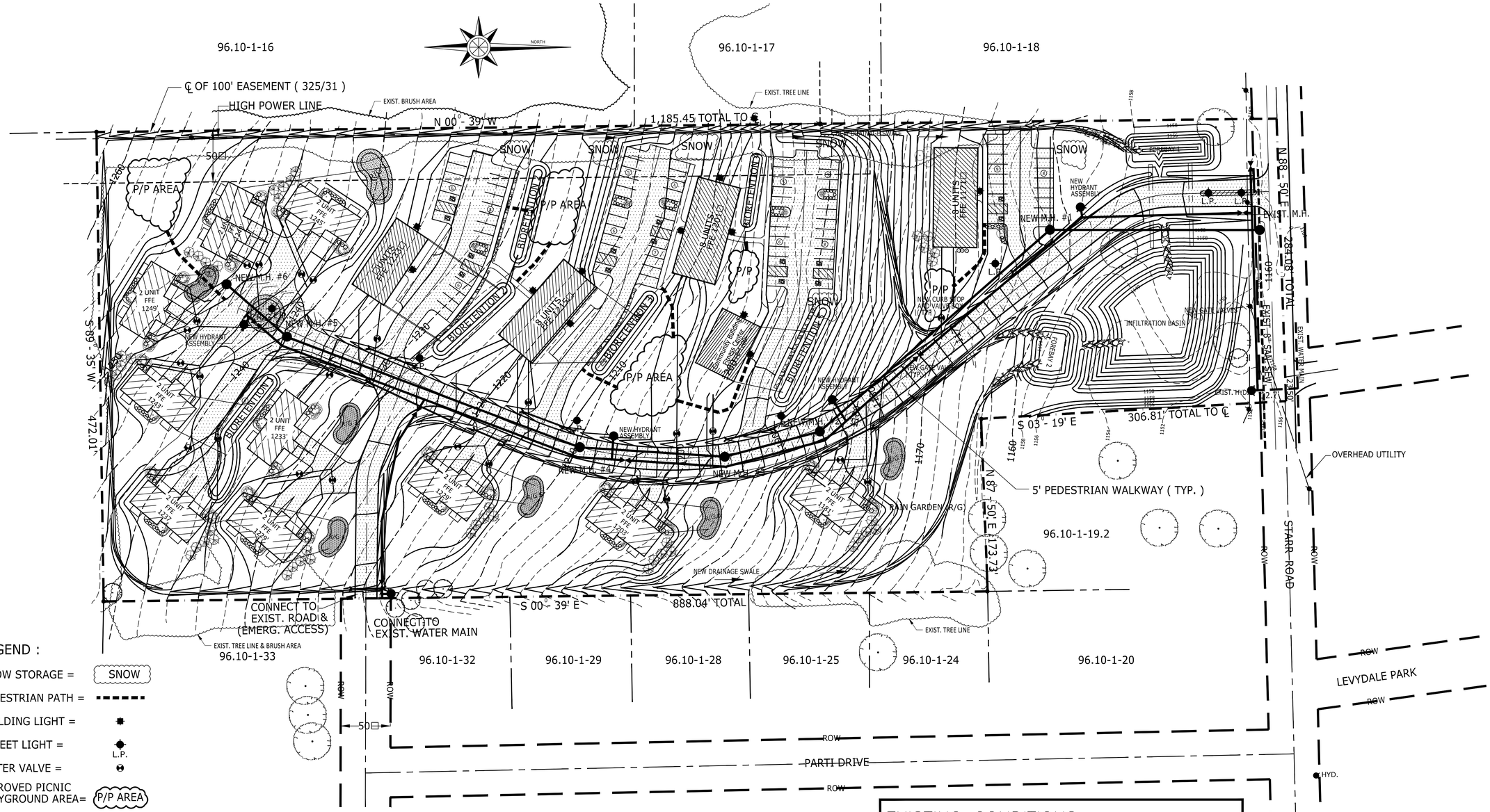


LEGEND :

SNOW STORAGE = SNOW

PEDESTRIAN PATH =

BUILDING LIGHT =

STREET LIGHT = L.P.

WATER VALVE =

IMPROVED PICNIC PLAYGROUND AREA= P/P AREA

DUPLEX = 2 UNIT

R/G RAIN GARDEN/ BIO-SWALE

MULTI FAMILY = 8 UNITS 6 UNITS

NOTES: 3 NEW ORNAMENTAL TREES PER D/U TO BE SCATTERED THROUGHOUT THE SITE; SIZE & CALIPER AS REQUIRED BY TOWN ORDINANCE

EXISTING TREES ALONG PROPERTY BOUNDARIES TO REMAIN AS A BUFFER

PROJECT DENSITY:
3 – 8 MULTI FAMILY HOMES – 24 DWELLINGS
1 – 6 MULTI FAMILY HOMES – 6 DWELLINGS
10 –DUPLEX HOMES – 20 DWELLINGS
50 TOTAL DWELLINGS/11.6 ACRES = 4.3 DU/AC
BASE DENSITY 9,600 SF/DU (R–2)= 4.5 DU/AC
AT 50 UNITS NO INCENTIVE INCREASE REQUIRED

PARKING SUMMARY:
30 MULTI FAMILY UNITS – 60 SPACES
10 DUPLEX UNITS – 20 SPACES (+ GARAGES)
COMMUNITY BUILDING/FITNESS CENTER – 20 SPACES
TOTAL PARKING SPACES PROVIDED – 100 SPACES

EXISTING CONDITIONS:
OPEN FIELD, BRUSH & WOODS.
TOTAL = 505,296 S.F.(11.6 AC+/–)

PROPOSED CONDITIONS:
BUILDINGS = 50,128 S.F. (1.2 AC)
PARKING = 79,562 S.F. (1.8 AC)
DRIVE/WALK = 30,638 S.F. (.7 AC)
STORMWATER = 52,272 S.F.(1.2 AC)
BRUSH/WOODS = 69,696 SF(1.6 AC)
OPEN SPACE = 223,000 SF (5.1 AC)

REVISIONS

No.	Date	SYM.	Description

PROPOSED SITE PLAN

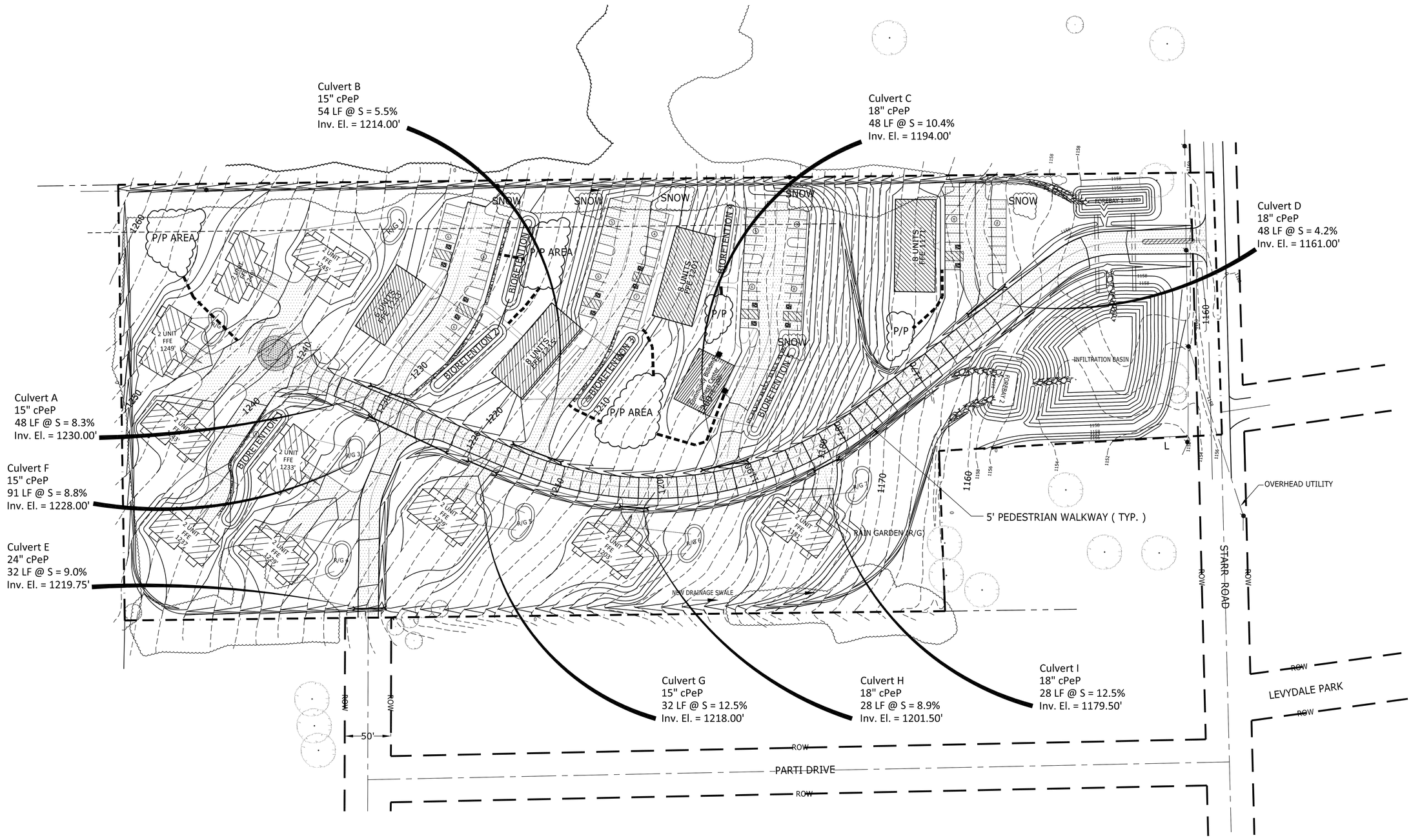
STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

STATE OF NEW YORK — LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL,P.E.
3 □IRE LANE 24,A □□RN, N.Y. 13021 607 423-1919

DATE: 2-2□-2018
SCALE: 1"□50□
DRAWN: MB□LB
JOB: 1432
SHEET: PUD-1



REVISIONS

No.	Date	SYM.	Description

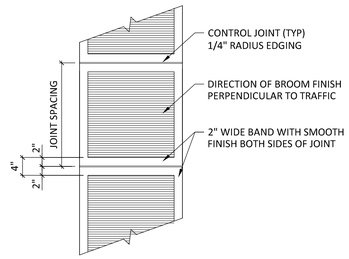
GRADING PLAN

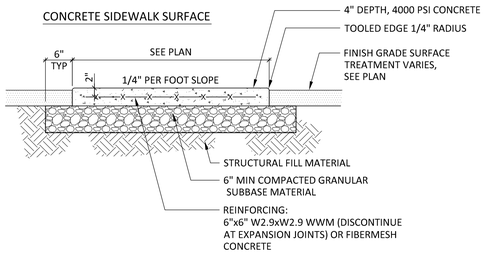
STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD , LOCKE N.Y. 13092 607 423-1919

DATE:	2-26-2018
SCALE:	1"=50'
DRAWN:	MB/JLB
JOB:	17-14
SHEET:	ST-1



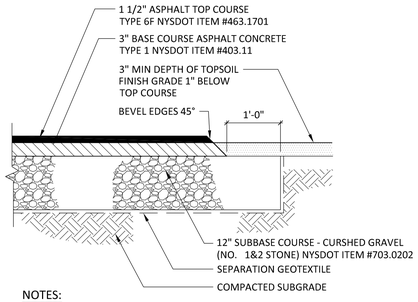


CONCRETE SIDEWALK SECTION

NOTES:

1. PROVIDE 1/4" WIDE CONTROL JOINTS TOOLED OR SAWN, 1-1/2" DEPTH AT SPACING NO GREATER THAN THE SIDEWALK WIDTH. SPACING SHALL BE ADJUSTED FOR EACH SEGMENT OF SIDEWALK SO THAT THE SEGMENT LENGTHS WILL REMAIN CONSISTENT THROUGHOUT EACH LENGTH OF SIDEWALK.
2. PROVIDE 1/2" WIDE EXPANSION JOINTS, FILLER AS SPECIFIED-RECESS 1/4". FILL RECESS WITH SEALANT. EXPANSION JOINT SPACING NOT TO EXCEED 25'-0" IN ANY DIRECTION AND AT CONTACT WITH WALLS, STEPS, DOORS, OR OTHER VERTICAL SURFACES.
3. PROVIDE BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAFFIC.

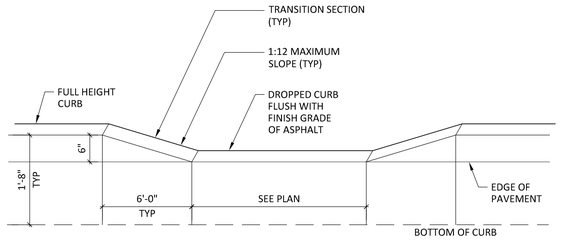
SECTION - CONCRETE SIDEWALK



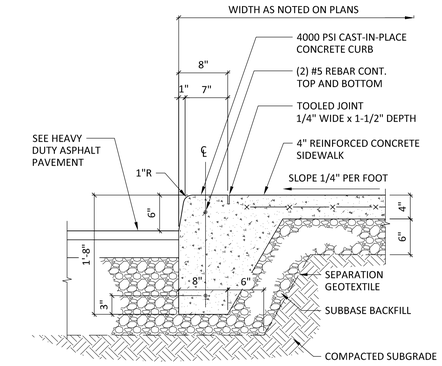
NOTES:

1. ALL DEPTHS OF MATERIAL ARE AFTER COMPACTION.

SECTION - ASPHALT PAVEMENT HEAVY DUTY



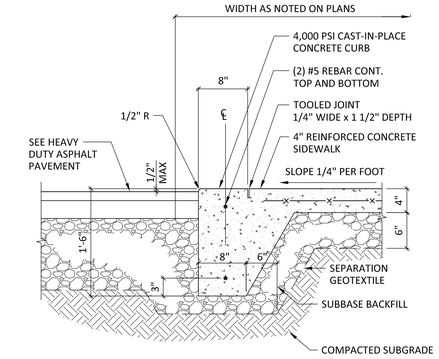
CURB TRANSITION



NOTES:

1. PROVIDE 1/2" EXPANSION JOINTS AT 30'-0" ON CENTER (MAX). USE ASPHALT IMPREGNATED PREMOLD FILLER.
2. CONTROL JOINTS AT 10'-0" ON CENTER (MAX) SPACE JOINTS EVENLY BETWEEN EXPANSION JOINTS.
3. USE WHERE CONCRETE WALK MEETS CONCRETE CURB.

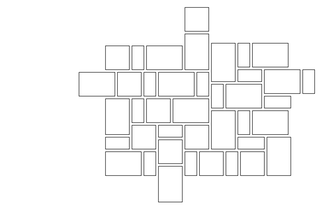
INTEGRAL CURB AND SIDEWALK



NOTES:

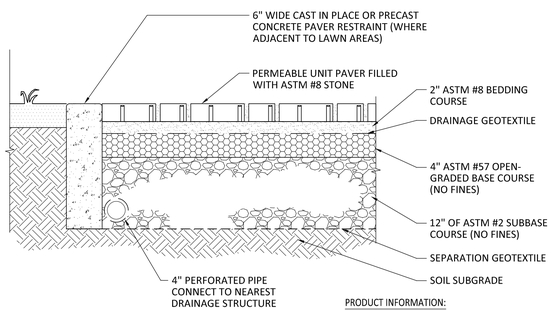
1. PROVIDE 1/2" EXPANSION JOINTS AT 30'-0" ON CENTER (MAX). USE ASPHALT IMPREGNATED PREMOLD FILLER.
2. CONTROL JOINTS AT 10'-0" ON CENTER (MAX) SPACE JOINTS EVENLY BETWEEN EXPANSION JOINTS.

