

P.E.: MICHAEL E. TADEMA-WIELANDT

NO.	DATE	REVISIONS
1	8-10-16	SUBMITTED TO TOWN OF WINDHAM FOR SITE PLAN APPROVAL
2	8-30-16	REVISED PER PEER REVIEW COMMENTS
3	8-31-16	REVISED POND GRADING PER ENGINEERING REVIEW COMMENTS

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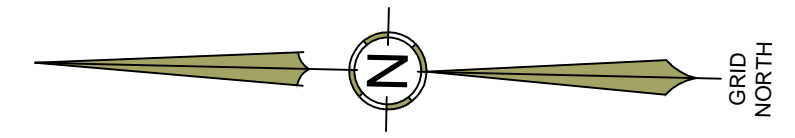
TERRADYN
CONSULTANTS, LLC

Civil Engineering - Land Planning - Stormwater Design - Environmental Permitting

SHEET DESCRIPTION
LANDING REAL ESTATE OFFICE
79 TANDERBERG TRAIL, WINDHAM, MAINE
GRADING, DRAINAGE & UTILITY PLAN

PREPARED FOR
ROBIE BUILDERS
472 ROSEVELT TRAIL
WINDHAM, MAINE 04082

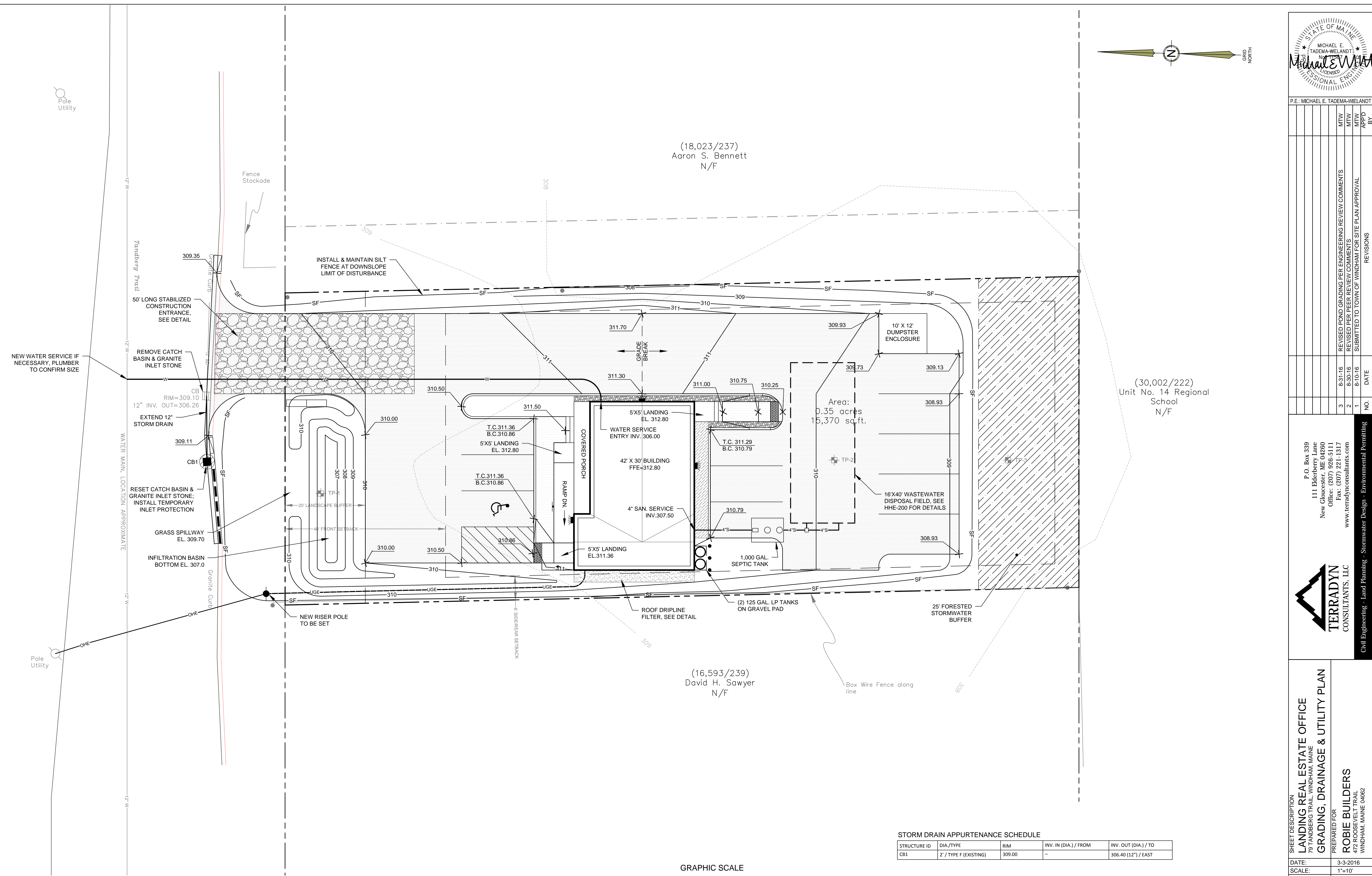
DATE: 3-3-2016
SCALE: 1"=10'
DESIGNED: MTW
JOB NO: 1565
FILE: 1607-GRADING.DWG
SHEET **C-4.0**



(18,023/237)
Aaron S. Bennett
N/F

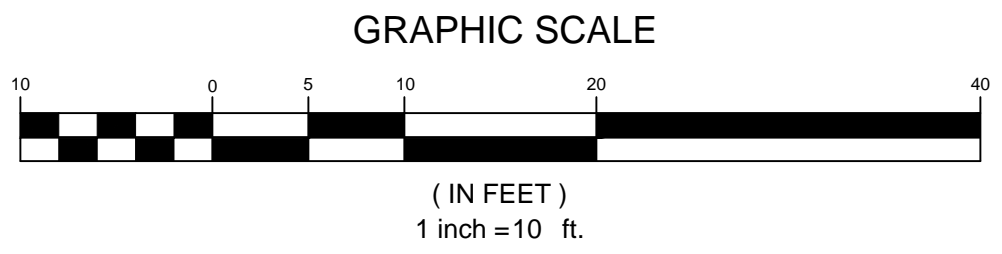
(30,002/222)
Unit No. 14 Regional
School
N/F

