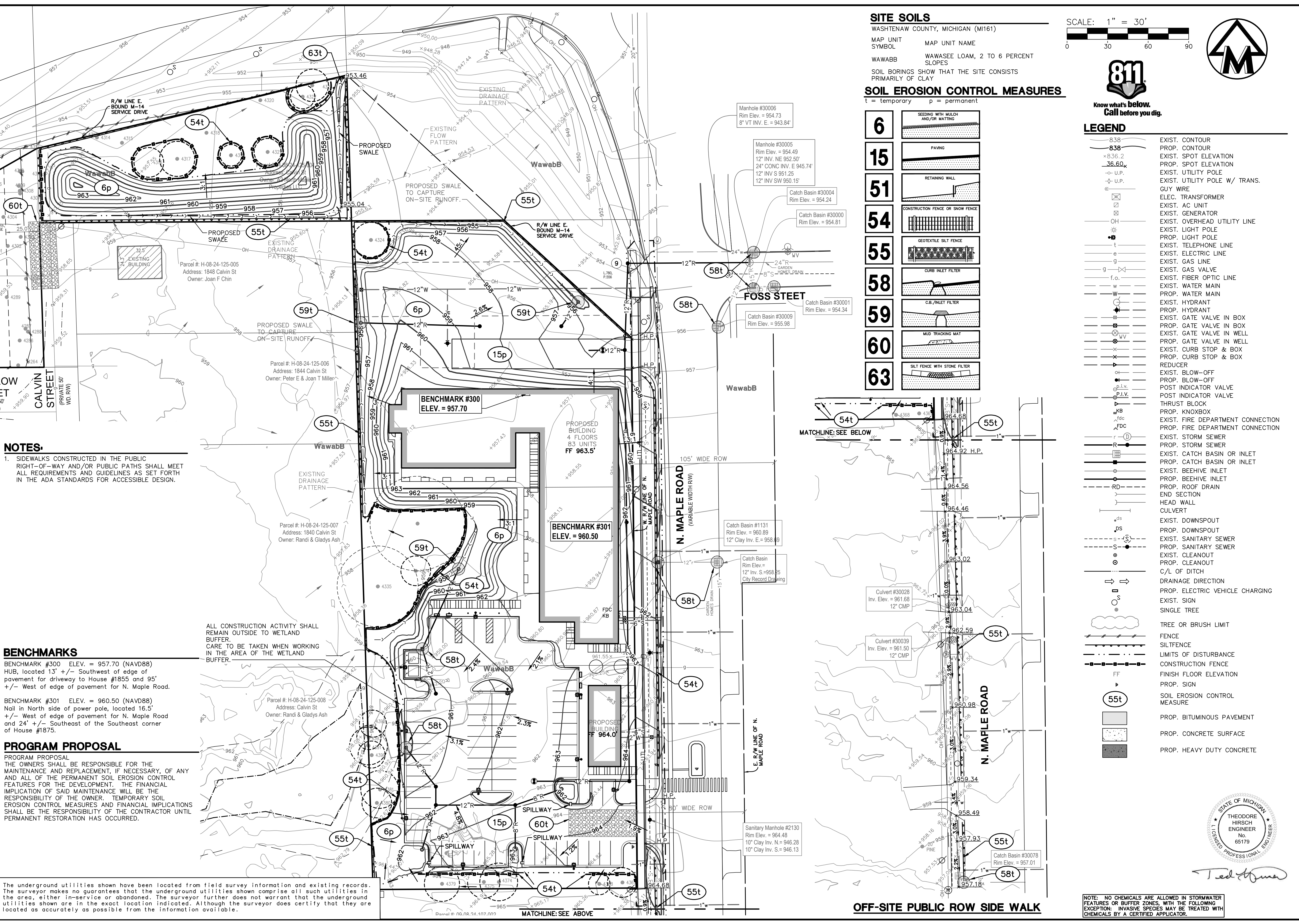


M:\CIVIL\2022\21147\Site Plan\21147_Site Plan.mxd, 7/27/2022 3:34 PM, Ted P. Hirsch, C.I.O. GRADING AND SECC PLAN, MCLLC PDF.dwg
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NOTES:

- SIDEWALKS CONSTRUCTED IN THE PUBLIC RIGHT-OF-WAY AND/OR PUBLIC PATHS SHALL MEET ALL REQUIREMENTS AND GUIDELINES AS SET FORTH IN THE ADA STANDARDS FOR ACCESSIBLE DESIGN.

BENCHMARKS

BENCHMARK #300 ELEV. = 957.70 (NAVD88)
 HUB, located 13' +/- Southwest of edge of pavement for driveway to House #1855 and 95' +/- West of edge of pavement for N. Maple Road.

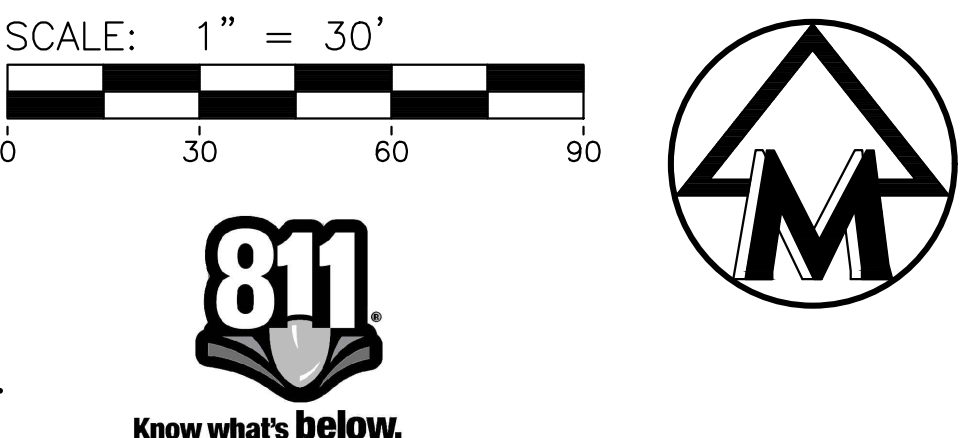
BENCHMARK #301 ELEV. = 960.50 (NAVD88)
 Nail in North side of power pole, located 16.5' +/- West of edge of pavement for N. Maple Road and 24' +/- Southeast of the Southeast corner of House #1875.

PROGRAM PROPOSAL

PROGRAM PROPOSAL
 THE OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REPLACEMENT, IF NECESSARY, OF ANY AND ALL OF THE PERMANENT SOIL EROSION CONTROL FEATURES FOR THE DEVELOPMENT. THE FINANCIAL IMPLICATION OF SAID MAINTENANCE WILL BE THE RESPONSIBILITY OF THE OWNER. TEMPORARY SOIL EROSION CONTROL MEASURES AND FINANCIAL IMPLICATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNTIL PERMANENT RESTORATION HAS OCCURRED.