INTEGRAL FLUSH CURB AND SIDEWALK



PANEL SIZES:
6 7/8" x 3 7/16" x 3 1/8"
6 7/8" x 6 7/8" x 3 1/8"
6 7/8" x 10 1/4" x 3 1/8"

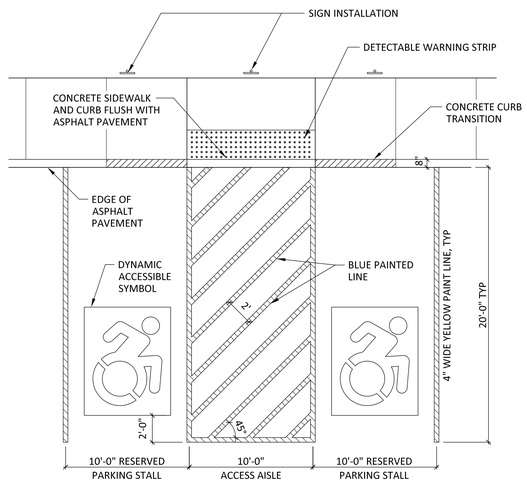
TYPICAL LAYOUT - MACHINE INSTALLED CLUSTER
(ECO-DUBLIN PATTERN)



PRODUCT INFORMATION:

BELGARD "ECO DUBLIN" PERMEABLE CONCRETE PAVER. FOSSIL BEIGE COLOR, SMOOTH FINISH. CONTACT INFO: 877-235-4273 OR WWW.BELGARD.COM

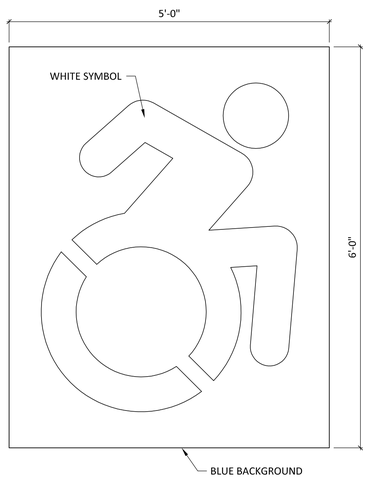
PERVIOUS UNIT PAVER



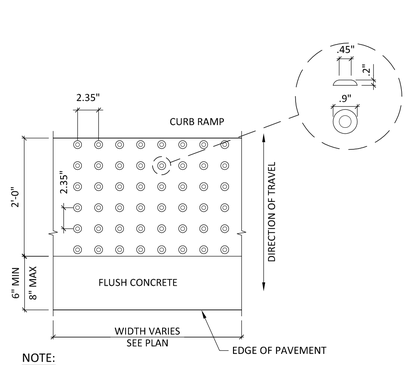
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE PLACED IN ACCORDANCE WITH SUBCHAPTER "E" OF THE NEW YORK STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.). LINE WIDTHS AND SPACING SHALL BE THE SAME AS INDICATED ON DRAWINGS.
2. AFTER THE CONTRACTOR HAS ESTABLISHED MARKING LINE POINTS FOR THE MARKINGS, AS PER SECTION 687-3.04 OF THE N.Y.SS STANDARD SPECIFICATIONS, CONSTRUCTION AND MATERIALS, JANUARY 2, 1985, BY PAINT OR OTHER APPROVED MEANS, THE E.I.C.SHALL REVIEW AND APPROVE OR REVISE THESE LOCATIONS TO MEET FIELD CONDITIONS. NECESSARY LOCATION ADJUSTMENTS WILL BE MADE PRIOR TO PLACING PAVEMENT MARKINGS

ACCESSIBLE PARKING STALL PLAN



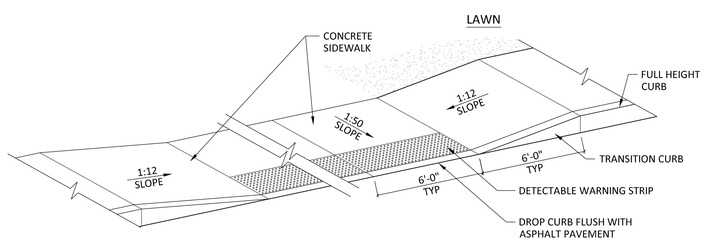
DYNAMIC ACCESSIBLE SYMBOL



NOTE:

1. BASIS OF DESIGN SHALL BE: ARMOR-TILE CAST IN PLACE DETECTABLE WARNING TILE. COLOR: COLONIAL RED. BY: ENGINEERED PLASTICS, INC. PHONE: 800-682-2525, WWW.ARMOR-TILE.COM, OR APPROVED EQUAL.

DETECTABLE WARNING STRIP



NOTE:

1. 4" DEPTH, 4,000 PSI CONCRETE PAVEMENT WITH 6" DEPTH AGGREGATE BASE COURSE. PROVIDE 6x6, W2.9 x W2.9 WWM REINFORCING. BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAFFIC.

ACCESSIBLE CURB RAMP

REVISIONS

No.	Date	SYM.	Description

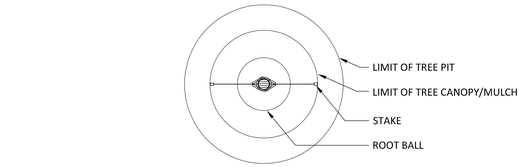
SITE DETAILS

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

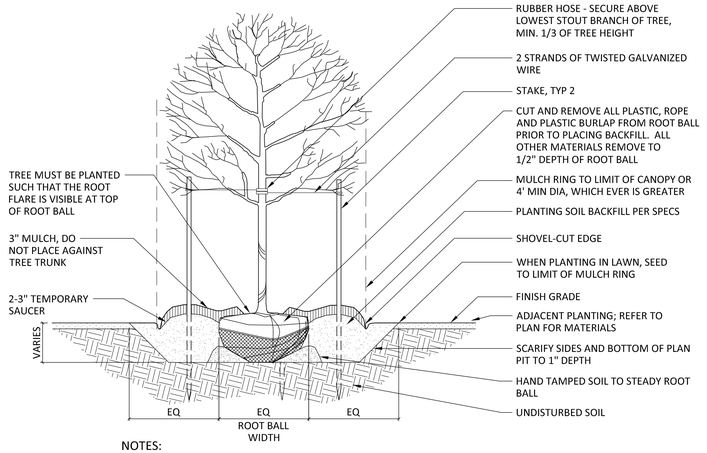
LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL, P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: 2-26-2018
SCALE: NONE
DRAWN: MB/JLB
JOB: 17-14
SHEET: ST-2



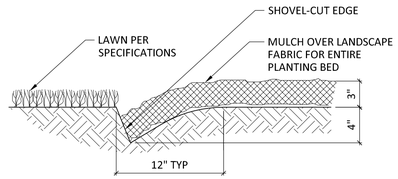
PLAN



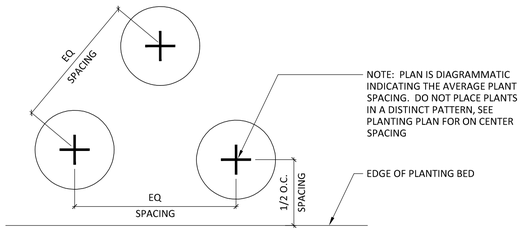
NOTES:

1. REFERENCE PLAN FOR ADJACENT PLANTING CONDITIONS.
2. DO NOT CUT CENTRAL LEADER.
3. SET TREE WITH 3" MAX. ROOT BALL ABOVE FINISH GRADE.
4. PROVIDE "TREE GATOR" 20 GALLON BAG DRIP IRRIGATION SYSTEM BY MEGADROW, WWW.MEGAGROW.COM, OR EQUAL, ON ALL NEW TREE PLANTINGS.

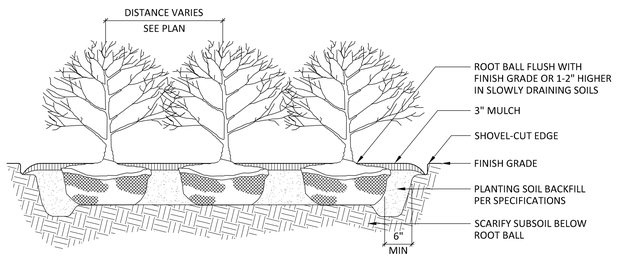
TREE PLANTING



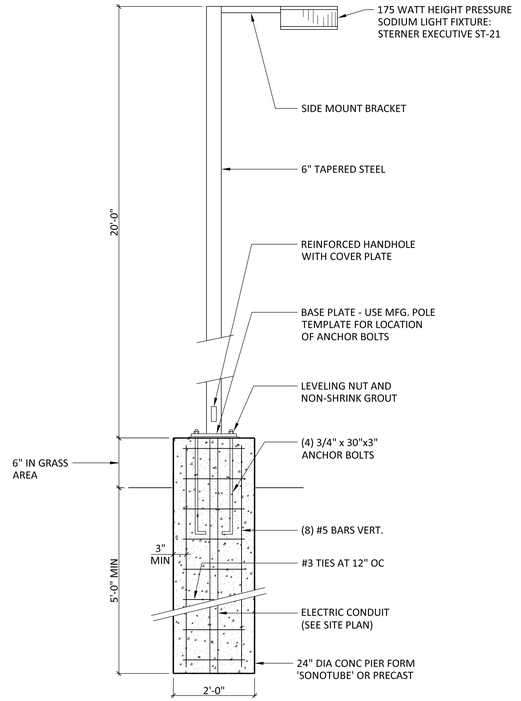
MULCH PLANTING BED



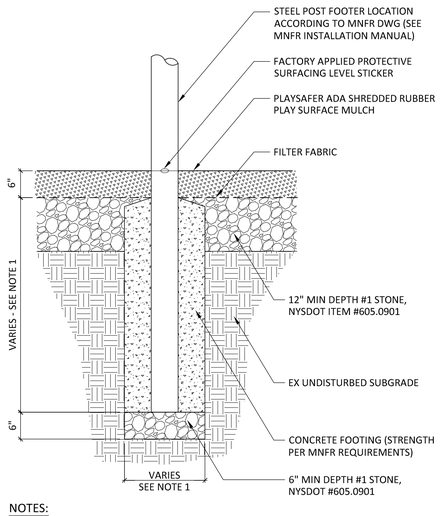
PLAN VIEW - TRIANGULAR SPACING: NOT TO SCALE



SHRUB PLANTING



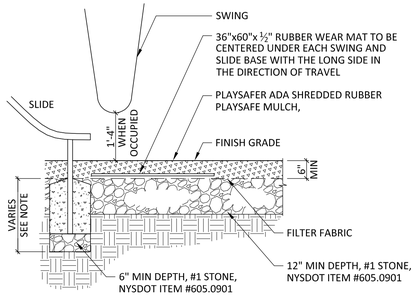
LIGHT POLE - PARKING LOTS



NOTES:

1. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DEPTH AND SIZE OF FOOTING.

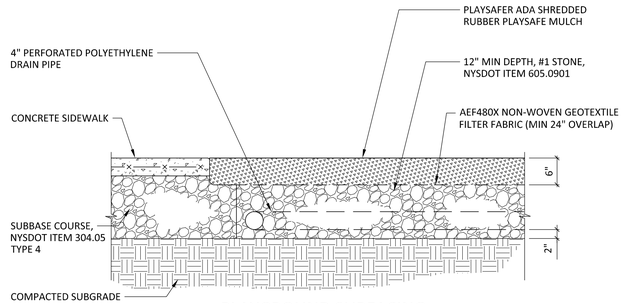
TYPICAL PLAYGROUND STRUCTURE FOOTING



NOTES:

1. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DEPTH AND SIZE OF FOOTING.

WEAR MAT PLACEMENT



PLAYGROUND SURFACING

REVISIONS

No.	Date	SYM.	Description

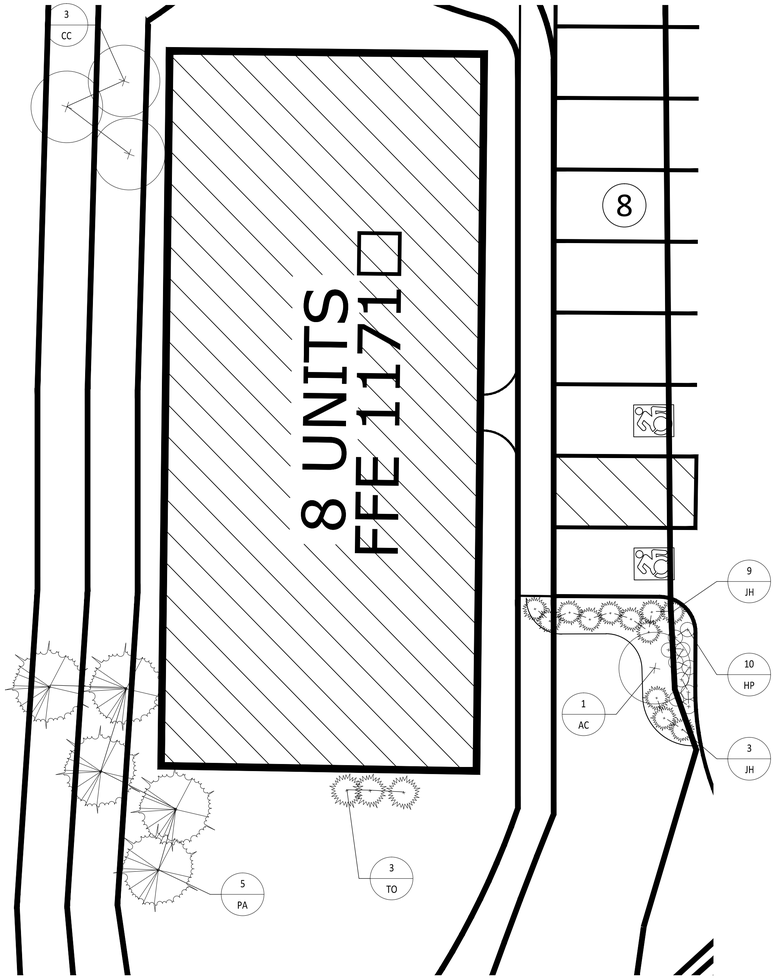
SITE DETAILS

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: 2-26-2018
SCALE: NONE
DRAWN: MB/JLB
JOB: 17-14
SHEET: ST-3



TYPICAL MULTI UNIT PLANTING PLAN

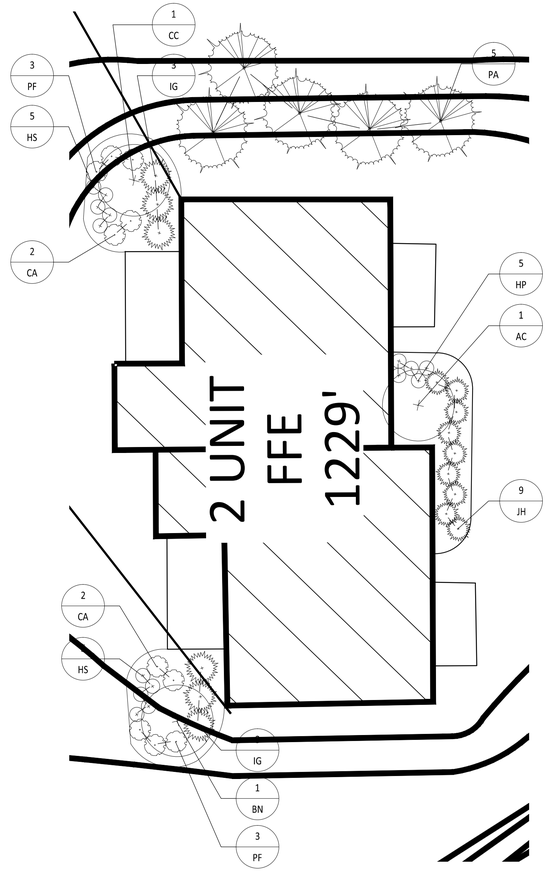
PLANTING SCHEDULE

KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	SPACING	NOTES
DECIDUOUS TREES						
AC	AMELANCHIER CANADENSIS 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	B & B	8-10' HT	10'-0" OC	MULTI-STEM
BN	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	B & B	8-10' HT	AS SHOWN	MULTI-STEM
CC	CRATAEGUS CRUSGALLI INERMIS 'CRUSADER'	CRUSADER THORNLESS COCKSPUR HAWTHORN	B & B	2 ½-3" CAL	10'-0" OC	THORNLESS VARIETY
EVERGREEN TREES						
PA	PICEA ABIES	NORWAY SPRUCE	B & B	7-8' HT	10'-0" OC	-
DECIDUOUS SHRUBS						
CA	CLETHIA ALNIFOLIA 'COMPACTA'	COMPACT SUMMERSWEET CLETHRA	#2 CONT	-	3'-0" OC	DWARF VARIETY
PF	POTENTILLA FRUITICOSA 'PRINCESS'	PRINCESS POTENTILLA	#2 CONT	-	3'-0" OC	PINK FLOWER VARIETY
EVERGREEN SHRUBS						
IG	ILEX GLABRA COMPACTA 'SHAMROCK'	SHAMROCK COMPACT INKBERRY	B & B	24-30" HT	4'-0" OC	COMPACT FORM
JH	JUNIPERIS HORIZONTALIS 'BLUE CHIP'	BLUE CHIP JUNIPER	#2 CONT	-	3'-0" OC	-
TO	THUJA OCCIDENTALIS 'NIGRA'	DARK AMERICAN ARBORVITAE	B & B	6-7' HT	6'-0" OC	-
PERENNIALS / ORNAMENTAL GRASSES / GROUND COVER						
HP	HEMEROCALLIS 'PARDON ME'	PARDON ME DAYLILLY	#1 CONT	-	2'-0" OC	RED FLOWER
HS	HEMEROCALLIS 'STELLA D'ORO'	STELLA D'ORO DAYLILLY	#1 CONT	-	2'-0" OC	YELLOW FLOWER

