO AS NOT TO INTERFERE WITH THE SEEDING AREA.
2. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
3. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHALL BE APPLIED DURING THE GROWING SEASON.
4. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. FERTILIZER SHALL BE RESTRICTED TO LIME, WOOD ASH OR LOW PHOSPHATE AND SLOW RELEASE NITROGEN VARIETIES, UNLESS A SOIL TEST WARRANTS OTHERWISE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*
   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

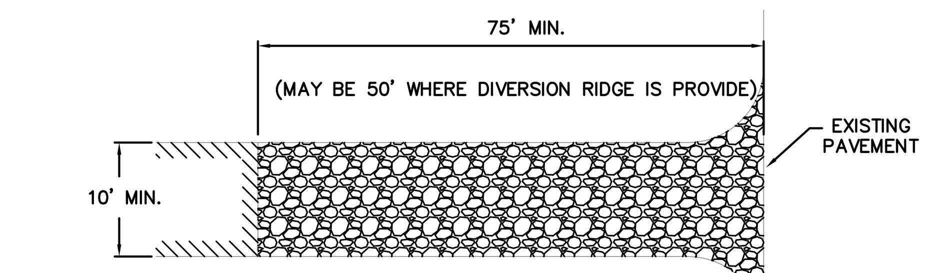
   FERTILIZER APPLICATION RATE = 870 LB./ACRE (20 LB./1,000-SF)*
   *LOW PHOSPHATE FERTILIZER (6-0-4) OR EQUIVALENT

SEEDING:
1. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDRO SEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.
2. TEMPORARY SEED SHALL TYPICALLY OCCUR PRIOR TO SEPTEMBER 15.
3. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHALL BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
4. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHALL BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVER WINTER PROTECTION.

MAINTENANCE REQUIREMENTS:
1. TEMPORARY SEEDING SHALL BE INSPECTED WEEKLY AFTER ANY RAINFALL EXCEEDING 1/2 INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHALL BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
2. BASED ON INSPECTION, AREAS SHALL BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHALL BE IMPLEMENTED.
3. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND AREAS SHALL BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.



PROFILE



PLAN

TEMPORARY CONSTRUCTION EXIT

NOT TO SCALE

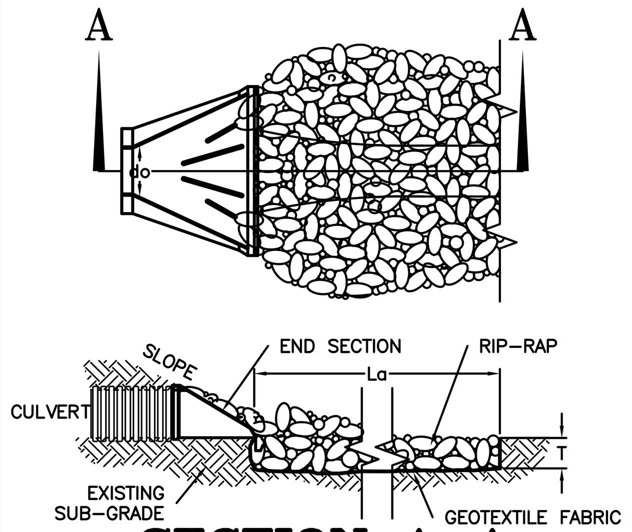
MAINTENANCE REQUIREMENTS:
1. WHEN THE CONTROL PAD BECOMES INEFFECTIVE, THE STONE SHALL BE REMOVED ALONG WITH THE COLLECTED SOIL MATERIAL, REGRADED ON SITE, AND STABILIZED. THE ENTRANCE SHALL TEN BE RECONSTRUCTED.
2. THE CONTRACTOR SHALL SWEEP THE PAVEMENT AT EXITS WHENEVER SOIL MATERIALS ARE TRACKED ONTO THE ADJACENT PAVEMENT OR TRAVELED WAY.
3. WHEN WHEEL WASHING IS REQUIRED, IT SHALL BE CONDUCTED ON AN AREA STABILIZED WITH AGGREGATE, WHICH DRAINS INTO AN APPROVED SEDIMENT-TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.

CONSTRUCTION SPECIFICATIONS:
1. THE MINIMUM STONE USED SHALL BE 3-INCH CRUSHED STONE.
2. THE MINIMUM LENGTH OF THE PAD SHALL BE 75 FEET, EXCEPT THAT THE MINIMUM LENGTH MAY BE REDUCED TO 50 FEET IF A 3-INCH TO 6-INCH BERM IS INSTALLED AT THE ENTRANCE OF THE PROJECT SITE.
3. THE PAD SHALL BE THE FULL WIDTH OF CONSTRUCTION ACCESS ROAD OR 10 FEET, WHICHEVER IS GREATER.
4. THE PAD SHALL SLOPE AWAY FROM THE EASTERN AVENUE.
5. THE PAD SHALL BE AT LEAST 6 INCHES THICK.
6. THE GEOTEXTILE FILTER FABRIC SHALL BE PLACED BETWEEN THE STONE PAD AND THE EARTH SURFACE BELOW THE PAD.
7. THE PAD SHALL BE MAINTAINED OR REPLACED WHEN MUD AND SOIL PARTICLES CLOG THE VOIDS IN THE STONE SUCH THAT MUD AND SOIL PARTICLES ARE TRACKED OFF-SITE.
8. NATURAL DRAINAGE THAT CROSSES THE LOCATION OF THE STONE PAD SHALL BE INTERCEPTED AND PIPED BENEATH THE PAD, AS NECESSARY, WITH SUITABLE OUTLET PROTECTION.

TEMPORARY EROSION & SEDIMENTATION CONTROL DETAILS
TAX MAP 110, LOT 10-00 &
LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

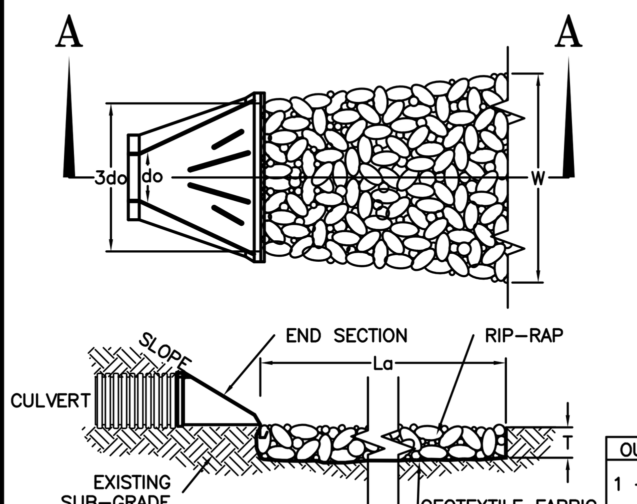
C-11

FILE NO. 166
PLAN NO. C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"



SECTION A-A

(PIPE OUTLET TO WELL DEFINED CHANNEL)



SECTION A-A

(PIPE OUTLET TO FLAT AREA NO WELL DEFINED CHANNEL)

RIP-RAP GRADATION

d50 = 3"

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	5	TO	6
85	4	TO	5
50	3	TO	5
15	1	TO	2

d50 = 4"

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	6	TO	8
85	5	TO	7
50	4	TO	6
15	1	TO	2

d50 = 6"

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	9	TO	12
85	7.8	TO	10.8
50	6	TO	9
15	1.8	TO	3

d50 = 9"

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)		
100	13.5	TO	18
85	11.7	TO	16.2
50	9	TO	13.5
15	2.7	TO	4.5

APRON DIMENSION TABLE

OUTLET PROT. #	PIPE OUTLET	Wo	W	La	T	d50
1 – FB#1 PIPE H	24" CPP	6'	23'	17'	12"	3"
2 – OS#1 PIPE L	15" CPP	4'	15'	11'	12"	3"
3 – OS#1 PIPE M	12" CPP	3'	12'	7'	12"	3"
4 – OS#1 PIPE N	12" CPP	3'	12'	7'	12"	3"

NOTES:
1. ALL PIPE CULVERTS SHALL HAVE END SECTIONS OR HEADWALLS. END SECTION MATERIAL AND MANUFACTURER SHALL MATCH THAT OF THE PIPE CULVERT.
2. THE LARGEST RIP-RAP SIZE DETERMINED DURING HYDROLOGIC ANALYSIS HAS BEEN USED FOR ALL OUTLETS FOR ECONOMY AND SIMPLICITY.
3. APRON LENGTHS, WIDTHS AND THICKNESSES HAVE BEEN ROUNDED UP TO WHOLE NUMBERS FOR EASE OF CONSTRUCTION.

CONSTRUCTION SPECIFICATIONS:
1. PREPARE THE SUB-GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP-RAP TO THE GRADES SHOWN ON THE PLANS.
2. MINIMUM 6" SAND/GRAVEL BEDDING OR GEOTEXTILE FABRIC REQUIRED UNDER ALL ROCK RIP-RAP.
3. THE ROCK OR GRAVEL USED FOR FILTER OR RIP-RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF ROCK RIP-RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO (2) PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
5. STONE FOR THE RIP-RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
6. RIP-RAP SIZE CHOSEN FOR THE WORST CASE OF ALL OUTLETS. ALL RIP-RAP USED FOR PIPE OUTLET PROTECTION WILL HAVE THE SAME GRADATION AND THICKNESS.

MAINTENANCE NOTES:
1. OUTLETS SHALL BE INSPECTED AND CLEANED ANNUALLY AND AFTER ANY MAJOR STORM EVENT. ANY EROSION OR DAMAGE TO THE RIP-RAP SHALL BE REPAIRED IMMEDIATELY.
2. THE CHANNEL IMMEDIATELY DOWNSTREAM FROM THE OUTLET SHOULD BE CHECKED TO SEE THAT NO EROSION IS OCCURRING.
3. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

PIPE OUTLET PROTECTION DETAIL

DUST CONTROL PRACTICES:

1. APPLY DUST CONTROL MEASURES AS NECESSARY TO MAINTAIN CONTROL OF DUST ON SITE.
2. WATER APPLICATION:
   A) MOISTEN EXPOSED SOIL SURFACES PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST.
   B) AVOID EXCESSIVE APPLICATION OF WATER THAT WOULD RESULT IN MOBILIZING SEDIMENT AND SUBSEQUENT DEPOSITION IN NATURAL WATERBODIES.
3. STONE APPLICATION:
   A) COVER SURFACE WITH CRUSHED OR COARSE GRAVEL.
   B) IN AREAS NEAR WATERWAYS USE ONLY CHEMICALLY STABILIZED OR WASHED AGGREGATE.
4. REFER TO "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" FOR OTHER ALLOWABLE DUST CONTROL PRACTICES (I.E. COMMERCIAL TACKIFIERS OR CHEMICAL TREATMENTS SUCH AS CALCIUM CHLORIDE, ETC.)

STOCKPILE PRACTICES:

1. LOCATE STOCKPILES A MINIMUM OF 50-FT. AWAY FROM CONCENTRATED FLOWS OF STORMWATER, DRAINAGE COURSES OR INLETS.
2. PROTECT ALL STOCKPILES FROM STORMWATER RUN-ON USING TEMPORARY PERIMETER MEASURES SUCH AS DIVERSIONS, BERMS, SANDBAGS OR OTHER APPROVED PRACTICES.
3. STOCKPILES SHALL BE SURROUNDED BY SEDIMENT BARRIERS AS DESCRIBED ON THE PLANS AND IN NHSMM VOL. 3. TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILE.
4. IMPLEMENT WIND EROSION CONTROL PRACTICES AS APPROPRIATE ON ALL STOCKPILED MATERIAL.
5. PLACE BAGGED MATERIALS ON PALLETS OR UNDERCOVER.

PROTECTION OF INACTIVE STOCKPILES:
6. INACTIVE SOIL STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY SEED AND MULCH OR OTHER TEMPORARY STABILIZATION PRACTICE) AND TEMPORARY PERIMETER SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES.
7. INACTIVE STOCKPILES OF CONCRETE RUBBLE, ASPHALT CONCRETE RUBBLE, AGGREGATE MATERIALS, AND SIMILAR MATERIALS SHALL BE PROTECTED WITH TEMPORARY SEDIMENT PERIMETER BARRIERS (I.E. SILT FENCE, ETC.) AT ALL TIMES. IF THE MATERIALS ARE A SOURCE OF DUST, THEY SHALL ALSO BE COVERED.

PROTECTION OF ACTIVE STOCKPILES:
8. ALL STOCKPILES SHALL BE SURROUNDED WITH TEMPORARY LINEAR SEDIMENT BARRIERS (I.E. SILT FENCE, ETC.) PRIOR TO THE ONSET OF PRECIPITATION. PERIMETER BARRIERS SHALL BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIAL FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHALL BE INSPECTED AT THE END OF EACH WORKING DAY.
9. WHEN A STORM IS PREDICTED, STOCKPILES SHALL BE PROTECTED WITH AN ANCHORED PROTECTIVE COVERING.

PERMANENT VEGETATION:

SPECIFICATIONS:

SITE PREPARATION:
1. INSTALL NEEDED EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILTATION BARRIERS, DIVERSIONS, AND SEDIMENT TRAPS.
2. GRADE AS NEEDED FOR THE ACCESS OF EQUIPMENT FOR SEEDBED PREPARATION, SEEDING, MULCH APPLICATION, AND MULCH ANCHORING.
3. RUNOFF SHALL BE DIVERTED FROM THE SEEDBED AREA.
4. ON SLOPES 4:1 OR STEEPER, THE FINAL PREPARATION SHALL INCLUDE CREATING HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.

SEEDBED PREPARATION:
1. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHALL BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY AND SILT SOILS SHALL BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
2. REMOVE FROM THE SURFACE ALL STONES 2INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
3. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
4. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
5. IF APPLICABLE, FERTILIZER AND ORGANIC SOIL AMENDMENTS SHALL BE APPLIED DURING THE GROWING SEASON.
6. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. FERTILIZER SHALL BE RESTRICTED TO LIME, WOOD ASH OR LOW PHOSPHATE AND SLOW RELEASE NITROGEN VARIETIES, UNLESS A SOIL TEST WARRANTS OTHERWISE. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL FERTILIZER AND LIMESTONE MAY BE APPLIED AT THE FOLLOWING RATES:

   LIMESTONE APPLICATION RATE = 3 TONS/ACRE (138 LB./1,000-SF)*
   *EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE

   FERTILIZER APPLICATION RATE = 870 LB./ACRE (20 LB./1,000-SF)*
   *LOW PHOSPHATE FERTILIZER (6-0-4) OR EQUIVALENT

SEEDING:
1. INOCULATE ALL LEGUME SEED WITH THE CORRECT TYPE OF INOCULANT.
2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL CULTIPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE.
3. WHERE FEASIBLE EXCEPT WHERE EITHER CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHALL BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
4. SPRING SEEDING USUALLY GIVES THE BEST RESULTS FOR ALL SEED MIXES OR WITH LEGUMES. PERMANENT SEEDING SHALL BE COMPLETED 45 DAYS PRIOR TO FIRST KILLING FROST. WHEN CROWN VETCH IS SEEDED IN LATE SUMMER AT LEAST 35% OF THE SEED SHALL BE HARD SEED (UNSCARIFIED). IF SEEDING CANNOT BE DONE WITHIN THE SPECIFIED SEEDING DATES, MULCH ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3. AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
5. AREAS SEEDED BETWEEN MAY 15 AND AUGUST 15 SHALL BE COVERED WITH HAY OR STRAW MULCH, ACCORDING TO THE "TEMPORARY AND PERMANENT MULCHING" PRACTICE DESCRIBED IN THE NHSSM, VOL 3.
6. VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA SHALL BE ACHIEVED PRIOR TO OCTOBER 15. IF THIS CONDITION IS NOT ACHIEVED, IMPLEMENT OTHER TEMPORARY STABILIZATION MEASURES FOR OVER WINTER PROTECTION.