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

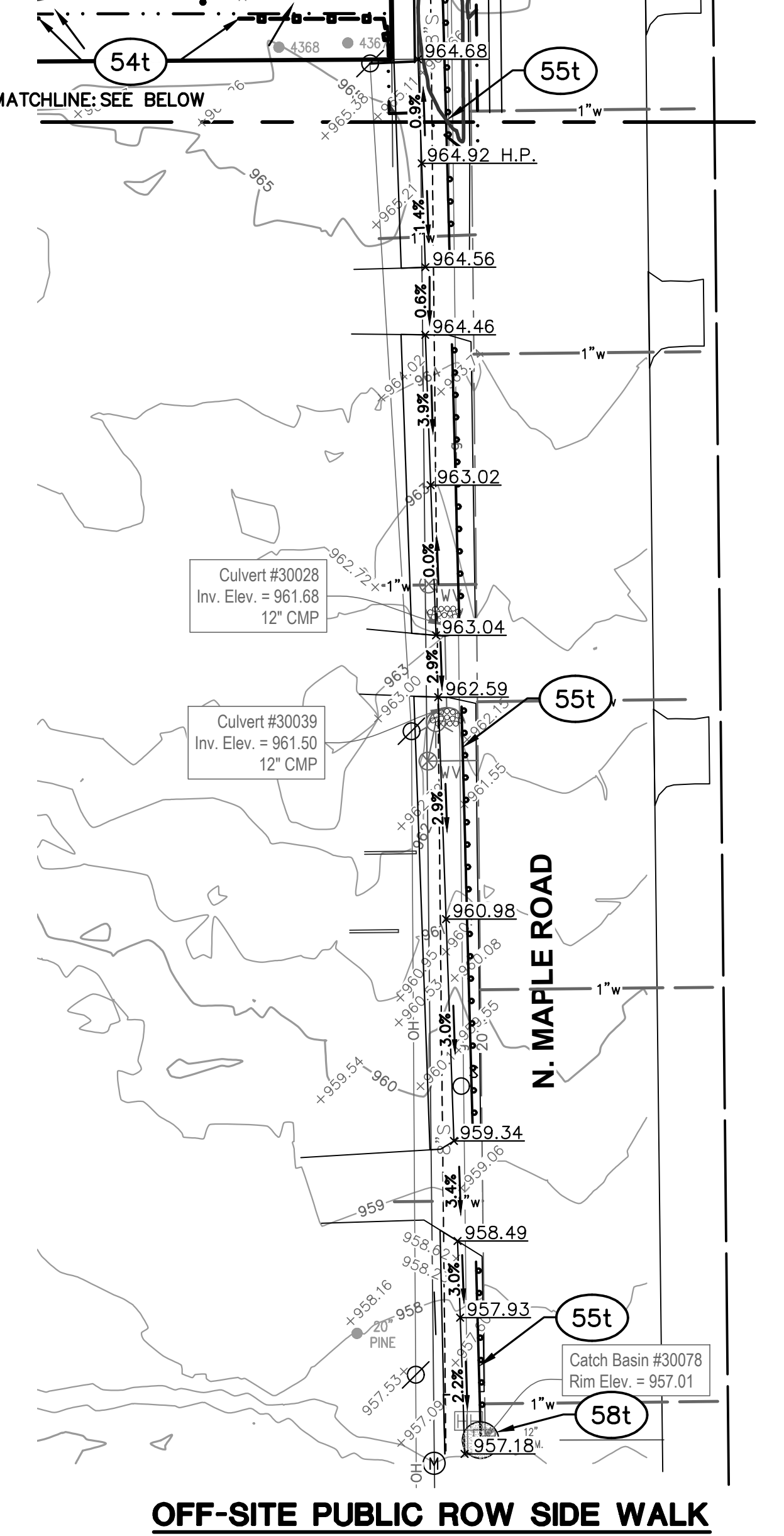
SITE SOILS
 WASHTENAW COUNTY, MICHIGAN (M161)
 MAP UNIT SYMBOL MAP UNIT NAME
 WAWABB WAWASEE LOAM, 2 TO 6 PERCENT SLOPES
 SOIL BORINGS SHOW THAT THE SITE CONSISTS PRIMARILY OF CLAY
SOIL EROSION CONTROL MEASURES
 t = temporary p = permanent



6	SEEDING WITH MULCH AND/OR MATTING
15	PAVING
51	RETAINING WALL
54	CONSTRUCTION FENCE OR SNOW FENCE
55	GEOTEXTILE SILT FENCE
58	CURB INLET FILTER
59	C.B./INLET FILTER
60	MUD TRACKING MAT
63	SILT FENCE WITH STONE FILTER

LEGEND

838	EXIST. CONTOUR
838	PROP. CONTOUR
836.2	EXIST. SPOT ELEVATION
36.80	PROP. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
U.P.	EXIST. UTILITY POLE W/ TRANS.
GUY WIRE	GUY WIRE
ELEC. TRANSFORMER	ELEC. TRANSFORMER
EXIST. AC UNIT	EXIST. AC UNIT
EXIST. GENERATOR	EXIST. GENERATOR
EXIST. OVERHEAD UTILITY LINE	EXIST. OVERHEAD UTILITY LINE
EXIST. LIGHT POLE	EXIST. LIGHT POLE
PROP. LIGHT POLE	PROP. LIGHT POLE
EXIST. TELEPHONE LINE	EXIST. TELEPHONE LINE
EXIST. ELECTRIC LINE	EXIST. ELECTRIC LINE
EXIST. GAS LINE	EXIST. GAS LINE
EXIST. GAS VALVE	EXIST. GAS VALVE
EXIST. FIBER OPTIC LINE	EXIST. FIBER OPTIC LINE
EXIST. WATER MAIN	EXIST. WATER MAIN
PROP. WATER MAIN	PROP. WATER MAIN
EXIST. HYDRANT	EXIST. HYDRANT
PROP. HYDRANT	PROP. HYDRANT
EXIST. GATE VALVE IN BOX	EXIST. GATE VALVE IN BOX
PROP. GATE VALVE IN BOX	PROP. GATE VALVE IN BOX
EXIST. GATE VALVE IN WELL	EXIST. GATE VALVE IN WELL
EXIST. CURB STOP & BOX	EXIST. CURB STOP & BOX
PROP. CURB STOP & BOX	PROP. CURB STOP & BOX
REDUCER	REDUCER
EXIST. BLOW-OFF	EXIST. BLOW-OFF
PROP. BLOW-OFF	PROP. BLOW-OFF
POST INDICATOR VALVE	POST INDICATOR VALVE
POST INDICATOR VALVE	POST INDICATOR VALVE
THRUST BLOCK	THRUST BLOCK
PROP. KNOXBOX	PROP. KNOXBOX
EXIST. FIRE DEPARTMENT CONNECTION	EXIST. FIRE DEPARTMENT CONNECTION
PROP. FIRE DEPARTMENT CONNECTION	PROP. FIRE DEPARTMENT CONNECTION
EXIST. STORM SEWER	EXIST. STORM SEWER
PROP. STORM SEWER	PROP. STORM SEWER
EXIST. CATCH BASIN OR INLET	EXIST. CATCH BASIN OR INLET
PROP. CATCH BASIN OR INLET	PROP. CATCH BASIN OR INLET
EXIST. BEEHIVE INLET	EXIST. BEEHIVE INLET
PROP. BEEHIVE INLET	PROP. BEEHIVE INLET
PROP. ROOF DRAIN	PROP. ROOF DRAIN
END SECTION	END SECTION
HEAD WALL	HEAD WALL
CULVERT	CULVERT
EXIST. DOWNSPOUT	EXIST. DOWNSPOUT
PROP. DOWNSPOUT	PROP. DOWNSPOUT
EXIST. SANITARY SEWER	EXIST. SANITARY SEWER
PROP. SANITARY SEWER	PROP. SANITARY SEWER
EXIST. CLEANOUT	EXIST. CLEANOUT
PROP. CLEANOUT	PROP. CLEANOUT
C/L OF DITCH	C/L OF DITCH
DRAINAGE DIRECTION	DRAINAGE DIRECTION
PROP. ELECTRIC VEHICLE CHARGING	PROP. ELECTRIC VEHICLE CHARGING
EXIST. SIGN	EXIST. SIGN
SINGLE TREE	SINGLE TREE
TREE OR BRUSH LIMIT	TREE OR BRUSH LIMIT
FENCE	FENCE
SILT FENCE	SILT FENCE
LIMITS OF DISTURBANCE	LIMITS OF DISTURBANCE
CONSTRUCTION FENCE	CONSTRUCTION FENCE
FINISH FLOOR ELEVATION	FINISH FLOOR ELEVATION
PROP. SIGN	PROP. SIGN
SOIL EROSION CONTROL MEASURE	SOIL EROSION CONTROL MEASURE
PROP. BITUMINOUS PAVEMENT	PROP. BITUMINOUS PAVEMENT
PROP. CONCRETE SURFACE	PROP. CONCRETE SURFACE
PROP. HEAVY DUTY CONCRETE	PROP. HEAVY DUTY CONCRETE