SYMBOLS

B & B - BALLED & BURLAPPED
CAL - CALIPER
CONT - CONTAINER
OC - ON CENTER
HT - HEIGHT

3 / CA — PLANT QUANTITY / PLANT KEY



TYPICAL SINGLE/DUPLEX UNIT PLANTING PLAN

10' 0' 10' 20'
HORIZONTAL SCALE: 1" = 10'-0"

REVISIONS

No.	Date	SYM.	Description

PLANTING PLANS

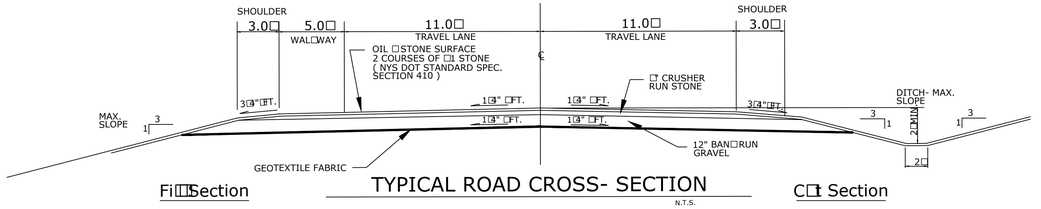
STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

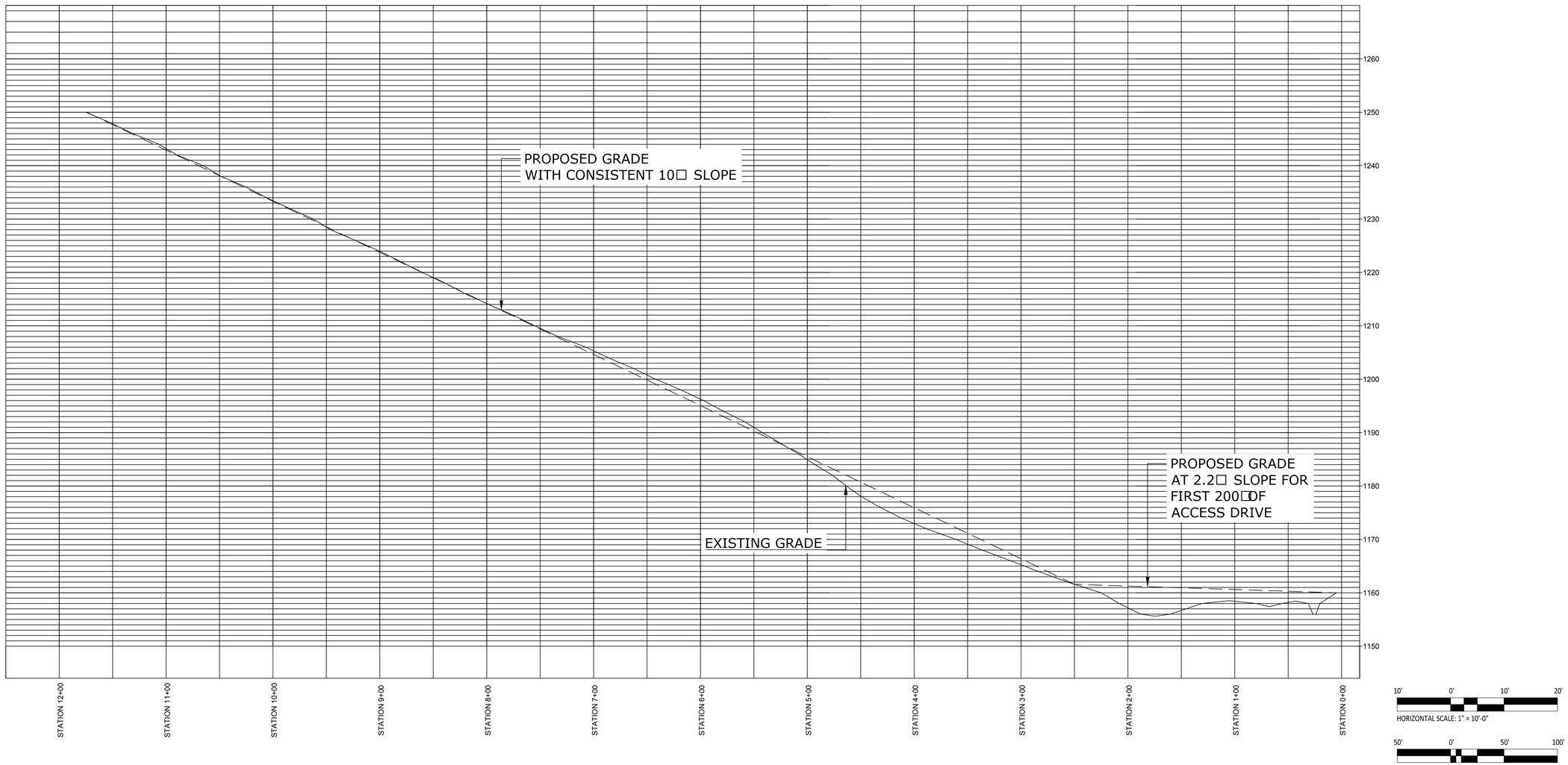
LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

STATE OF NEW YORK TIMOTHY C. BUHL LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1910

DATE: 2-2□-2018
SCALE: NONE
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-4





REVISIONS

No.	Date	SYM.	Description

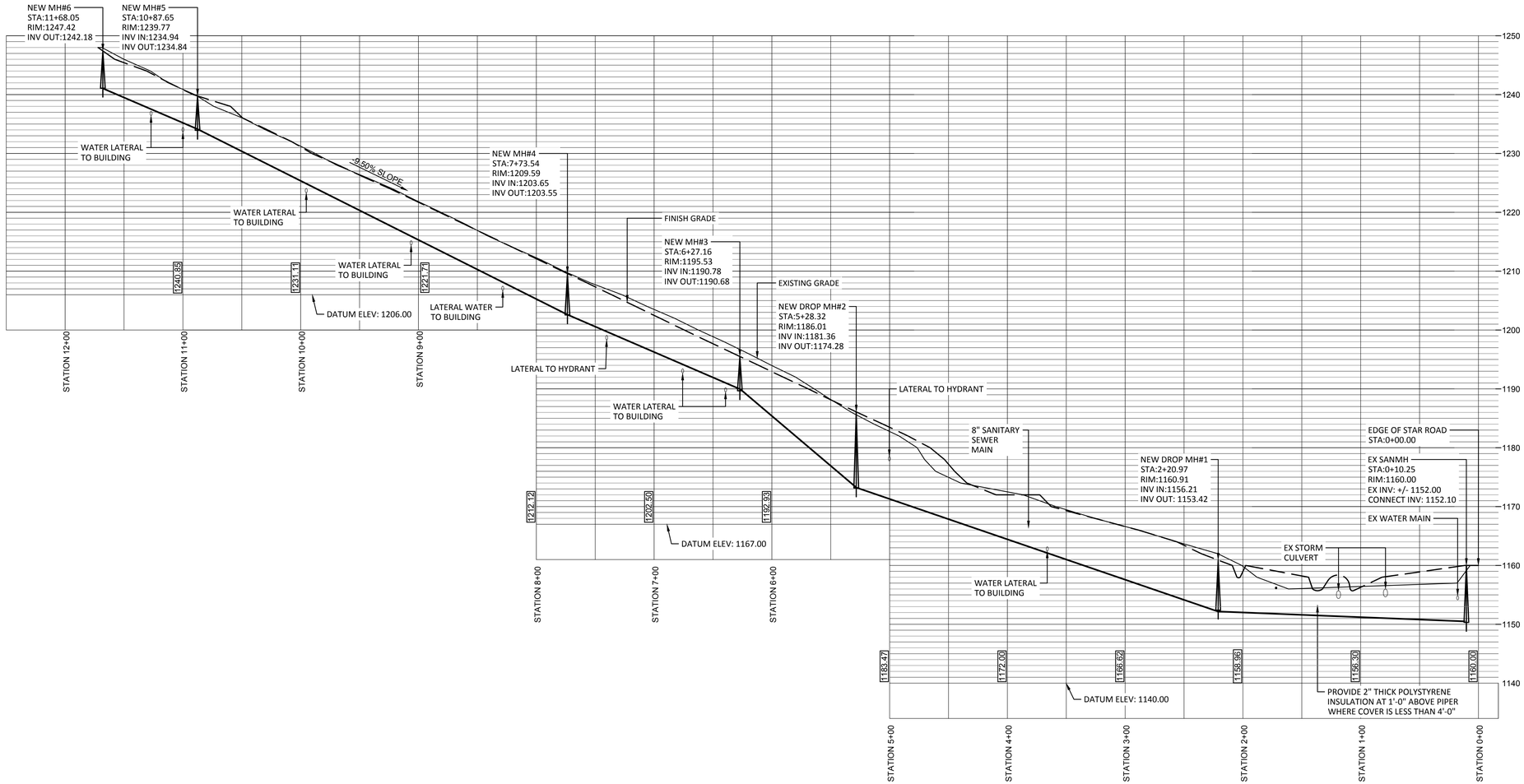
PRELIM ROAD SECTION

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD . LOCKE N.Y. 13092 607 423-1919

DATE: 2-2□2018
SCALE: 1"□50□
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-5A



10' 0' 10' 20'
HORIZONTAL SCALE: 1" = 10'-0"

50' 0' 50' 100'
VERTICAL SCALE: 1" = 50'-0"

REVISIONS

No.	Date	SYM.	Description

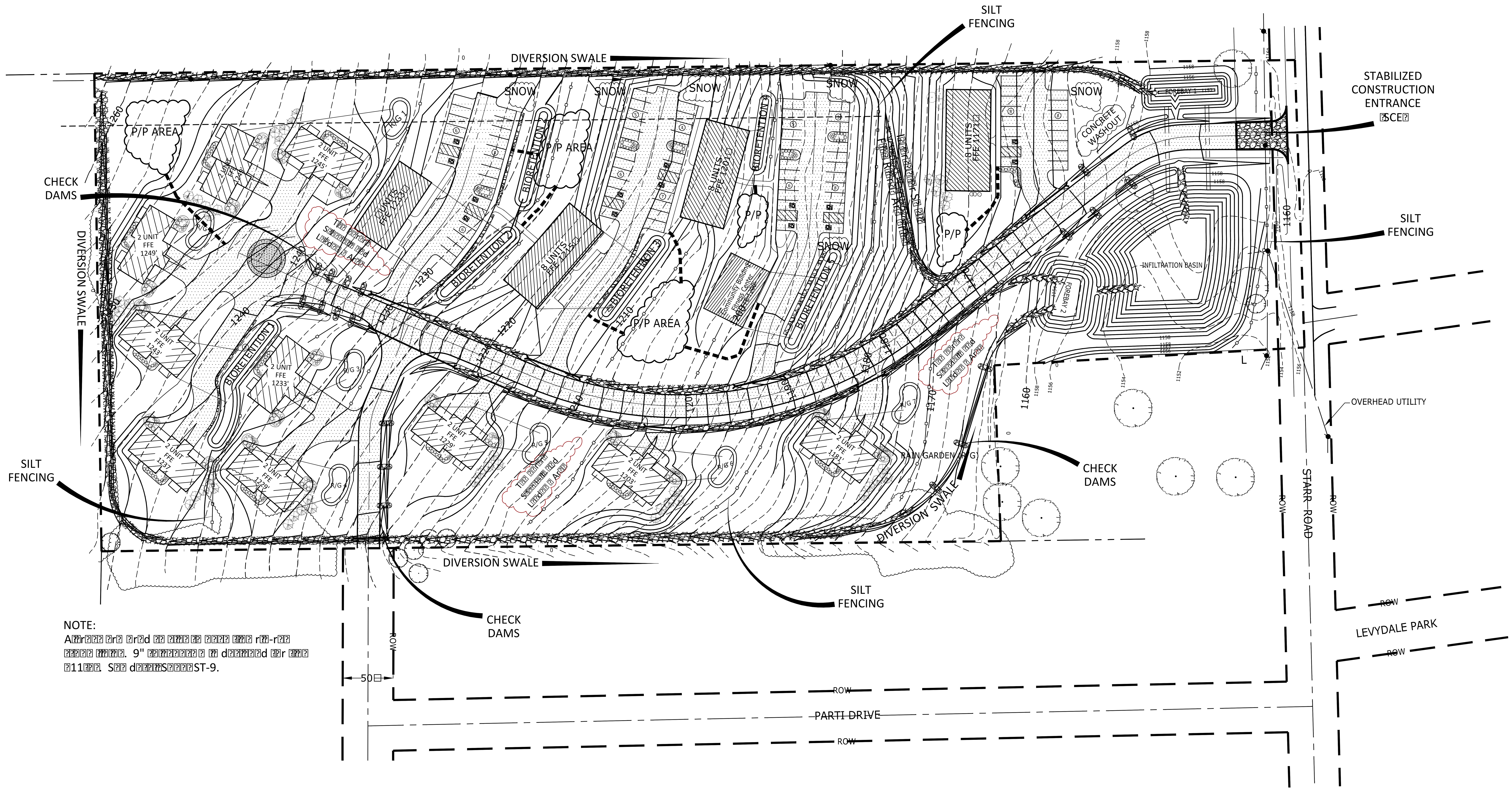
SANITARY SEWER PROFILE

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607423-1919

DATE: 3-19-2018
SCALE: NOTED
DRAWN: JLB
JOB: 17-14
SHEET: ST-5B



NOTE:
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REVISIONS

No.	Date	SYM.	Description

ESC PLAN

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

STATE OF NEW YORK · TIMOTHY C. BUHL · LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL, P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2[illegible], 2018
SCALE: 1" [illegible] 50[illegible]
DRAWN: MB[illegible]LB
JOB: 17-14
SHEET: ST-[illegible]

GENERAL NOTES

NYS STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, AUGUST 2005

1. PHYSICALLY MARK LIMITS OF LAND DISTURBANCE ON THE SITE WITH TAPE, SIGNS, OR ORANGE CONSTRUCTION FENCE, SO THAT WORKERS CAN SEE THE AREAS TO BE PROTECTED.