HYDROSEEDING:
1. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
2. SLOPES BUST BE NO STEEPER THAN 2:1 (2 FEET HORIZONTALLY BY 1 FOOT VERTICALLY.
3. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
4. SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

MAINTENANCE REQUIREMENTS:
1. PERMANENT SEEDED AREAS SHALL BE INSPECTED AT LEAST MONTHLY DURING THE COURSE OF CONSTRUCTION. INSPECTION, MAINTENANCE AND CORRECTIVE ACTIONS SHALL CONTINUE UNTIL THE OWNER ASSUMES PERMANENT OPERATION OF THE SITE.
2. SEEDED AREAS SHALL BE MOWED AS REQUIRED TO MAINTAIN A HEALTHY STAND OF VEGETATION. MOWING HEIGHT AND FREQUENCY DEPEND OF TYPE OF GRASS COVER.
3. BASED ON INSPECTION, AREAS SHALL BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS.
4. AT A MINIMUM 85% OF THE SOIL SURFACE SHALL BE COVERED BY VEGETATION.
5. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND AREAS SHALL BE RESEEDED, WITH OTHER TEMPORARY MEASURES (I.E. MULCH, ETC.) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION SEEDING RECOMMENDATIONS

USE	MIXTURE	SPECIES	LBS./ACRE	LBS./ 1,000-SF
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY RECREATION SITES	A	TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL	20 20 2 42	0.45 0.45 0.05 0.95
PLAY AREAS AND ATHLETIC FIELDS (TOPSOIL ESSENTIAL FOR GOOD TURF)	F	CREEPING RED FESCUE KENTUCKY BLUEGRASS TOTAL	50 50 100	1.15 1.15 2.30

SOURCES:
1. NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3, TABLES 4-2 AND 4-3
2. MINNICK, E.L. AND H.T. MARSHALL, (AUGUST 1992)

GENERAL CONSTRUCTION PHASING:

1. STABILIZATION:
   A SITE IS DEEMED STABILIZED WHEN IT IS IN A CONDITION IN WHICH THE SOIL ON SITE WILL NOT EXPERIENCE ACCELERATED OR UNNATURAL EROSION UNDER THE CONDITIONS OF A 10-YEAR STORM EVENT, SUCH AS BUT NOT LIMITED TO:
   A)IN AREAS THAT WILL NOT BE PAVED:
   a) A MINIMUM OF 85% VEGETATIVE COVER HAS BEEN ESTABLISHED;
   b) A MINIMUM OF 3-INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR A CERTIFIED COMPOST BLANKET HAS BEEN INSTALLED, OR;
   c) EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
   B)IN AREAS TO BE PAVED:
   a) BASE COURSE GRAVELS HAVE BEEN INSTALLED.
2. TEMPORARY STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHALL BE TEMPORARILY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 45 DAYS FROM THE TIME OF INITIAL DISTURBANCE, UNLESS A SHORTER TIME IS SPECIFIED BY LOCAL AUTHORITIES, THE CONSTRUCTION SEQUENCE APPROVED AS PART OF THE ISSUED PERMIT OR AN INDEPENDENT MONITOR.
3. PERMANENT STABILIZATION:
   ALL AREAS OF EXPOSED OR DISTURBED SOIL SHALL BE PERMANENTLY STABILIZED AS SOON AS PRACTICABLE BUT NO LATER THAN 3 DAYS FOLLOWING FINAL GRADING.
4. MAXIMUM AREA OF DISTURBANCE:
   THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, NO MORE THAN 5 ACRES SHALL BE DISTURBED (NOT STABLIZED) AT ANY TIME.
5. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION.
   A) FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED.
   B) EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION.
6. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED GRADING AND DRAINAGE PLAN DEPICTED ON SHEET C-3.
7. ALL EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN DEPICTED ON SHEET C-4.
8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN THE AMOUNT NECESSARY TO COMPLETE FINISHED GRADING AND BE PROTECTED FROM EROSION.
9. STOCKPILES, BORROW AREAS AND SPOILS SHALL BE STABILIZED AS DESCRIBED UNDER "SOIL STOCKPILE PRACTICES".
10. SLOPES SHALL NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGE.
11. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND/OR OTHER OBJECTIONABLE MATERIALS.
12. AREAS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3-INCHES PRIOR TO PLACEMENT OF TOPSOIL. TOPSOIL SHALL BE PLACED WITHOUT SIGNIFICANT COMPACTION TO PROVIDE A LOOSE BEDDING FOR PLACEMENT OF SEED.
13. ALL FILLS SHALL BE COMPACTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES, SITE UTILITIES, CONDUITS AND OTHER FACILITIES, SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
14. IN GENERAL, FILLS SHALL BE COMPACTED IN LAYERS RANGING FROM 6 TO 24 INCHES IN THICKNESS. THE CONTRACTOR SHALL REVIEW THE PROJECT GEOTECHNICAL REPORT AND/OR THE "PROJECT SPECIFIC PHASING NOTES" FOR SPECIFIC GUIDANCE.
15. ANY AND ALL FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS (LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING INSTALLED), LOGS, STUMPS, BUILDING DEBRIS, FROZEN MATERIAL AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY LIFTS.
16. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE (I.E. CLAY, SILT) MATERIALS ARE SUSCEPTIBLE TO ACCELERATED SETTLEMENT AND POTENTIAL ACCELERATED EROSION. WORK IN AREAS OF THESE MATERIALS SHALL BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER.
17. THE OUTER FACE OF THE FILL SLOPE SHALL BE ALLOWED TO STAY LOOSE, NOT ROLLED OR COMPACTED, OR BLADE SMOOTHED. A BULLDOZER MAY RUN UP AND DOWN THE FILL SLOPE SO THE DOZER TREADS (CLEAT TRACKS) CREATE GROOVES PERPENDICULAR TO THE SLOPE. IF THE SOIL IS NOT TOO MOIST, EXCESSIVE COMPACTION WILL NOT OCCUR. SEE "SURFACE ROUGHENING" IN THE NHSMM, VOL.3.
18. ROUGHEN THE SURFACE OF ALL SLOPES DURING THE CONSTRUCTION OPERATION TO RETAIN WATER, INCREASE INFILTRATION AND FACILITATE VEGETATION ESTABLISHMENT.
19. USE SLOPE BREAKS, SUCH AS DIVERSIONS, BENCHES, OR CONTOUR FURROWS AS APPROPRIATE TO REDUCE THE LENGTH OF CUT-FILL SLOPES TO LIMIT SHEET AND RILL EROSION AND PREVENT GULLY EROSION. ALL BENCHES SHALL BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.
20. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE EVALUATED BY A PROFESSIONAL ENGINEER (PREFERABLY THE DESIGN ENGINEER) TO DETERMINE IF THE PROPOSED DESIGN SHALL BE REVISED TO PROPERLY MANAGE THE CONDITION.
21. STABILIZE ALL GRADED AREAS (AS ABOVE) WITH VEGETATION, CRUSHED STONE, COMPOST BLANKET, OR OTHER GROUND COVER AS SOON AS GRADING IS COMPLETE OR IF WORK IS INTERRUPTED FOR 21 WORKING DAYS OR MORE. USE MULCH OR OTHER APPROVED METHODS TO STABILIZE AREAS TEMPORARILY WHERE FINAL GRADING MUST BE DELAYED.
22. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
23. THE PROJECT SHALL BE CONSTRUCTED TO MEET ALL REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARG 3800 RELATIVE TO INVASIVE SPECIES.

ABOVE NOTES EXCERPTED, ADAPTED AND REFERENCED FROM "NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 3 CONSTRUCTION PHASE EROSION AND SEDIMENT CONTROLS, DECEMBER 2008" (NHSMM, VOL. 3)

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

STATE OF NEW HAMPSHIRE
SCOTT A. LAWLER
No.10026
LICENSED
PROFESSIONAL ENGINEER

PROJECT SPECIFIC CONSTRUCTION PHASING:

1. REFER TO THE "GENERAL CONSTRUCTION PHASING" NOTES PRIOR TO COMMENCING CONSTRUCTION IN ACCORDANCE WITH THE FOLLOWING PHASING. THE "GENERAL CONSTRUCTION PHASING" NOTES APPLY TO THE OVERALL CONSTRUCTION AND SHALL BE ADHERED TO.
2. INSTALL ALL TEMPORARY SEDIMENT CONTROL BARRIERS (I.E. SILT FENCE, EROSION CONTROL MIX BERM, STONE CHECK DAMS, ETC.) AROUND THE OUTER PERIMETER OF THE CONSTRUCTION SITE AS DEPICTED ON SHEET C-4 PRIOR TO EARTH MOVING OPERATIONS.
3. INSTALL ORANGE SNOW FENCE AROUND THE PEREMITER OF THE INFILTATION BASINS AND THE FENCE SHALL REMAIN IN PLACE UNTIL CONSTRUCTION OF THE BASINS HAS STARTED.
4. CLEAR, GRUB AND STRIP THE SITE. STUMPS, BRUSH AND OTHER ORGANIC WASTE SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.
5. INSTALL A TEMPORARY CONSTRUCTION EXIT AT INTERSECTION OF FREEDOM DRIVE AND EASTERN AVEVNUE. MAINTAIN AS DIRECTED BY THE TEMPORARY CONSTRUCTION EXIT DETAIL.
6. STOCKPILE STRIPPED TOPSOIL AND CUT MATERIAL TO BE REUSED ON SITE IN AN APPROPRIATE LOCATION IN ACCORDANCE WITH THE "SOIL STOCKPILES PRACTICES". MAINTAIN THE STOCKPILES AS DIRECTED IN THE "SOIL STOCKPILE PRACTICES".
7. PERFORM THE NECESSARY CUTS AND FILLS TO CONSTRUCT THE INFILTRATION BASIN AS DEPICTED ON SHEET C-3 AND IN ACCORDANCE WITH THE INFILTRATION BASIN DETAILS SHOWN ON SHEET C-8.
8. CONSTRUCT THE INFILTRATION BASINS, SEDIMENT FOREBAY, THE TREATMENT SWALE AND OUTLET PROTECTION. LOAM SEED AND MULCH THE SIDE SLOPES OF THE BASINS AND TREATMENT SWALE AS DIRECTED IN THE INFILTRATION BASIN DETAILS AND TREATMENT SWALE DETAILS.
9. ALL DITCHES/SWALES/AND BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
10. PERFORM THE NECESSARY CUTS AND FILLS TO SUBGRADE ROADWAY.
    A) INSTALL REQUIRED FILLS IN MAXIMUM 8-INCH LIFTS AND COMPACT EACH LIFT TO 95% MAXIMUM PROCTOR DENSITY.
11. AS SUBGRADE IS ACHIEVED INSTALL REMAINING SEDIMENT CONTROL BARRIERS WITHIN THE SITE (I.E. ADDITIONAL SILT FENCE, CHECK DAMS AND SEDIMENT CONTROLS AND CATCH BASINS, ETC.)
12. INSTALL ALL UTILITIES AND CLOSED DRAINAGE SYSTEM COMPONENTS (I.E. PIPE CULVERTS, CATCH BASINS, SEWER AND REMAINING WATER MAIN) PER THE CORRESPONDING DETAILS AND AS SHOWN ON SHEET C-6, C-7, C-8 AND C-9. AS EACH STRUCTURE IS COMPLETED INSTALL THE CORRESPONDING SEDIMENTATION CONTROL MEASURE.
13. ALL CUT AND FILL SLOPES AND LAWN AREAS NOT TO BE PAVED SHALL BE LOAMED AND SEEDED FOR PERMANENT VEGETATION AND STABILIZATION AS DESCRIBED UNDER THE "PERMANENT VEGETATION PRACTICES" WITHIN 3 DAYS OF ACHIEVING FINAL GRADE.
14. INSTALL ALL GRAVEL BASE AND CRUSHED GRAVEL MATERIALS FOR THE ROADWAY AS SPECIFIED IN THE CORRESPONDING DETAILS.
15. INSTALL PAVEMENT SURFACES AS SOON AS POSSIBLE AFTER THE INSTALLATION OF THE GRAVEL BASE AND CRUSHED GRAVEL, IN ORDER TO LIMIT THE SOIL EROSION AND POLLUTION OF THE GRAVEL MATERIALS WITH ORGANIC MATERIALS. IN NO CASE SHALL AREAS TO BE PAVED BE LEFT UNPROTECTED THROUGH OUT THE WINTER MONTHS.
16. ALL DISTURBED AREAS SHALL BE STABILIZED AS SOON AS POSSIBLE. IN NO CASE SHALL ANY DISTURBED AREA BE LEFT UN-STABILIZED FOR LONGER THAN 21 DAYS. IF NECESSARY TEMPORARY STABILIZATION MEASURES AS DISCUSSED IN THE "GENERAL CONSTRUCTION PHASING NOTES" AND NHSMM, VOL. 3 SHOULD BE EMPLOYED.

MAINTENANCE AND INSPECTION:
1. DURING CONSTRUCTION ALL TEMPORARY AND PERMANENT SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES SHOULD BE INSPECTED WEEKLY, AFTER EVERY 1/2 INCH OF RAINFALL, AND ANNUALLY.
2. EXCESS SEDIMENT SHOULD BE REMOVED FROM TEMPORARY SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES WHEN IT REACHES PRESCRIBED THRESHOLDS DISCUSSED IN THE DETAILS FOR EACH PRACTICE.
3. ALL DAMAGED TEMPORARY AND PERMANENT SEDIMENT, EROSION CONTROL AND STORMWATER MANAGEMENT PRACTICES SHOULD BE REPAIRED OR REPLACED IMMEDIATELY UPON NOTICE.
4. SEDIMENT SHALL BE DISPOSED OF PROPERLY EITHER ON SITE OR OFF SITE.

PROJECT COMPLETION AND STABILIZATION:
1. UPON PROJECT COMPLETION, ONCE THE SITE IS DEEMED STABILIZED (VEGETATION IS GERMINATED), THE TEMPORARY SEDIMENT CONTROL BARRIERS AND EROSION CONTROL PRACTICES SHALL BE REMOVED. ANY DISTURBANCE CREATED DURING REMOVAL SHALL BE REPAIRED IN AN APPROPRIATE MANNER.
2. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM ALL ON SITE CATCH BASINS AND THE SEDIMENT FOREBAY.

WINTER STABILIZATION & CONSTRUCTION PRACTICES:

MAINTENANCE REQUIREMENTS:
1. MAINTENANCE MEASURES SHALL BE PERFORMED THROUGHOUT CONSTRUCTION, INCLUDING OVER THE WINTER PERIOD. AFTER EACH RAINFALL, SNOWSTORM, OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL CONDUCT INSPECTION OF ALL INSTALLED EROSION CONTROL PRACTICES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUED FUNCTION.
2. FOR ANY AREA STABILIZED BY TEMPORARY OR PERMANENT SEEDING PRIOR TO THE ONSET OF THE WINTER SEASON, THE CONTRACTOR SHALL CONDUCT AN INSPECTION IN THE SPRING TO ASCERTAIN THE CONDITION OF THE VEGETATION AND REPAIR ANY DAMAGED AREAS OR BARE SPOTS AND RESEED AS REQUIRED TO ACHIEVE AN ESTABLISHED VEGETATIVE COVER (AT LEAST 85% OF AREA VEGETATED WITH HEALTHY, VIGOROUS GROWTH.)

SPECIFICATIONS:
THE FOLLOWING STABILIZATION TECHNIQUES SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 15.
1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE LIMITED TO 1-ACRE AND SHALL BE PROTECTED AGAINST EROSION BY THE METHODS DISCUSSED IN NHSMM, VOL. 3 AND ELSEWHERE IN THIS PLAN SET, PRIOR TO ANY THAW OR SPRING MELT EVENT.
2. STABILIZATION AS FOLLOWS SHALL BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
   A. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING, OR 2 INCHES OF EROSION CONTROL MIX (REFER TO NHSMM, VOL. 3 FOR SPECIFICATION).
   B. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15 SHALL BE SEEDED AND COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET OR WITH A MINIMUM OF 4 INCHES OF EROSION CONTROL MIX, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. NOTE THAT COMPOST BLANKETS SHALL NOT EXCEED 2 INCHES IN THICKNESS OR THEY MAY OVERHEAT.
3. ALL STONE COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.
5. ALL MULCH APPLIED DURING WINTER SHALL BE ANCHORED (I.E. BY NETTING, TRACKING, WOOD CELLULOSE FIBER).
6. WITHIN 24 HOURS OF STOCKPILING SOIL MATERIALS SHALL BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR WITH A 4 INCH LAYER OF EROSION CONTROL MIX. MULCH SHALL BE REESTABLISHED PRIOR TO ANY RAIN OR SNOWFALL. NO SOIL STOCKPILE SHALL BE PLACED (EVEN COVERED WITH MULCH) WITHIN 100-FT OF ANY WETLAND OR OTHER WATER RESOURCE AREA.
7. FROZEN MATERIAL (I.E. FROST LAYER REMOVED DURING WINTER CONSTRUCTION) SHALL BE STOCKPILED SEPARATELY AND IN A LOCATION AWAY FROM ANY AREA NEEDING PROTECTION. FROZEN MATERIAL STOCKPILES CAN MELT IN SPRING AND BECOME UNWORKABLE AND DIFFICULT TO TRANSPORT DUE TO HIGH SOIL MOISTURE CONTENT.
8. INSTALLATION OF EROSION CONTROL BLANKETS SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH OR ON FROZEN GROUND.
9. ALL GRASS-LINED DITCHES AND CHANNELS SHALL BE CONSTRUCTED BY SEPTEMBER 1. ALL DITCHES AND SWALES WHICH DO NOT EXHIBIT 85% VEGETATIVE GROWTH BY OR ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS AS DETERMINED BY A PROFESSIONAL ENGINEER. IF STONE LINING IS NECESSARY, THE CONTRACTOR MAY NEED TO RE-GRADE THE DITCH AS REQUIRED TO PROVIDE ADEQUATE CROSS-SECTION AFTER ALLOWING FOR PLACEMENT OF THE STONE.
10. ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY OCTOBER 15.
11. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER SHALL BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF SAND AND GRAVEL WITH A GRADATION THAT IS LESS THAN 12% OF THE SAND PORTION, OR MATERIAL PASSING THE NUMBER 4 SIEVE, BY WEIGHT, PASSES THE NUMBER 200 SIEVE.
12. SEDIMENT BARRIERS THAT ARE INSTALLED DURING FROZEN CONDITIONS SHALL CONSIST OF EROSION CONTROL MIX BERMS, OR CONTINUOUS CONTAINED BERMS. SILT FENCES AND HAY BALES SHALL NOT BE INSTALLED WHEN FROZEN CONDITIONS PREVENT PROPER EMBEDMENT OF THESE BARRIERS.