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 A2 NORTH MAPLE PROPERTIES LLC
 2370 E. STADIUM BLVD. # 305
 ANN ARBOR, MI 48104
 JEFF WILKERSON
 (989) 529-5858

NORTH MAPLE APARTMENTS
 GRADING AND SECC PLAN

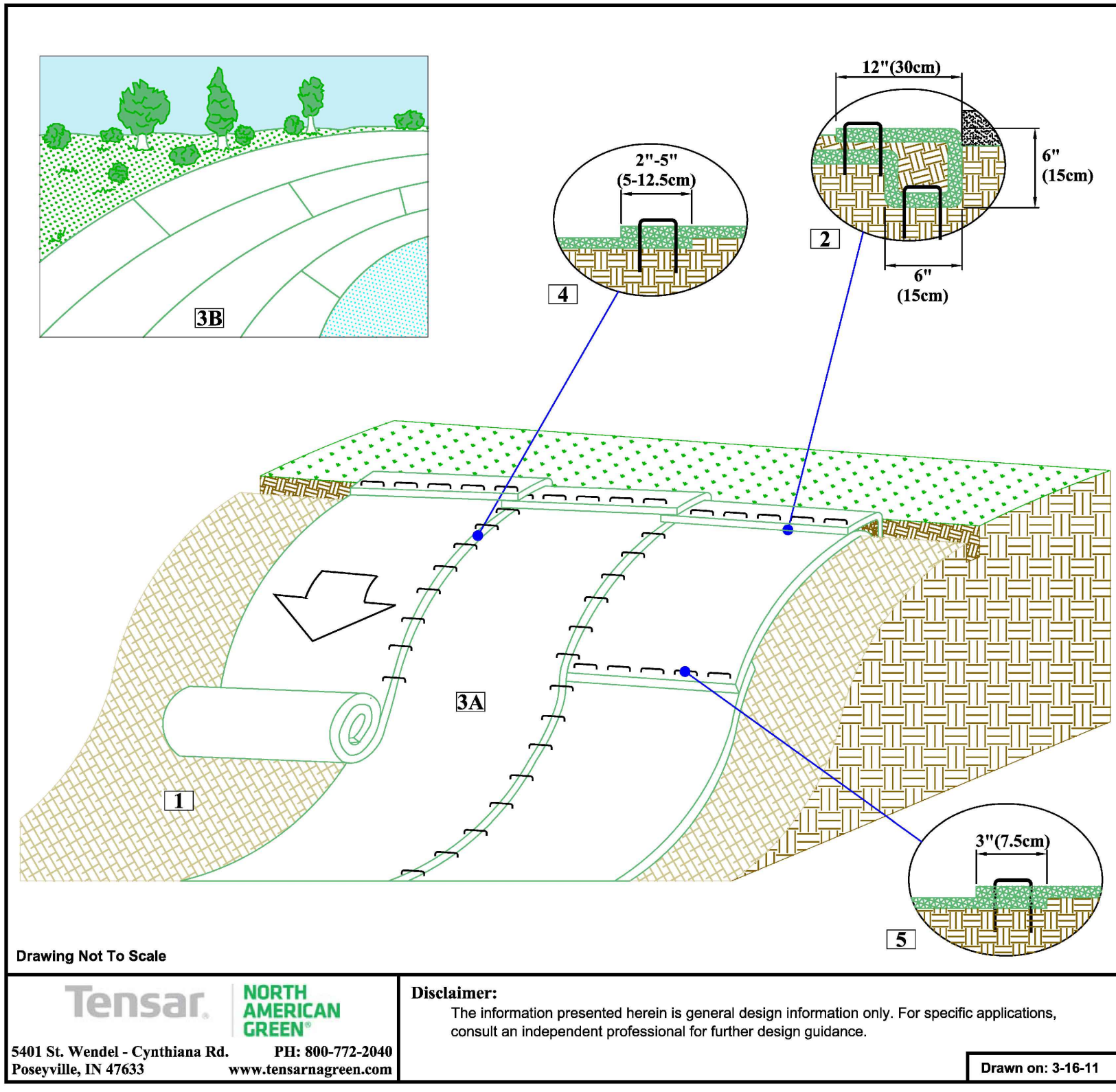
C1.0

JOB No.	21147
DATE:	2/1/22
SHEET	OF
REV. DATE	4/20/22
CADD: RM/II	
PER MUNICIPAL REVIEW	7/25/22
PER MUNICIPAL REVIEW	7/15/22
PER WATER RESOURCES REVIEW	7/27/22
TECH: RM/II	
7/21/2021	

THEODORE HIRSCH
 ENGINEER
 No. 68179
 LICENSED PROFESSIONAL ENGINEER

NOTE: NO CHEMICALS ARE ALLOWED IN STORMWATER FEATURES OR BUFFER ZONES, WITH THE FOLLOWING EXCEPTION: INVASIVE SPECIES MAY BE TREATED WITH CHEMICALS BY A CERTIFIED APPLICATOR.