2. DIVERT OFF-SITE RUNOFF FROM HIGHLY ERODIBLE SOILS AND STEEP SLOPES TO STABLE AREAS.

3. CLEAR ONLY WHAT IS REQUIRED FOR IMMEDIATE CONSTRUCTION ACTIVITY. LARGE PROJECTS SHOULD BE CLEARED AND GRADED AS CONSTRUCTION PROGRESSES. AREAS EXCEEDING TWO ACRES IN SIZE SHOULD NOT BE DISTURBED WITHOUT A SEQUENCING PLAN THAT REQUIRES PRACTICES TO BE INSTALLED AND THE SOIL STABILIZED, AS DISTURBANCE BEYOND THE TWO ACRES CONTINUES. MASS CLEARINGS AND GRADING OF ENTIRE SITE SHOULD BE AVOIDED.

4. RESTABILIZE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETED. ON SITES GREATER THAN TWO ACRES IN SIZE, WAITING UNTIL ALL DISTURBED AREAS ARE READY FOR SEEDING IS UNACCEPTABLE. FOURTEEN DAYS SHALL BE THE MAXIMUM EXPOSURE PERIOD. MAINTENANCE MUST BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION. EXCEPT AS NOTED BELOW, ALL SITES SHALL BE SEEDED AND STABILIZED WITH EROSION CONTROL MATERIALS, SUCH AS STRAW MULCH, JUTE MESH, OR EXCELSIOR, INCLUDING AREAS WHERE CONSTRUCTION HAS BEEN SUSPENDED OR SECTIONS COMPLETED:

A. FOR ACTIVE CONSTRUCTION AREAS SUCH AS BORROW OR STOCKPILE AREAS, ROADWAY IMPROVEMENTS AND AREAS WITHIN 50 FT. OF A BUILDING UNDER CONSTRUCTION, A PERIMETER SEDIMENT CONTROL SYSTEM CONSISTING, FOR EXAMPLE, OF SILT FENCING OR HAY BALES, SHALL BE INSTALLED AND MAINTAINED TO CONTAIN SOIL. EXPOSED DISTURBED AREAS ADJACENT TO A CONVEYANCE THAT PROVIDES RAPID OFF-SITE DISCHARGE OF SEDIMENT, SUCH AS A CUT SLOPE AT AN ENTRANCE, SHALL BE COVERED WITH PLASTIC OR, GEOTEXTILE FABRIC TO PREVENT SOIL LOSS UNTIL IT CAN BE STABILIZED. STABILIZED CONSTRUCTION ENTRANCES WILL BE MAINTAINED TO CONTROL VEHICLE TRACKING MATERIAL OFF-SITE.

B. ON THE CUT SIDE OF ROADS, DITCHES SHALL BE STABILIZED IMMEDIATELY WITH ROCK RIP-RAP OR OTHER NON-ERODIBLE LINERS (EG. ROLLED EROSION PRODUCTS), OR WHERE APPROPRIATE, VEGETATIVE MEASURES SUCH AS SOD.

C. PERMANENT SEEDING SHOULD OPTIMALLY BE UNDERTAKEN IN THE SPRING FROM MARCH THROUGH MAY, AND IN LATE SUMMER AND EARLY FALL FROM SEPTEMBER TO OCTOBER 15. DURING THE PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15, WHEN SEEDING IS FOUND TO BE IMPRACTICABLE, AN APPROPRIATE TEMPORARY MULCH SHALL BE APPLIED. PERMANENT SEEDING MAY BE UNDERTAKEN DURING THE SUMMER IF PLANS PROVIDE FOR ADEQUATE WATERING. TEMPORARY SEEDING WITH RYE CAN BE UTILIZED THROUGH NOVEMBER.

D. ALL SLOPES STEEPER THAN 3:1 (H:V), OR 33.3%, AS WELL AS PERIMETER DIKES, SEDIMENT BASINS AND TRAPS, AND EMBANKMENTS SHALL, UPON COMPLETION, BE IMMEDIATELY STABILIZED WITH SOD, SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM SHALL NOT BE DISTURBED. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE CONTINUED STABILIZATION.

E. TEMPORARY SEDIMENT TRAPPING DEVICES SHALL NOT BE REMOVED UNTIL PERMANENT STABILIZATION IS ESTABLISHED IN ALL CONTIRBUTORY DRAINAGE AREAS. SIMILARLY, STABILIZATION SHALL BE ESTABLISHED PRIOR TO CONVERTING SEDIMENT TRAPS/BASINS INTO PERMANENT (POST-CONSTRUCTION) STORMWATER MANAGEMENT PRACTICES.

5. WHERE TEMPORARY WORK ROADS OR HAUL ROADS CROSS STREAM CHANNELS, ADEQUATE WATERWAY OPENINGS SHALL BE CONSTRUCTED USING SPANS, CULVERTS, WASHED ROCK BACKFILL, OR OTHER ACCEPTABLE, CLEAN METHODS THAT WILL ENSURE THAT ROAD CONSTRUCTION AND THEIR USE DO NOT RESULT IN TURBIDITY AND SEDIMENT DOWNSTREAM. ALL CROSSING ACTIVITIES AND APPURTENANCES ON STREAMS REGULATED BY ARTICLE 15 OF THE ENVIRONMENTAL CONSERVATION LAW SHALL BE IN COMPLIANCE WITH A PERMIT ISSUED PURSUANT TO ARTICLE 15 OF THE ECL.

6. MAKE SURE THAT ALL CONTRACTORS AND SUB-CONTRACTORS UNDERSTAND THE ESC PLAN AND SIGN THE CERTIFICATION STATEMENT REQUIRED BY NYSDEC GP.

7. DESIGNATE RESPONSIBLITY FOR THE ESC PLAN TO ONE INDIVIDUAL. THIS PERSON SHALL BE NAMED IN THE NOTICE OF INTENT.

8. AN ESC PLAN INSPECTION PROGRAM MEETING THE REQUIREMENTS OF THE NYSDEC GP, IS NECESSARY TO DETERMINE WHEN ESC MEASURES NEED MAINTENANCE OR REPAIR. PAY PARTICULAR ATTENTION TO INSPECTIONS REQUIRED AFTER RAINFALL. THE INSPECTION PROGRAM SHALL ALSO STATE THE COMPLETION OF IDENTIFIED REPAIR AND MAINTENANCE ITEMS.

9. IF CONSTRUCTION ACTIVITIES CONTINUE DURING WINTER, ACCESS POINTS SHOULD BE ENLARGED AND STABILIZED TO PROVIDE FOR SNOW STOCKPILING. IN ADDITION SNOW MANAGEMENT PLAN SHOULD BE PREPARED WITH ADEQUATE STORAGE AND CONTROL OF MELTWATER. A MINIMUM 25 FOOT BUFFER SHALL BE MAINTAINED FROM PERIMETER CONTROLS SUCH AS SILT FENCING. KEEP DRAINAGE STRUCTURES OPEN AND FREE OF SNOW AND ICE DAMS. INSPECTION AND MAINTENANCE ARE NECESSARY TO ENSURE THE FUNCTION OF THESE PRACTICES DURING RUNOFF EVENTS.

LAND GRADING SPECIFICATIONS

1. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.

2. ALL FILL TO BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.

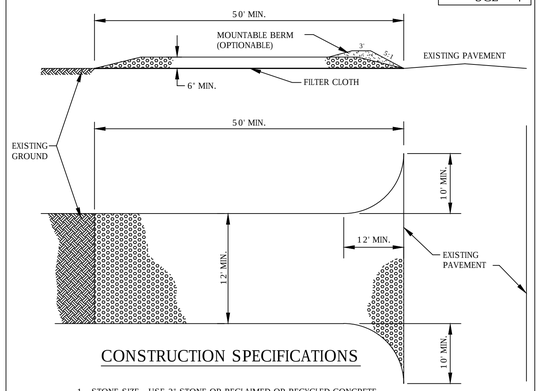
3. EXCEPT FOR APPROVED LANDFILLS, FILL MATERIAL SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.

4. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.

5. STOCKPILES, BORROW AREAS AND SPOIL AREAS SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATION.

STABILIZED CONSTRUCTION ENTRANCE

SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 2" STONE OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.

2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MIN. LENGTH WOULD APPLY).

3. THICKNESS - NOT LESS THAN SIX (6) INCHES.

4. WIDTH - TWELVE (12) FOOT MIN. BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.

5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.

6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.

7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.

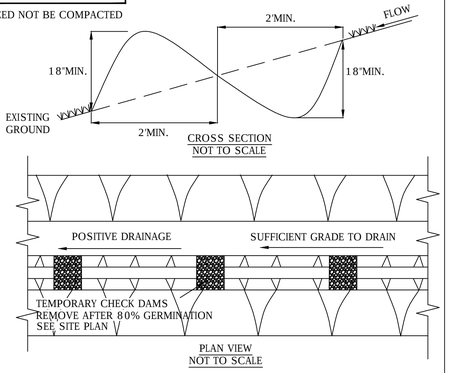
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPINGS DEVICE.

9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

10. TEMPORARY CONSTRUCTION ENTRANCES, EXITS AND TEMPORARY ACCESS SHALL BE SUBJECT TO THE APPROVAL OF THE APPROPRIATE AUTHORITIES.

GRASSED/VEGETATED SWALE

SYMBOL: G



CONSTRUCTION SPECIFICATIONS

GRASSED/VEGETATED SWALE

1. DRAINAGE AREA SHALL BE LESS THAN 5 ACRES.

2. HEIGHT SHALL BE NO LESS THAN 18-INCHES FROM BOTTOM OF SWALE TO TOP OF DIKE EVENLY DIVIDED BETWEEN DIKE HEIGHT AND SWALE DEPTH.

3. BOTTOM WIDTH OF DIKE SHALL BE NO LESS THAN 2-FEET.

4. WIDTH OF SWALE SHALL BE NO LESS THAN 2-FEET.

5. SWALE SHALL HAVE POSITIVE DRAINAGE TO AN ADEQUATELY STABILIZED OUTLET TO AN UNDISTURBED AREA. MAXIMUM ALLOWABLE GRADE NOT TO EXCEED 8%.

6. THE DISTURBED AREA OF THE DIKE AND SWALE SHALL BE STABILIZED WITHIN 7 DAYS OF INSTALLATION, IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR TEMPORARY SWALES.

7. DIVERTED RUNOFF FROM A DISTURBED OR EXPOSED UPLAND AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE SUCH AS A TRAP, BASIN, OR TO AN AREA PROTECTED BY ANY OF THESE PRACTICES .

8. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

TOP SOILING SPECIFICATIONS

1. PRESERVE EXISTING TOPSOIL IN PLACE WHERE POSSIBLE, THEREBY REDUCING THE NEED FOR ADDED TOPSOIL.

2. AS NEEDED, INSTALL EROSION CONTROL PRACTICES SUCH AS DIVERSIONS, CHANNELS, SEDIMENT TRAPS, AND STABILIZING MEASURES, OR MAINTAIN IF ALREADY INSTALLED.

3. COMPLETE ROUGH GRADING AND FINAL GRADE, ALLOWING FOR DEPTH OF TOPSOIL TO BE ADDED.

4. SCARIFY ALL COMPACT, SLOWLY PERMEABLE, MEDIUM AND FINE TEXTURED SUBSOIL AREAS. SCARIFY AT APPROXIMATELY RIGHT ANGLES TO THE SLOPE DIRECTION IN SOIL AREAS THAT ARE STEEPER THAN 5%. AREAS THAT HAVE BEEN OVERLY COMPACTED SHALL BE DECOMPACTED TO A MINIMUM DEPTH OF 12-INCHES WITH A DEEP RIPPER OR CHISEL PLOW PRIOR TO TOPSOILING.

5. REMOVE REFUSE, WOODY PLANT PARTS, STONES OVER 3-INCHES IN DIAMETER, AND OTHER LITTER.

6. TOPSOIL SHALL HAVE AT LEAST 6% BY WEIGHT OF FINE TEXTURED STABLE ORGANIC MATERIAL, AND NO GREATER THAN 20%. MUCK SOIL SHALL NOT BE CONSIDERED TOPSOIL.

7. TOPSOIL SHALL HAVE NOT LESS THAN 20% FINE TEXTURED MATERIAL (PASSING THE NO. 200 SIEVE) AND NOT MORE THAN 15% CLAY.

8. TOPSOIL TREATED WITH SOIL STERILANTS OR HERBICIDES SHALL BE SO IDENTIFIED TO THE PURCHASER.

9. TOPSOIL SHALL BE RELATIVELY FREE OF STONES OVER 1 1/2-INCHES IN DIAMETER, TRASH, NOXIOUS WEEDS SUCH AS NUTSEDGE AND QUACKGRASS, AND WILL HAVE LESS THAN 10% GRAVEL.

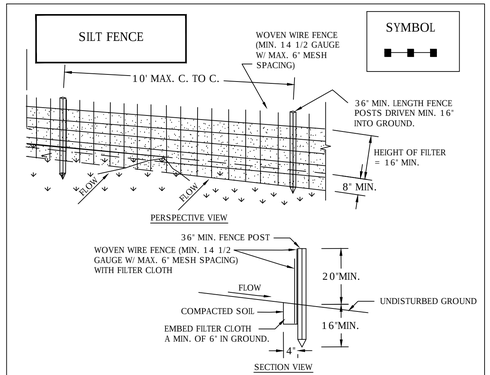
10. TOPSOIL CONTAINING SOLUBLE SALTS GREATER THAN 500 PARTS PER MILLION SHALL NOT BE USED.

11. TOPSOIL SHALL BE DISTRIBUTED TO A UNIFORM DEPTH OVER THE AREA. IT SHALL NOT BE PLACED WHEN IT IS PARTIALY FROZEN, MUDDY, OR ON FROZEN SLOPES OR OVER ICE, SNOW, OR STANDING WATER PUDDLES.

12. TOPSOIL PLACED AND GRADED ON SLOPES STEEPER THAN 5% SHALL BE PROMPTLY FERTILIZED, SEEDED, MULCHED, AND STABILIZED BY "TRACKING" WITH SUITABLE EQUIPMENT.

SILT FENCE

SYMBOL



CONSTRUCTION SPECIFICATIONS

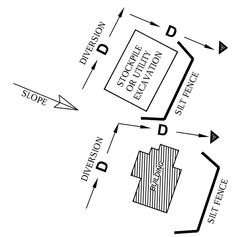
1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.

2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24' AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 12 1/2 GAUGE, 6" MAXIMUM MESH OPENING.

3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.

4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.

5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.



SEDIMENT & EROSION CONTROL MEASURES
TYPICAL
N.T.S.

MATERIAL STOCKPILING

1. FOR RESIDENTIAL CONSTRUCTION, ONE SPECIFIC AREA ON EACH LOT SHALL BE DESIGNATED FOR TEMPORARY STOCKPILING OF TOPSOIL AND ALL OTHER CONSTRUCTION MATERIALS CONTAINING FINES THAT CAN BE MOVED BY RUNOFF. THIS AREA SHALL BE AS SMALL AS PRACTICABLE .

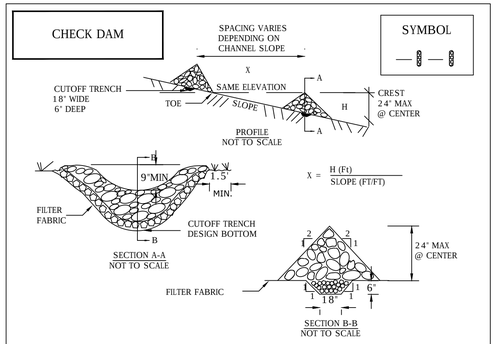
2. STOCK PILES WILL HAVE DOWN HILL SIDE PERIMETER SILT FENCING PROTECTION. REFERENCE SILT FENCE DETAILS THESE PLANS.

3. STOCK PILES WILL BE SEEDED AND MULCHED IF ANTICPATED TO BE LEFT IN PLACE 14-DAYS OR MORE. REFERENCE DETAIL SHEET NOTES AND SPECIFICATIONS THIS PLANT SET AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) ACCOMPANYING THIS PLAN SET.

4. SILT FENCE AND OTHER TEMPORARY CONTROL MEASURES SHALL BE IN PLACE BEFORE STOCKPILING OF MATERIALS.

CHECK DAM

SYMBOL



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.

2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.

3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.