PERMANENT EROSION & SEDIMENTATION CONTROL DETAILS

TAX MAP 110, LOT 10-00 &
LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH
PREPARED FOR:
GOLDEN OAKS LLC.
MARCH 2020

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

31 Mooney Street, Alton, N.H. 603-875-3948
NORWAY PLAINS ASSOCIATES, INC.
2 Continental Blvd., Rochester, N.H. 603-335-3948

TEST PIT DATA:

THE SOILS ON THE REFERENCED PROPERTY WERE EXAMINED BY DAVID J. ALLAIN CSS#13 ON FEBRUARY 24 AND 28, 2020 TO PROPERLY ADDRESS DRAINAGE AND REGULATORY REQUIREMENTS. THE SOIL PROFILES WERE EXAMINED AND RECORDED USING NRCS, SSSNNE AND NHDES CRITERIA AS FOLLOWS:

TP# 1 (2-24-2020)
0-3" 10YR3/2 SANDY LOAM, GRANULAR, FRIABLE
3-12" 10YR3/4 LOAMY SAND, GRANULAR, FRIABLE
12-48" 10YR6/2 LOAMY SAND, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT AT 12" NO OBSERVED WATER, (915) DEERFIELD VARIANT, SOMEWHAT POORLY DRAINED. BECAUSE THE SHWT IS LESS THAN 24", THE HYDROLOGIC SOIL GROUP IS D.,

TP# 2 (2-24-2020)
0-2" 10YR3/2 SANDY LOAM, GRANULAR, FRIABLE
2-25" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE
25-60" 10YR6/2 LOAMY SAND, MASSIVE, FIRM IN PLACE FRIABLE IN HAND. REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT AT 25", OBSERVED WATER AT 29", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC GROUP B.

TP# 3 (2-24-2020)
0-5" 10YR3/2 SANDY LOAM, GRANULAR, FRIABLE
5-36" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE
36-56" 10YR6/2 LOAMY SAND, MASSIVE, FRIABLE. REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT AT 36", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 4 (2-24-2020)
0-3" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE
3-24" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE
24-64" 10YR6/2 LOAMY SAND, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT AT 24", OBSERVED WATER AT 48", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 5 (2-24-2020)
0-3" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE
3-18" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE
18-48" 10YR6/2 LOAMY SAND, MASSIVE, FRIABLE. REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT AT 18", OBSERVED WATER AT 46", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED, BECAUSE THE SHWT IS LESS THAN 24", THE HYDROLOGIC SOIL GROUP IS D.

TP# 6 (2-24-2020)
0-3" 10YR3/2 SANDY LOAM, GRANULAR, FRIABLE.
3-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 38" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
38-58" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 38", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 7 (2-24-2020)
0-2 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-7" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
7- 30" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
30-62" 10YR 5/3 LOAMY SANDS, MASSIVE, GRANULAR, FRIABLE, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 30", OBSERVED WATER AT 58", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 8 (2-24-2020)
0-6" 10YR4/4 SANDY LOAM, GRANULAR, FRIABLE.
6- 18" 10YR 5/6 LOAMY SAND, GRANULAR, FRIABLE.
18- 28" 10YR5/4 LOAMY SAND, MASSIVE, FRIABLE,
28-60" 10YR 6/2 LOAMY SAND, MASSIVE, FRIABLE, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 28", OBSERVED WATER AT 62", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 9 (2-24-2020)
0-10" 10YR5/4 SANDY LOAM, GRANULAR, FRIABLE.
10-33" 10YR 5/6 LOAMY SAND, GRANULAR, FRIABLE.
33-64" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 33", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 10 (2-24-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 30" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE,
30-58" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 30", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 11 (2-24-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-16" 10YR 5/6 LOAMY SAND, GRANULAR, FRIABLE.
16-24" 10YR5/3 LOAMY SAND, GRANULAR, FRIABLE,
24-66" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 24", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 12 (2-24-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-4" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
4- 30" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
30-60" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 30", OBSERVED WATER AT 58", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 13 (2-24-2020)
0-3" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
3-12" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
12- 23" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE,
23-62" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS, FEW ROUNDED BOULDERS.
NOTES: SHWT 23", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED, BECAUSE THE SHWT IS LESS THAN 24", THE HYDROLOGIC SOIL GROUP IS D.

TP# 14 (2-24-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-12" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
12- 23" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE,
23-63" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 23", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. BECAUSE THE SHWT IS LESS THAN 24", THE HYDROLOGIC SOIL GROUP IS D.

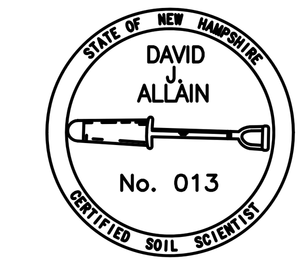
TP# 15 (2-24-2020)
0-12 10YR5/4 SANDY LOAM, GRANULAR, FRIABLE.
12-28" 10YR 5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES
28-65" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 28", OBSERVED WATER AT 32" , (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

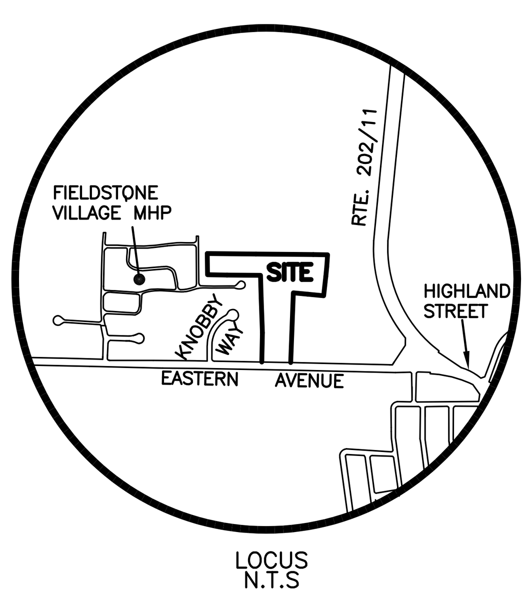
TP# 16 (2-24-2020)
0-2 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-9" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
9- 26" 10YR5/6 LOAMY SAND, MASSIVE, FRIABLE.
26-62" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 26", OBSERVED WATER AT 46" , (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 17 (2-24-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
3-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 28" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE,
28-63" 10YR 6/2 LOAMY SANDS, MASSIVE, FIRM IN PLACE FRIABLE IN HAND, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 28", OBSERVED WATER AT 50", (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 18 (2-28-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 25" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, FEW COBBLE SIZE STONES.
25-48" 10YR 6/2 LOAMY SANDS, MASSIVE, FRIABLE, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 25", NO OBSERVED WATER, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.

TP# 19 (2-28-2020)
0-2" 10YR2/2 SANDY LOAM, GRANULAR, FRIABLE.
2-8" 10YR 5/4 LOAMY SAND, GRANULAR, FRIABLE.
8- 25" 10YR5/6 LOAMY SAND, GRANULAR, FRIABLE, MANY COBBLE SIZE STONES.
25-50" 10YR 6/2 LOAMY SANDS, MASSIVE, FRIABLE, REDOX CONCENTRATIONS AND DEPLETIONS.
NOTES: SHWT 25", OBSERVED WATER ENTERING RAPIDLY FROM DOWN HILL SIDE, (313) DEERFIELD SERIES, MODERATELY WELL DRAINED. HYDROLOGIC SOIL GROUP B.





LOCUS
N.T.S

TAX MAP 110 – LOT 10-00,
LOTS 10-2 THRU 10-18
OWNER OF RECORD:
ARTHUR TAYLOR, JR.
479 TOVAR DRIVE
SAN JOSE, CA 95123-4948
BK 3434, PG 903

TEST PIT DATA
TAX MAP 110, LOT 10-00 & LOTS 10-2 THRU 10-18
FREEDOM DRIVE
ROCHESTER, NH

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC.

MARCH 2020

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 INCH = 100 FEET

CAREFULLY REVIEW ALL SHEETS OF THIS PACKAGE TO INSURE PROPER CONSTRUCTION. SPECIFIC SITE CONDITIONS SHOULD BE EXPLORED PRIOR TO CONSTRUCTION. CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT OWNER FOR ANY AVAILABLE GEOTECHNICAL OR HYDROGEOLOGICAL INFORMATION AVAILABLE BUT NOT CONTAINED WITH IN THE PLAN SET. IF THERE ARE ANY QUESTIONS WITH THE DESIGN PRESENTED IN THIS PLAN SET PLEASE CONTACT THE ENGINEERING STAFF AT NORWAY PLAINS ASSOCIATES, INC. (603)-335-3948.

FILE NO. 166
PLAN NO.C-3043
DWG. NO. 19138/S-1
F.B. NO. "33" "CEK"

C-13

GOLDEN OAKS DEVELOPMENT, LLC
RESIDENTIAL SUBDIVISION
FREEDOM DRIVE
SANITARY SEWER SYSTEM DESIGN

PREPARED FOR:
GOLDEN OAKS DEVELOPMENT, LLC
FREEDOM DRIVE
ROCHESTER, NH

MARCH 2020

PREPARED BY:

NORWAY PLAINS ASSOCIATES, INC.

Scott A. Lawler, P.E. N.H. Reg. #10026

2 CONTINENTAL BOULEVARD, P.O. BOX 249, ROCHESTER, NEW HAMPSHIRE 03866-0249 (603) 335-3948

TABLE OF CONTENTS

TABLES

APPENDICES

FIGURES

PLANS

1.0 INTRODUCTION:

This report and supporting document have been prepared on behalf of Golden Oaks Development, LLC for the "PROPOSED 16 LOT SUBDIVISION".

The purpose of this design is to provide sanitary sewer connection for the proposed houses on a residential subdivision. The proposed sanitary connection will be the existing municipal sewer system located at Eastern Avenue.

2.0 EXISTING DEVELOPMENT:

2.1 PROJECT LOCATION:

The subdivision is located on the westerly side of Eastern Avenue. Please refer to Figure 1 (Rochester Tax Map Sketch) for a pictorial placement of the project area. The parcel is known as Tax Map 110, Lot 10, 10-2 through 10-18 on the Rochester Assessing maps. These parcels were created in 2007 as part of an eighteen-lot residential subdivision.

2.2 MUNCIPAL SEWER SYSTEM:

The sanitary sewer for the original subdivision was designed utilizing a traditional gravity collection system which drained towards the rear of the property to a large suction-lift pump station. A four-inch force main carried the sanitary waste back up towards Eastern Avenue to a point where gravity would allow for connection to the municipal sewer system within the Eastern Avenue right-of-way. This phase was approved by NHDES Wastewater Engineering Bureau on July 12, 2007, Permit Number D2007-8. However, due to economic downturn that occur shortly after the project was approved, only one of the lots was sold and built upon.

Prior to the project dying, the developer constructed a short section of the gravity sewer system, approximately 118 linear feet with the connection to the municipal sewer line and installed one sewer manhole. The single house developed ties into the section of gravity sewer

3.0 PROPOSED DEVELOPMENT

The 16-lot residential subdivision is proposed in the general location as the previously approved subdivision. The proposed road will provide access to 16 single-family lots, mostly 3-bedroom homes. Within the Right-of-way, a municipal sewer system will be constructed. This system will consist of a 900 linear feet of low-pressure force mains will be 2" SDR21 HDPE which ties into the aforementioned sewer manhole constructed at the entrance of the project.

The proposed low-pressure force mains were designed for effluent only. Therefore, each house lot will have a 2-compartment septic tank with pump chamber. Additionally, each lot will have independent effluent pump with alarms. Sewer shut-off gave valves will be installed at the road ROW, to allow the City to shutoff a lot for maintenance similar to a water curb-stop.

3.1 PROPOSED DESIGN FLOWS:

The average daily designs flows must be determined to design the sewer collection system and sewage pump stations. Please refer to Appendix A-1 for the design worksheet.

N

Rochester, NH

1 inch = 300 Feet

0 300 600 900

CAI Technologies
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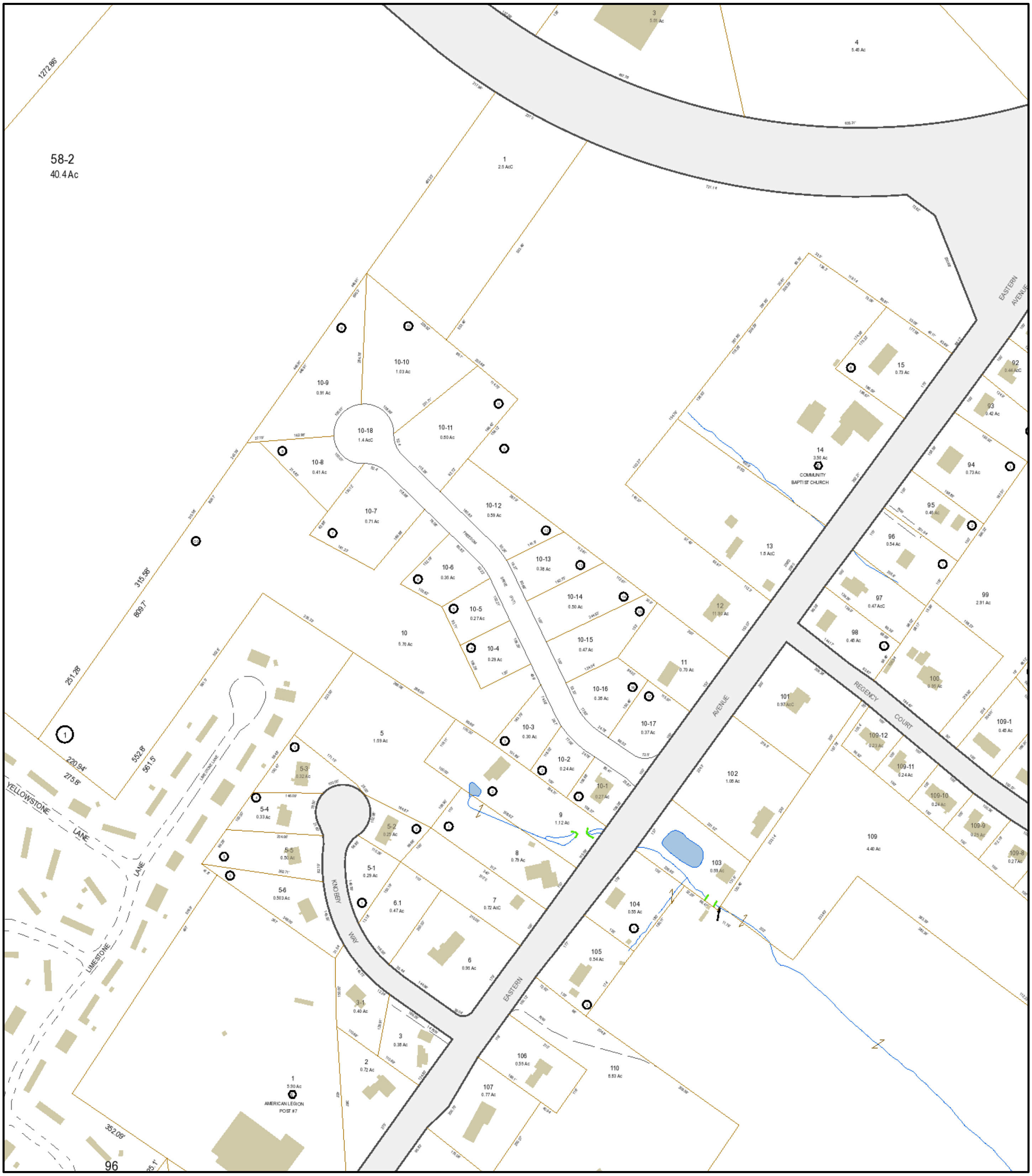
March 10, 2020



Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

3.1.1 RESIDENTIAL FLOWS:

The proposed sewer design is based on Residential Dwelling that have an average of 3-bedrooms. The design flow rate is in accordance with the table 1008 -1 of Env-Wq. 1008.03 is 300 gpd for a 2-bedroom dwelling and 150 gpd for every bedroom more than 2. Therefore, the total design flow of 450 gpd was used for each lot.

TABLE 1: PROPOSED AVERAGE DAILY SEWER DESIGN FLOWS SUMMARY:

Dwelling Units	Number of Units	Average Daily Design Rate (gpd/unit)	Total Daily Design Flows (gpd)
3-Bedroom Homes	16	450 gpd	7,200 gpd

3.1.2 INFILTRATION AND INFLOW:

Design of any new sewer system requires the allowance for infiltration and inflow. NHDES derives this allowance using a rate of 300 gpd per inch of pipe per mile per day. There is 118 linear feet of 8” SDR35 HDPE sewer pipes associated with the proposed on-site collection system. Additionally, there will be about 160 linear feet of 4” SDR35 HDPE pipe from the houses to the septic tanks. As such, the I & I is calculated at a daily rate of 90 gpd.