(16,593/239)
David H. Sawyer
N/F

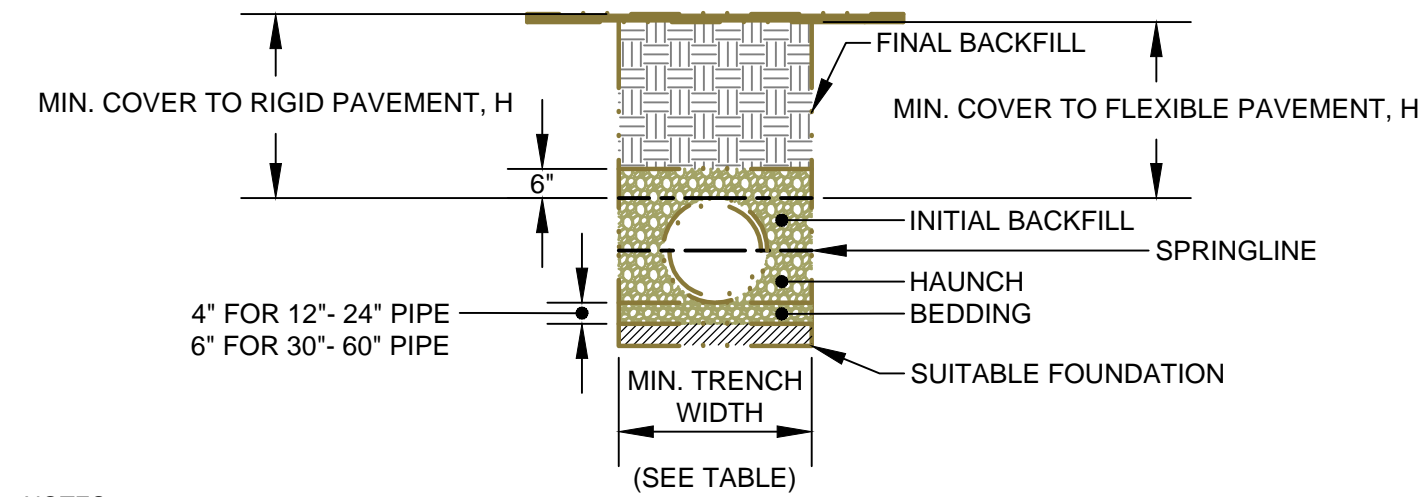


STORM DRAIN APPURTENANCE SCHEDULE

STRUCTURE ID	DIA./TYPE	RIM	INV. IN (DIA.) / FROM	INV. OUT (DIA.) / TO
CB1	2' / TYPE F (EXISTING)	309.00	-	306.40 (12") / EAST



PRELIMINARY - NOT FOR CONSTRUCTION



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE PINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. **FOUNDATION:** WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. **BEDDING:** SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, UNLESS OTHERWISE NOTED BY THE ENGINEER. MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).
5. **INITIAL BACKFILL:** SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6' ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. **MINIMUM COVER:** MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE. MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

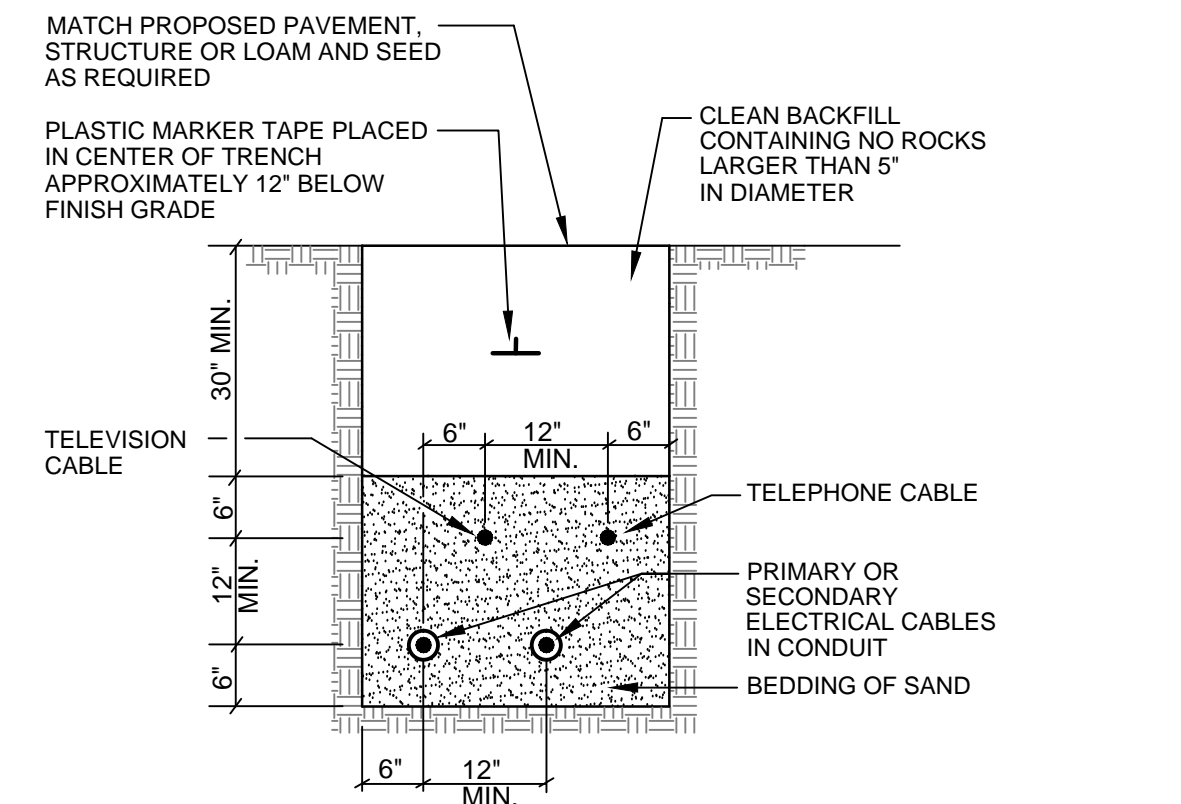
MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

PIPE DIAM.	SURFACE LIVE LOADING CONDITION	
	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" - 48"	12"	48"
54" - 60"	24"	60"

* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

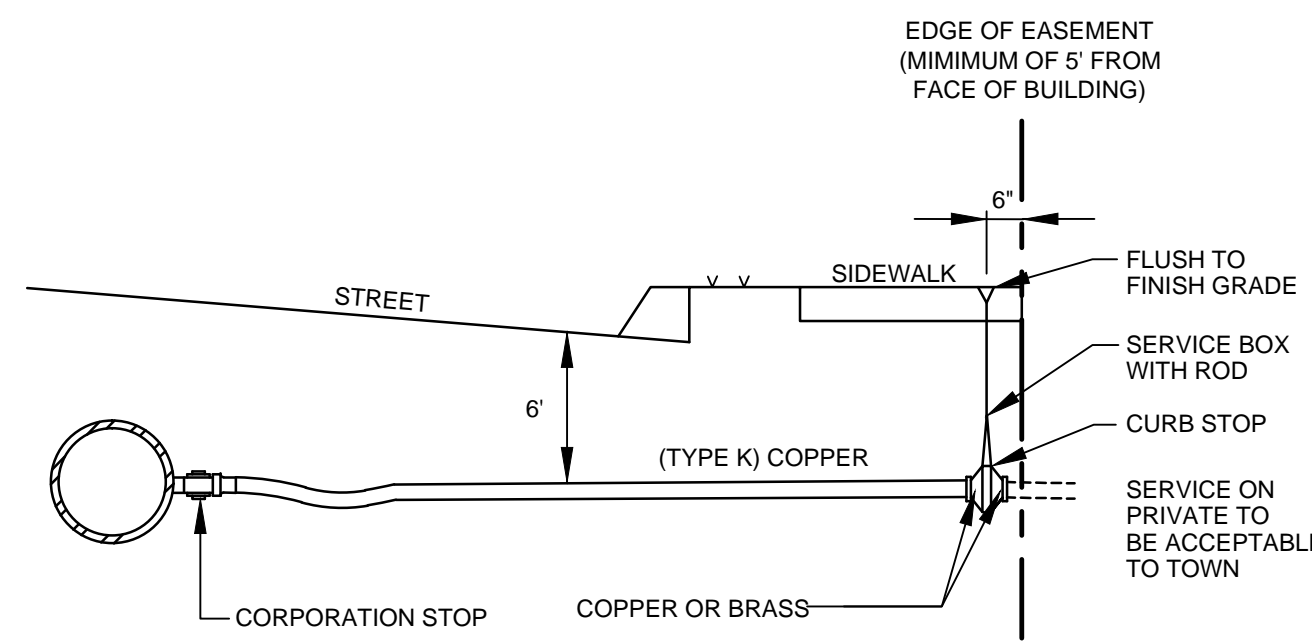
TYPICAL TRENCH DETAIL

NOT TO SCALE



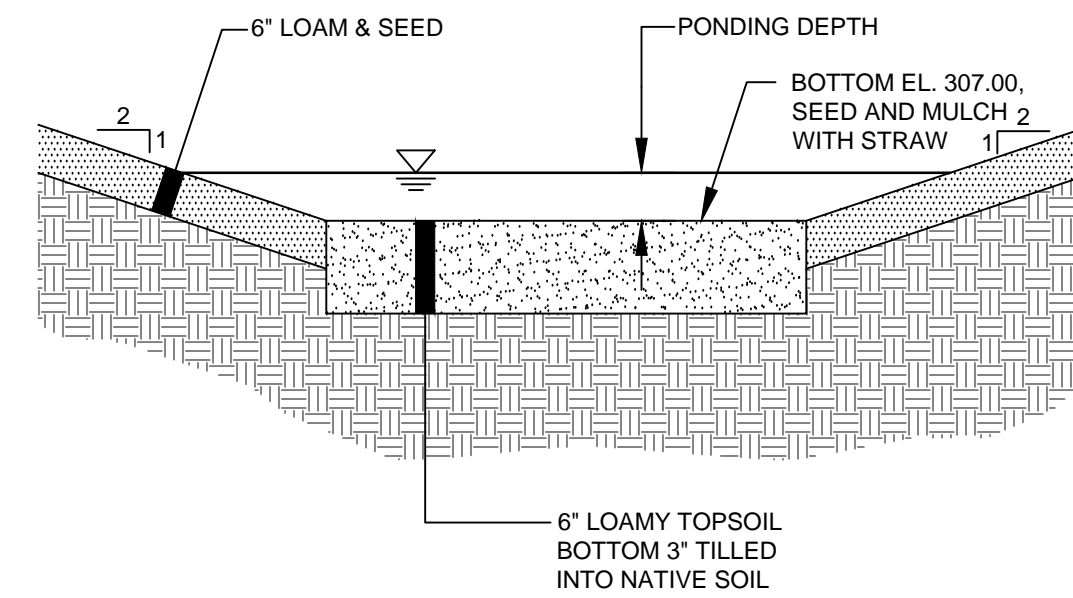
TYPICAL UNDERGROUND CABLE INSTALLATION

NOT TO SCALE



TYPICAL WATER SERVICE CONNECTION

NOT TO SCALE



GENERAL NOTES:

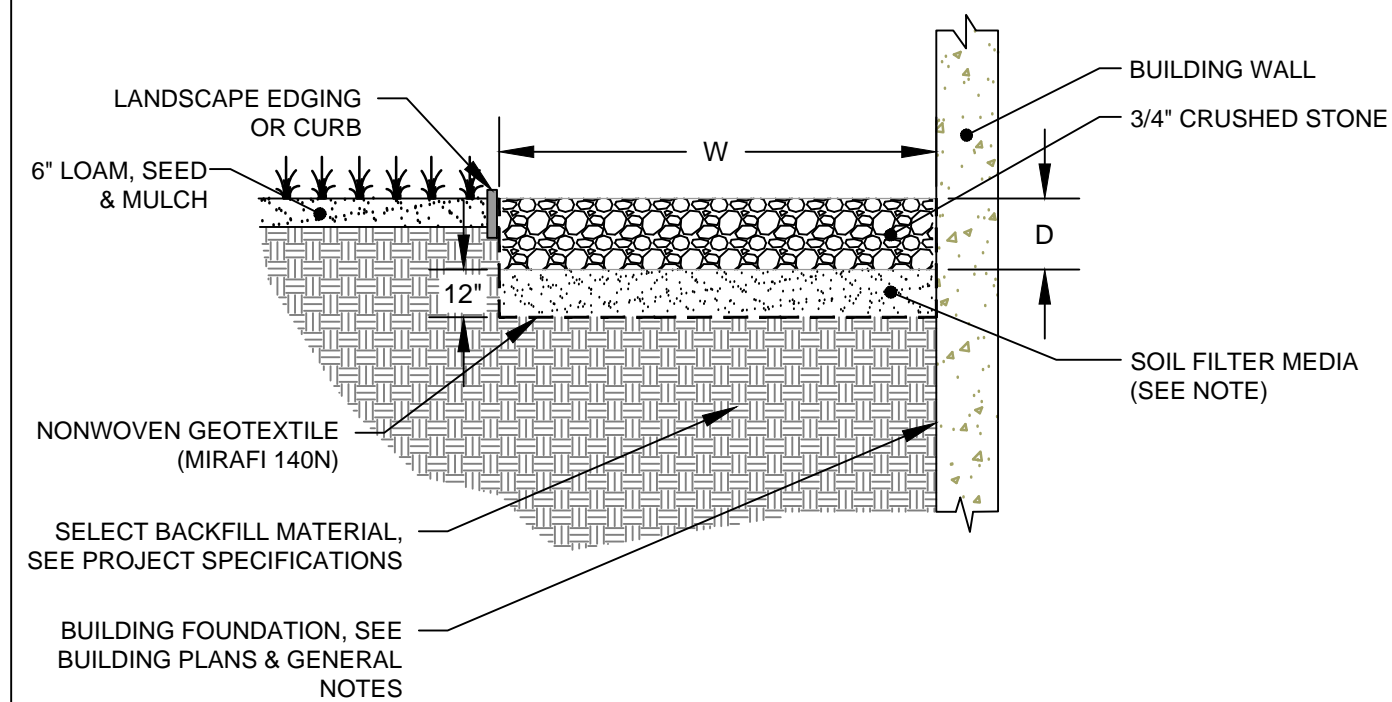
1. TEST PIT TP1 WAS CONDUCTED WITHIN THE FOOTPRINT OF THE PROPOSED BIOTENTION FILTER. THE TEST PIT WAS EXCAVATED TO A DEPTH OF 48". NO EVIDENCE OF SEASONAL HIGH GROUNDWATER WAS FOUND.