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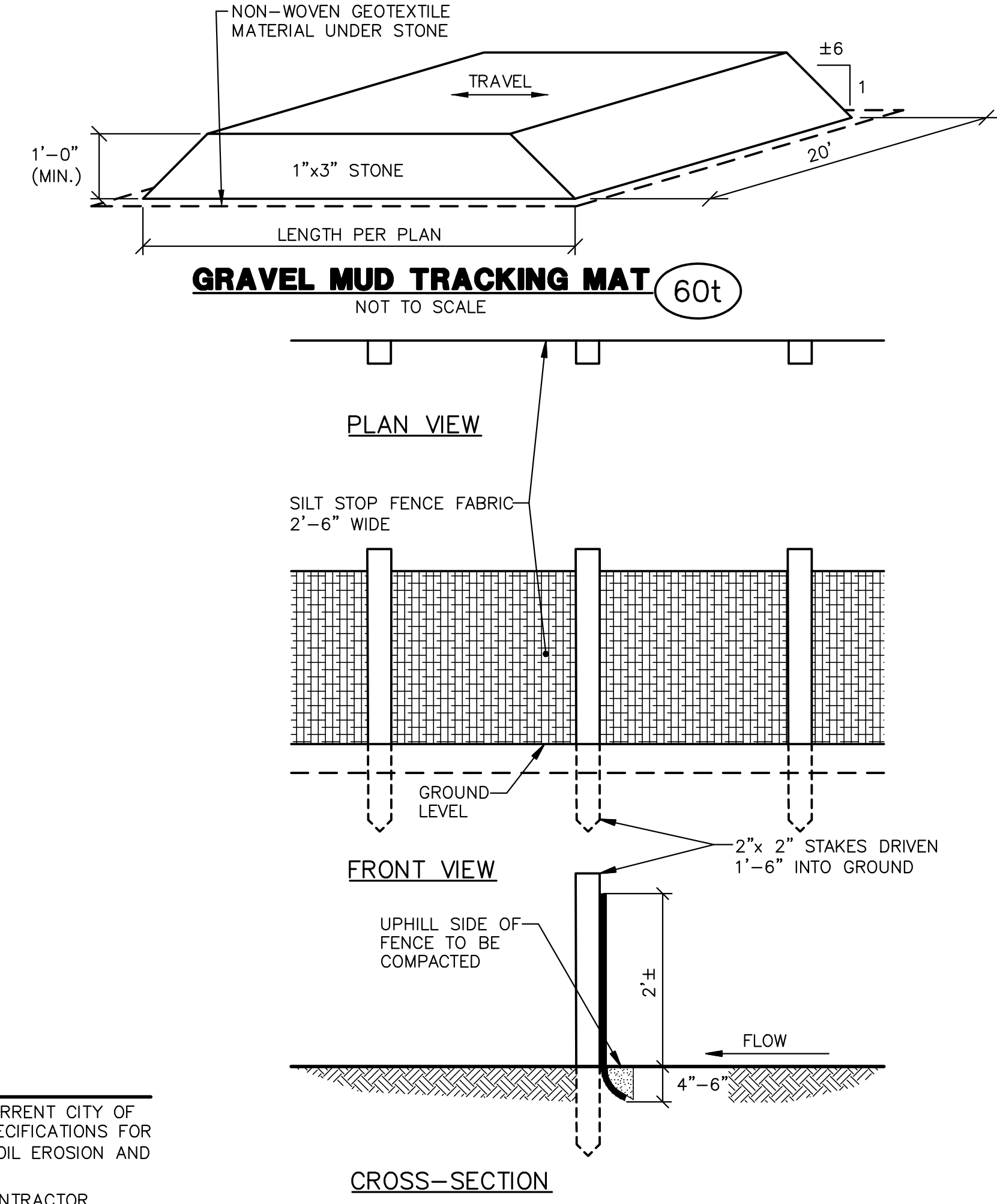
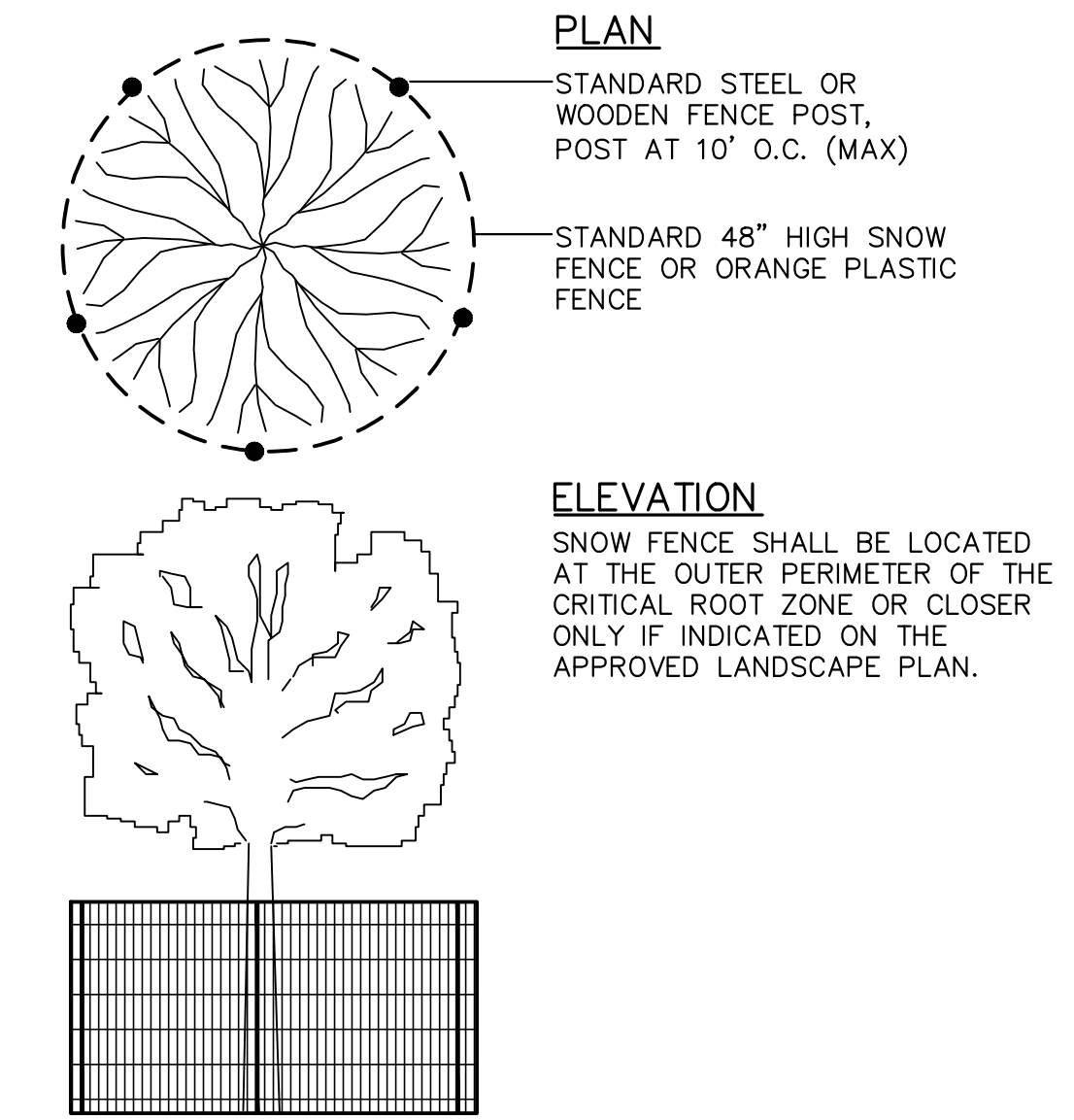
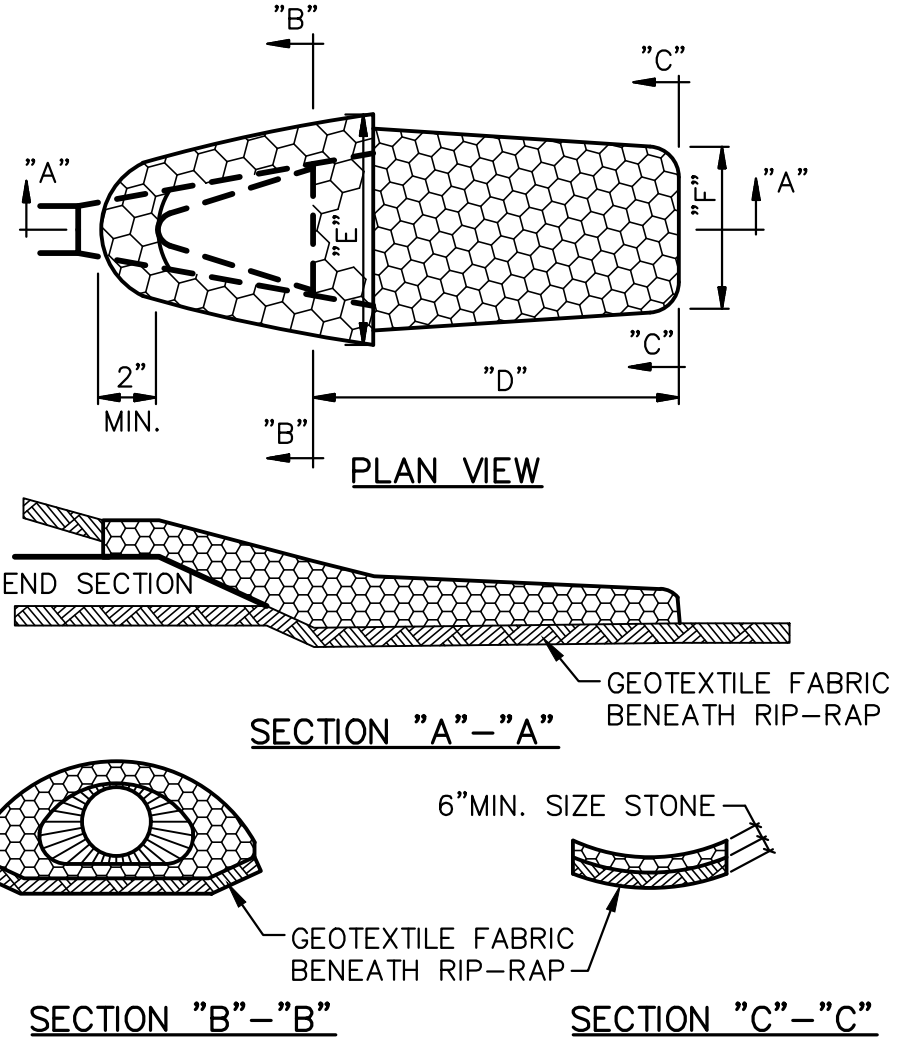
SLOPE INSTALLATION DETAIL

- Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
- Begin at the top of the slope by anchoring the RECPs in a 6" (15cm) deep x 6" (15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12" (30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12" (30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" (30cm) apart across the width of the RECPs.
- Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
- The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
- Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3" (7.5cm) overlap. Staple through overlapped area, approximately 12" (30cm) apart across entire RECPs width.

NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6" (15cm) may be necessary to properly secure the RECPs.

Drawing Not To Scale
Tensar NORTH AMERICAN GREEN
5401 St. Wendel - Cynthia Rd. Poseyville, IN 47633
PH: 800-772-2040
www.tensargreen.com
Disclaimers: The information presented herein is general design information only. For specific applications, consult an independent professional for further design guidance.
Drawn on: 3-16-11

PIPE Ø	D	E	F	SQ. YDS.
12"	5'-0"	6'-6"	3'-0"	4
15"	5'-0"	7'-0"	3'-0"	4
18"	5'-0"	7'-6"	3'-6"	4
21"	5'-6"	8'-0"	4'-0"	5
24"	6'-0"	8'-6"	4'-6"	7
27"	6'-6"	9'-0"	5'-0"	7
30"	7'-0"	9'-6"	5'-6"	8
33"	7'-6"	10'-3"	5'-6"	9
36"	8'-0"	10'-9"	6'-0"	10
42"	9'-0"	11'-9"	6'-6"	12
48"	10'-0"	13'-0"	7'-0"	14



EROSION CONTROL BLANKET 6P
NOT TO SCALE

CONSTRUCTION SEQUENCE (SUMMER 2022 - SUMMER 2023)

- SESC PRE-GRADING MEETING**
 - INVENTORY SITE.
 - IDENTIFY CONSTRUCTION LIMITS.
 - BRUSH THE SITE.
 - INSTALL CONSTRUCTION FENCING.
 - DEFINE THE SITE ACCESS AND INSTALL MUD TRACKING MATS AS NEEDED.
 - DEFINE THE CONSTRUCTION STORAGE AREAS WITHIN THE GRADING LIMITS AS DEFINED ON THE PLANS.
 - CLEAR AND GRUB SITE, DEMOLITION AND REMOVALS:**
 - MAINTAIN EXISTING CONTROLS.
 - INSTALL SILT FENCE.
 - INSTALL STONE FILTERS.
 - TREE AND STUMP REMOVAL.
 - STRUCTURE AND UTILITY REMOVALS.
 - CONSTRUCT DETENTION SYSTEM:**
 - MAINTAIN EXISTING CONTROLS.
 - CONSTRUCT THE STORM SEWER.
 - CONSTRUCT THE DETENTION SYSTEM
 - INSTALL SEDIMENT FILTERS ON COMPLETED CATCH BASINS AND INLETS.
 - MASS GRADING AND UTILITY CONSTRUCTION:**
 - MAINTAIN EXISTING CONTROLS.
 - MASS GRADE THE SITE.
 - BEGIN AGGREGATE BASE COURSE CONSTRUCTION:**
 - MAINTAIN EXISTING CONTROLS.
 - AGGREGATE BASE COURSE FOR THE INTERNAL DRIVES AND PARKING LOTS SHALL COMMENCE. PROGRESS OF INSTALLED AGGREGATE BASE COURSE SHALL BE APPROVED BY THE FIRE DEPARTMENT PRIOR TO BEGINNING FOUNDATION CONSTRUCTION.
 - BUILDING FOUNDATION CONSTRUCTION:**
 - MAINTAIN EXISTING CONTROLS.
 - INSTALL EARTH RETENTION SYSTEMS (IF NECESSARY).
 - EXCAVATE FOR BUILDING FOUNDATIONS.
 - CONSTRUCT BUILDING FOUNDATIONS.
 - COMPLETE ON-SITE AGGREGATE BASE COURSE CONSTRUCTION FOR INTERNAL DRIVES AND PARKING LOTS.
 - CONSTRUCT FIRST LEVEL OF ASPHALT AND CURBING.
 - CONNECT WATER AND SANITARY SERVICE LEADS IN MAPLE ROAD.**
 - TEMPORARY SEED AND MULCH DISTURBED AREAS IF PRACTICAL.
 - CONSTRUCT AND MAINTAIN FIRE DEPARTMENT ACCESS TO FLAMMABLE MATERIALS. SUPPORTING HYDRANTS SHALL BE INSTALLED AND OPERATIONAL PRIOR TO ISSUANCE OF INDIVIDUAL BUILDING PERMITS.
 - BUILDING CONSTRUCTION**
 - ERECT FRAME FOR BUILDING.
 - FINE GRADE AND BUILDING CONSTRUCTION:**
 - MAINTAIN EXISTING CONTROLS.
 - CONSTRUCT BUILDING.
 - FINE GRADE THE SITE.
 - REMOVE ACCUMULATED SEDIMENT FROM THE DETENTION SYSTEM.
 - SEED AND MULCH (SEED AND MAT SLOPES GREATER THAN 4:1) DISTURBED AREAS BEHIND CURB WITHIN 5 DAYS OF ESTABLISHING FINAL GRADES.
 - PLANT TREES, SHRUBS AND LANDSCAPE ITEMS PRIOR TO ISSUANCE OF THE CERTIFICATES OF OCCUPANCY.
 - INSTALL PERMANENT FENCING.
 - FINAL PAVING OF DRIVEWAYS AND PARKING LOT:**
 - MAINTAIN EXISTING CONTROLS.
 - COMPLETE PAVING OF THE PARKING LOTS AND MAIN DRIVE AREAS.
 - SEED AND MULCH (SEED AND MAT SLOPES GREATER THAN 4:1) DISTURBED AREAS BEHIND CURB WITHIN 5 DAYS OF ESTABLISHING FINAL GRADES.
 - CLEAN-UP SITE:**
 - SEED AND MULCH OR SOD AREAS THAT HAVE NOT TAKEN.
 - MAINTAIN EXISTING CONTROLS.
 - FOLLOW-UP AFTER THE SITE IS STABILIZED:**
 - REMOVE SILT FENCE AND STONE FILTERS.
 - REMOVE CATCH BASIN FILTERS OR SILT SACKS.
 - REMOVE SILT FROM THE STORM SEWER SYSTEM.
 - FINAL REMOVAL OF SEDIMENT FROM THE DETENTION SYSTEMS, IF NEEDED.
 - FINALIZE BUILDING CONSTRUCTION:**
 - MAINTAIN PERMANENT SOIL EROSION CONTROL MEASURES
 - REMOVE CONSTRUCTION FENCING
 - MAINTAIN FIRE DEPARTMENT ACCESS TO HYDRANTS AND BUILDINGS.
 - TIE OVER ALL AUXILIARY WATER MAINS, BUILDING LEADS, AND HYDRANT LEADS.
- NOTE:** THE CONSTRUCTION SEQUENCE AND SCHEDULE IS PRELIMINARY AND SUBJECT TO ADJUSTMENT IN RESPONSE TO FORCES BEYOND OUR CONTROL. THESE MAY INCLUDE WEATHER, MATERIAL AVAILABILITY, LABOR UNREST, POLITICAL AND REGULATORY DELAYS, OR OTHER UNFORESEEN CIRCUMSTANCES.