3.1.3 TOTAL AVERAGE DAILY FLOW:

The total average daily design flow is the combination of the residential flows and the infiltration and inflow daily rates. As a result, the total design flow from this project is 7,290 gpd.

4.0 PUMP STATION DESIGN

Each lot will have a two compartment 1,250-gallon septic tank with a 500-gallon pump chamber installed adjacent to the house. Each lot will have an effluent pump, 1/3 hp with a 1 1/2” SDR21 HDPE force main outlet pipe. Within the road right-of-way, there will be a 2” SDR21 HDPE force main that discharges to the sewer manhole located at the higher elevations.

4.1 PUMP SELECTION

The pumps were designed depending on the anticipated total dynamic head (static head and friction losses) to ensure minimum velocities within the force main. Please see the pump selection worksheets in Appendix A-2.1 for the house lots. As such, the following table provide the pump selection:

TABLE 2: PROPOSED PUMP SELECTION AND DATA SUMMARY:

Lot Number	Pump Selection	Design Flow Rate (gpm)	Velocity (ft./sec)	Pump Run Time (min.)
110-10-2	Pentair SSM 33I	30	2.7	4.0
110-10-3	Pentair SSM 33I	30	2.7	4.0
110-10-4	Pentair SSM 33I	30	2.7	4.0
110-10-5	Pentair SSM 33I	27	2.5	4.4
110-10-6	Pentair SSM 33I	25	2.3	4.8
110-10-7	Pentair ME 3F	27	2.5	4.4
110-10-8	Pentair ME 3F	30	2.7	4.0
110-10-9	Pentair ME 3F	30	2.7	4.0
110-10-10	Pentair ME 3F	30	2.7	4.0

110-10-11	Pentair ME 3F	27	2.5	4.4
110-10-12	Pentair SSM 33I	25	2.3	4.8
110-10-13	Pentair SSM 33I	27	2.5	4.4
110-10-14	Pentair SSM 33I	30	2.7	4.0
110-10-15	Pentair SSM 33I	30	2.7	4.0
110-10-16	Pentair SSM 33I	30	2.7	4.0
110-10-17	Pentair SSM 33I	30	2.7	4.0

Please see the manufacturing specification sheets in Appendix A-2.2.

5.0 CONSTRUCTION SPECIFICATIONS:

Included in Appendix A-3, is a set of construction specifications for the proposed sanitary sewer system. These specifications were developed in accordance with State of New Hampshire and City of Rochester requirements.

APPENDICES

PLANS

APPENDIX A-1:

SEWER DESIGN FLOW WORK SHEET

NHDES, Water Division: Sewer Design Flow

Given Information:

*Refer to NHDES Rules Env-Wq 700

Avg. Daily Flow (ADF) =	**300**	**gpd for 2-bedroom Dwelling's**	Env-Wq 1008.03		
	150	**gpd/bedroom for more than 2**	Env-Wq 1008.03		
	450				
Peaking Factor =	**6**		Env-Wq 706.03(d)		
Infiltration Rate =	**300**	**gal./inch dia./mile/day**	Env-Wq 706.03(f)		
Number of 3 Bedroom Dwelling's =	**16**		**Gallons Per Day=**	**7200**	gpd
Total Length of = of Gravity Sewer	**118**	**ft.**	**Diameter of = Gravity Sewer**	**8**	**inch**
Total Length of = of Sewer Services	**160**	**ft.**	**Diameter of = Sewer Services**	**4**	**inch**
Total Length of = of Force Main	**900**	**ft.**	**Diameter of = Force Main**	**2**	**inch**

***Information in Red is user input**
Assumes all proposed lots are 3-bedroom Dwellings
Assumes all house services are 20 feet from house to tank

Daily Flow:

Daily Flow = ADF x number of units

Daily Flow = 7,200 gpd

Infiltration:

Infiltration = Infiltration Rate x (Total Length of Gravity Sewer + Sewer Services)

Infiltration = 90 gpd

Total Daily Flow:

Total Daily Flow = Daily Flow + Infiltration

Total Daily Flow = 7,290 gpd

Peak Flow:

Peak Flow = Total Daily Flow x Peaking Factor

Peak Flow = 43,740 gal.

Peak Hourly Flow = Peak Flow / 24hr / 60 min/hr.

Peak Flow = 30 gal./min

Peak Flow = 0.07 cf/sec

APPENDIX A-2:

SEWER PUMP STATION CALCULATION WORK SHEET

Norway Plains Associates, Inc.
PO Box 249
Rochester, NH 03866-0249

File No. 166, Job No. 19138

Prepared for:
Golden Oaks Development
Freedom Drive, Rochester

Buoyancy Calculator for Small Structures:

Essentially, buoyancy is the calculated by subtracting the weight of water displaced by a structure from the weight of the structure itself. If the weight of water displaced is larger that the weight of the structure; the structure is "buoyant". In large structures like deep foundations and pile foundations friction force also becomes important to consider. For small structures friction is negligible and is not accounted for in the following calculation. This actually makes the following results conservative.

Structure Dimensions and Given Information: 2- compartment Septic Tanks

Round Structure:

Inside dia. (D) =	0	inches

Rectangular Structure:

Outside width (B) =	84	inches
Outside Length (L) =	120	inches

Thickness & Height:

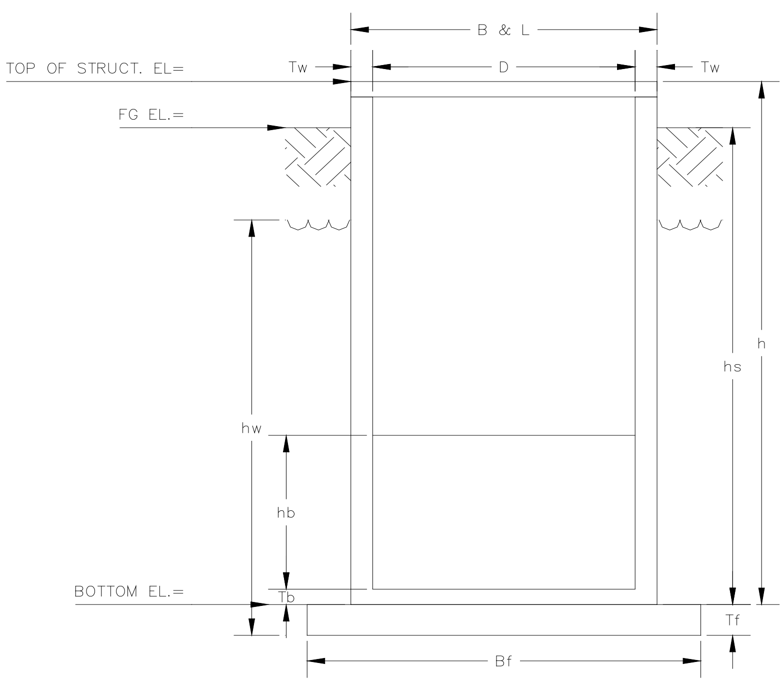
Wall thickness (Tw) =	4	inches
Bottom thickness (Tb) =	4	inches*
Top thickness (Tt) =	4	inches
Height of Struct. (h) =	5.66	feet
Depth of Ballast (hb) =	0	feet
Depth of Soil (hs) =	6.66	feet
Depth of Water (hw) =	4.66	feet

Densities:

Structure Material:	Concrete	
density structure (ρ(struct)) =	150	pcf
Ballast if any and type:	sewer water	
density of ballast (ρ(bal)) =	62.4	pcf
density of soil (ρ(soil)) =	125	pcf
density of water (ρ(water)) =	62.4	pcf
density of concrete (ρ(conc)) =	150	pcf

Thickness & Height:

Footing Dia. (Bf) =	0	inches
Footing thickness (Tf) =	0	inches



TOS =	261.00
FG EL. =	262.00
H2O EL. =	260.00
Chamber Bot. =	255.67
Bottom El. =	255.34
Ftg. Bottom =	255.34

Equations:

Aout = Outside area of Structure
Ain = Inside area of Structure
Afoot = Area of Footing = (pi)(Bf/2)^2 (round) or

Vstruct = Volume of Structure Material ={ (Aout - Ain) x (h - Tt - Tb)} + (Aout x (Tt + Tb)
Vbal = Volume of Ballast Material = (Ain x hb)
Vdisp = Volume of displaced water = Aout x hw + Vfoot
Vfoot = Volume of footing = Afoot x Tf
Vsoil = Volume of Soil on Footing = (Afoot - Aout) x hs
Vfill = Volume of Soil on Tank = (Afout) x (hs - h)

Wstruct = ρ(struct) x Vstruct
Wbal = ρ(bal) x Vbal
Wwater = ρ(water) x Vdisp

Wfoot = ρ(conc) x Vfoot
Wsoil = ρ(soil) x Vsoil
Wfill= ρ(soil) x Vsoiltank

Wstruct + Wbal + Wfoot + Wsoil + Wfill ≥ Wwater Structure is not Buoyant

Wstruct + Wbal + Wfoot + Wsoil + Wfill < Wwater Structure is Buoyant

Calculations:

Aout =	70.00	sq.ft.	Vstruct =	101.04	cu.ft.
Ain =	59.11	sq.ft.	Vbal =	0.00	cu.ft.
Afoot =	136.00	sq.ft.	Vdisp =	326.20	cu.ft.
			Vfoot =	0.00	cu.ft.
			Vsoil =	0.00	cu.ft.
			VsoilTank =	70.00	cu.ft.
Wstruct =	15156	lbs.	Wfoot =	0	lbs.
Wbal =	0	lbs.	Wsoil =	0	lbs.
Wwater =	20355	lbs.	Wfill =	8750	lbs.

Wstruct+Wbal+Wfoot+Wsoil+Wfiil =	23906	**<**	20355	= Wwater	**Structure is NOT buoyant**

SSM33I

Cast Iron Submersible Sump
and Effluent Pump

THE MYERS SSM33I IS A RUGGED, HEAVY DUTY CAST IRON 1/3 HP SUBMERSIBLE PUMP DESIGNED FOR DEMANDING DRAINAGE JOBS. The SSM33I's recessed, vortex impeller provides a clear, unobstructed passage in the volute case for superior solids handling. Its 1/2" solids handling capability allows it to be used in a wide variety of drainage and effluent pumping applications. Heavy duty cast iron construction ensures that the SSM33I will perform for years to come in most installations. Contact your Myers distributor, or the Myers Ohio sales office at 419/289-1144 for more details.

ADVANTAGES BY DESIGN

DURABLE MOTOR WILL DELIVER MANY YEARS OF RELIABLE SERVICE.

- Oil-filled motor for maximum heat dissipation and continuous bearing lubrication.
- Shaded pole motor eliminates starting switches.
- Recessed vortex impeller provides free flow-through passage for solids and liquid with minimal radial loading for long bearing life.

THE SSM33I IS ENGINEERED FOR MANY YEARS OF MAINTENANCE-FREE OPERATION.

- Automatic models available with piggy-back float or vertical switch. (Both mercury free)
- Pump can be operated manually by unplugging piggy-back switch and plugging pump directly into outlet (Automatic models).
- Heavy cast iron motor housing and volute case dissipate heat, allow motor to run cooler for extended life and resist corrosion.

PRODUCT CAPABILITIES

Capacities To	31 gpm	117 lpm
Heads To	23 ft.	7 m
Pump Down Range Float Switch Vertical Switch	 7 to 10 in. 4-1/8"	 178 to 254 mm 107 mm
Solids Handling Capacity	1/2 in.	12.8 mm
Liquids Handling	fresh drain water, effluent	
Intermittent Liquid Temp.	up to 140°F	up to 60°C
Motor	1/3 HP shaded pole 1550 RPM	
Electrical	115V, 9.0 amps 1Ø, 60 Hz.	
Acceptable pH Range	5 - 9	
Discharge, NPT	1-1/2 in.	38.1 mm
Minimum Sump Diameter	12 in.	305 mm

Construction Materials	
Motor Housing, Volute Case	cast iron, Class 30, ASTM A48
Pump Base	cast iron, Class 30, ASTM A48
Impeller	recessed, thermoplastic
Power Cord	10 or 20 ft., 16/3 SJTW/SJTW-A
Mechanical Seal	carbon and ceramic

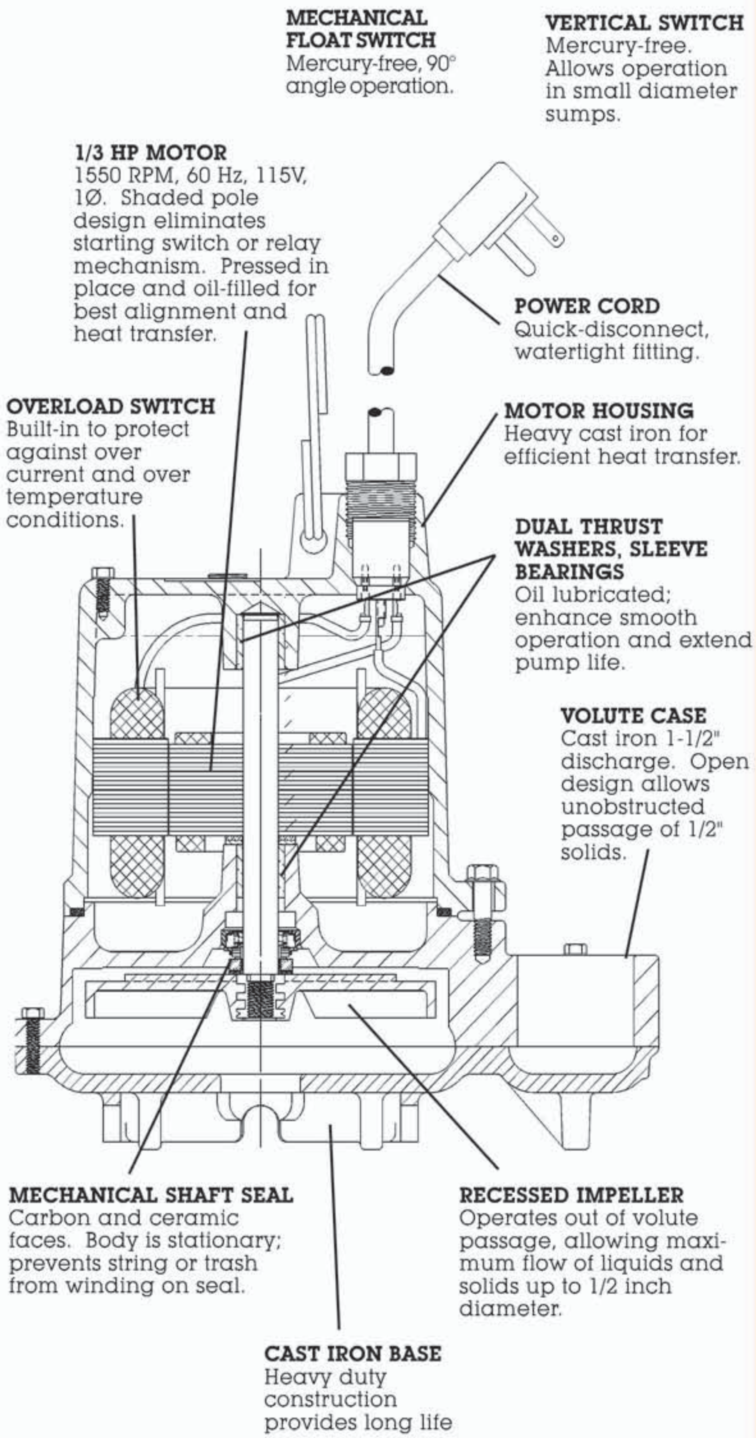
WHERE INNOVATION MEETS TRADITION

Myers®

Pentair Water

SSM33I

Cast Iron Submersible Sump
and Effluent Pump



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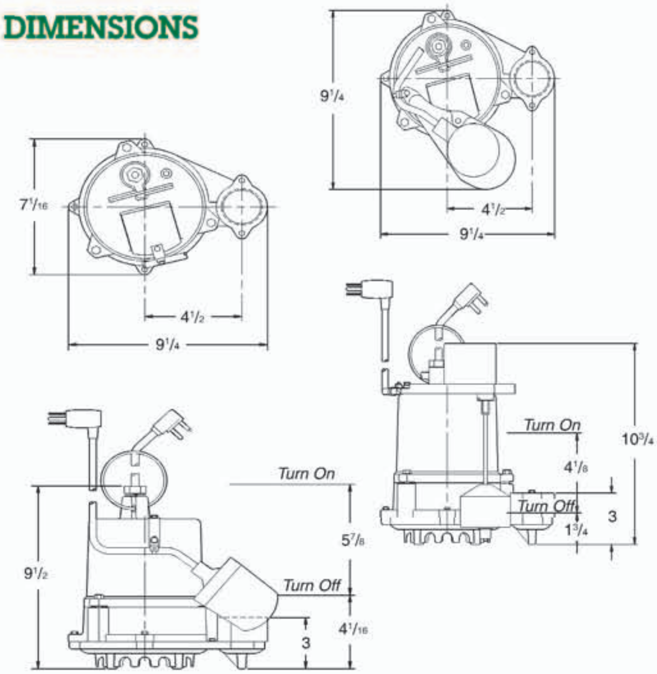
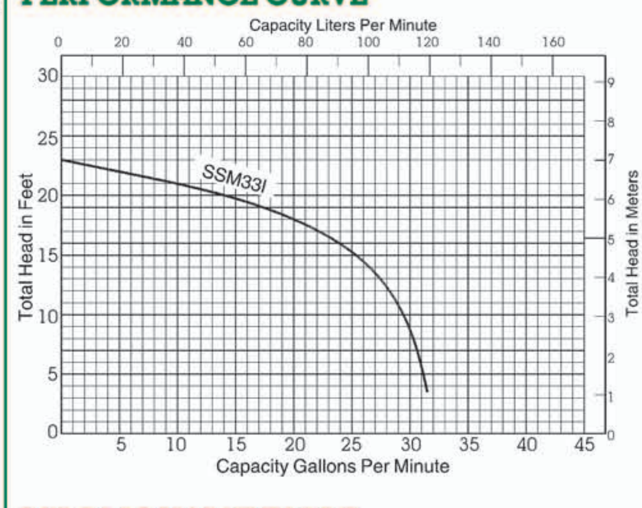


PERFORMANCE CURVE



PERFORMANCE TABLE

Total Head	Ft.	2	4	6	8	10	12	14	16	18	20	22
	M	0.61	1.22	1.83	2.44	3.05	3.66	4.27	4.88	5.49	6.1	6.71
Gal/Hr.		1860	1830	1810	1780	1740	1650	1560	1410	1200	720	240
L/Hr.		7040	6927	6851	6737	6586	6245	5905	5337	4542	2725	908

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Myers (Canada), 269 Trillium Drive, Kitchener, Ontario N2G 4W5
519/748-5470, FAX: 519/748-2553

ME3 SERIES

High Head (ME3H) and High Flow (ME3F)
Submersible Effluent Pumps

ME3F

ME3H

THE MYERS ME3 SERIES ARE RUGGED 1/3 HP EFFLUENT PUMPS DESIGNED FOR DEMANDING EFFLUENT PUMPING JOBS WHERE DEPENDABILITY IS A MUST. The ME3 is constructed of only the highest quality corrosion resistant materials - like cast iron, stainless steel and engineered thermoplastics - to provide many years of service in the harsh effluent environment. The ME3 is available with a recessed impeller for high-head applications or an enclosed impeller for high-flow applications - both will pass a full 3/4" spherical solid. The ME3 is available in automatic models with piggy-back mechanical float switch or manual models for use with external controls. For more information, call your Myers distributor today or the Myers Ashland, Ohio sales office at 419/289-1144.