TEST PIT DATA

TEST PIT	APPROX. EXISTING GROUND EL.	DEPTH TO EVIDENCE OF SEASONAL HIGH GROUNDWATER	SEASONAL HIGH GROUNDWATER	BOTTOM OF INFILTRATION BASIN
TP1	308.50	>48"	<304.50	307.00

INFILTRATION BASIN DETAILS AND NOTES

NOT TO SCALE



DRIP EDGE LOCATION	WIDTH (W)	DEPTH (D)
EAST SIDE OF BUILDING	36"	9"

GENERAL NOTES:

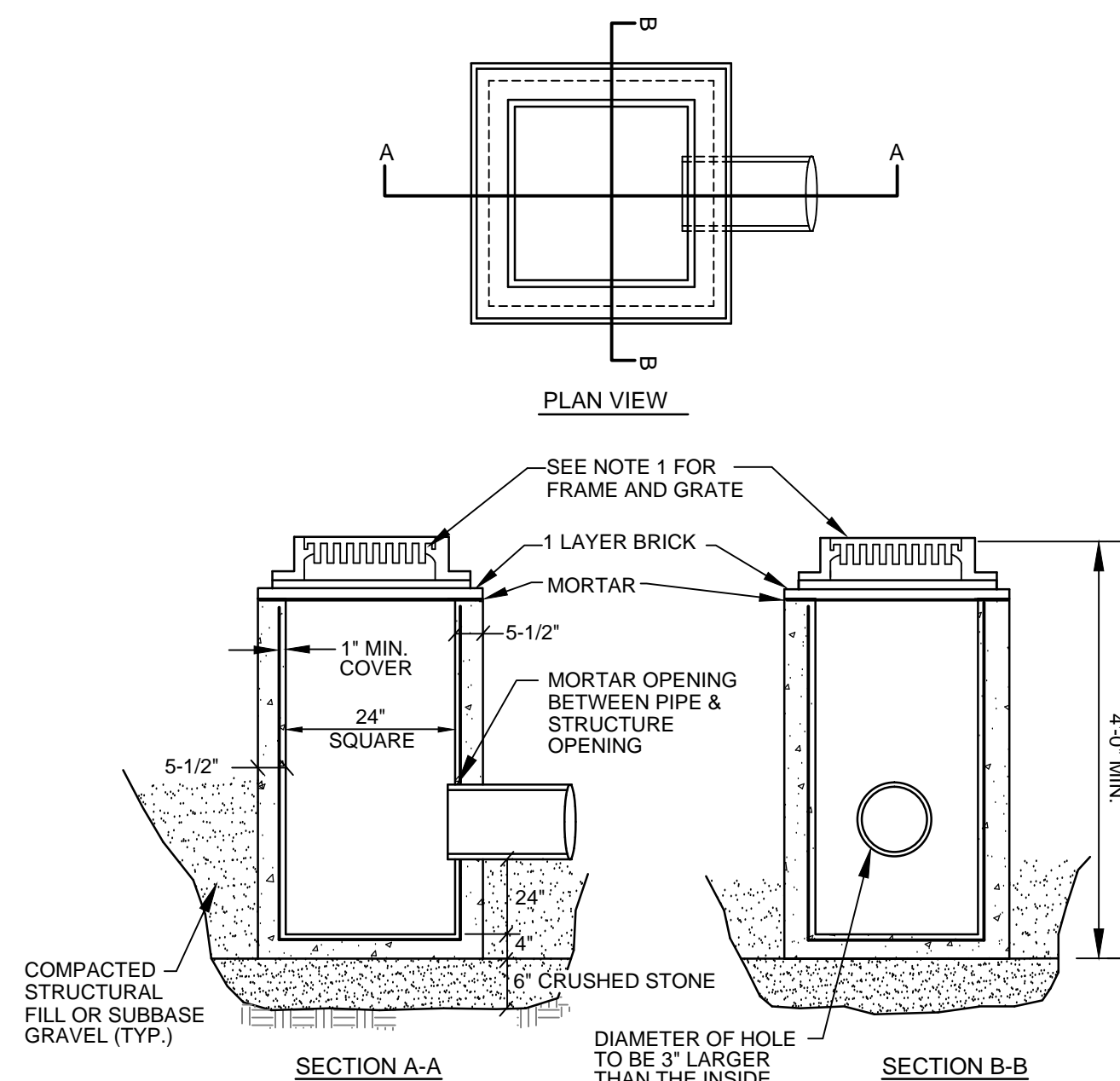
1. THE BACKFILL FOR THE FOUNDATION MAY BE USED AS THE FILTER MEDIA AS LONG AS THE MATERIAL IS A MINERAL SOIL WITH BETWEEN 4% & 7% FINES (PASSING #200 SIEVE).
2. CONTRACTOR RESPONSIBLE FOR INSTALLING FOUNDATION DRAIN IN ACCORDANCE WITH RECOMMENDATION FROM GEOTECHNICAL ENGINEER
3. FOUNDATION WATERPROOFING IS THE RESPONSIBILITY OF THE CONTRACTOR

CONSTRUCTION INSPECTION NOTES:

1. INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT CONSTRUCTION FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE FILTER.

ROOF DRIPLINE FILTER BED

NOT TO SCALE



NOTES:

1. FRAME SHALL BE FOR 24" SQUARE GRATE - LEBARON TYPE 'F' SQUARE FRAME (LF 245) 4 FLANGE OR ETHERIDGE SQUARE FRAME S24G. GRATE SHALL BE 24"x24" CAST IRON.
2. ENTIRE CATCH BASIN WITH EXCEPTION OF LEVELING BRICK FRAME AND GRATE TO BE PRECAST AS SINGLE PORTLAND CEMENT CONCRETE UNIT.