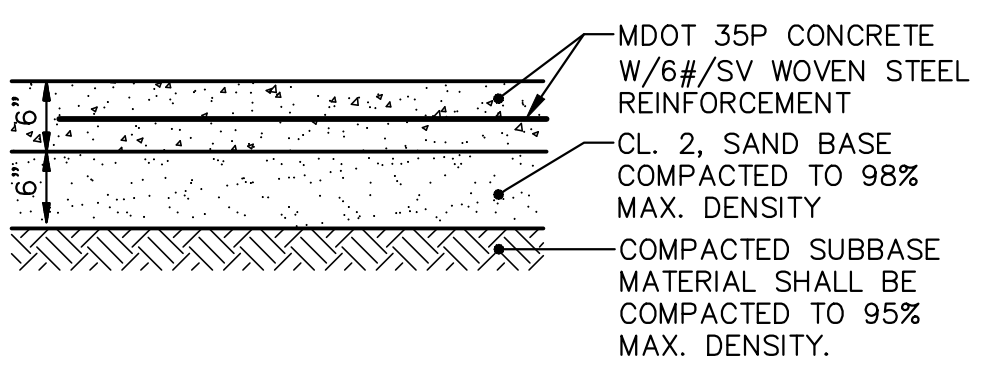
MAINTENANCE TASK AND SCHEDULE

TASKS:	SCHEDULE:	ESTIMATED COST:
Inspect for sediment accumulation	X X X X X X Weekly and after every 1 st storm event	\$ 200
Removal of sediment accumulation	X X X X X X As needed and prior to turnover	\$ 1,200
Inspect for floatable and debris	X X X X X X Quarterly and after every 1 st storm event	\$ 100
Cleaning of floatable and debris	X X X X X X Quarterly, as needed, and at turnover	\$ 200
Inspect for erosion	X X X X X X Weekly	\$ 200
Establish permanent vegetation on eroded slopes	X As needed and prior to turnover	\$ 2,000
Total Construction Phase Cost Estimate		\$ 3,900

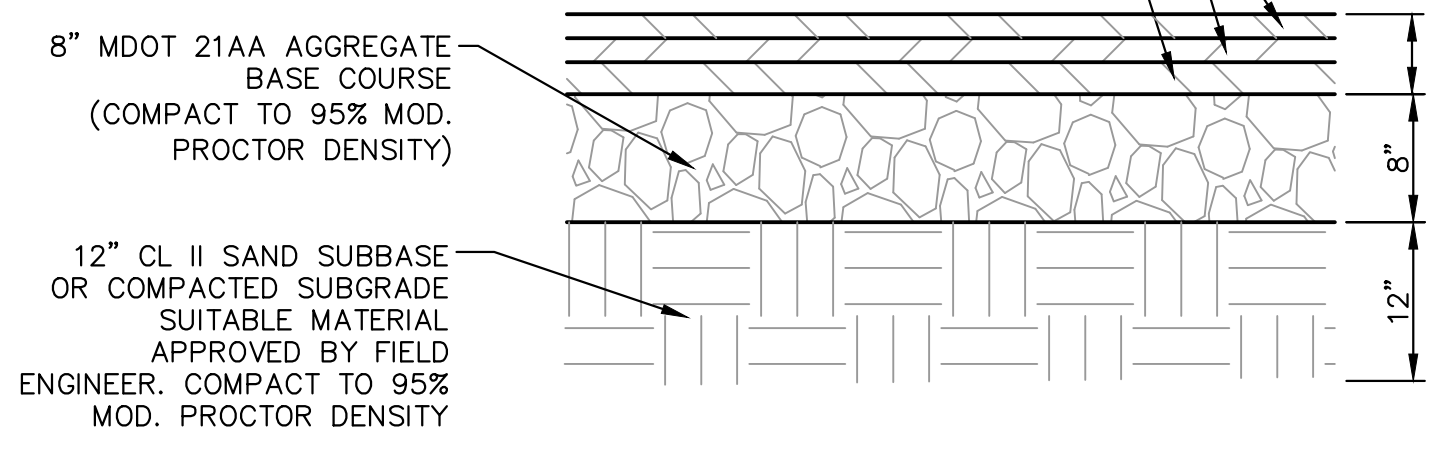
TASKS:	SCHEDULE:	ESTIMATE TED:
Inspect for sediment accumulation	X X X X X X Yearly and after every 1 st storm event	\$ 200
Removal of sediment accumulation	X X X X X X As needed	\$ 800
Inspect for floatable and debris	X X X X X X Yearly and after every 1 st storm event	\$ 100
Cleaning of floatable and debris	X X X X X X As needed	\$ 200
Inspect for erosion	X X X X X X Yearly	\$ 200
Establish permanent vegetation on eroded slopes	X As needed	\$ 500
Replacement of stone filters and rip-rap	X X X X X X As needed	\$ 1,000
Total Annual Cost Estimate		\$ 3,000