ADVANTAGES BY DESIGN

DURABLE MOTOR WILL DELIVER MANY YEARS OF RELIABLE SERVICE.

- Oil-filled motor for maximum heat dissipation and continuous bearing lubrication.
- Overload protected, shaded pole motor eliminates starting switches and relays which are prone to fail.
- Heavy cast iron motor housing and volute case dissipate heat, allow motor to run cooler for extended life.

THE ME3 IS ENGINEERED FOR MANY YEARS OF MAINTENANCE-FREE OPERATION.

- Field tested, wide angle, mercury-free mechanical float switch for maximum draw down. (Automatic piggy-back models only).
- Automatic pump models can be operated manually by unplugging piggy-back switch and plugging pump directly into outlet.
- Passes a full 3/4" solid.

PRODUCT CAPABILITIES

Capacities To	ME3H ME3F	36 gpm 66 gpm	136 lpm 250 lpm
Heads To	ME3H ME3F	36 ft. 32 ft.	11.0 m 9.75 m
Max. Spherical Solids		3/4 in.	19 mm
Liquids Handling		domestic effluent and drain water	
Intermittent Liquid Temp.		up to 140°F	up to 60°C
Motor Electrical Data		1/3 hp, 1550 rpm shaded pole, oil-filled 115 volts, 11.5 amps, 1 ph, 60 hz 230 volts, 5.8 amps, 1 ph, 60 hz	
Third Party Approvals		UL, CSA	
Acceptable pH Range		5 - 9	
Specific Gravity		.9 - 1.1	
Viscosity		28 - 35 SSU	
Discharge, NPT		1-1/2 in.	50.8 mm
Min. Sump Dia.	Simplex Duplex	24 in. 36 in.	60.1 cm 91.4 cm

Construction Materials	
Motor Housing	cast iron, Class 30, ASTM A48
Impeller	engineered thermoplastic
Impeller Type ME3H ME3F	recessed enclosed
Impeller Wear Ring (ME3F only)	304 SST
Volute	cast iron, Class 30, ASTM A48
Volute Sealing Ring (ME3F only)	Buna-N
Power Cord	10 or 20 ft., 16/3 SJTW/SJTW-A
Mechanical Shaft Seal	carbon and ceramic
Fasteners	300 Series SST

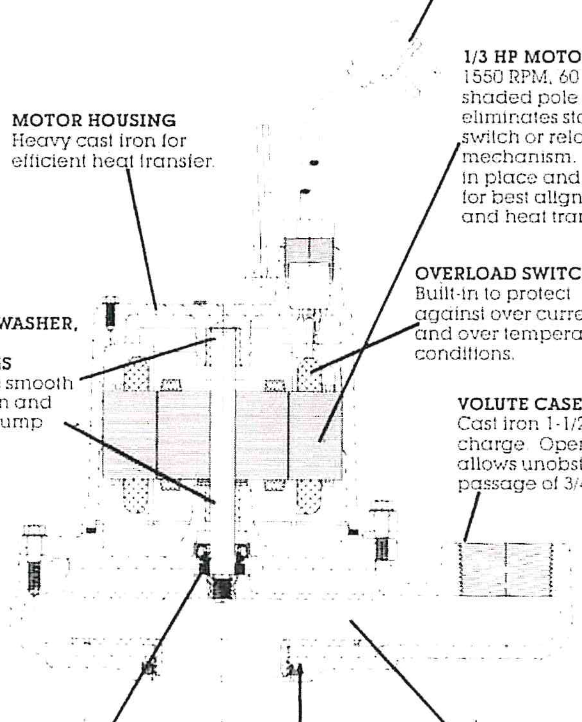
WHERE INNOVATION MEETS TRADITION

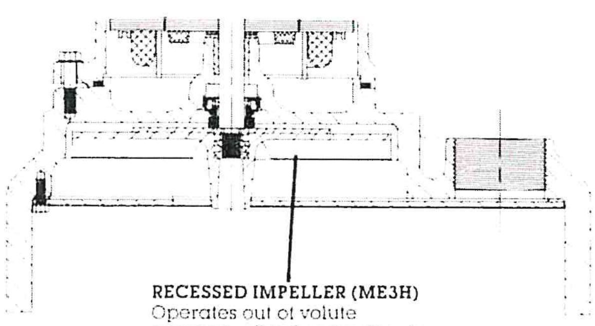
ISO 9001 Registered Quality System

Myers®
Pentair Pump Group

ME3 SERIES

High Head (ME3H) and High Flow (ME3F)
Submersible Effluent Pumps





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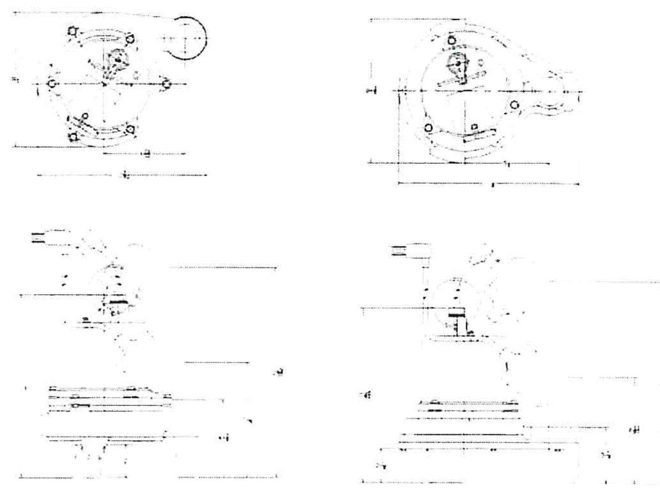
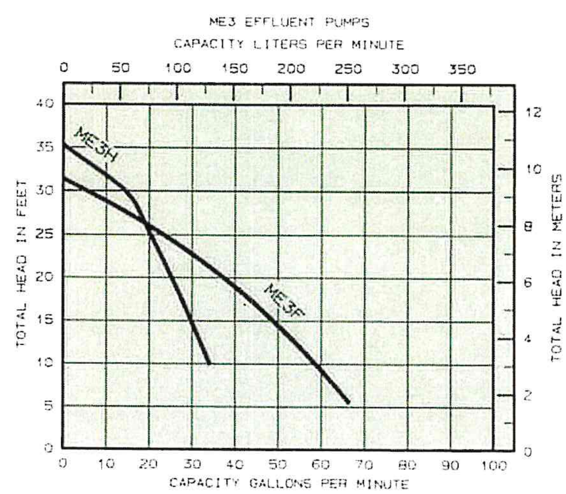


(ME3F) (ME3H)

PERFORMANCE CURVE



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519/748-5470, FAX: 519/748-2553

Pump Design:

Tax Map 110 - Lots 2 & 17

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow: **450** **GPD**

Pipe 1:	**SDR 21**	**1.5**	in. dia.
Pipe 2:	**SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber = **1.00** ft.

No. of doses/day = 4

Volume of dose = 120 Gallons

Pump Chamber Inverts:

Rim =	**261.00**	
-	2.00	
Inv. In. =	**259.00**	(assumed)
-	1.70	
High Water Alarm =	257.30	
-	0.5	
Pump On =	256.80	
-	1.00	
Pump Off =	255.80	
-	1.00	
Chamber Bottom =	254.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off = 255.80
Force Main Elevation = 258.00

258.50	Destination Invert
255.80	Lower of Pump Off or Force Main Elevation
2.70	ft.

Static Head = 2.70 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	12	12
Gate Valve = (0/2 closed)	1	1.5	1.5
90deg. Elbows =	4	3	12
45deg. Elbows =	7	2.5	17.5
Tee =	1	12	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 40 LF

Joint Pipe Head = 55 LF

Total Pipe 1 Length = 95 LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	95.00	1.5	1.89	1.80	2.83
25	95.00	1.5	2.86	2.72	3.53
30	95.00	1.5	4.01	3.81	4.24
35	95.00	1.5	5.33	5.06	4.95
40	95.00	1.5	6.82	6.48	5.65
45	95.00	1.5	8.49	8.07	6.36

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	0	28	0
Gate Valve = (0/2 closed)	2	2.5	5
90deg. Elbows =	0	10	0
45deg. Elbows =	0	5	0
Tee =	1	20	20
		Total Joint = Pipe Head	25.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 68 LF

Joint Pipe Head = 25 LF

Total Pipe 2 Length = 93 LF

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	93.00	2	0.63	0.59	1.80
25	93.00	2	0.960	0.89	2.25
30	93.00	2	1.340	1.25	2.70
35	93.00	2	1.780	1.66	3.15
40	93.00	2	2.280	2.12	3.61
45	93.00	2	2.840	2.64	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	2.70	188.00	2.38	5.08	1.80
25	2.70	188.00	3.61	6.31	2.25
30	2.70	188.00	5.06	7.76	2.70
35	2.70	188.00	6.72	9.42	3.15
40	2.70	188.00	8.60	11.30	3.61
45	2.70	188.00	10.71	13.41	4.06

Pump Specification

Pump Selection:

Capacity = 30.00 GPM
Tot. Dynamic Head = 6.51 ft.
Velocity = 2.7 ft./sec. (within 2" force main)
Pump Make/Model: Pentair SSM33I Effluent Pump
Pipe Length = 68 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 2 & 17

Rim =	261.00	Pipe 1 Type:	SDR 21	
Inv. In. =	259.00	Pipe 1 Length =	40	ft.
High Water Alarm =	257.30	Pipe 2 Type:	0	
Lag Pump On =	256.80	Pipe 1 Length =	68	ft.
Pump Off =	255.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	254.80	Tot. Dynamic Head =	6.51	ft.

Pump Make/Model: Pentair SSM33I Effluent Pump

Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

Pump Design:
Tax Map 110 - Lots 3 & 16

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow:		**450**	**GPD**
Pipe 1:	**SDR 21**	**1.5**	in. dia.
Pipe 2:	**SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**261.00**	
-	2.00	
Inv. In. =	**259.00**	(assumed)
-	1.70	
High Water Alarm =	257.30	
-	0.5	
Pump On =	256.80	
-	1.00	
Pump Off =	255.80	
-	1.00	
Chamber Bottom =	254.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	255.80
Force Main Elevation =	257.50

258.50	Destination Invert
255.80	Lower of Pump Off or Force Main Elevation
2.70	ft.

Static Head = 2.70 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	12	12
Gate Valve = (0/2 closed)	1	1.5	1.5
90deg. Elbows =	4	3	12
45deg. Elbows =	7	2.5	17.5
Tee =	1	12	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 75 tr

Joint Pipe Head = 55 LF

Total Pipe 1 Length = 130 LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	0	28	0
Gate Valve = (0/2 closed)	2	2.5	5
90deg. Elbows =	0	10	0
45deg. Elbows =	0	5	0
Tee =	1	20	20
		Total Joint = Pipe Head	25.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 138 LF

Joint Pipe Head = 25 LF

Total Pipe 2 Length = 163 LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	130.00	1.5	1.89	2.46	2.83
25	130.00	1.5	2.86	3.72	3.53
30	130.00	1.5	4.01	5.21	4.24
35	130.00	1.5	5.33	6.93	4.95
40	130.00	1.5	6.82	8.87	5.65
45	130.00	1.5	8.49	11.04	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	163.00	2	0.63	1.03	1.80
25	163.00	2	0.960	1.56	2.25
30	163.00	2	1.340	2.18	2.70
35	163.00	2	1.780	2.90	3.15
40	163.00	2	2.280	3.72	3.61
45	163.00	2	2.840	4.63	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	2.70	293.00	3.48	6.18	1.80
25	2.70	293.00	5.28	7.98	2.25
30	2.70	293.00	7.40	10.10	2.70
35	2.70	293.00	9.83	12.53	3.15
40	2.70	293.00	12.58	15.28	3.61
45	2.70	293.00	15.67	18.37	4.06

Pump Specification

Pump Selection:

Capacity =	30.00	GPM	
Tot. Dynamic Head =	9.1	ft.	
Velocity =	2.7	ft./sec.	(within 2" force main)
Pump Make/Model:	Pentair SSM33I Effluent Pump		
Pipe Length =	68	ft.	
Pipe Type:	SDR 21		

Run Time:

(= gal./dose / pump gpm)

Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary:

Tax Map 110 - Lots 3 & 16

Rim =	261.00	Pipe 1 Type:	SDR 21	
Inv. In. =	259.00	Pipe 1 Length =	75	ft.
High Water Alarm =	257.30	Pipe 2 Type:	0	
Lag Pump On =	256.80	Pipe 1 Length =	138	ft.
Pump Off =	255.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	254.80	Tot. Dynamic Head =	9.1	ft.

Pump Make/Model:	Pentair SSM33I Effluent Pump	
Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

Pump Design:

Tax Map 110 - Lot 15

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow:	**450**	**GPD**
Pipe 1: **SDR 21**	**1.5**	in. dia.
Pipe 2: **SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**261.00**	
-	2.00	
Inv. In. =	**259.00**	(assumed)
-	1.70	
High Water Alarm =	257.30	
-	0.5	
Pump On =	256.80	
-	1.00	
Pump Off =	255.80	
-	1.00	
Chamber Bottom =	254.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	255.80
Force Main Elevation =	257.25

258.50	Destination Invert
255.80	Lower of Pump Off or Force Main Elevation
2.70	ft.

Static Head = 2.70 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	12	12
Gate Valve = (0/2 closed)	1	1.5	1.5
90deg. Elbows =	4	3	12
45deg. Elbows =	7	2.5	17.5
Tee =	1	12	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 40 tr

Joint Pipe Head = 55 LF

Total Pipe 1 Length = 95 LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	0	28	0
Gate Valve = (0/2 closed)	2	2.5	5
90deg. Elbows =	0	10	0
45deg. Elbows =	0	5	0
Tee =	1	20	20
		Total Joint = Pipe Head	25.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 200 LF

Joint Pipe Head = 25 LF

Total Pipe 2 Length = 225 LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	95.00	1.5	1.89	1.80	2.83
25	95.00	1.5	2.86	2.72	3.53
30	95.00	1.5	4.01	3.81	4.24
35	95.00	1.5	5.33	5.06	4.95
40	95.00	1.5	6.82	6.48	5.65
45	95.00	1.5	8.49	8.07	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	225.00	2	0.63	1.42	1.80
25	225.00	2	0.960	2.16	2.25
30	225.00	2	1.340	3.02	2.70
35	225.00	2	1.780	4.01	3.15
40	225.00	2	2.280	5.13	3.61
45	225.00	2	2.840	6.39	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	2.70	320.00	3.21	5.91	1.80
25	2.70	320.00	4.88	7.58	2.25
30	2.70	320.00	6.82	9.52	2.70
35	2.70	320.00	9.07	11.77	3.15
40	2.70	320.00	11.61	14.31	3.61
45	2.70	320.00	14.46	17.16	4.06

Pump Specification

Pump Selection:

Capacity = 30.00 GPM
Tot. Dynamic Head = 8.5 ft.
Velocity = 2.7 ft./sec. (within 2" force main)
Pump Make/Model: Pentair SSM33I Effluent Pump
Pipe Length = 200 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lot 15

Rim =	261.00	Pipe 1 Type:	SDR 21	
Inv. In. =	259.00	Pipe 1 Length =	40	ft.
High Water Alarm =	257.30	Pipe 2 Type:	0	
Lag Pump On =	256.80	Pipe 1 Length =	200	ft.
Pump Off =	255.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	254.80	Tot. Dynamic Head =	8.5	ft.