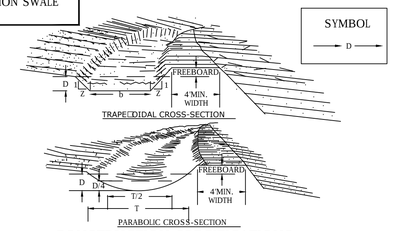
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.

5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

DIVERSION SWALE

SYMBOL: D



CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIVERSION.

2. THE DIVERSION SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.

3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE DIVERSION.

4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIVERSION.

5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.

A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER. SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE DIVERSION DURING THE ESTABLISHMENT OF THE VEGETATION.

B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER. SEC., THE DIVERSION SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.

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A□□□ST 2005

REVISIONS

No.	Date	SYM.	Description

ESC DETAILS

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

STATE OF NEW YORK · TIMOTHY C. BUHL · LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-7

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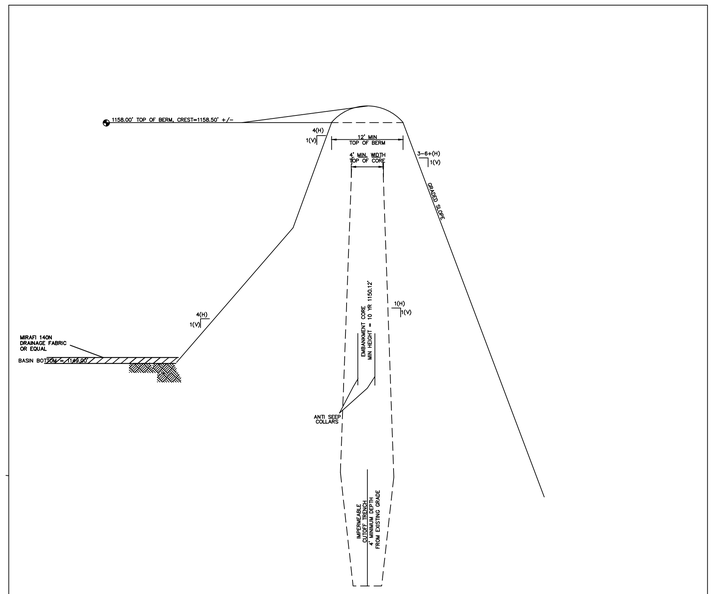

DETAIL- TEMPORARY SEDIMENT BASIN SECTION - Typ.

Note 1: Use o□reco□□ended in□□tration practices dependent □pon s□ccess□□□ in□□tration rate testin□ □□t□appro□a□ □□T□e To□n o□Cort□and□□□e and Cort□and Co□nt□ Test to □e per□or□ed □□ot□ers. To □e s□ta□□e □or in□□tration, □nder□□in□soi□S s□a□□□a□e an in□□tration rate o□at □east 0.5"□□r, □a□e a c□□content o□□ess t□an 20□, and □a□e separation □et□een t□e □otto□ o□t□e treat□ent practice and t□e seasona□ □□□ro□nd□ater ta□□e □□at □east 3 □ertica□□eet.

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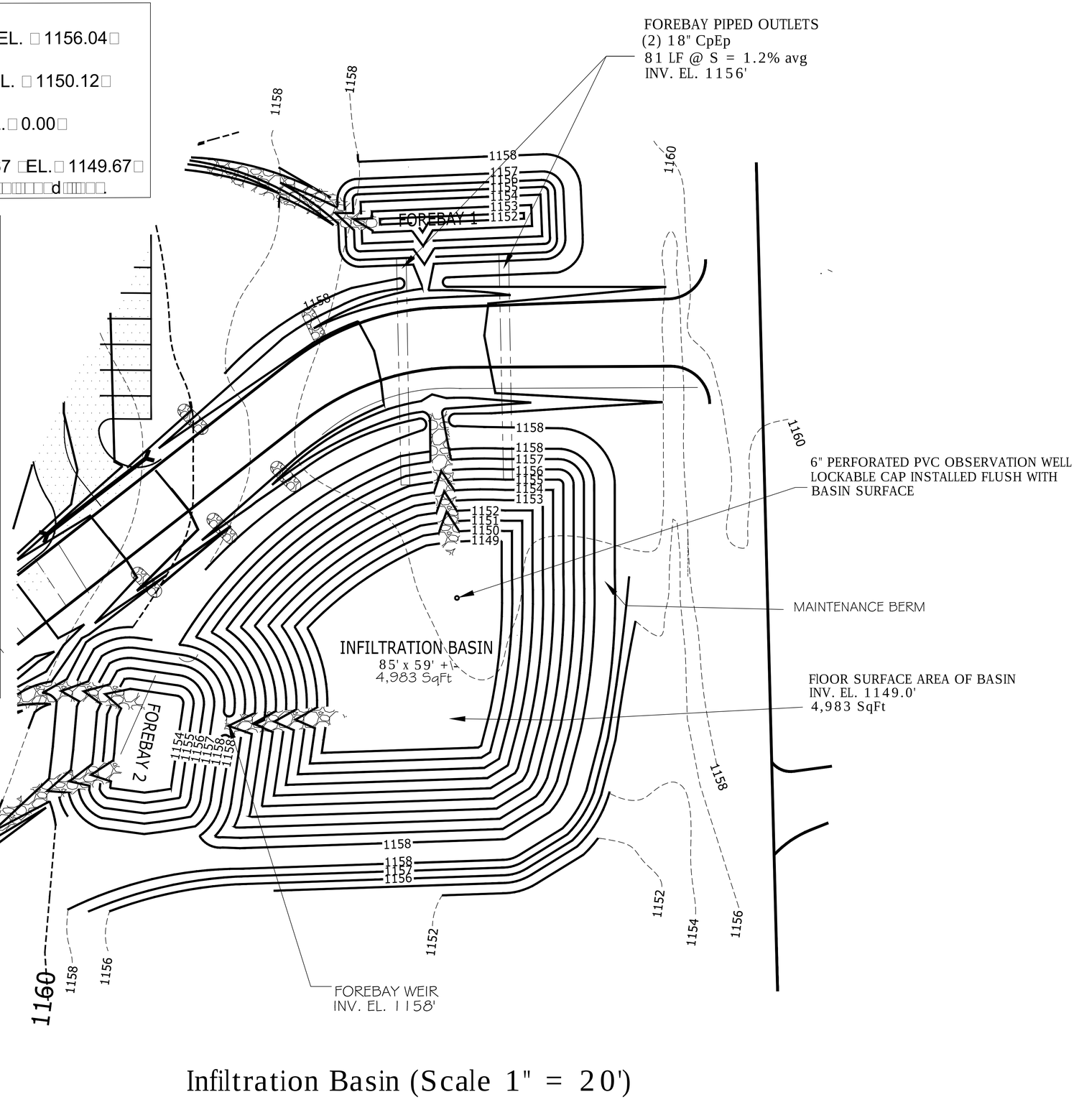

Infiltration Basin (Scale 1" = 20')

REVISIONS

No.	Date	SYM.	Description

INFILTRATION BASIN PLAN DETAILS

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD . LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
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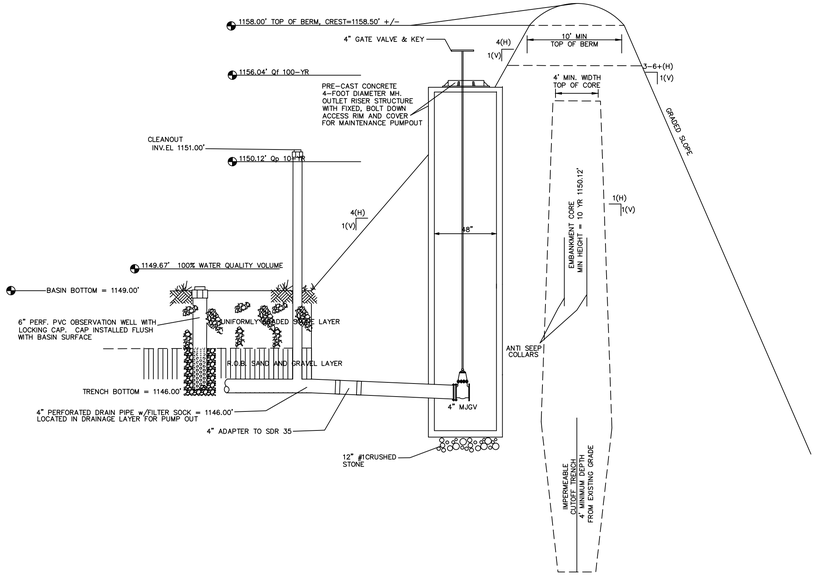
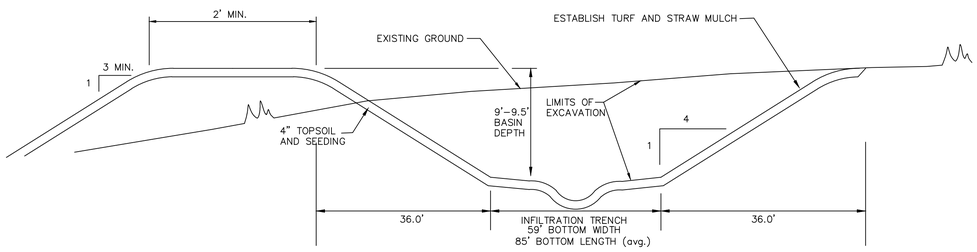
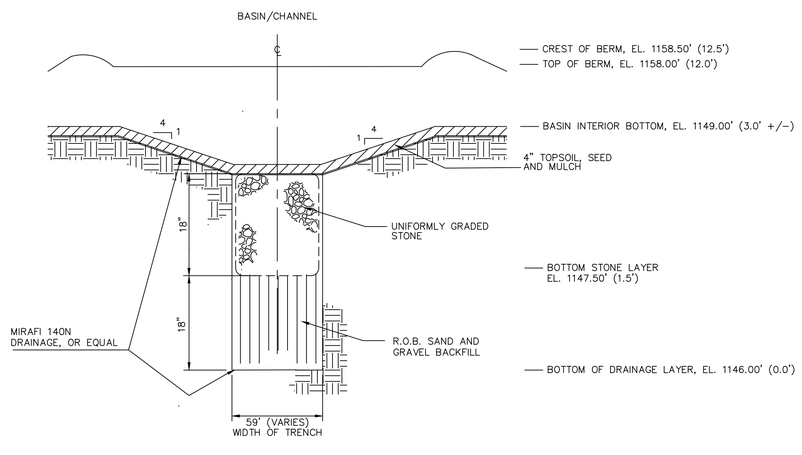


INFILTRATION BASIN OUTLET STRUCTURE DETAIL



CROSS-SECTION - BASIN

DIMENSIONS VARY AS PER PLAN

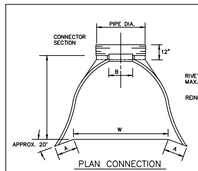


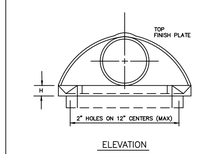
DETAIL- INFILTRATION BASIN SECTION - Typ.

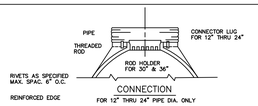
NOTES ON INFILTRATION PRACTICES

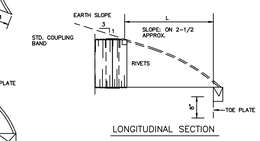
Note 1: During the initial phase of construction, a sediment trap shall be established using the same footprint and surface area, as shown in these plans. A layer of Mirafi 140 N drainage fabric (or equal) shall be placed along the bottom of the infiltration basin to protect underlying soils from sediment during construction. Once soil disturbance has been completed and the site has achieved 80% germination, the trap shall be converted to a full infiltration practice by removing the fabric, cleaning out all accumulated sediment and then installing the engineered subgrade infiltration layers as shown in these plans.

GENERAL PIPED OUTLETS, OVERFLOWS & CHANNEL DETAILS







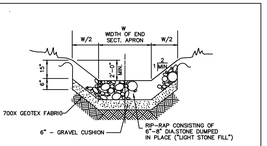


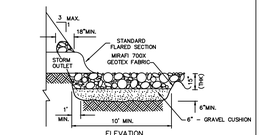
TYPICAL COURRUGATED PIPE END SECTION

TYPICAL END SECTION TABLE OF DIMENSIONS						
PIPE DIA.	GAGE	DIMENSION (WITH TOLERANCE) A 1" TOL	B MAX.	H 1" TOL.	I 1-1/2"	W 2" TOL.
12"	16	4-3/4"	6"	6"	21"	24"
15"	16	6"	8"	6"	26"	30"
18"	16	7"	9"	6"	31"	36"
21"	16	8-1/4"	11"	6"	36"	42"
24"	14	9-1/2"	12"	6"	42"	48"
30"	14	12"	15"	7-1/2"	5-1/2"	60"

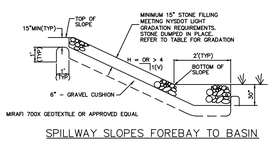
END SECTION SHALL BE FURNISHED WITH A GAGE EQUAL TO THE GAGE OF THE PIPE BEING ATTACHED TO OR AS SHOWN ABOVE, WHICHEVER IS THE LARGEST GAGE.

NOTES:
1. TOE PLATE TO BE PUNCHED TO MATCH HOLE IN SKIRT LIP. 3/8" GALV. BOLTS TO BE FURNISHED. LENGTH OF TOE PLATE = W + 10 FOR 12" DIA. PIPE.
2. SKIRT SECTION FOR 12" THRU 24" DIA. PIPE TO BE MADE IN ONE PIECE.
3. SKIRT SECTION FOR 30" THRU 48" DIA. PIPE MAY BE MADE FROM TWO SHEETS BY RIVETING OR BOLTING ON CENTER LINE.
4. CONNECTOR SECTION, CORNER PLATE TO BE SAME GAGE AS SKIRT.
5. TOE PLATE TO BE FURNISHED IN ALL END SECTIONS UNLESS OTHERWISE NOTED.
6. DETAILS ON TABLE SHOWN ARE BASED UPON METAL PIPE. CONTRACTOR TO VERIFY DIMENSIONS FOR HDPE END SECTIONS. PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THIS ENGINEER.

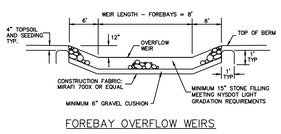




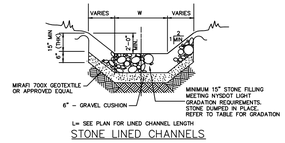
END SECTION W/ STONE LINED APRON



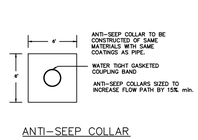
SPILLWAY SLOPES FOREBAY TO BASIN



FOREBAY OVERFLOW WEIRS



STONE LINED CHANNELS



ANTI-SEEP COLLAR

NOTES:
BASIN EMBANKMENT CONSTRUCTION:

1: EMBANKMENT MATERIAL SPECIFICATIONS: EMBANKMENT CORE AND CUT OFF TRENCH MATERIAL SHALL BE MATERIAL CONFORMING TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL WITH AT LEAST 30% PASSING #200 SIEVE. CORE AND CUT OFF TRENCH MATERIAL SHALL BE STOCKPILED SEPARATELY FROM OUTER SHELL MATERIAL. MATERIAL SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6-INCHES, FROZEN OR OTHER OBJECTIONABLE MATERIALS. STOCKPILED MATERIAL SHALL BE COVERED AND PROTECTED FROM WATER, TRAFFIC AND OTHER DELETERIOUS SUBSTANCES OR PROCESSES.

2: EMBANKMENT COMPACTION: EMBANKMENT FILL SHALL BE PLACED IN 12-INCH LIFTS MAXIMUM AND COMPACTED. THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 2% OF OPTIMUM. ALL COMPACTION TO BE DETERMINED BY AASHTO METHOD 99 STANDARD PROCTOR.