MIXTURE TYPE	3E	4E	5E
MIN #SYD	330	220	165
MAX #SYD	410	275	220

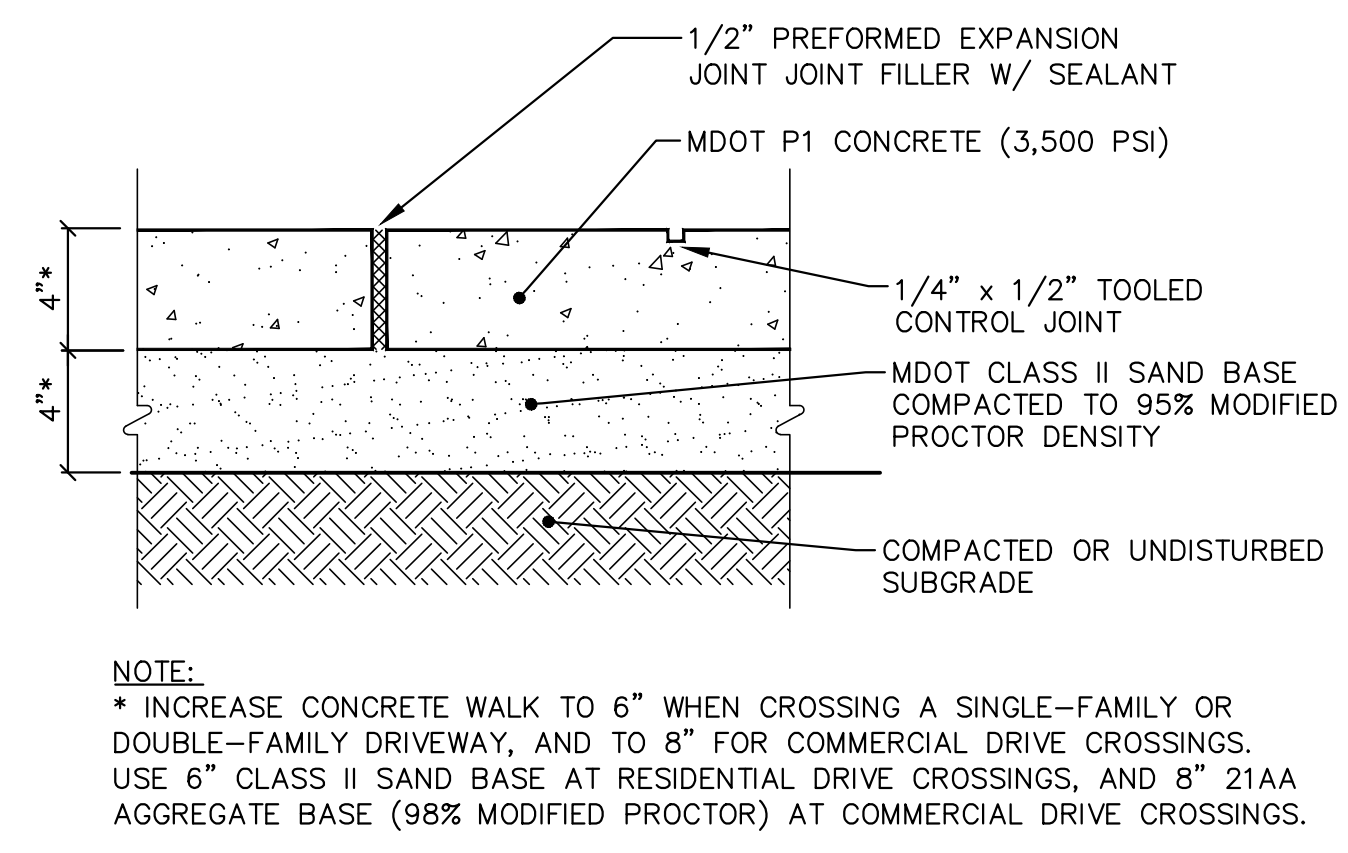
1.5" 5E3 HMA WEARING COURSE
1.5" 4E3 HMA LEVELING COURSE
2.0" 3E3 HMA BASE COURSE



HEAVY DUTY CONCRETE
NOT TO SCALE



BITUMINOUS PAVEMENT - PUBLIC R.O.W.
NOT TO SCALE



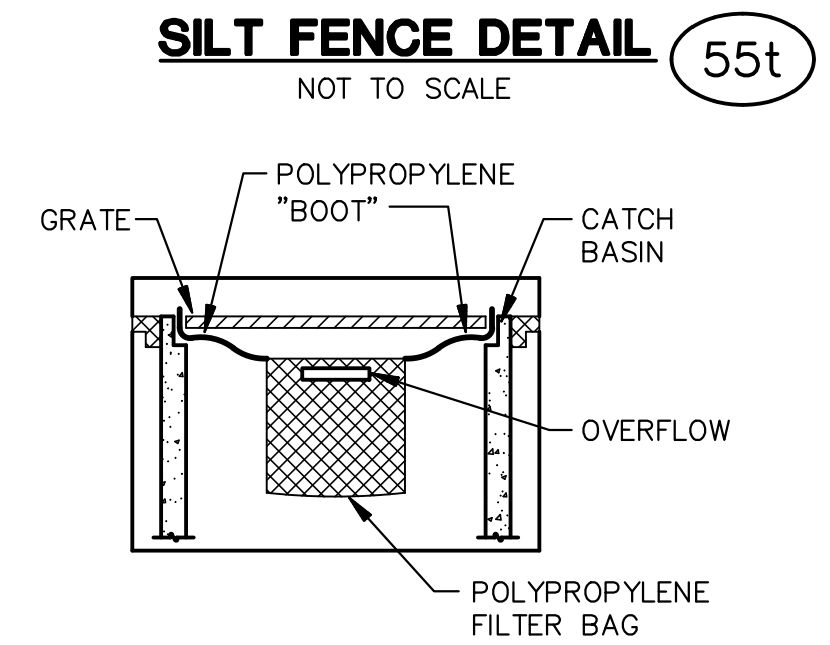
CONCRETE WALK DETAIL
NOT TO SCALE

SOIL EROSION CONSTRUCTION NOTES

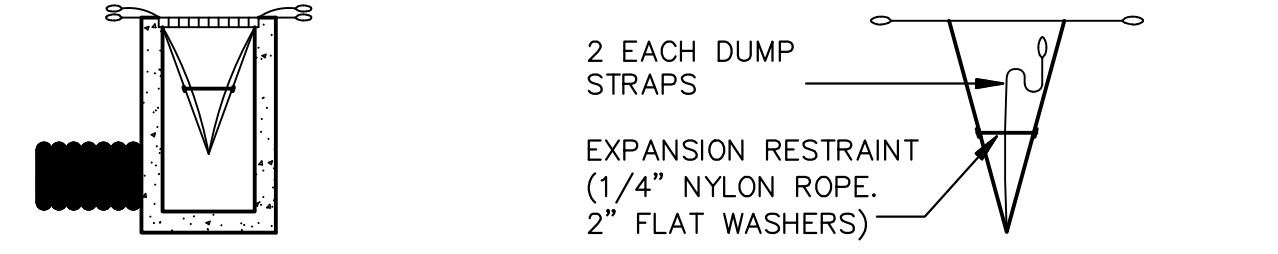
- ALL SOIL EROSION CONTROL MEASURES SHALL COMPLY WITH THE CURRENT CITY OF ANN ARBOR ORDINANCES, WASHTENAW COUNTY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND STATE OF MICHIGAN "SOIL EROSION AND SEDIMENTATION CONTROL ACT" (ACT #347).
- PRIOR TO COMMENCING EARTHMOVING OPERATIONS, THE GRADING CONTRACTOR SHALL INSTALL THE MUD TRACKING MAT, THE SILT FENCE AND TEMPORARY GRAVEL FILTER(S) SHOWN ON THE PLANS.
- ANY LAWN AREA WHICH WILL HAVE A SLOPE STEEPER THAN 4:1 (4 FT. MEASURED HORIZONTALLY AND 1 FT. MEASURED VERTICALLY) SHALL BE SODDED AND PEGGED OR SEEDED AND MULCHED USING A SOIL EROSION CONTROL FABRIC OR BLANKET. HYDROSEEDING MAY BE USED IN LIEU OF SEED AND MULCH OR SOD WHERE SLOPES ARE FLATTER THAN 4:1.
- THE ACTUAL LOCATION OF THE MUD TRACKING MATS AND THE GRAVEL FILTERS MAY BE ADJUSTED BY THE CONTRACTOR TO MATCH CONTRACTOR'S OPERATIONS AND FIELD CONDITIONS BUT ONLY IF APPROVED BY THE ENGINEER.
- ALL DISTURBED AREAS, EVEN WHERE FUTURE PAVEMENT AND BUILDINGS ARE PROPOSED, ARE TO BE REVEGETATED PER COUNTY STANDARDS FOR TEMPORARY SEEDING.
- ESTIMATED EARTHWORK FOR THIS PROJECT IS 6,500 CY CUT AND 5,500 CY FILL. THIS IS AN ESTIMATE ONLY AND IS NOT TO BE USED FOR CONSTRUCTION OR ESTIMATING PURPOSES.
- THE ESTIMATED COST OF PROTECTING ALL EXPOSED SURFACES FROM EROSION SHOULD CONSTRUCTION CEASE IS \$5,000. (RESPREAD 3" TOPSOIL AND SEEDING)