Pump Make/Model: Pentair SSM33I Effluent Pump

Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

Pump Design:

Tax Map 110 - Lots 4 & 14

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow:	**450**	**GPD**
Pipe 1: **SDR 21**	**1.5**	in. dia.
Pipe 2: **SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Pump Chamber Inverts:

Rim =	**262.00**	
-	2.00	
Inv. In. =	**260.00**	(assumed)
-	1.70	
High Water Alarm =	258.30	
-	0.5	
Pump On =	257.80	
-	1.00	
Pump Off =	256.80	
-	1.00	
Chamber Bottom =	255.80	

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	256.80
Force Main Elevation =	257.00

258.50	Destination Invert
256.80	Lower of Pump Off or Force Main Elevation
1.70	ft.

Static Head = 1.70 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**1**	**12**	12
Gate Valve = (0/2 closed)	**1**	**1.5**	1.5
90deg. Elbows =	**4**	**3**	12
45deg. Elbows =	**7**	**2.5**	17.5
Tee =	**1**	**12**	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**92**	tr
Joint Pipe Head =	55	LF
Total Pipe 1 Length =	147	LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**2**	**28**	56
Gate Valve = (0/2 closed)	**2**	**2.5**	5
90deg. Elbows =	**0**	**10**	0
45deg. Elbows =	**0**	**5**	0
Tee =	**1**	**20**	20
		Total Joint = Pipe Head	81.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**320**	LF
Joint Pipe Head =	81	LF
Total Pipe 2 Length =	401	LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	147.00	1.5	**1.89**	2.78	2.83
25	147.00	1.5	**2.86**	4.20	3.53
30	147.00	1.5	**4.01**	5.89	4.24
35	147.00	1.5	**5.33**	7.84	4.95
40	147.00	1.5	**6.82**	10.03	5.65
45	147.00	1.5	**8.49**	12.48	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	401.00	2	**0.63**	2.53	1.80
25	401.00	2	**0.960**	3.85	2.25
30	401.00	2	**1.340**	5.37	2.70
35	401.00	2	**1.780**	7.14	3.15
40	401.00	2	**2.280**	9.14	3.61
45	401.00	2	**2.840**	11.39	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	1.70	548.00	5.30	7.00	1.80
25	1.70	548.00	8.05	9.75	2.25
30	1.70	548.00	11.27	12.97	2.70
35	1.70	548.00	14.97	16.67	3.15
40	1.70	548.00	19.17	20.87	3.61
45	1.70	548.00	23.87	25.57	4.06

Pump Specification

Pump Selection:

Capacity = 30.00 GPM
Tot. Dynamic Head = 12 ft.
Velocity = 2.7 ft./sec. (within 2" force main)
Pump Make/Model: Pentair SSM33I Effluent Pump
Pipe Length = 320 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 4 & 14

Rim =	262.00	Pipe 1 Type:	SDR 21	
Inv. In. =	260.00	Pipe 1 Length =	92	ft.
High Water Alarm =	258.30	Pipe 2 Type:	0	
Lag Pump On =	257.80	Pipe 1 Length =	320	ft.
Pump Off =	256.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	255.80	Tot. Dynamic Head =	12	ft.

Pump Make/Model: Pentair SSM33I Effluent Pump

Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

Pump Design: Tax Map 110 - Lots 5 & 13

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow:	**450**	**GPD**
Pipe 1: SDR 21	**1.5**	in. dia.
Pipe 2: SDR 21	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**263.00**	
-	3.00	
Inv. In. =	**260.00**	(assumed)
-	1.70	
High Water Alarm =	258.30	
-	0.5	
Pump On =	257.80	
-	1.00	
Pump Off =	256.80	
-	1.00	
Chamber Bottom =	255.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	256.80
Force Main Elevation =	255.25

258.50	Destination Invert
255.25	Lower of Pump Off or Force Main Elevation
3.25	ft.

Static Head = 3.25 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**1**	**12**	12
Gate Valve = (0/2 closed)	**1**	**1.5**	1.5
90deg. Elbows =	**4**	**3**	12
45deg. Elbows =	**7**	**2.5**	17.5
Tee =	**1**	**12**	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**60**	tr
Joint Pipe Head =	55	LF
Total Pipe 1 Length =	115	LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	115.00	1.5	**1.89**	2.17	2.83
25	115.00	1.5	**2.86**	3.29	3.53
30	115.00	1.5	**4.01**	4.61	4.24
35	115.00	1.5	**5.33**	6.13	4.95
40	115.00	1.5	**6.82**	7.84	5.65
45	115.00	1.5	**8.49**	9.76	6.36

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**3**	**28**	84
Gate Valve = (0/2 closed)	**2**	**2.5**	5
90deg. Elbows =	**0**	**10**	0
45deg. Elbows =	**0**	**5**	0
Tee =	**1**	**20**	20
		Total Joint = Pipe Head	109.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**415**	LF
Joint Pipe Head =	109	LF
Total Pipe 2 Length =	524	LF

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	524.00	2	**0.63**	3.30	1.80
25	524.00	2	**0.960**	5.03	2.25
30	524.00	2	**1.340**	7.02	2.70
35	524.00	2	**1.780**	9.33	3.15
40	524.00	2	**2.280**	11.95	3.61
45	524.00	2	**2.840**	14.88	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	3.25	639.00	5.47	8.72	1.80
25	3.25	639.00	8.32	11.57	2.25
30	3.25	639.00	11.63	14.88	2.70
35	3.25	639.00	15.46	18.71	3.15
40	3.25	639.00	19.79	23.04	3.61
45	3.25	639.00	24.65	27.90	4.06

Pump Specification

Pump Selection:

Capacity = 27.00 GPM
Tot. Dynamic Head = 13 ft.
Velocity = 2.56 ft./sec. (within 2" force main)
Pump Make/Model: Pentair SSM33I Effluent Pump
Pipe Length = 320 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 27.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.44 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 5 & 13

Rim =	263.00	Pipe 1 Type:	SDR 21	
Inv. In. =	260.00	Pipe 1 Length =	60	ft.
High Water Alarm =	258.30	Pipe 2 Type:	0	
Lag Pump On =	257.80	Pipe 1 Length =	415	ft.
Pump Off =	256.80	Velocity =	2.56	ft./sec.
Chamber Bottom =	255.80	Tot. Dynamic Head =	13	ft.

Pump Make/Model: Pentair SSM33I Effluent Pump

Capacity =	27.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.44	minute

Pump Design: Tax Map 110 - Lots 6 & 12

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow: **450** **GPD**

Pipe 1: **SDR 21** **1.5** in. dia.
Pipe 2: **SDR 21** **2** in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**262.00**	
-	2.00	
Inv. In. =	**260.00**	(assumed)
-	1.70	
High Water Alarm =	258.30	
-	0.5	
Pump On =	257.80	
-	1.00	
Pump Off =	256.80	
-	1.00	
Chamber Bottom =	255.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	256.80
Force Main Elevation =	253.75

258.50	Destination Invert
253.75	Lower of Pump Off or Force Main Elevation
4.75	ft.

Static Head = 4.75 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	12	12
Gate Valve = (0/2 closed)	1	1.5	1.5
90deg. Elbows =	4	3	12
45deg. Elbows =	7	2.5	17.5
Tee =	1	12	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	60	tr
Joint Pipe Head =	55	LF
Total Pipe 1 Length =	115	LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	3	28	84
Gate Valve = (0/2 closed)	2	2.5	5
90deg. Elbows =	0	10	0
45deg. Elbows =	0	5	0
Tee =	1	20	20
		Total Joint = Pipe Head	109.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	520	LF
Joint Pipe Head =	109	LF
Total Pipe 2 Length =	629	LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	115.00	1.5	1.89	2.17	2.83
25	115.00	1.5	2.86	3.29	3.53
30	115.00	1.5	4.01	4.61	4.24
35	115.00	1.5	5.33	6.13	4.95
40	115.00	1.5	6.82	7.84	5.65
45	115.00	1.5	8.49	9.76	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	629.00	2	0.63	3.96	1.80
25	629.00	2	0.960	6.04	2.25
30	629.00	2	1.340	8.43	2.70
35	629.00	2	1.780	11.20	3.15
40	629.00	2	2.280	14.34	3.61
45	629.00	2	2.840	17.86	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	4.75	744.00	6.14	10.89	1.80
25	4.75	744.00	9.33	14.08	2.25
30	4.75	744.00	13.04	17.79	2.70
35	4.75	744.00	17.33	22.08	3.15
40	4.75	744.00	22.18	26.93	3.61
45	4.75	744.00	27.63	32.38	4.06

Pump Specification

Pump Selection:

Capacity = 25.00 GPM
Tot. Dynamic Head = 14 ft.
Velocity = 2.25 ft./sec. (within 2" force main)
Pump Make/Model: Pentair SSM33I Effluent Pump
Pipe Length = 520 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 25.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.80 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 6 & 12

Rim =	262.00	Pipe 1 Type:	SDR 21	
Inv. In. =	260.00	Pipe 1 Length =	60	ft.
High Water Alarm =	258.30	Pipe 2 Type:	0	
Lag Pump On =	257.80	Pipe 1 Length =	520	ft.
Pump Off =	256.80	Velocity =	2.25	ft./sec.
Chamber Bottom =	255.80	Tot. Dynamic Head =	14	ft.

Pump Make/Model: Pentair SSM33I Effluent Pump

Capacity =	25.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.80	minute

Pump Design: Tax Map 110 - Lots 7 & 11

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow: **450** **GPD**

Pipe 1:	**SDR 21**	**1.5**	in. dia.
Pipe 2:	**SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**262.00**	
-	2.00	
Inv. In. =	**260.00**	(assumed)
-	1.70	
High Water Alarm =	258.30	
-	0.5	
Pump On =	257.80	
-	1.00	
Pump Off =	256.80	
-	1.00	
Chamber Bottom =	255.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	256.80
Force Main Elevation =	251.00

258.50	Destination Invert
251.00	Lower of Pump Off or Force Main Elevation
7.50	ft.

Static Head = 7.50 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**1**	**12**	12
Gate Valve = (0/2 closed)	**1**	**1.5**	1.5
90deg. Elbows =	**4**	**3**	12
45deg. Elbows =	**7**	**2.5**	17.5
Tee =	**1**	**12**	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**60**	tr
Joint Pipe Head =	55	LF
Total Pipe 1 Length =	115	LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**3**	**28**	84
Gate Valve = (0/2 closed)	**4**	**2.5**	10
90deg. Elbows =	**0**	**10**	0
45deg. Elbows =	**0**	**5**	0
Tee =	**1**	**20**	20
		Total Joint = Pipe Head	114.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length =	**800**	LF
Joint Pipe Head =	114	LF
Total Pipe 2 Length =	914	LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	115.00	1.5	**1.89**	2.17	2.83
25	115.00	1.5	**2.86**	3.29	3.53
30	115.00	1.5	**4.01**	4.61	4.24
35	115.00	1.5	**5.33**	6.13	4.95
40	115.00	1.5	**6.82**	7.84	5.65
45	115.00	1.5	**8.49**	9.76	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	914.00	2	**0.63**	5.76	1.80
25	914.00	2	**0.960**	8.77	2.25
30	914.00	2	**1.340**	12.25	2.70
35	914.00	2	**1.780**	16.27	3.15
40	914.00	2	**2.280**	20.84	3.61
45	914.00	2	**2.840**	25.96	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	7.50	1029.00	7.93	15.43	1.80
25	7.50	1029.00	12.06	19.56	2.25
30	7.50	1029.00	16.86	24.36	2.70
35	7.50	1029.00	22.40	29.90	3.15
40	7.50	1029.00	28.68	36.18	3.61
45	7.50	1029.00	35.72	43.22	4.06

Pump Specification

Pump Selection:

Capacity = 27.00 GPM
Tot. Dynamic Head = 22 ft.
Velocity = 2.56 ft./sec. (within 2" force main)
Pump Make/Model: Pentair ME3F Effluent Pump
Pipe Length = 800 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 27.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.44 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 7 & 11

Rim =	262.00	Pipe 1 Type:	SDR 21	
Inv. In. =	260.00	Pipe 1 Length =	60	ft.
High Water Alarm =	258.30	Pipe 2 Type:	0	
Lag Pump On =	257.80	Pipe 1 Length =	800	ft.
Pump Off =	256.80	Velocity =	2.56	ft./sec.
Chamber Bottom =	255.80	Tot. Dynamic Head =	22	ft.

Pump Make/Model:	Pentair ME3F Effluent Pump	
Capacity =	27.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.44	minute

Pump Design:

Tax Map 110 - Lots 8 & 10

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow: **450** **GPD**

Pipe 1:	**SDR 21**	**1.5**	in. dia.
Pipe 2:	**SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber = **1.00** ft.

No. of doses/day = 4

Volume of dose = 120 Gallons

Pump Chamber Inverts:

Rim =	**262.00**	
-	2.00	
Inv. In. =	**260.00**	(assumed)
-	1.70	
High Water Alarm =	258.30	
-	0.5	
Pump On =	257.80	
-	1.00	
Pump Off =	256.80	
-	1.00	
Chamber Bottom =	255.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off = 256.80
Force Main Elevation = 250.50

258.50	Destination Invert
250.50	Lower of Pump Off or Force Main Elevation
8.00	ft.

Static Head = 8.00 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**1**	**12**	12
Gate Valve = (0/2 closed)	**1**	**1.5**	1.5
90deg. Elbows =	**4**	**3**	12
45deg. Elbows =	**7**	**2.5**	17.5
Tee =	**1**	**12**	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = **80** tr

Joint Pipe Head = 55 LF

Total Pipe 1 Length = 135 LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	**3**	**28**	84
Gate Valve = (0/2 closed)	**4**	**2.5**	10
90deg. Elbows =	**0**	**10**	0
45deg. Elbows =	**0**	**5**	0
Tee =	**1**	**20**	20
		Total Joint = Pipe Head	114.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = **880** LF

Joint Pipe Head = 114 LF

Total Pipe 2 Length = 994 LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	135.00	1.5	**1.89**	2.55	2.83
25	135.00	1.5	**2.86**	3.86	3.53
30	135.00	1.5	**4.01**	5.41	4.24
35	135.00	1.5	**5.33**	7.20	4.95
40	135.00	1.5	**6.82**	9.21	5.65
45	135.00	1.5	**8.49**	11.46	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	994.00	2	**0.63**	6.26	1.80
25	994.00	2	**0.960**	9.54	2.25
30	994.00	2	**1.340**	13.32	2.70
35	994.00	2	**1.780**	17.69	3.15
40	994.00	2	**2.280**	22.66	3.61
45	994.00	2	**2.840**	28.23	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	8.00	1129.00	8.81	16.81	1.80
25	8.00	1129.00	13.40	21.40	2.25
30	8.00	1129.00	18.73	26.73	2.70
35	8.00	1129.00	24.89	32.89	3.15
40	8.00	1129.00	31.87	39.87	3.61
45	8.00	1129.00	39.69	47.69	4.06

Pump Specification

Pump Selection:

Capacity =	30.00	GPM	
Tot. Dynamic Head =	26.7	ft.	
Velocity =	2.7	ft./sec.	(within 2" force main)
Pump Make/Model:	Pentair ME3F Effluent Pump		
Pipe Length =	800	ft.	
Pipe Type:	SDR 21		

Run Time:

(= gal./dose / pump gpm)

Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lots 8 & 10

Rim =	262.00	Pipe 1 Type:	SDR 21	
Inv. In. =	260.00	Pipe 1 Length =	80	ft.
High Water Alarm =	258.30	Pipe 2 Type:	0	
Lag Pump On =	257.80	Pipe 1 Length =	880	ft.
Pump Off =	256.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	255.80	Tot. Dynamic Head =	26.7	ft.

Pump Make/Model: Pentair ME3F Effluent Pump

Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

Pump Design:

Tax Map 110 - Lot 9

Destination Invert: **Existing SMH at Station 1+35**

inv in. = **258.50**

Design Flow:		**450**	**GPD**
Pipe 1:	**SDR 21**	**1.5**	in. dia.
Pipe 2:	**SDR 21**	**2**	in. dia.