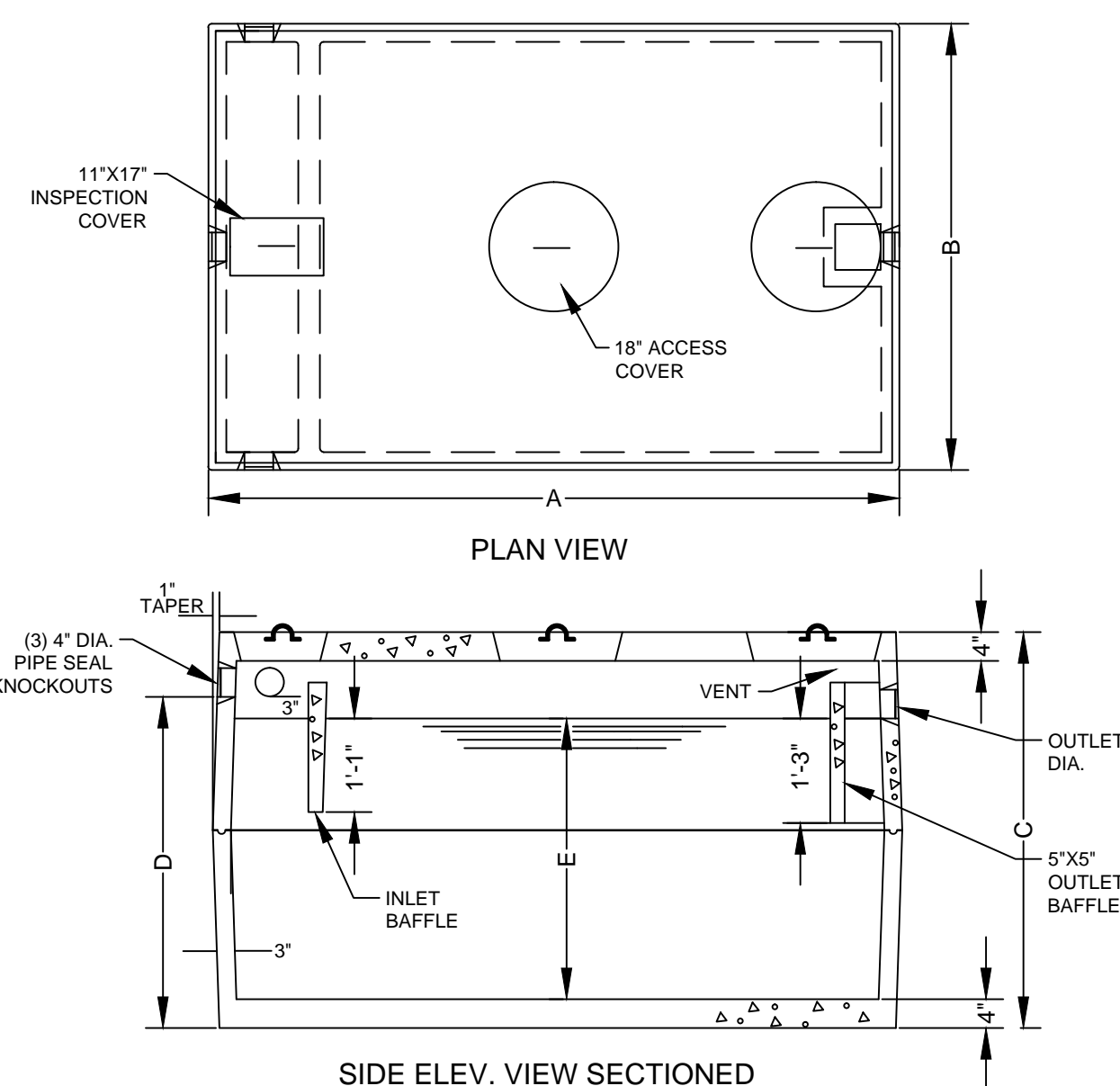
TYP. TYPE 'F' CATCH BASIN

NOT TO SCALE

THIS PROJECT

ITEM NO.		GALLON CAPACITY	DATA CHART					APPROX WEIGHT
STD	HD		A	B	C	D	E	
RST 0750-LB	RST 0750-LB-HD	750	8'-0"	6'-0"	4'-0"	3'-1"	2'-10"	7,100 LBS.
RST 1000	RST 1000-HD	1,000	8'-0"	6'-0"	4'-7"	3'-10"	3'-7"	8,100 LBS.
RST 1000-LB	RST 1000-LB-HD	1,000	10'-6"	6'-4"	4'-0"	3'-1"	2'-10"	8,100 LBS.
RST 1250	RST 1250-HD	1,250	8'-0"	6'-0"	5'-5"	4'-8"	4'-8"	8,800 LBS.
RST 1500	RST 1500-HD	1,500	8'-0"	6'-0"	6'-3"	5'-6"	5'-3"	9,200 LBS.
RST 2000	RST 2000-HD	2,000	10'-6"	6'-4"	6'-2"	5'-3"	5'-0"	11,200 LBS.

* NOTE: FOR HEAVY-DUTY TANKS (HD), ADD 6" TO DIMENSIONS IN COLUMN C AND 3" TO THOSE IN COLUMN D.

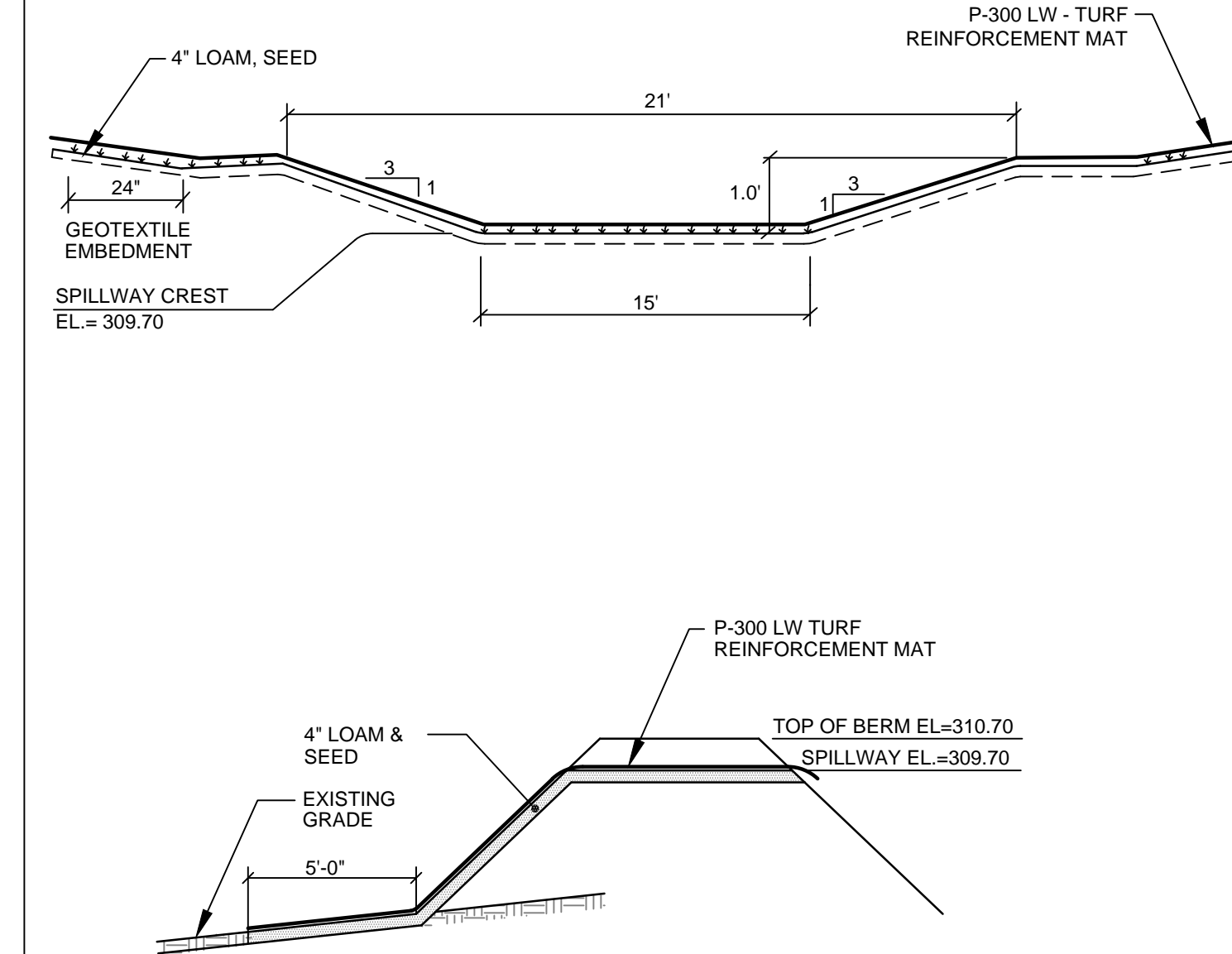


NOTES

- 1) CONCRETE: 4,000 PSI @ 28 DAYS.
- 2) CEMENT: PORTLAND TYPE III PER ASTM C150
- 3) REINFORCING: 6X6X10WWM OR FIBERS
- 4) DESIGN LOADING: H-10
- 5) CONSTRUCTION JOINTS: SEALED W/BUTYL SEAL
- 6) HEAVY-DUTY TANK TOPS: REINFORCED W/ 5/8" REBAR @ 12" O.C. EACH WAY

RESIDENTIAL SEPTIC TANK

NOT TO SCALE



EMBANKMENT CONSTRUCTION

1. CONSTRUCTION OF COMMON BORROW MATERIAL MEETING M.D.O.T. SPECIFICATION 703.
2. PLACE BORROW MATERIAL IN 12" LIFTS COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
3. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED ON PLANS
4. LOAM, SEED, AND STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN.