3: EMBANKMENT CORE DIMENSIONS: THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION COMPACTION EQUIPMENT, ROLLERS, OR TAMPS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. THE CORE SHALL BE CONSTRUCTED/PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

4: EMBANKMENT SURFACE: A 4-INCH LAYER OF TOPSOIL SHALL BE PLACED ON ENTIRE SURFACE AREA OF THE EMBANKMENT. GOOD GRASSED COVER SHALL BE ESTABLISHED BY SEEDING, LIMING, FERTILIZING, MULCHING, ETC. IN ACCORDANCE WITH NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. EMBANKMENT SHALL BE KEPT FREE OF WOODY PLANT GROWTH AND TREES.

STONE LINING FOR STORMWATER CONVEYANCE SECTIONS						
MIN. THICKNESS (THK)	STONE FILLING ITEM	V MAX[2] 2' DEPTH	SEE NOTES	STONE SIZE[1]	PERCENT OF TOTAL BY WEIGHT	MANNING'S ROUGHNESS COEFF "N"
9"	FINE	11.0 FPS	2,3,4	SMALLER THAN 8" LARGER THAN 3" SMALLER THAN NO. 10 SIEVE	90-100 50-100 0-10	0.0314
15"	LIGHT	13.0 FPS	2,3,4	LIGHTER THAN 100 LBS LARGER THAN 6" SMALLER THAN 1/2"	90-100 50-100 0-10	0.0352
18"	MEDIUM	15.5 FPS	2,3,4	HEAVIER THAN 100 LBS SMALLER THAN 4"	50-100 0-10	0.0395
30"	HEAVY	17.0 FPS	2,3,4	HEAVIER THAN 100 LBS SMALLER THAN 8"	50-100 0-10	0.0423

[1] SOURCE: HYDRAULIC ENGINEERING CIRCULAR NO. 15 DESIGN OF STABLE CHANNELS WITH FLEXIBLE LININGS
[2] SOURCE: SOILS DESIGN PROCEDURE SDP2, BANK AND CHANNEL PROTECTIVE LINING DESIGN PROCEDURES

NOTES:
1. STONE SIZES, OTHER THAN WEIGHTS, REFER TO THE AVERAGE OF THE MAXIMUM AND MINIMUM DIMENSIONS OF A STONE PARTICLE AS ESTIMATED BY THE ENGINEER.
2. MATERIALS SHALL CONTAIN LESS THAN 20 PERCENT OF STONES WITH A RATIO OF MAXIMUM TO MINIMUM DIMENSIONS GREATER THAN THREE.
3. AIR-COOLED BLAST FURNACE SLAG, COBBLES OR GRAVEL HAVING AT LEAST ONE FRACTURED FACE PER ACCEPTABLE SUBSTITUTES FOR STONE UNDER THESE ITEMS, PROVIDED THAT SOUNDNESS AND GRADATION REQUIREMENTS ARE MET.
4. MATERIALS SHALL CONTAIN A SUFFICIENT AMOUNT OF STONES SMALLER THAN THE AVERAGE STONE SIZE TO FILL THE SPACES BETWEEN THE STONES.

TYPICAL OUTLET, OVERFLOW, AND CHANNEL DETAILS

REFERENCE THE BASIN PLAN & SECTION SHEETS FOR ELEVATIONS, DIMENSIONS, LINES & GRADES

REVISIONS

No.	Date	SYM.	Description

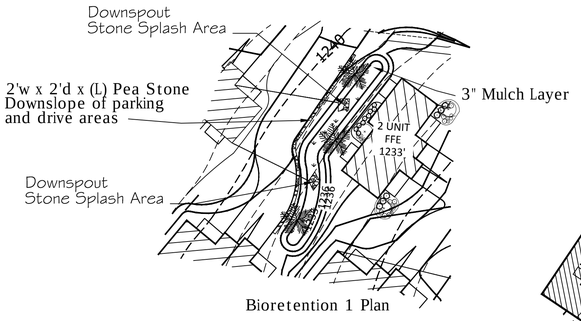
INFILTRATION BASIN SECTION

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

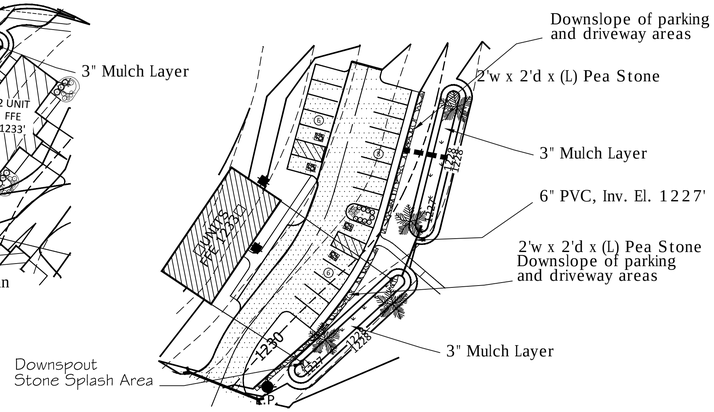
LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

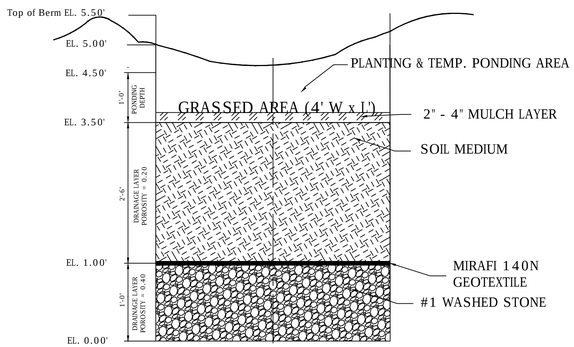
TIMOTHY C. BUHL, P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-9



Bioretention 1 Plan





BIORETENTION AREA, Typ

Bioretention Area Details				
Location	Bottom Length (ft)	Bottom Width (ft)	Bottom Surface Area (Sqft)	Floor of Practice El. (ft)
Bioretention Area 1	133	8	1068	1235.0
Bioretention Area 2	182	8	1446	1227.0
Bioretention Area 3	92	12	1156	1211.0
Bioretention Area 4	69	10	682	1201.0
Bioretention Area 5	69	10	682	1195.0

Bioretention Suggested Plantings - USDA Zone 5A	
SHRUBS	HERBACEOUS PLANTS
Witch Hazel Hamemelis viginiana	Cinnamon Fern Osmunda cinnamomea
Winterberry Ilex verticillata	Cutleaf Coneflower Rudbeckia laciniata
Arrowwood Viburnum dentatum	Woolgrass Scirpus cyperinus
Brook-side Alder Alnus serrulata	New England Aster Aster novae-angliae
Red-Osier Dogwood Cornus stolonifera	Fox Sedge Carex vulpinoidea
Sweet Pepperbush Clethra alrifolia	Spotted Joe-Pye Weed Eupatorium maculatum
	Switch Grass Panicum virgatum
	Great Blue Lobelia Lobelia siphatica
	Wild Bergamot Mondarda fistulosa
	Red Milkweed Ascelpias incarnata

Bioretention 3 Plan

Bioretention 4 Plan

Bioretention 5 Plan

Temporary Sediment Trap, All

NOTES ON INFILTRATION PRACTICES

Note 1: During the initial phase of construction, sediment traps shall be established using the same footprint AND surface area, as shown in these plans. A layer of Mirafi 140 N drainage fabric (or equal) shall be placed along the bottom of the traps to protect underlying soils from sediment during construction. Once soil disturbance has been completed and the site has achieved 80% germination, the traps shall be converted to bioretention areas by removing the fabric, cleaning out all accumulated sediment and then installing the engineered subgrade infiltration layers as shown in these plans.

SPECIFICATIONS FOR BIORETENTION SYSTEMS

Planting Soil

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of noxious weeds.

Planting soil shall be of a sandy loam consistency containing approximately 35-60% sand, 30-55% silt, and 10-25% clay.

Compaction

Minimize compaction of both the base of the bioretention area and the required backfill. Place soil in lifts 12" or great. Do not use heavy equipment within the bioretention area basin.

REVISIONS

No.	Date	SYM.	Description

BIORETENTION AREA DETAILS 2

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-10

Section 9.5.1 Alternative Stormwater Management Practices Rain Gardens

Description

The rain garden is a stormwater management practice to manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression. They are most commonly used in residential land use settings. The method is a variation on bioretention and combines physical filtering and adsorption with bio-geochemical processes to remove pollutants. Rain gardens are typically smaller than bioretention and are generally designed as a more passive filter system without an underdrain connected to the stormdrain system, although a gravel filter bed is recommended. Rainwater is directed into the garden from residential roof drains, driveways and other hard surfaces. The runoff temporarily ponds in the garden and seeps into the soil over several days. The system consists of an inflow component, a shallow ponding area over a planted soil bed, a mulch layer, a gravel filter chamber, plant materials consisting of attractive shrubs, grasses and flowers, and an overflow mechanism to convey larger rain events to the storm drain system (see Figure 1) or receiving waters.

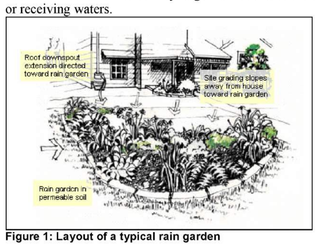


Figure 1: Layout of a typical rain garden

Recommended Application of the Practice

The rain garden is suitable for townhouse and single family residential applications where it is used to treat small storm runoff from residential rooftops, driveways, and sidewalks. Rain gardens can be utilized in residential redevelopment projects, including townhouse projects, and in some institutional settings such as schoolyard projects. Since rain gardens do not need to be tied directly into the stormdrain system, they can be used to treat areas that may be difficult to otherwise address due to inadequate head or other grading issues. Rain gardens are designed as an "exfilter," allowing rainwater to slowly seep through the soil. They have a prepared soil mix and should be designed with a deeper gravel chamber to improve treatment volume, and to compensate for clays and fines washing into the area. They are typically 150 - 300 square feet for a residential area. Rain gardens can be integrated into a site with a high degree of flexibility and work well in combination with other structural management systems, including porous pavement, infiltration trenches, and swales.

Benefits

Rain gardens can have many benefits when applied to redevelopment and infill projects in urban settings. The most notable include:

- Effective pollutant treatment for residential rooftops and driveways, including solids, metals, nutrients and hydrocarbons
- Groundwater recharge augmentation
- Micro-scale habitat
- Aesthetic improvement to turfgrass or otherwise hard urban surfaces (Figure 2)
- Ease of maintenance, coupling routine landscaping maintenance with effective stormwater management control
- Promotion of watershed education and stewardship

Figure 2: Rain gardens also have aesthetic value.

Feasibility/Limitations

Rain gardens have some limitations, similar to bioretention, that restrict their application. The most notable of these include:

- Steep slopes. Rain gardens require relatively flat slopes to be able to accommodate runoff filtering through the system. Some design modifications can address this constraint through the use of berms and timber or block retaining walls on moderate slopes.
- Compacted and clay soils. Soils compacted by construction and heavy clay soils need more augmentation than sandy soils, though all soils should be prepared to specification. In compacted soils and clay, additional excavation is necessary, along with a gravel bed and, under some circumstances, an underdrain system.
- A single rain garden system should be designed to receive sheet flow runoff or shallow concentrated flow from an impervious area or from a roof drain downspout with a drainage area equal to or less than 1,000 square feet. Because the system works by filtration through a planting media, runoff must enter at the surface.
- The rain garden must be sited in a location that allows overflow from the area to sheet flow or be otherwise safely conveyed to the formal drainage system. Rain gardens should be located downgradient and at least 10 feet from basement foundations.
- Rain gardens require a modest land area to effectively capture and treat residentialrunoff from storms up to approximately the 1-inch precipitation event.
- Rain gardens should not be located in areas with heavy tree cover, as the root systems will make installation difficult and may be damaged by the excavation.

Sizing and Design Guidance

Stormwater quantity reduction in rain gardens occurs via evaporation, transpiration, and infiltration, though only the infiltration capacity of the soil and drainage system is considered for water quality sizing. The storage volume of a rain garden is achieved within the gravel bed, soil medium and ponding area above the bed. The size should be determined using the water quality volume (WQv), where the site area is the impervious area draining to the rain garden. The following sizing criteria should be followed to arrive at the surface area of the rain garden, based on the required WQv:

$WQv \leq V_{SM} + V_{DL} + (D_P \times A_{RG})$

$V_{SM} = A_{RG} \times D_{SM} \times n_{SM}$

$V_{DL}(\text{optional}) = A_{RG} \times D_{DL} \times n_{DL}$

where:

V_{SM} = volume of the soil media [cubic feet]
V_{DL} = volume of the drainage layer [cubic feet]
A_{RG} = rain garden surface area [square feet]
D_{SM} = depth of the soil media, typically 1.0 to 1.5 feet [feet]
D_{DL} = depth of the drainage layer, typically .05 to 1.0 feet [feet]
D_P = depth of ponding above surface, maximum 0.5 feet [feet]
n_{SM} = porosity of the soil media (≥20%)
n_{DL} = porosity of the drainage layer (≥40%)
WQv = Water Quality Volume [cubic feet], as defined in Chapter 4 of the New York Stormwater Management Design Manual

A simple example for sizing rain gardens based upon WQv is presented in Table 1.

Table 1: Rain Garden Simple Sizing Example

Given a 1,000 square foot impervious drainage area (e.g., rooftop), a rain garden design has been proposed with a 200 square foot surface area, a soil layer depth of 12 inches, a drainage layer depth of 6 inches, and an allowable ponding depth of 3 inches. Evaluate if the proposed rain garden design satisfies site WQv requirements

Step 1: Calculate water quality volume using the following equation:

$$WQv = \frac{(P)(Rv)(A)}{12}$$

where:

P = 90% rainfall number = 0.9 in

Rv = 0.05+0.009 (I) = 0.05+0.009(100) = 0.95

I = Percentage impervious area draining to site = 100%

A = Area draining to practice (treatment area) = 1,000 ft²

$$WQv = \frac{(0.9)(0.95)(1{,}000)}{12} \qquad WQv = 71.25\ ft^3$$

Step 2: Solve for drainage layer and soil media storage volume:

$V_{SM} = A_{RG} \times D_{SM} \times P_{SM}$

$V_{DL} = A_{RG} \times D_{DL} \times P_{DL}$

where:
A_{RG} = proposed rain garden surface area = 200 ft²

D_{SM} = depth soil media = 12 inches = 1.0 ft

D_{DL} = depth drainage layer = 6 inches = 0.5 ft

P_{SM} = porosity of soil media = 0.20

P_{DL} = porosity of drainage layer = 0.40

V_{SM} = 200 ft² x 1.0 ft x 0.20 = 40 ft³

V_{DL} = 200 ft² x 0.5 ft x 0.40 = 40 ft³

D_P = ponding depth = 3 inches = 0.25 ft

$WQv \leq V_{SM} + V_{DL} + (D_P \times A_{RG}) = 40\ ft^3 + 40\ ft^3 + (0.25\ ft \times 200\ ft^2)$

WQv = 71.25 ft³ ≤ 130.0 ft³, OK
Therefore, the proposed design for treating an area of 1,000 ft² satisfies the WQv requirements .

Siting Rain gardens should be located within approximately 30 feet of the downspout or impervious area treated. Rooftop conveyance to the rain garden is through roof leaders directed to the area, with stone or splash blocks placed at the point of discharge into the rain garden to prevent erosion. Runoff from driveways and other paved surfaces should be directed to the rain garden at a non-erosive rate through shallow swales, or allowed to sheet flow across short distances (Figure 3).

Sizing The following considerations should be given to design of the rain garden (after PA Stormwater Design Manual, Bannerman 2003 and LID Center):

Figure 3: This rain garden treats road and driveway runoff.

- Ponding depth above the rain garden bed should not exceed 6 inches. The recommended maximum ponding depth of 6 inches provides surface storage of stormwater runoff, but is not too deep to affect plant health, safety, or create an environment of stagnant conditions. On perfectly flat sites, this depth is achieved through excavation of the rain garden and backfilling to the appropriate level; on sloping sites, this depth can be achieved with the use of a berm on the downslope edge, and excavation/backfill to the required level.
- Surface area is dependent upon storage volume requirements but should not exceed a maximum loading ratio of 5:1 (drainage area to infiltration area, where drainage area is assumed to be 100% impervious; to the extent that the drainage area is not 100% impervious, the loading ratio may be modified)
- A length to width ratio of 2:1, with the long axis perpendicular to the slope and flow path is recommended.