Dosing Calculations:

Desired Dose Ht. in Pump Chamber =	**1.00**	ft.
No. of doses/day =	4	
Volume of dose =	**120**	**Gallons**

Pump Chamber Inverts:

Rim =	**258.00**	
-	2.00	
Inv. In. =	**256.00**	(assumed)
-	1.70	
High Water Alarm =	254.30	
-	0.5	
Pump On =	253.80	
-	1.00	
Pump Off =	252.80	
-	1.00	
Chamber Bottom =	251.80	

Pump Chamber:

Radius =		ft.
Length =	**2.75**	ft.
Width =	**5.83**	ft.
HI =	**50.00**	in
Volume/ft. of depth =	16.03	ft^3/ft
Volume/ft. of depth =	120	gal./ft.

Static Head Calc's:

Static Head = Destination Invert - Pump Off (or Force Main Elevation)

Pump Off =	252.80
Force Main Elevation =	250.00

258.50	Destination Invert
250.00	Lower of Pump Off or Force Main Elevation
8.50	ft.

Static Head = 8.50 ft.

Friction Losses:

Pipe 1 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	1	12	12
Gate Valve = (0/2 closed)	1	1.5	1.5
90deg. Elbows =	4	3	12
45deg. Elbows =	7	2.5	17.5
Tee =	1	12	12
		Total Joint = Pipe Head	55.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 80 tr

Joint Pipe Head = 55 LF

Total Pipe 1 Length = 135 LF

Pipe 2 Head Calculations For Joints Etc.:

Item:	Amount:	Equivalent Length (ft.)	Tot. Equiv. Length (ft.)
Check Valve =	3	28	84
Gate Valve = (0/2 closed)	4	2.5	10
90deg. Elbows =	0	10	0
45deg. Elbows =	0	5	0
Tee =	1	20	20
		Total Joint = Pipe Head	114.00

Total Pipe Length:
(=Pipe Length + Joint Pipe Head)

Pipe Length = 910 LF

Joint Pipe Head = 114 LF

Total Pipe 2 Length = 1024 LF

Pipe #1 (1 1/2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	135.00	1.5	1.89	2.55	2.83
25	135.00	1.5	2.86	3.86	3.53
30	135.00	1.5	4.01	5.41	4.24
35	135.00	1.5	5.33	7.20	4.95
40	135.00	1.5	6.82	9.21	5.65
45	135.00	1.5	8.49	11.46	6.36

Pipe #2 (2" SDR21)

Pump Rate (GPM)	Tot. Pipe Length (ft.)	Pipe Size (in.)	Friction Loss 100-ft	Friction Loss (ft.)	Velocity (ft/sec)
20	1024.00	2	0.63	6.45	1.80
25	1024.00	2	0.960	9.83	2.25
30	1024.00	2	1.340	13.72	2.70
35	1024.00	2	1.780	18.23	3.15
40	1024.00	2	2.280	23.35	3.61
45	1024.00	2	2.840	29.08	4.06

Total Losses

Pump Rate (GPM)	Static Head (ft.)	Tot. Pipe Length (ft.)	Friction Loss (ft.)	Total Dynamic Head	Min. Velocity (ft/sec)
20	8.50	1159.00	9.00	17.50	1.80
25	8.50	1159.00	13.69	22.19	2.25
30	8.50	1159.00	19.14	27.64	2.70
35	8.50	1159.00	25.42	33.92	3.15
40	8.50	1159.00	32.55	41.05	3.61
45	8.50	1159.00	40.54	49.04	4.06

Pump Specification

Pump Selection:

Capacity = 30.00 GPM
Tot. Dynamic Head = 27 ft.
Velocity = 2.7 ft./sec. (within 2" force main)
Pump Make/Model: Pentair ME3F Effluent Pump
Pipe Length = 800 ft.
Pipe Type: SDR 21

Run Time:

(= gal./dose / pump gpm)
Pump GPM = 30.00

*Pump GPM either selected from above or taken from Pump Curve at intersection.

Run Time = 4.00 minute

*Run Time shall be greater than 3 min.

Summary: Tax Map 110 - Lot 9

Rim =	258.00	Pipe 1 Type:	SDR 21	
Inv. In. =	256.00	Pipe 1 Length =	80	ft.
High Water Alarm =	254.30	Pipe 2 Type:	0	
Lag Pump On =	253.80	Pipe 1 Length =	910	ft.
Pump Off =	252.80	Velocity =	2.7	ft./sec.
Chamber Bottom =	251.80	Tot. Dynamic Head =	27	ft.

Pump Make/Model: Pentair ME3F Effluent Pump

Capacity =	30.00	GPM
No. of doses/day =	4	
Volume of dose =	120	Gallons
Run Time =	4.00	minute

APPENDIX A-3:

SANITARY SYSTEM CONSTRUCTION SPECIFICATIONS

SECTION 221313
FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pipe and fittings.
   2. Nonpressure and pressure couplings.
   3. Expansion joints.
   4. Cleanouts.
   5. Encasement for piping.
   6. Manholes.

1.2 ACTION SUBMITTALS

A. Product Data: For expansion joints.

B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

B. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.

C. Field quality-control reports.

1.4 NOTIFICATIONS

A. The Contractor shall contact the **City of Rochester Public Works Department** prior to the start of any sanitary sewer service installation.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. PVC Type PSM Sewer Piping:
   1. Pipe: ASTM D 3034, **SDR 35**, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
   2. Fittings: ASTM D 3034, PVC with bell ends.
   3. Gaskets: ASTM F 477, elastomeric seals.

B. H.D.P.E. (High-Performance High-Density Polyethylene) Pipe.
   1. H.D.P.E. used for the force main shall conform to ASTM D-2241 and D-1784 (class 1254-B). A safety factor of 2.5 shall be used for pressure rating determination with a standard dimension ratio (SDR) no higher than 11.
   2. All H.D.P.E pipe and fittings shall conform to the most recent requirements of ASTM Specifications. ASTM D2683 (socket fused) ASTM D3261 (butt fused).

2.2 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:
   1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
   2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Unshielded, Flexible Couplings:
   1. Description: Elastomeric sleeve with **stainless-steel shear ring and** corrosion-resistant-metal tension band and tightening mechanism on each end.

D. Ring-Type, Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

2.3 CLEANOUTS

A. Cast-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
   1. Top-Loading Classification(s): **Heavy Duty**.
   2. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

2.4 ENCASEMENT FOR PIPING

A. Standard: ASTM A 674 or AWWA C105.

B. Material: **high-density, cross-laminated polyethylene film of 0.004-inch** minimum thickness.

C. Form: [**Sheet**] [**or**] [**tube**].

D. Color: [**Black**] [**or**] [**natural**].

2.5 MANHOLES

A. Standard Precast Concrete Manholes:
   1. Description: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for sealant joints.
   2. Diameter: 60 inches minimum unless otherwise indicated.
   3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
   4. Base Section: 6-inch minimum thickness for floor slab and 4-inch (100-mm) minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
   5. Riser Sections: 4-inch minimum thickness, of length to provide depth indicated.
   6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
   7. Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
   8. Resilient Pipe Connectors: ASTM C 923 (ASTM C 923M), cast or fitted into manhole walls, for each pipe connection.
   9. Adjusting Rings: Interlocking HDPE rings, with level or sloped edge in thickness and diameter matching manhole frame and cover, and with height as required adjusting manhole frame and covering to indicated elevation and slope. Include sealant recommended by ring manufacturer.
   10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.
   11. Brick: Frame and Cover may be adjusted to grade using (a) course(s) of brick and mortar not to exceed 6-inches in thickness.

B. Manhole Frames and Covers:
   1. Description: Ferrous; 30-inch ID by 7- to 9-inch riser, with 4-inch- minimum-width flange and 32-inch diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SEWER." **PAMREX 30-inch diameter frame and cover. EJ Prescott Product #62113-32-S.**
   2. Material: **ASTM A 536, Grade 60-40-18 ductile** [**ASTM A 48/A 48M, Class 35 gray** iron unless otherwise indicated.

2.6 CONCRETE

A. General: Cast-in-place concrete complying with ACI 318, ACI 350/350R (ACI 350M/350RM), and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
   1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
      a. Invert Slope: **2** percent through manhole.
   2. Benches: Concrete, sloped to drain into channel.
      a. Slope: **8** percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of micro tunneling.

F. Install gravity-flow, nonpressure, drainage piping according to the following:
   1. Install piping pitched down in direction of flow, at minimum slope of 0.004 ft/ft unless otherwise indicated.
   2. Install piping **NPS 6** and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.

3. Install piping with **60-inch** minimum cover.
4. Install PVC corrugated sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PVC Type PSM sewer piping according to ASTM D 2321 and ASTM F 1668.

G. Install corrosion-protection piping encasement over the following underground metal piping according to ASTM A 674 or AWWA C105:
1. Expansion joints.

H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping according to the following:
1. Join PVC Type PSM sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
2. Join dissimilar pipe materials with nonpressure-type, **rigid** couplings.

B. Pipe couplings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
1. Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
    a. Unshielded flexible couplings for pipes of same or slightly different OD.
    b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

3.4 MANHOLE INSTALLATION

A. General: Install manholes complete with appurtenances and accessories indicated.

B. Pre-cast and poured-in-place bases shall be placed on a 6" layer of compacted bedding material as described. The excavations shall be properly dewatered while placing bedding material and setting the base.

C. Inlet and outlet stubs shall be connected into manholes and sealed in accordance with an approved pipe to manhole joint as shown on the Standard Details.

D. Install precast concrete manhole sections with sealants according to ASTM C 891.

E. Install FRP manholes according to manufacturer's written instructions.

F. Form continuous concrete channels and benches between inlets and outlet.

G. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops **3 inches** above finished surface elsewhere unless otherwise indicated.

H. Install manhole-cover inserts in frame and immediately below cover.

3.5 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.6 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
1. Use Light-Duty, top-loading classification cleanouts in **earth or unpaved foot-traffic** areas.
2. Use Medium-Duty, top-loading classification cleanouts in **paved foot-traffic**] areas.

3. Use Heavy-Duty, top-loading classification cleanouts in **vehicle-traffic service** areas.
4. Use Extra-Heavy-Duty, top-loading classification cleanouts in **roads**.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block, **18 by 18 by 12 inches** deep. Set with tops **1 inch** above surrounding grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.7 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Section 221316 "Sanitary Waste and Vent Piping."

B. Make connections to existing piping and underground manholes.
1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Make branch connections from side into existing piping, NPS 4 to NPS 20 (DN 100 to DN 500). Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
3. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.8 IDENTIFICATION

A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.
1. Use **warning tape or** detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.9 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. The maximum allowable deflection of flexible sewer pipe shall be 5% percent of average inside diameter. A rigid ball or mandrel with a diameter of at least 95% of the average inside pipe diameter shall be used for testing pipe deflection. The deflection test shall be conducted without mechanical pulling devices
   c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:
    a. Fill sewer piping with water. Test with pressure of at least 10-foot head of water, and maintain such pressure without leakage for at least 15 minutes.
    b. Close openings in system and fill with water.
    c. Purge air and refill with water.
    d. Disconnect water supply.
    e. Test and inspect joints for leaks.
6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
    b. Option: Test concrete gravity sewer piping according to ASTM C 924 (ASTM C 924M).
7. Manholes: Perform vacuum test according to ASTM C1244. A manhole may be backfilled prior to performing a vacuum test, but if the manhole fails the vacuum test, backfill shall be removed so repairs to the manhole can be made from the outside of the manhole prior to retesting.
    a. The manhole vacuum test shall conform to the following
       The initial vacuum gauge test pressure shall be 10 inches Hg
    b. The minimum acceptable test hold time for a 1-inch Hg pressure drop to 9 inches Hg shall be
        1. Not less than 2 minutes for manholes less than 10 feet deep in depth;
        2. Not less than 2.5 minutes for manholes 10 to 15 feet deep; and
        3. Not less than 3 minutes for manholes more than 15 feet deep
    c. The manhole shall be repaired and retested if the test hold times fail to achieve the acceptance limits specified in (b), above
    d. Inverts and shelves shall not be installed until after successful testing is completed.
    e. Immediately following completion of the leakage test, the frame and cover shall be placed on the top of the manhole or some other means used to prevent accidental entry by unauthorized persons, children, or animals, until the contractor is ready to make final adjustment to grade
8. Force Main and Pressure Sewer Testing: Force mains and pressure sewers shall be tested in accordance with section 5 of the AWWA C600, “Installation of Cast Iron Water Mains and Their Appurtenances” standard in effect when the test is conducted, available as noted in Appendix D, at a pressure equal to the greater of 150 percent of the design operating total dynamic head or at least 100 psi.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.10 CLEANING

A. Clean dirt and superfluous material from interior of piping. **Flush with potable water.**

END OF SECTION 221313

SECTION 221343
FACILITY SEWAGE PUMPING STATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The contractor shall furnish and install all components of the sewage pumping station such as pumps, tanks, pipes, fittings and controls as shown on the project plans.

1.3 PERFORMANCE REQUIREMENTS

A. Pressure Rating of Sewage Pumps and Discharge Piping Components: At least equal to sewage pump discharge pressure, but not less than 125 psig (860 kPa).

B. Pressure Rating of Other Piping Components: At least equal to system operating pressure.

1.4 ACTION SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Show fabrication and installation details for each packaged sewage pumping station. Detail equipment assemblies and indicate dimensions; shipping, installed, and operating weights; loads; required clearances; method of field assembly; components; electrical characteristics; and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of sewage pump, signed by product manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For equipment to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with UL 778, "Motor-Operated Water Pumps," for sewage pumps.

E. Comply with “Standards of Design and Construction For Sewerage and Wastewater Treatment Facilities", latest edition, as published by the NHDES - Water Division.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewer Service: Do not interrupt sanitary sewer service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sanitary sewer service according to requirements indicated:

1. Notify **Civil Engineer and City of Rochester Department of Public Works** no fewer than **5** days in advance of proposed interruption of sanitary sewer service.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged sewage pumping stations that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including shell.
      b. Faulty operation of sewage pumps, controls, or accessories.
      c. Deterioration of metals, metal finishes, and other materials beyond normal use.
   2. Warranty Period for Shells: **1** year from date of Substantial Completion.
   3. Warranty Period for Sewage Pumps and Controls: **1** year from date of Substantial Completion.
   4. Warranty Period for Accessories: **1** year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 IDENTIFICATION

A. Underground-Type Plastic Line Marker: Manufacturer's standard, permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 4" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BELOW".

2.2 PIPES AND FITTINGS

A. Provide pipe and fittings for sewer pipe, complete with elbows, tees, adapters, couplings, collars, accessories, and joint materials. Use pipe as called for on the plan from the following material choices.

B. P.V.C. (Poly Vinyl Chloride) Pipe.
   1. All P.V.C. (Poly Vinyl Chloride) pipe and fittings shall conform to the most recent requirements of ASTM Specifications for Type PSM Poly Vinyl Chloride (P.V.C.) Sewer Pipe and Fittings, Designation D 3034 and ASTM Specifications for Sewer Pipe, Joints Using Elastomeric Seals, Designation D 3212. Manufacturer's certificate of compliance shall be furnished to the Engineer, prior to installation. Methods of shipping and storage on site shall be such as to avoid injury to the pipe. Damaged pipe shall be rejected and removed from the job.
   2. Minimum "pipe stiffness" (F/y) at 7 1/2% deflection shall be 45 psi for sizes when tested in accordance with ASTM Methods of test D 2412, "External Loading properties of Plastic Pipe by Parallel Plate Loading."
   3. All gravity P.V.C. pipe shall be Type SDR 35 (a measure of thickness and rigidity) and shall have elastomeric gasket joints. Solvent cement joints shall not be allowed.

C. H.D.P.E. (High-Performance High-Density Polyethylene) Pipe.
   1. H.D.P.E. used for the force main shall conform to ASTM D-3035 standard.
   2. All H.D.P.E pipe and fittings shall conform to the most recent requirements of ASTM Specifications. ASTM D2683 (socket fused) ASTM D3261 (butt fused).
   3. H.D.P.E. pressure main that all pipe sections shall be joined by thermal heat fusion.
   4. Connections or transitions to non-HDPE components shall be made with fittings approved for HDPE connections. The welding technician shall be experienced in HDPE heat fusion welding with minimum of 500 hours of welding experience.

2.3 STRUCTURES

A. General: Provide precast reinforced concrete structures, including pump chambers and manholes, of dimensions and capacity as indicated; ASTM A 478.

B. Reinforced concrete structures shall conform to NHDES-WSPCD and local standards.
   1. Concrete structures shall be the products as manufactured by one of the following manufactures or equivalent products by another approved manufacturer.
      a. Superior Concrete Co
      b. A.J. Foss Co.
      c. Phoenix Precast Products
   2. Concrete structures shall be designed for AASHTO H-20 loading where indicated and where vehicle traffic may be present.
   3. Manufacturer shall submit calculations of negative buoyancy of concrete structures to verify that uplift conditions will not occur under all installed conditions with groundwater within 6" of finished ground surface.

C. All openings for pipes in precast concrete shall be cored or formed with permanently installed metal sleeves with a center fin for water stop. Do not use tapered plugs or knockout sleeves to form openings. Pipes shall be suitably sealed into structure with rubber gaskets complying with ASTM C 443. Follow manufacturer's recommendation for size determination and installation.

2.4 PUMPS

A. Pumps, motors, valves, controls and ancillary equipment shall be supplied in quantities and sizes as indicated on the drawings and as required for a complete system.