TURF SPILLWAY DETAIL

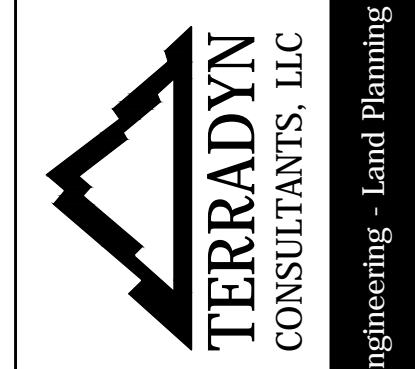
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DATE:	3-3-2016
SCALE:	1"=10'
DESIGNED:	MTW
JOB NO.:	1565
FILE:	1607-DETAIL.DWG
SHEET	C-5.1

PRELIMINARY - NOT FOR CONSTRUCTION

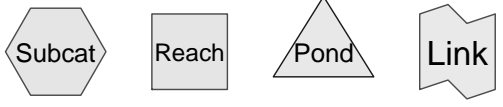
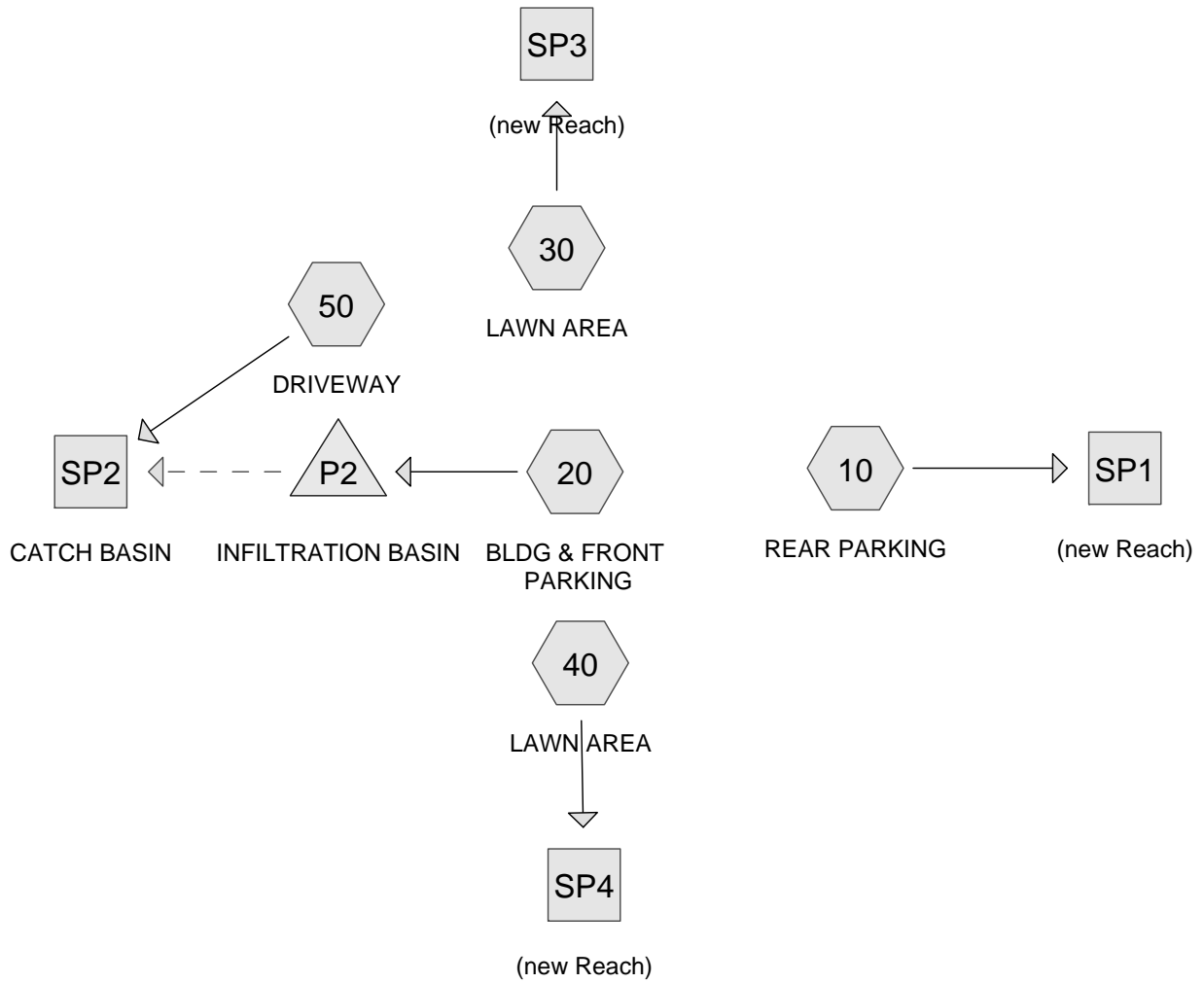
INFILTRATION BASIN DESIGN

Total Tributary Area: 5,975 SF
 Impervious Area: 4,091 SF
 Landscape Area: 1,884 SF

Required Storage Volume: 404 CF 1" x Imp. Area + 0.4" x LS Area

STAGE STORAGE

ELEVATION	AREA (SF)	INCREMENTAL VOLUME (CF)	TOTAL VOLUME (CF)	
307	100	0	0	<-- Surface of Basin
308	245	173	173	
309	440	343	515	
309.7	713	404	919	<-- Outlet Elevation
310	830	231	1150	



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Landing Real Estate Office
Type III 24-hr 2-YR Rainfall=3.10"

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Page 2

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 10: REAR PARKING	Runoff Area=7,264 sf 62.36% Impervious Runoff Depth>0.88" Flow Length=92' Tc=15.2 min CN=74 Runoff=0.13 cfs 0.012 af
Subcatchment 20: BLDG & FRONT	Runoff Area=5,975 sf 68.47% Impervious Runoff Depth>1.16" Flow Length=55' Slope=0.0250 '/' Tc=5.0 min CN=79 Runoff=0.20 cfs 0.013 af
Subcatchment 30: LAWN AREA	Runoff Area=1,207 sf 0.00% Impervious Runoff Depth=0.00" Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af
Subcatchment 40: LAWN AREA	Runoff Area=786 sf 0.00% Impervious Runoff Depth=0.00" Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af
Subcatchment 50: DRIVEWAY	Runoff Area=1,510 sf 70.66% Impervious Runoff Depth>1.29" Flow Length=74' Tc=5.0 min CN=81 Runoff=0.06 cfs 0.004 af
Reach SP1: (new Reach)	Inflow=0.13 cfs 0.012 af Outflow=0.13 cfs 0.012 af
Reach SP2: CATCH BASIN	Inflow=0.06 cfs 0.004 af Outflow=0.06 cfs 0.004 af
Reach SP3: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach SP4: (new Reach)	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Pond P2: INFILTRATION BASIN	Peak Elev=308.36' Storage=272 cf Inflow=0.20 cfs 0.013 af Discarded=0.02 cfs 0.011 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af

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Landing Real Estate Office
Type III 24-hr 2-YR Rainfall=3.10"

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Summary for Subcatchment 10: REAR PARKING

Runoff = 0.13 cfs @ 12.23 hrs, Volume= 0.012 af, Depth> 0.88"