Soil The composition of the soil media should consist of 50% sand, 20-30% topsoil with less than 5% clay content, and 20-30% leaf compost. The depth of the amended soil should be approximately 4 inches below the bottom of the deepest root ball.
Construction Rain gardens should initially be dug out to a 24" depth, then backfilled with a 6 - 10 inch layer of clean washed gravel (approximately 1.5-2.0 inch diameter rock), and filled back to the rain garden bed depth with a certified soil mix.

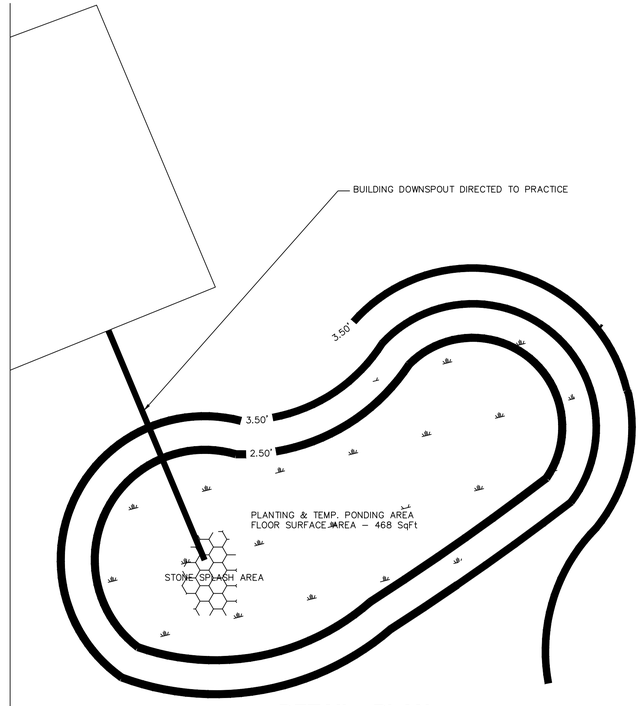
Table 2: Suggested Plant List

Shrubs	Herbaceous Plants
Witch Hazel *Hamemelis virginiana*	Cinnamon Fern *Osmunda cinnamomea*
Winterberry *Ilex verticillata*	Cutleaf Coneflower *Rudbeckia laciniata*
Arrowwood *Viburnum dentatum*	Woolgrass *Scirpus cyperinus*
Brook-side Alder *Alnus serrulata*	New England Aster *Aster novae-angliae*
Red-Osier Dogwood *Cornus stolonifera*	Fox Sedge *Carex vulpinoidea*
Sweet Pepperbush *Clethra alnifolia*	Spotted Joe-Pye Weed *Eupatorium maculatum*
	Switch Grass *Panicum virgatum*
	Great Blue Lobelia *Lobelia siphatica*
	Wild Bergamot *Monarda fistulosa*
	Red Milkweed *Asclepias incarnata*

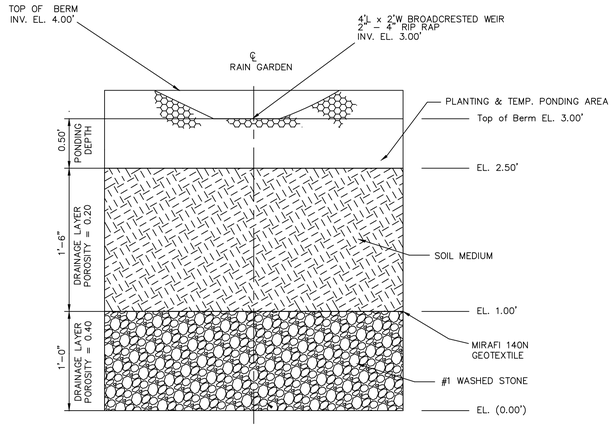
Adapted from NYSDM Bioretention Specifications, Bannerman, Brooklyn Botanic Garden.

Maintenance

Rain gardens are intended to be relatively low maintenance. Weeding and watering are essentialthe first year, and can be minimized with the use of a weed free mulch layer. Rain gardens should be treated as a component of the landscaping, with routine maintenance provided by the homeowner or homeowners' association, including the occasional replacement of plants, mulching, weeding and thinning to maintain the desired appearance. Homeowners and landscapers should be educated regarding the purpose of the rain garden, so the desirable aspects of ponded water are recognized and maintained.



DETAIL - PLAN
RAIN GARDEN
W/ UNDERDRAIN SYSTEM (Typ.)



DETAIL - CROSS SECTION
RAIN GARDEN
W/ UNDERDRAIN SYSTEM

REVISIONS

No.	Date	SYM.	Description

TYPICAL RAIN GARDEN DETAILS

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL, P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-11

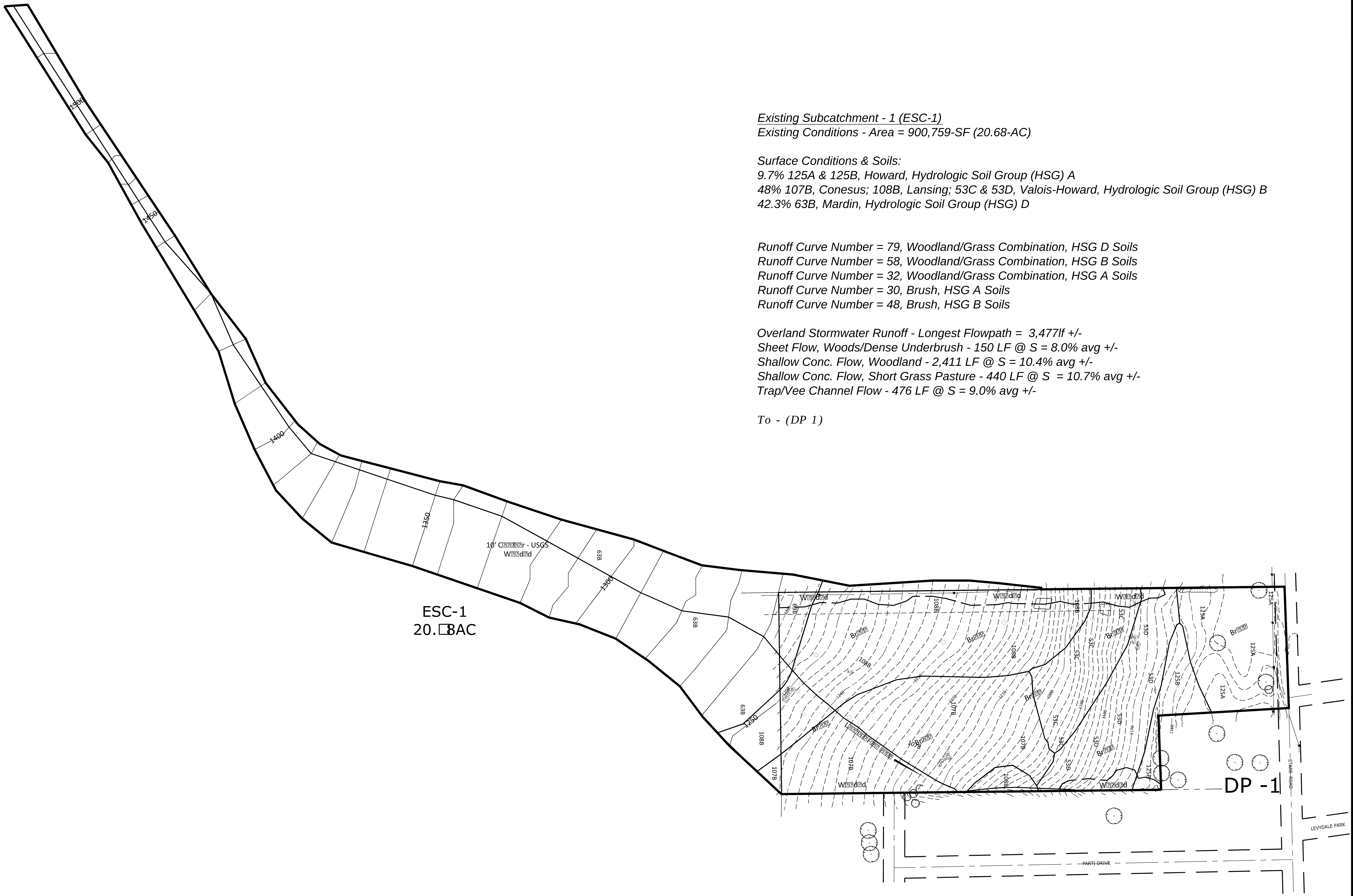
Existing Subcatchment - 1 (ESC-1)
Existing Conditions - Area = 900,759-SF (20.68-AC)

Surface Conditions & Soils:
9.7% 125A & 125B, Howard, Hydrologic Soil Group (HSG) A
48% 107B, Conesus; 108B, Lansing; 53C & 53D, Valois-Howard, Hydrologic Soil Group (HSG) B
42.3% 63B, Mardin, Hydrologic Soil Group (HSG) D

Runoff Curve Number = 79, Woodland/Grass Combination, HSG D Soils
Runoff Curve Number = 58, Woodland/Grass Combination, HSG B Soils
Runoff Curve Number = 32, Woodland/Grass Combination, HSG A Soils
Runoff Curve Number = 30, Brush, HSG A Soils
Runoff Curve Number = 48, Brush, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 3,477lf +/-
Sheet Flow, Woods/Dense Underbrush - 150 LF @ S = 8.0% avg +/-
Shallow Conc. Flow, Woodland - 2,411 LF @ S = 10.4% avg +/-
Shallow Conc. Flow, Short Grass Pasture - 440 LF @ S = 10.7% avg +/-
Trap/Vee Channel Flow - 476 LF @ S = 9.0% avg +/-

To - (DP 1)



REFERENCE HYDROCAD (HYDRAULIC & HYDROLOGIC) MODELING RESULTS PRESENTED WITH THESE PLANS
EXISTING CONDITIONS

REVISIONS

No.	Date	SYM.	Description

HYDROLOGIC AND HYDRAULIC WOR□SHEET - EXISTING COND.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

STATE OF NEW YORK · LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL, P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-12

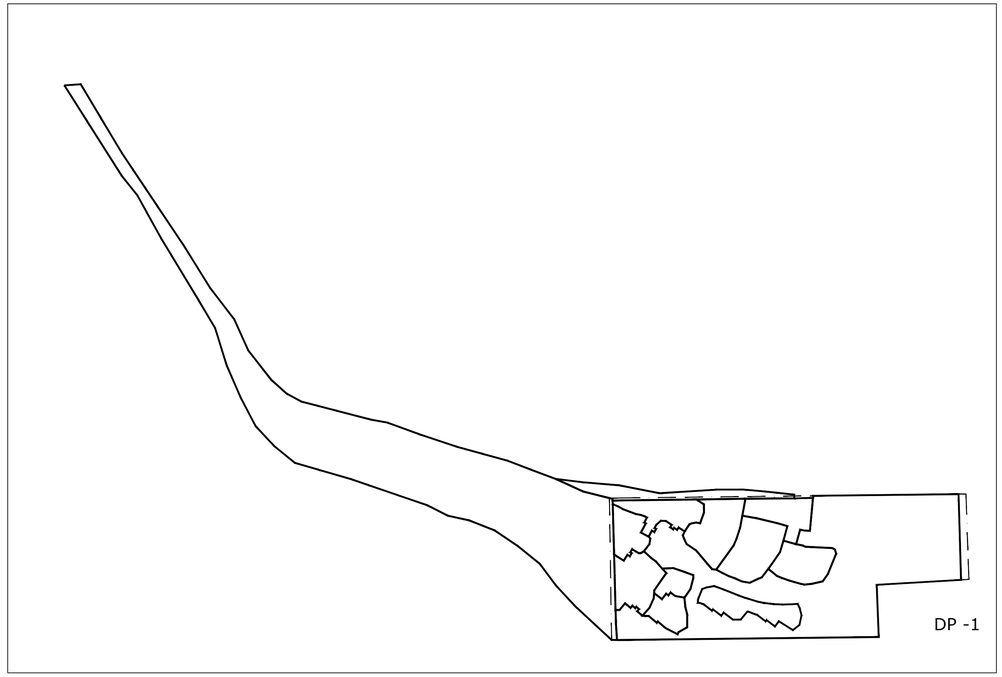
Off-Site Subcatchment - 1 (OSC-1)
Proposed Conditions - Area = 383,171SF (8.80-AC)

Surface Conditions & Soils:
100.0% 63B, Mardin, Hydrologic Soil Group (HSG) D

Runoff Curve Number = 79, Woodland/Grass Combination, HSG D Soils

Overland Stormwater Runoff - Longest Flowpath = 2,768 lf +/-
Sheet Flow, Woods/Dense Underbrush - 150 LF @ S = 8.0% avg +/-
Shallow Conc. Flow, Woodland - 2,350LF @ S = 10.4% avg +/-
Trap/Vee Channel Flow - 268LF @ S = 6.0% avg +/-

To - (DP 1)



Off-Site Subcatchment - 2 (OSC-2)
Proposed Conditions - Area = 22,679 SF (0.52-AC)

Surface Conditions & Soils:
37% 63B, Mardin, Hydrologic Soil Group (HSG) D
63% 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 79, Woodland/Grass Combination, HSG D Soils
Runoff Curve Number = 48, Brush, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 709 lf +/-
Sheet Flow, Woods/Dense Underbrush - 100 LF @ S = 8.0% avg +/-
Trap/Vee Channel Flow - 609LF @ S = 7.6% avg +/-

To - (DP 1)

DP -1

REFERENCE HYDROCAD (HYDRAULIC & HYDROLOGIC) MODELING RESULTS PRESENTED WITH THESE PLANS
PROPOSED OFF-SITE WATERSHED CONDITIONS

REVISIONS

No.	Date	SYM.	Description

HYDROLOGIC AND HYDRAULIC WORKSHEET - PROPOSED COND. 1

STARR RD. RESIDENTIAL PUD
STARR ROAD
CORTLANDVILLE (T) N.Y.