B. Pumps shall be submersible wastewater pumps capable of pumping effluent at flow rates and total dynamic heads as indicated on the drawings. Pumps shall be mounted on slide rail assemblies for removal of pumps and motors from pump chamber. Pumps shall be as manufactured by one of the following manufactures or approved equal.
   1. Crane - Barnes
   2. Meyers - F.E. Meyers

C. Motors: Submersible motor shall be constructed with open winding and operate in clean dry dielectric oil for cooling winding and lubricating motor bearings. Motor shaft to be sealed with mechanical shaft seal, having super-lapped seal rings of carbon and ceramic. Integral motor and pump shaft shall be of stainless steel supported by two ball bearings. Motors to be 1-phase, 230 Volt and have horsepower indicated. Each pump motor shall be furnished with a minimum of twenty-five feet (25') of power cord.

D. Material: Pump and motor housing shall be of cast iron construction. Impeller shall be cast iron, of the recessed type, passing a maximum 2 inch spherical solid. No suction strainers or screens of any type are to be used. All fasteners shall be of 18-8 stainless steel.

2.5 CONTROL PANEL

A. Pump controls shall be simplex controls contained in a non-corrosive enclosure meeting NEMA 4-X and U.L. 94 V-O requirements.

B. The motor control panel shall be assembled and tested by a shop meeting U.L. Standard 508 for industrial controls. The motor control panel shall be assembled and tested by the same manufacturer supplying the pumps so as to insure suitability and assurance of experience in matching controls to motors and to insure single source responsibility for the equipment. The control panel shall include circuit breakers, magnetic starters, automatic pumping controls, and all internal wiring. Panels shall be remotely located at the direction of the Engineer.

C. The enclosure shall be thermal formed from an engineered thermoplastic material. The enclosure shall be steel gray in color and chemically induced. Painting of the enclosure shall not be acceptable. The enclosure shall have provisions for padlocking. A nameplate shall be permanently affixed to the panel and include model number, voltage, phase, hertz, ampere rating and horsepower rating. A warning label against electric shock shall be permanently affixed to the outer door. All fasteners shall be 300 series stainless steel or type 6063T5 aluminum, or thermoplastic. The outer door shall be attached to the enclosure using captured; quarter turn thermoplastic screws and a non-corrosive lift off hinge. The hinge shall permit the outer door to be separated from the main enclosure, when opened, by a simple upward motion. A hinge arrangement, which requires unbolting for the removal of the outer door, shall not be acceptable.

D. In the interest of safety, an inner swing door (swing dead front), constructed of clear plastic material, shall be attached to the enclosure using a piano hinge. The door shall have cutouts to allow the pullout handle(s) of the fuse disconnect(s) and components on the accessory board to protrude through in a manner so as to maintain the dead front. Disconnects shall have to be pulled before opening. No live electrical components shall be mounted on the inner swing dead front. A schematic and chart indicating a legend for wire color abbreviations as used on the schematic shall be permanently attached to the inside surface of the outer door.

E. A steel back panel with electroplated bright zinc and clear chromate finish shall be provided. A painted steel back panel shall not be acceptable. The back panel shall be mounted on stainless steel bolts using stainless steel nuts and lock washers to maintain enclosure integrity and shall be used as the means for mounting the components in the enclosure.

F. A circuit breaker shall be used to protect from line faults and to disconnect the control panel from the incoming power. Circuit breakers shall be thermal magnetic and sized to meet NEC requirements for motor controls.

G. For each pump, a red run light, running time meter, and a hand-off-auto switch shall be provided. Run lights and hand-off-auto switches shall be mounted on an electroplated bright zinc with clear chromate steel bracket. The run lights and hand-off-auto switches shall be properly labeled as to function. The hand-off-auto switches shall be rocker type with an electrical life of 50,000 operations. The run lights shall match the hand-off-auto switches in appearance and have an electrical life of 50,000 hours.

H. Control voltage shall be 120 VAC and may be accomplished by means of a transformer or available line voltage. A control fuse and on-off switch shall protect and isolate the control voltage from the line.

I. A simplex pump controller shall be provided for control logic. Pump controller shall be solid state utilizing a printed circuit board to avoid conventional wiring. The printed circuit board of the pump controller shall be made of U.L. listed materials. The pump controller shall indicate float circuit operations utilizing red amber LED indicator lights. LED indicator lights shall provide adequate information so that they can be used for diagnosis in troubleshooting problems located in float circuits. Each LED shall be permanently labeled on the pump controller as to function. Pump controller shall have provisions for connecting float level controls to box type lug connectors. Wiring of hand-of-auto switches, run lights, contactors, and overloads to the pump controller shall be accomplished by means of plug connectors

J. A high wet well alarm light with polycarbonate globe for durability shall be mounted on top of the control panel for 360-degree visibility. A solid-state flasher shall be included. An alarm bell shall be furnished and installed within the building to sound when the high water float tilts under condition. A push button silence switch shall be provided for the alarm bell.

K. An elapsed time meter shall be furnished for each pump such that it is energized when that particular pump is running. It shall be non-resettable and capable of recording up to 9999.9 hours.

L. Wetwell controls - To control the operation of the wastewater pumps with variations in liquid level in the wetwell, a minimum of **three (3)** sealed float type mercury switches shall be provided. The mercury tube switches shall be sealed in a solid polyurethane float for corrosion and shock resistance. The support wire shall have a heavy neoprene jacket and be multi-stranded in order to prevent fatigue. A weight shall be attached to the cord above the float to hold the switch in place in the wetwell and to prevent sharp bends in the cord when the float operates under water. The float switches shall hang in the wetwell supported only by the cord that is held to a NEMA 4 watertight junction box. A special support bracket shall be bolted to the junction box. The bracket shall have plastic cord snubber(s) to hold, and allow for adjustment of, the switches at the required height. Cords shall be spaced apart along the support bracket to prevent tangling. A minimum of twenty (20) feet of cord shall be provided with each switch to eliminate the hazards created by splicing. The sealed float type mercury switches shall be Model 3900 as manufactured by Aurora/Hydromatic Pump, A Unit of General Signal, Ashland, Ohio 44805.

M. System Operation - Normal operation of all appropriate controls and level sensors shall be as follows. The lower float serves to de-energize both pump contactors and both pumps will stop. As the liquid level rises, the next higher float energizes the lead pump contactor and starts the lead pump. The lead pump will lower the liquid level to the pump off float and the cycle will start over. The lead pump is defined by the alternator relay which indexes each time the pump off float is de-activated, i.e. the wetwell level drops below the lower float. The pumps will alternate lead position on each successive cycle of pumping. If the wetwell level continues to rise when the lead pump is operating or not, the high water alarm float shall energize the high water alarm light and bell to give early warning of the possibility of lead pump malfunction. If the wetwell level reaches and tilts the high water alarm float, the alarm light and bell shall turn on and stay on until the wetwell level drops below the level of the high water alarm float. If the wetwell level continues to rise to the next higher float, the lag pump on float energizes the lag pump contactor and starts the lag pump. Both the lead and lag pumps shall operate together until the wetwell level falls below the both pumps off float level. If the wetwell level drops below the low water alarm float, then both pumps shall not operate and the alarm light and bell shall turn on and stay on until the wetwell level rises above the level of the low water alarm float.

2.6 VALVES

A. Gate valves shall be bronze.
B. Ball check valve shall be PVC
C. Gate and check valves shall be as manufactured by **Kennedy** or approved equal.
D. Gate and check valves shall open right.
E. Gate and check valve box covers shall be stamped “sewer” and painted green.

2.7 FLOATS

A. All floats shall be control duty mechanical narrow angle switch.
B. Floats shall be either Normally Open (N/O) or Normally Closed (N/C) depending on the placement.
   1. Normally Open (N/O) Floats shall be used for
      a. Pump Off Float
      b. Pump On Float
      c. High Water Alarm Float.
   2. Normally Closed (N/C) Floats shall be used for
      a. Low Water Alarm Float.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
B. Examine roughing-in of sewerage piping systems to verify actual locations of piping connections before packaged sewage pumping station installation.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.3 INSTALLATION

A. Install sewage pumping station components where indicated, according to specific equipment and piping arrangement indicated.
B. Grout under and around shell. Ensure that there are no voids between foundation slab and under slab of pumping station.
C. Fill voids between shell sidewalls, sleeves, and piping and make watertight seal with grout.
D. Connect anode conductors to grounding lugs on steel housing.
E. Join separate sections of housing by field welding.
F. Field weld entrance tube to housing.

3.4 CONNECTIONS

A. Sanitary sewer piping installation requirements are specified in Section 221313 "Facility Sanitary Sewers." Drawings indicate general arrangement of piping.
B. Install piping adjacent to machine to allow service and maintenance.

3.5 IDENTIFICATION

A. Install identifying labels permanently attached to equipment.
B. Install operating instruction signs permanently attached to equipment or on pumping station wall near equipment.
C. Arrange for installing **warning tape or** detectable warning tape over outside edges of underground packaged sewage pumping stations. Tape materials and their installation are specified in Section 312000 "Earth Moving."

3.6 PAINTING

A. Prepare and paint ferrous piping in wet wells, structural-steel supports, and anchor devices with coal-tar epoxy-polyamide paint according to SSPC-Paint 16.
B. Paint field-welded areas to match factory coating.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: A qualified testing agency to perform field tests and inspections and prepare test reports.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.

C. Perform tests and inspections and prepare test reports.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Wet wells shall be tested prior to operation using exfiltration testing method ACI 350.1 Method HST-NML in effect at the time the wet well is installed, available as noted in Appendix D. Any visible signs of leakage shall be repaired and retested prior to placing the wet well in service.

E. Tests and Inspections:
   1. After installing packaged sewage pumping stations and after electrical circuitry has been energized, test for compliance with requirements. Furnish water required for pump tests.
   2. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
   3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

F. Remove and replace packaged sewage pumping stations that do not pass tests and inspections and retest as specified above.

3.8 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Adjust pump, accessory, and control settings, and safety and alarm devices.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged sewage pumping stations.

END OF SECTION 221343

APPENDIX A-4:

ADDITIONAL REFERENCES USED IN ANALYSIS AND DESIGN

(2) There will be no expansion of the condominium or of the size or use of the individual units in the condominium.

Source. (See Revision Note at chapter heading for Env-Wq 1000) #9086, eff 2-9-08

Env-Wq 1008.02 System Capacity.

(a) The maximum allowable design capacity for an ISDS without a groundwater discharge permit as required under RSA 485-A:13 or RSA 485-C shall be 20,000 GPD.

(b) Systems with design capacity of 2,500 GPD or more shall have at least 2 EDA separated by at least 20 feet.

(c) The minimum size of system allowed shall be designed to accommodate a sewage flow of 300 GPD for commercial or non-commercial uses.

Source. (See Revision Note at chapter heading for Env-Wq 1000) #9086, eff 2-9-08

Env-Wq 1008.03 Daily Flow Volume. In order to determine the appropriate size of the septic system components, such as the septic tank, pipe, and EDA, the daily flow volume of sewage in gallons per day shall be determined by one of the following methods:

(a) For new uses, by using metered water readings for similar uses, which shall be determined as follows:

(1) By finding the average of water meter readings and multiplying the average by a minimum peaking factor of 2 for commercial light flow or a maximum peaking factor of 3 for commercial heavy flow; or

(2) By measuring 6 months of consecutive daily meter readings, in which case the system shall be designed based on the highest daily flow without application of a peaking factor;

(b) For existing uses, by using the metered water readings for the use in accordance with (a)(1) or (a)(2) above; or

(c) For existing or new uses, by using the unit design flow figures as listed in Table 1008-1, below, subject to (d), below:

Table 1008-1 Unit Design Flow Figures

USE	Design Flow
AIRPORTS	5 GPD/Transient plus 10 GPD/Employee
APARTMENTS:	
1-Bedroom or Studio	225 GPD
2 or more bedrooms per Apartment	150 GPD/Bedroom
BARS, LOUNGES	20 GPD/Seat
BED & BREAKFAST	60 GPD/Guest, based on the greater of 2 guests per room or the actual number of guests the room is designed to accommodate, plus 10 GPD/Employee
CAMPS:	
Campground with Central Comfort Station	45 GPD/site, plus 20 GPD/Site for the dump station

USE	**Design Flow**
Recreational Campgrounds with 3-way hookups	60 GPD/Site
Construction Camps	50 GPD/Person
Day Camps (not including meals)	15 GPD/Person
Dining Facility	3 GPD/Person/meal
Residential Youth Recreation Camps	25 GPD/Person plus 3 GPD/Person/meal
CATERERS – Function Rooms	12 GPD/patron
CHURCHES:	
Sanctuary Seating	3 GPD/Seat
Church Suppers	12 GPD/Seat
COUNTRY CLUBS – PRIVATE	
Dining Room	10 GPD/Seat
Snack Bar	10 GPD/Seat
Locker & Showers	20 GPD/Locker
DAY CARE CENTERS	10 GPD/Person
DENTISTS	10 GPD/Chair plus 35 GPD/Staff Member
DOCTOR'S OFFICES	250 GPD/Doctor
DOG KENNELS	50 GPD/Kennel, with one dog per kennel
DWELLINGS:	
Private Residences	300 GPD plus 150 GPD for each bedroom over 2
Rooming Houses – With Meals	60 GPD/Person
Rooming Houses – Without Meals	40 GPD/Person
Senior Housing	See Senior Housing
FACTORIES (Exclusive of Industrial Waste):	
Without Cafeteria or Showers	20 GPD/Person
With Cafeteria, No Showers	25 GPD/Person
With Cafeteria and Showers	35 GPD/Person
Warehouses	20 GPD/Person
FIRE STATIONS – Without full-time employees; without floor drains or food preparation	5 GPD/Person
FOOD SERVICE:	
Cafeteria or Eat in, plus toilet and kitchen waste	40 GPD/Seat plus 35 GPD/Employee
Cafeteria or Eat in, paper service, plus toilet and kitchen waste	20 GPD/Seat plus 35 GPD/Employee
Ice cream dipper	100 GPD/dipper plus 35 GPD/Employee
Kitchen Waste only	3 GPD/Meal served plus 35 GPD/Employee
Bars and lounges	20 GPD/Seat plus 35 GPD/Employee
Function Rooms	12 GPD/Seat plus 35 GPD/Employee
GYMS	10 GPD/participant plus 3 GPD per Spectator seat
HAIRDRESSERS	150 GPD/Chair plus 35 GPD/Operator
HOSPITALS	200 GPD/Bed plus 35 GPD/Employee
HOTELS AND MOTELS:	
If plan shows that only one double bed can be accommodated	100 GPD/Room plus 10 GPD/Employee
All other	200 GPD/Room plus 10 GPD/Employee
INSTITUTIONS OTHER THAN HOSPITALS	See Residential Institutions
LAUNDROMATS, COIN-OPERATED	500 GPD/Machine

USE	Design Flow
MANUFACTURED HOUSING PARKS	150 GPD/ Bedroom/Site with 300 GPD/Site minimum
MOTELS, see HOTELS	
NURSING HOMES	125 GPD/Bed plus 35 GPD/Employee
OFFICE BUILDINGS:	
Without Cafeteria	15 GPD/Employee
With Cafeteria	20 GPD/ Employee
Unspecified Office Space	15 GPD/100 Square Feet
PICNIC PARKS	See Recreational Facilities
RECREATIONAL FACILITIES	
Toilet Waste Only	5 GPD/person
With Showers and Toilets	10 GPD/person
RESIDENTIAL INSTITUTIONS OTHER THAN HOSPITALS AND NURSING HOMES	135 GPD/Bed plus 35 GPD/Employee
RESTAURANTS	See Food Service
SCHOOLS:	
Boarding	100
Day, Without Gym, Cafeteria, or Showers	10
Day, Without Gyms or Showers, with Cafeteria	15
Day, With Gyms, Showers, and Cafeteria	25
SENIOR HOUSING	125 GPD/2 Bedroom unit
SERVICE STATIONS	75 GPD/Island plus 35 GPD/Employee
SKATING RINKS	See Gyms
SKI AREAS	See Recreational Facilities
STORES:	
Dry Goods, stand-alone	5 GPD/100 Square feet
Dry Goods Stores in Shopping Centers	100 GPD/Person
Supermarkets with Meat Dept. without Garbage Grinder	7.5 GPD/100 Square feet
Supermarkets with Meat Dept. with Garbage Grinder	11 GPD/100 Square feet
SWIMMING POOLS, Public	See Recreational Facilities
TENNIS COURTS	See Recreational Facilities
THEATERS	3 GPD/Auditorium Seat
TOWN HALLS	5 GPD/Seat for total seating capacity
TOWN OFFICES	15 GPD/Office employee plus 5 GPD /Transient
TRAVEL TRAILER PARKS	See Camps
WAREHOUSES	See Factories

(d) For any structure with a combination of uses, such as a day camp that serves meals, a recreational facility with a cafeteria, or a ski area that also has a day care, the loading shall be the combined total of the loading for the separate uses.

Source. (See Revision Note at chapter heading for Env-Wq 1000) #9086, eff 2-9-08; amd by #9904-A, eff 4-16-11

Env-Wq 1008.04 Minimum Distances.

PLANS