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

Area (sf)	CN	Description
4,530	98	Paved parking, HSG A
797	39	>75% Grass cover, Good, HSG A
1,937	32	Woods/grass comb., Good, HSG A
7,264	74	Weighted Average
2,734		37.64% Pervious Area
4,530		62.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	62	0.0300	1.45		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
14.5	30	0.0050	0.03		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.10"
15.2	92	Total			

Summary for Subcatchment 20: BLDG & FRONT PARKING

Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.013 af, Depth> 1.16"

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

Area (sf)	CN	Description
4,091	98	Paved parking, HSG A
1,884	39	>75% Grass cover, Good, HSG A
5,975	79	Weighted Average
1,884		31.53% Pervious Area
4,091		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0250	1.31		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	55	Total			

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Type III 24-hr 2-YR Rainfall=3.10"

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Summary for Subcatchment 30: LAWN AREA

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

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

Area (sf)	CN	Description
1,207	39	>75% Grass cover, Good, HSG A
1,207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 40: LAWN AREA

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

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

Area (sf)	CN	Description
786	39	>75% Grass cover, Good, HSG A
786		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 50: DRIVEWAY

Runoff = 0.06 cfs @ 12.08 hrs, Volume= 0.004 af, Depth> 1.29"

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

Area (sf)	CN	Description
1,067	98	Paved parking, HSG A
443	39	>75% Grass cover, Good, HSG A
1,510	81	Weighted Average
443		29.34% Pervious Area
1,067		70.66% Impervious Area

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Type III 24-hr 2-YR Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0250	1.15		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.10"
0.3	46	0.0200	2.87		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	74	Total			

Summary for Reach SP1: (new Reach)

Inflow Area = 0.167 ac, 62.36% Impervious, Inflow Depth > 0.88" for 2-YR event
 Inflow = 0.13 cfs @ 12.23 hrs, Volume= 0.012 af
 Outflow = 0.13 cfs @ 12.23 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP2: CATCH BASIN

Inflow Area = 0.035 ac, 70.66% Impervious, Inflow Depth > 1.29" for 2-YR event
 Inflow = 0.06 cfs @ 12.08 hrs, Volume= 0.004 af
 Outflow = 0.06 cfs @ 12.08 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP3: (new Reach)

Inflow Area = 0.028 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP4: (new Reach)

Inflow Area = 0.018 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond P2: INFILTRATION BASIN

Inflow Area = 0.137 ac, 68.47% Impervious, Inflow Depth > 1.16" for 2-YR event
 Inflow = 0.20 cfs @ 12.08 hrs, Volume= 0.013 af
 Outflow = 0.02 cfs @ 13.53 hrs, Volume= 0.011 af, Atten= 91%, Lag= 86.9 min
 Discarded = 0.02 cfs @ 13.53 hrs, Volume= 0.011 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 308.36' @ 13.53 hrs Surf.Area= 314 sf Storage= 272 cf

Plug-Flow detention time= 175.6 min calculated for 0.011 af (80% of inflow)
Center-of-Mass det. time= 123.2 min (929.9 - 806.7)

Volume	Invert	Avail.Storage	Storage Description
#1	307.00'	1,150 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
307.00	100	0	0
308.00	245	173	173
309.00	440	343	515
310.00	830	635	1,150

Device	Routing	Invert	Outlet Devices
#1	Discarded	307.00'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	309.70'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 13.53 hrs HW=308.36' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=307.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 10-YR Rainfall=4.60"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 10: REAR PARKINGRunoff Area=7,264 sf 62.36% Impervious Runoff Depth>1.89"
Flow Length=92' Tc=15.2 min CN=74 Runoff=0.30 cfs 0.026 af**Subcatchment 20: BLDG & FRONT**Runoff Area=5,975 sf 68.47% Impervious Runoff Depth>2.29"
Flow Length=55' Slope=0.0250 '/' Tc=5.0 min CN=79 Runoff=0.40 cfs 0.026 af**Subcatchment 30: LAWN AREA**Runoff Area=1,207 sf 0.00% Impervious Runoff Depth>0.10"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af**Subcatchment 40: LAWN AREA**Runoff Area=786 sf 0.00% Impervious Runoff Depth>0.10"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af**Subcatchment 50: DRIVEWAY**Runoff Area=1,510 sf 70.66% Impervious Runoff Depth>2.46"
Flow Length=74' Tc=5.0 min CN=81 Runoff=0.11 cfs 0.007 af**Reach SP1: (new Reach)**Inflow=0.30 cfs 0.026 af
Outflow=0.30 cfs 0.026 af**Reach SP2: CATCH BASIN**Inflow=0.11 cfs 0.007 af
Outflow=0.11 cfs 0.007 af**Reach SP3: (new Reach)**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach SP4: (new Reach)**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Pond P2: INFILTRATION BASIN**Peak Elev=309.19' Storage=604 cf Inflow=0.40 cfs 0.026 af
Discarded=0.03 cfs 0.018 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.018 af

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Type III 24-hr 10-YR Rainfall=4.60"

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Summary for Subcatchment 10: REAR PARKING

Runoff = 0.30 cfs @ 12.22 hrs, Volume= 0.026 af, Depth> 1.89"

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

Area (sf)	CN	Description
4,530	98	Paved parking, HSG A
797	39	>75% Grass cover, Good, HSG A
1,937	32	Woods/grass comb., Good, HSG A
7,264	74	Weighted Average
2,734		37.64% Pervious Area
4,530		62.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	62	0.0300	1.45		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
14.5	30	0.0050	0.03		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.10"
15.2	92	Total			

Summary for Subcatchment 20: BLDG & FRONT PARKING

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.026 af, Depth> 2.29"

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

Area (sf)	CN	Description
4,091	98	Paved parking, HSG A
1,884	39	>75% Grass cover, Good, HSG A
5,975	79	Weighted Average
1,884		31.53% Pervious Area
4,091		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0250	1.31		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	55	Total			

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Type III 24-hr 10-YR Rainfall=4.60"

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Summary for Subcatchment 30: LAWN AREA

Runoff = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af, Depth> 0.10"

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

Area (sf)	CN	Description
1,207	39	>75% Grass cover, Good, HSG A
1,207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 40: LAWN AREA

Runoff = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af, Depth> 0.10"

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

Area (sf)	CN	Description
786	39	>75% Grass cover, Good, HSG A
786		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 50: DRIVEWAY

Runoff = 0.11 cfs @ 12.08 hrs, Volume= 0.007 af, Depth> 2.46"

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

Area (sf)	CN	Description
1,067	98	Paved parking, HSG A
443	39	>75% Grass cover, Good, HSG A
1,510	81	Weighted Average
443		29.34% Pervious Area
1,067		70.66% Impervious Area

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Type III 24-hr 10-YR Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0250	1.15		Sheet Flow, A-B
					Smooth surfaces n= 0.011 P2= 3.10"
0.3	46	0.0200	2.87		Shallow Concentrated Flow, B-C
					Paved Kv= 20.3 fps
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	74	Total			

Summary for Reach SP1: (new Reach)

Inflow Area = 0.167 ac, 62.36% Impervious, Inflow Depth > 1.89" for 10-YR event
 Inflow = 0.30 cfs @ 12.22 hrs, Volume= 0.026 af
 Outflow = 0.30 cfs @ 12.22 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP2: CATCH BASIN

Inflow Area = 0.035 ac, 70.66% Impervious, Inflow Depth > 2.46" for 10-YR event
 Inflow = 0.11 cfs @ 12.08 hrs, Volume= 0.007 af
 Outflow = 0.11 cfs @ 12.08 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP3: (new Reach)