LEONIDAS GRP. OF VIRGIL, LLC
5 SOUTH ST.-PO BOX 1107
DRYDEN, N.Y. 13053

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD. LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-13

Proposed Subcatchment - 1 (PSC-1)
Proposed Conditions - Area = 20,935 SF (0.48-AC)

Surface Conditions & Soils:
9% 63B, Mardin, Hydrologic Soil Group (HSG) D
91% 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 73, Dense Grass, HSG D Soils
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 271 lf +/-
Sheet Flow - Dense Grass, 100 LF @ S = 9.0% avg +/-
Shallow Conc. Flow - Grassed Waterway, 171LF @ S = 5.3% avg +/-

To - (DP 1)

Proposed Subcatchment - 2 (PSC-2)
Proposed Conditions - Area = 15,616 SF (0.36-AC)

Surface Conditions & Soils:
39% 63B, Mardin, Hydrologic Soil Group (HSG) D
61% 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 73, Brush, HSG D Soils
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 114 lf +/-
Sheet Flow - Short Grass, 100 LF @ S = 9.5% avg +/-
Shallow Conc. Flow - Grassed Waterway, 14LF @ S = 6% avg +/-

To - (DP 1)

Proposed Subcatchment - 3 (PSC-3)
Proposed Conditions - Area = 25,151 SF (0.58-AC)

Surface Conditions & Soils:
0.5% 63B, Mardin, Hydrologic Soil Group (HSG) D
99.5% 107B, Conesus; 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 80, Grass Cover >75%, HSG D Soils
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 165 lf +/-
Sheet Flow - Short Grass, 100 LF @ S = 9.5% avg +/-
Shallow Conc. Flow - Grassed Waterway, 65LF @ S = 7.7% avg +/-

To - (DP 1)

Proposed Subcatchment - 4 (PSC-4)
Proposed Conditions - Area = 8,943 SF (0.21-AC)

Surface Conditions & Soils:
100% 107B, Conesus; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 82 lf +/-
Sheet Flow - Short Grass, 100 LF @ S = 7.0% avg +/-

To - (DP 1)

Proposed Subcatchment - 5 (PSC-5)
Proposed Conditions - Area = 12,665 SF (0.29-AC)

Surface Conditions & Soils:
100% 107B, Conesus; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 115 lf +/-
Sheet Flow - Short Grass, 51 LF @ S = 8.8% avg +/-
Sheet Flow - Smooth Surfaces, 25 LF @ S = 1.0% avg +/-
Sheet Flow - Short Grass, 24 LF @ S = 4.0% avg +/-
Shallow Conc. Flow - Grassed Waterway, 15 LF @ S = 5.0% avg. +/-

To - (DP 1)

Proposed Subcatchment - 6 (PSC-6)
Proposed Conditions - Area = 29,924 SF (0.69-AC)

Surface Conditions & Soils:
100% 107B, Conesus; 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 152 lf +/-
Sheet Flow - Short Grass, 90 LF @ S = 12.2% avg +/-
Shallow Conc. Flow - Pavement, 62LF @ S = 4.8% avg +/-

To - (DP 1)

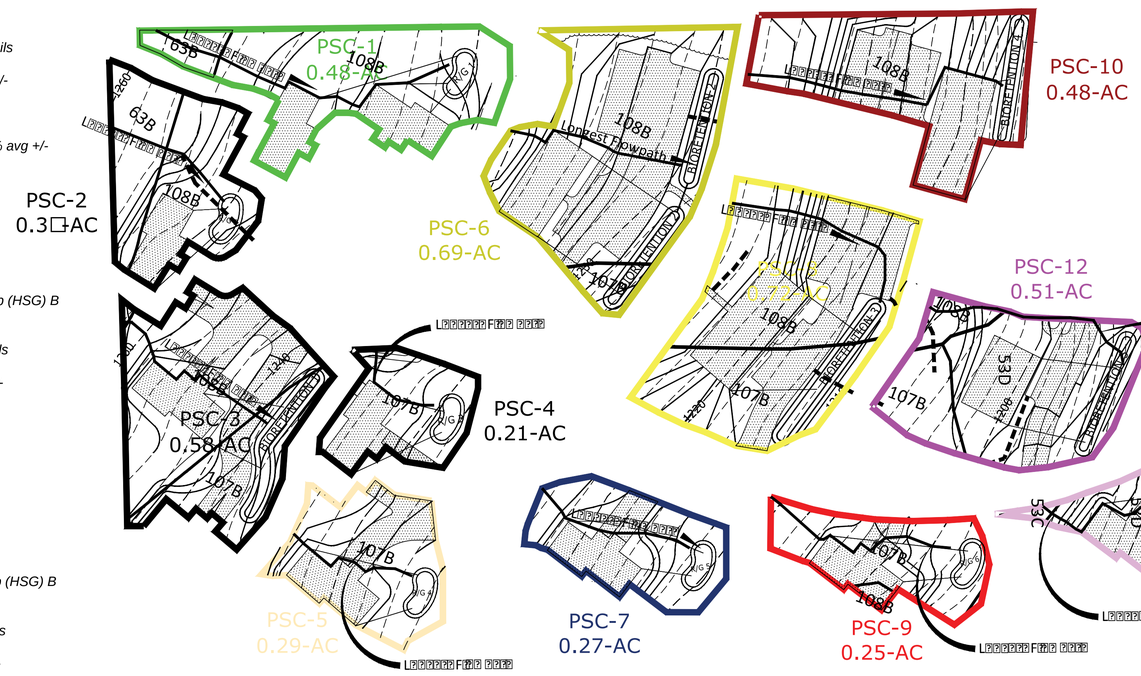
Proposed Subcatchment - 7 (PSC-7)
Proposed Conditions - Area = 11,807 SF (0.27-AC)

Surface Conditions & Soils:
100% 107B, Conesus; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 137 lf +/-
Sheet Flow - Short Grass, 60 LF @ S = 8.3% avg +/-
Sheet Flow - Smooth Surfaces, 29 LF @ S = 1.0% avg +/-
Sheet Flow - Short Grass, 11 LF @ S = 20.0% avg +/-
Shallow Conc. Flow - Grassed Waterway 37LF @ S = 8.1% avg +/-

To - (DP 1)



Proposed Subcatchment - 8 (PSC-8)
Proposed Conditions - Area = 31,189 SF (0.72-AC)

Surface Conditions & Soils:
100% 107B, Conesus; 108B, Lansing; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 174 lf +/-
Sheet Flow - Short Grass, 77 LF @ S = 18.1% avg +/-
Sheet Flow - Smooth Surfaces, 23 LF @ S = 1.0% avg +/-
Shallow Conc. Flow - Paved 74F @ S = 2.0avg +/-

To - (DP 1)

Proposed Subcatchment - 9 (PSC-9)
Proposed Conditions - Area = 10,873SF (0.25-AC)

Surface Conditions & Soils:
100% 107B, Conesus; 108B, Lansing; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 177 lf +/-
Sheet Flow - Short Grass, 100 LF @ S = 6.0% avg +/-
Shallow Conc. Flow - Paved 29LF @ S = 6.9% avg +/-
Shallow Conc. Flow - Grassed Waterway, 48 LF @ S = 8.3% avg +/-

To - (DP 1)

Proposed Subcatchment - 10 (PSC-10)
Proposed Conditions - Area = 20,980SF (0.48-AC)

Surface Conditions & Soils:
100% 108B, Lansing; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 233 lf +/-
Sheet Flow - Short Grass, 77 LF @ S = 18.1% avg +/-
Sheet Flow - Smooth Surfaces 23 LF @ S = 4.0% avg +/-
Shallow Conc. Flow - Paved, 54 LF @ S = 3.7% avg +/-
Shallow Conc. Flow - Grassed Waterway, 79LF @ S = 15.1% avg +/-

To - (DP 1)

Proposed Subcatchment - 11 (PSC-11)
Proposed Conditions - Area = 10,429 SF (0.24-AC)

Surface Conditions & Soils:
100% 53C and D, Valois-Howard; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 153 lf +/-
Sheet Flow - Short Grass, 94 LF @ S = 10.6% avg +/-
Shallow Conc. Flow - Paved, 37 LF @ S = 8.1% avg +/-
Shallow Conc. Flow - Grassed Waterway, 22LF @ S = 13.6% avg +/-

To - (DP 1)

Proposed Subcatchment - 12 (PSC-12)
Proposed Conditions - Area = 22,163 SF (0.51-AC)

Surface Conditions & Soils:
100% 53D, Valois-Howard; 107B, Conesus; 108B, Lansing ; Hydrologic Soil Group (HSG) B

Runoff Curve Number = 98, Rooftops/Impervious
Runoff Curve Number = 61, Grass Cover >75%, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 185 lf +/-
Sheet Flow - Short Grass, 94 LF @ S = 10.6% avg +/-
Shallow Conc. Flow - Paved, 50 LF @ S = 4.0% avg +/-
Shallow Conc. Flow - Grassed Waterway, 41LF @ S = 9.7% avg +/-

To - (DP 1)

DP -1

REFERENCE HYDROCAD (HYDRAULIC & HYDROLOGIC) MODELING RESULTS PRESENTED WITH THESE PLANS
PROPOSED ON-SITE CONDITIONS

REVISIONS

No.	Date	SYM.	Description

HYDROLOGIC AND HYDRAULIC WORKSHEET - PROPOSED COND. 2

STARR RD. RESIDENTIAL PUD
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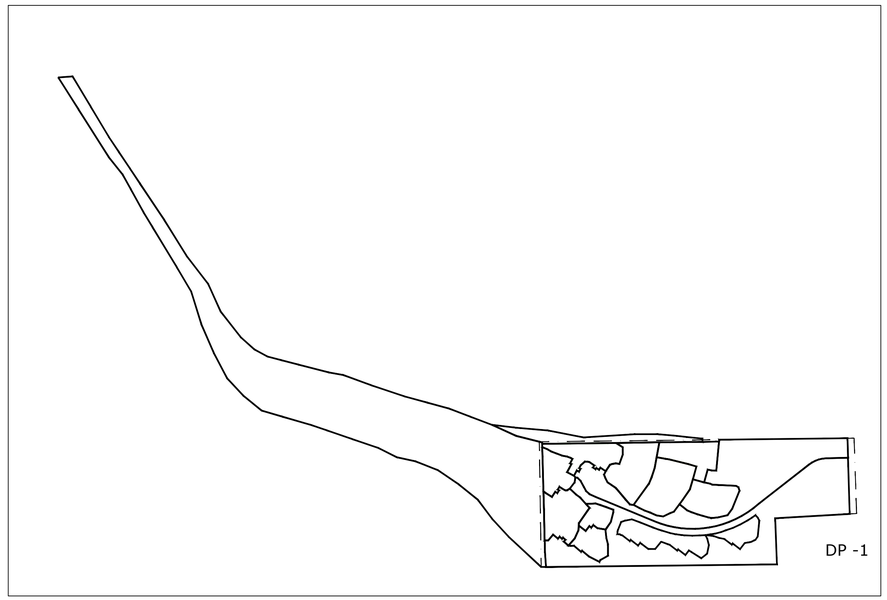
STATE OF NEW YORK · TIMOTHY C. BUHL · LICENSED PROFESSIONAL ENGINEER

TIMOTHY C. BUHL,P.E.
GOODRICH HILL ROAD, LOCKE N.Y. 13092 607 423-1919

DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-14



Proposed Subcatchment - 13 (PSC-13)
Proposed Conditions - Area = 113,779-SF (2.61AC)

Surface Conditions & Soils:
20% 125A & 125B, Howard, Hydrologic Soil Group (HSG) A
80% 107B, Conesus; 108B, Lansing; 53C & 53D,
Valois-Howard, Hydrologic Soil Group (HSG) B

Runoff Curve Number = 61, >75% Grass, HSG B Soils
Runoff Curve Number = 39, >75% Grass, HSG A Soils
Runoff Curve Number = 98, Impervious, HSG A Soils
Runoff Curve Number = 98, Impervious, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 1,100lf +/-
Sheet Flow, Short Grass - 100 LF @ S = 5.0% avg +/-
Shallow Conc. Flow, Grassed Waterway - 112 LF @ S = 8.0% avg +/-
Shallow Conc. Flow, Grassed Waterway - 37 LF @ S = 13.5% avg +/-
Trap/Vee Channel Flow - 107 LF @ S = 11.2% avg +/-
Circular Pipe 15" - 54 LF @ S = 5.5% avg +/-
Trap/Vee Channel Flow - 155LF @ S = 8.4% avg +/-
Circular Pipe 18" - 48 LF @ S = 10.4% avg +/-
Trap/Vee Channel Flow - 290 LF @ S = 9.7% avg +/-
Circular Pipe 18" - 48 LF @ S = 4.2% avg +/-
Trap/Vee Channel Flow - 144 @ S = 2.7% avg +/-

To - (DP 1)

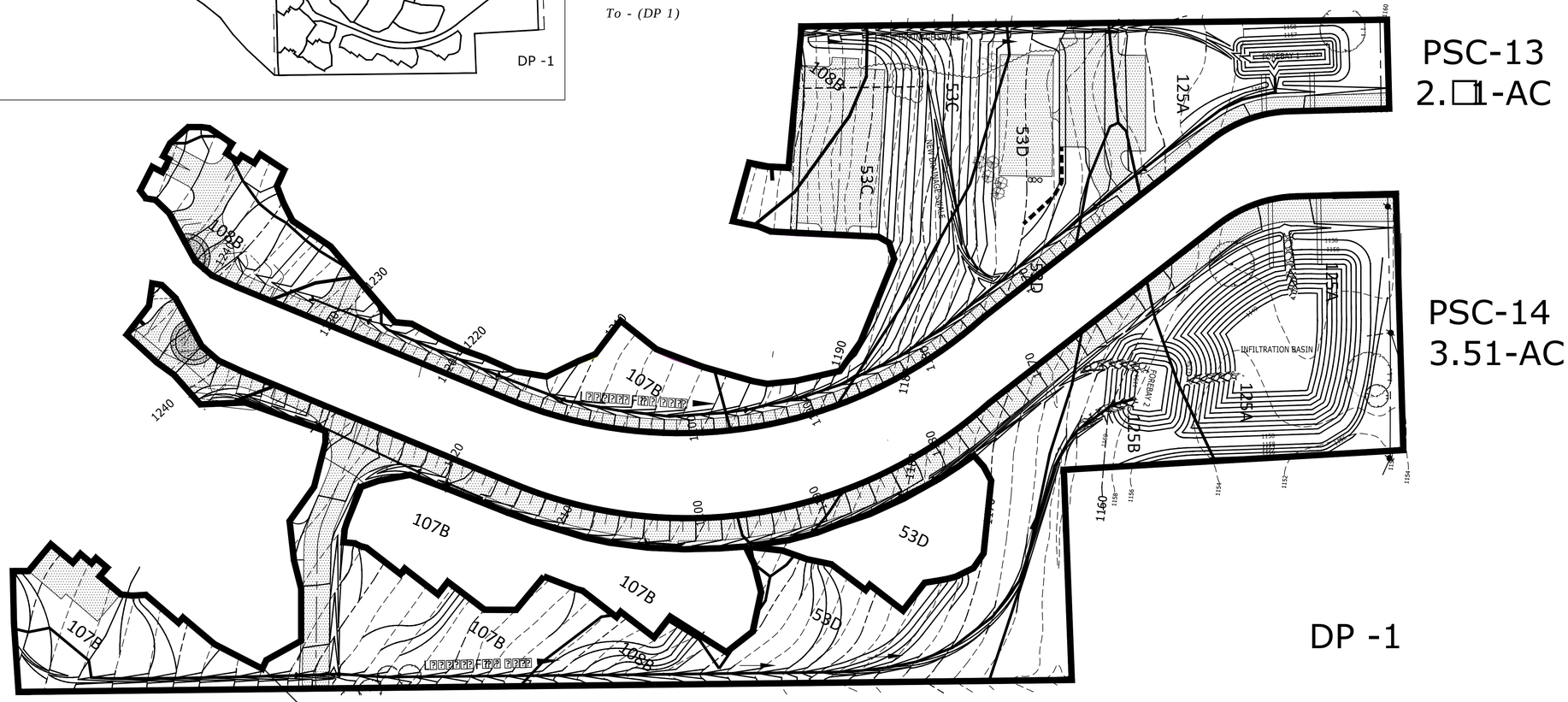
Proposed Subcatchment - 14 (PSC-14)
Proposed Conditions - Area = 153,054-SF (3.51AC)

Surface Conditions & Soils:
36.5% 125A & 125B, Howard, Hydrologic Soil Group (HSG) A
63.5% 107B, Conesus; 108B, Lansing; 53C & 53D, Valois-Howard, Hydrologic Soil Group (HSG) B

Runoff Curve Number = 61, >75% Grass, HSG B Soils
Runoff Curve Number = 39, >75% Grass, HSG A Soils
Runoff Curve Number = 98, Impervious, HSG A Soils
Runoff Curve Number = 98, Impervious, HSG B Soils

Overland Stormwater Runoff - Longest Flowpath = 1,087lf +/-
Sheet Flow, Short Grass - 86LF @ S = 9.3% avg +/-
Trap/Vee Channel Flow - 177 LF @ S = 8.5% avg +/-
Circular Pipe 24" - 32 LF @ S = 9.0% avg +/-
Trap/Vee Channel Flow - 792LF @ S = 7.6% avg +/-

To - (DP 1)



REFERENCE HYDROCAD (HYDRAULIC & HYDROLOGIC) MODELING RESULTS PRESENTED WITH THESE PLANS
PROPOSED ON-SITE CONDITIONS

REVISIONS

No.	Date	SYM.	Description

HYDROLOGIC AND HYDRAULIC WORK□SHEET - PROPOSED COND. 3

STARR RD. RESIDENTIAL PUD
STARR ROAD
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TIMOTHY C. BUHL,P.E.
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DATE: FEB 2□ 2018
SCALE: N.T.S.
DRAWN: MB□LB
JOB: 17-14
SHEET: ST-15