Inflow Area = 0.028 ac, 0.00% Impervious, Inflow Depth > 0.10" for 10-YR event
 Inflow = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP4: (new Reach)

Inflow Area = 0.018 ac, 0.00% Impervious, Inflow Depth > 0.10" for 10-YR event
 Inflow = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 14.56 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond P2: INFILTRATION BASIN

Inflow Area = 0.137 ac, 68.47% Impervious, Inflow Depth > 2.29" for 10-YR event
 Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.026 af
 Outflow = 0.03 cfs @ 13.74 hrs, Volume= 0.018 af, Atten= 93%, Lag= 99.7 min
 Discarded = 0.03 cfs @ 13.74 hrs, Volume= 0.018 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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Type III 24-hr 10-YR Rainfall=4.60"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 309.19' @ 13.74 hrs Surf.Area= 513 sf Storage= 604 cf

Plug-Flow detention time= 200.4 min calculated for 0.018 af (69% of inflow)
 Center-of-Mass det. time= 132.0 min (923.4 - 791.4)

Volume	Invert	Avail.Storage	Storage Description
#1	307.00'	1,150 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
307.00	100	0	0
308.00	245	173	173
309.00	440	343	515
310.00	830	635	1,150

Device	Routing	Invert	Outlet Devices
#1	Discarded	307.00'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	309.70'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.03 cfs @ 13.74 hrs HW=309.19' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=307.00' (Free Discharge)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 25-YR Rainfall=5.80"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 10: REAR PARKING Runoff Area=7,264 sf 62.36% Impervious Runoff Depth>2.80"
Flow Length=92' Tc=15.2 min CN=74 Runoff=0.44 cfs 0.039 af

Subcatchment 20: BLDG & FRONT Runoff Area=5,975 sf 68.47% Impervious Runoff Depth>3.28"
Flow Length=55' Slope=0.0250 '/' Tc=5.0 min CN=79 Runoff=0.56 cfs 0.037 af

Subcatchment 30: LAWN AREA Runoff Area=1,207 sf 0.00% Impervious Runoff Depth>0.32"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.001 af

Subcatchment 40: LAWN AREA Runoff Area=786 sf 0.00% Impervious Runoff Depth>0.32"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment 50: DRIVEWAY Runoff Area=1,510 sf 70.66% Impervious Runoff Depth>3.47"
Flow Length=74' Tc=5.0 min CN=81 Runoff=0.15 cfs 0.010 af

Reach SP1: (new Reach) Inflow=0.44 cfs 0.039 af
Outflow=0.44 cfs 0.039 af

Reach SP2: CATCH BASIN Inflow=0.15 cfs 0.010 af
Outflow=0.15 cfs 0.010 af

Reach SP3: (new Reach) Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Reach SP4: (new Reach) Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond P2: INFILTRATION BASIN Peak Elev=309.67' Storage=896 cf Inflow=0.56 cfs 0.037 af
Discarded=0.04 cfs 0.025 af Secondary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.025 af

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Type III 24-hr 25-YR Rainfall=5.80"

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Summary for Subcatchment 10: REAR PARKING

Runoff = 0.44 cfs @ 12.21 hrs, Volume= 0.039 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
4,530	98	Paved parking, HSG A
797	39	>75% Grass cover, Good, HSG A
1,937	32	Woods/grass comb., Good, HSG A
7,264	74	Weighted Average
2,734		37.64% Pervious Area
4,530		62.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	62	0.0300	1.45		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
14.5	30	0.0050	0.03		Sheet Flow, B-C Woods: Light underbrush n= 0.400 P2= 3.10"
15.2	92	Total			

Summary for Subcatchment 20: BLDG & FRONT PARKING

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.037 af, Depth> 3.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
4,091	98	Paved parking, HSG A
1,884	39	>75% Grass cover, Good, HSG A
5,975	79	Weighted Average
1,884		31.53% Pervious Area
4,091		68.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0250	1.31		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	55	Total			

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Type III 24-hr 25-YR Rainfall=5.80"

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Summary for Subcatchment 30: LAWN AREA

Runoff = 0.00 cfs @ 12.35 hrs, Volume= 0.001 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
1,207	39	>75% Grass cover, Good, HSG A
1,207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 40: LAWN AREA

Runoff = 0.00 cfs @ 12.35 hrs, Volume= 0.000 af, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
786	39	>75% Grass cover, Good, HSG A
786		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, 5 MINUTE MIN. Tc

Summary for Subcatchment 50: DRIVEWAY

Runoff = 0.15 cfs @ 12.08 hrs, Volume= 0.010 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
1,067	98	Paved parking, HSG A
443	39	>75% Grass cover, Good, HSG A
1,510	81	Weighted Average
443		29.34% Pervious Area
1,067		70.66% Impervious Area

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	28	0.0250	1.15		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.10"
0.3	46	0.0200	2.87		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
4.3					Direct Entry, 5 MINUTE MIN. Tc
5.0	74	Total			

Summary for Reach SP1: (new Reach)

Inflow Area = 0.167 ac, 62.36% Impervious, Inflow Depth > 2.80" for 25-YR event
 Inflow = 0.44 cfs @ 12.21 hrs, Volume= 0.039 af
 Outflow = 0.44 cfs @ 12.21 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP2: CATCH BASIN

Inflow Area = 0.035 ac, 70.66% Impervious, Inflow Depth > 3.47" for 25-YR event
 Inflow = 0.15 cfs @ 12.08 hrs, Volume= 0.010 af
 Outflow = 0.15 cfs @ 12.08 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP3: (new Reach)

Inflow Area = 0.028 ac, 0.00% Impervious, Inflow Depth > 0.32" for 25-YR event
 Inflow = 0.00 cfs @ 12.35 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 12.35 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP4: (new Reach)

Inflow Area = 0.018 ac, 0.00% Impervious, Inflow Depth > 0.32" for 25-YR event
 Inflow = 0.00 cfs @ 12.35 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 12.35 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond P2: INFILTRATION BASIN

Inflow Area = 0.137 ac, 68.47% Impervious, Inflow Depth > 3.28" for 25-YR event
 Inflow = 0.56 cfs @ 12.08 hrs, Volume= 0.037 af
 Outflow = 0.04 cfs @ 13.71 hrs, Volume= 0.025 af, Atten= 93%, Lag= 98.1 min
 Discarded = 0.04 cfs @ 13.71 hrs, Volume= 0.025 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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Type III 24-hr 25-YR Rainfall=5.80"

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 309.67' @ 13.71 hrs Surf.Area= 701 sf Storage= 896 cf

Plug-Flow detention time= 205.4 min calculated for 0.025 af (67% of inflow)
 Center-of-Mass det. time= 135.3 min (918.5 - 783.2)

Volume	Invert	Avail.Storage	Storage Description
#1	307.00'	1,150 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
307.00	100	0	0
308.00	245	173	173
309.00	440	343	515
310.00	830	635	1,150

Device	Routing	Invert	Outlet Devices
#1	Discarded	307.00'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	309.70'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00			
2.50 3.00 3.50 4.00 4.50 5.00 5.50			
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65			
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88			

Discarded OutFlow Max=0.04 cfs @ 13.71 hrs HW=309.67' (Free Discharge)
 ↳1=Exfiltration (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=307.00' (Free Discharge)
 ↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)