SOIL EROSION MAINTENANCE REQUIREMENTS

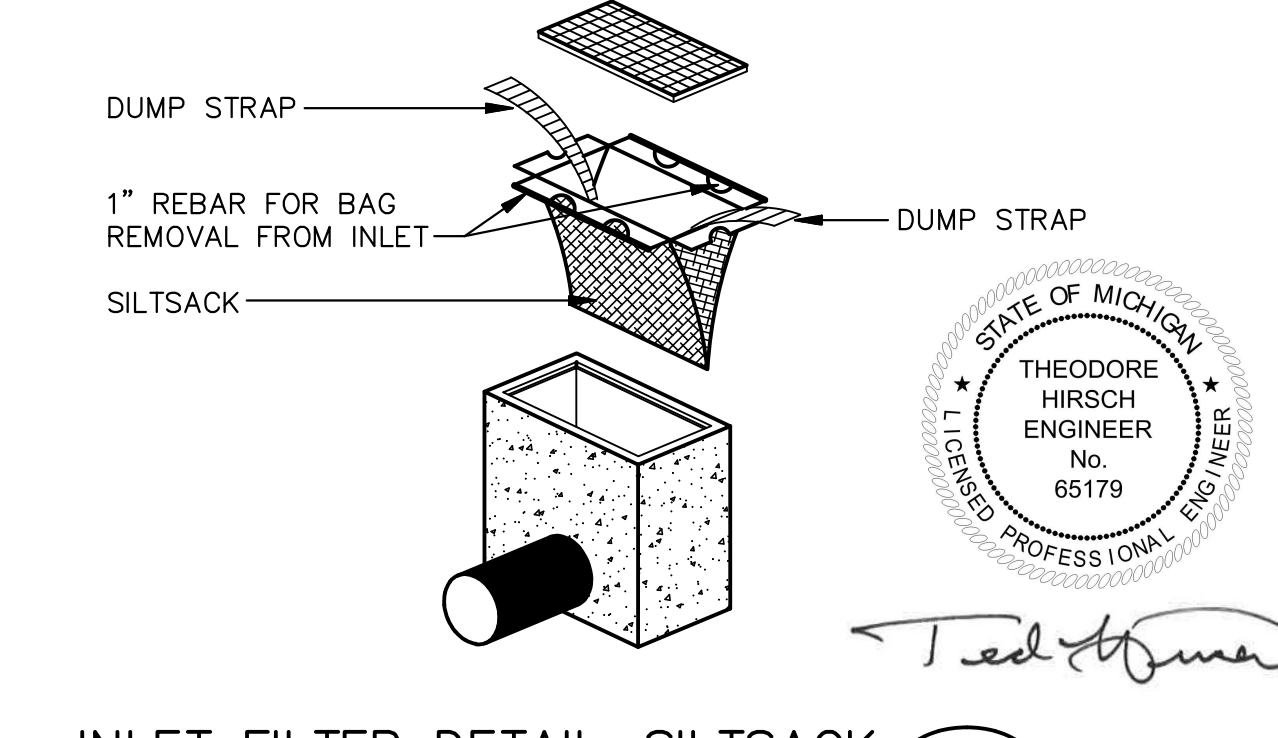
- ALL STRAW BALE AND/OR SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. IF AT ANY TIME THE DEPTH OF SILT AND SEDIMENT COMES TO WITHIN 6" OF THE TOP OF ANY STRAW BALE OR WITHIN 12" OF THE TOP OF ANY SILT FENCE, ALL SILT AND SEDIMENT SHALL BE REMOVED TO ORIGINAL GRADE.
- ALL TEMPORARY GRAVEL FILTERS SHOULD BE ADJUSTED AS TO LOCATION PER ACTUAL FIELD CONDITIONS. THE REMOVAL OF TRAPPED SEDIMENT AND THE CLEANOUT OR REPLACEMENT OF CLOGGED STONE MAY BE NECESSARY AFTER EACH STORM EVENT DURING THE PROJECT.
- ONLY UPON STABILIZATION OF ALL DISTURBED AREAS MAY THE SILT FENCE, AND TEMPORARY GRAVEL FILTERS BE REMOVED. ALSO, ALL STORM SEWERS MUST BE CLEANED OF ALL SEDIMENT.



SILT FENCE DETAIL 55t
NOT TO SCALE



INSTALLATION DETAIL



INLET FILTER DETAIL-SILTSACK 58t
NOT TO SCALE

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A2 NORTH MAPLE PROPERTIES LLC
2370 E. STADIUM BLVD. # 305
ANN ARBOR, MI 48104
JEFF WILKERSON
(989)-529-5858

NORTH MAPLE APARTMENTS

SESC DETAILS

C1.1

JOB No. **21147**

DATE: 2/1/22

REV. DATE: 4/20/22

REV. DATE: 6/25/22

REV. DATE: 7/15/22

REV. DATE: 7/22/22

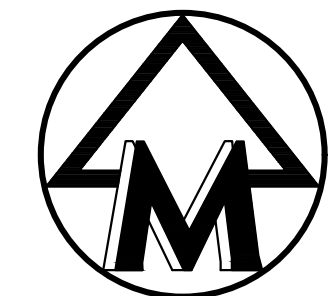
REV. DATE: 7/21/2021

BY: [Signature]

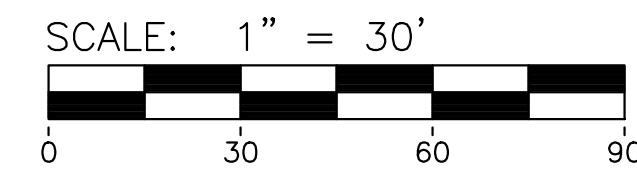
DATE: 7/21/2021

STATE OF MICHIGAN
THEODORE HIRSCH
ENGINEER
No. 65179
LICENSED PROFESSIONAL ENGINEER

M:\Civ\132_Proj\132\114\Site Plan\114\Site Plan.dwg, 7/22/2022 3:35 PM, Ted P. Hirsch, C2.0 UTILITY PLAN, MLLC PDF.ppt
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811
Know what's below.
Call before you dig.



LEGEND

	838	EXIST. CONTOUR
	836.2	PROP. CONTOUR
	36.60	EXIST. SPOT ELEVATION
	U.P.	PROP. SPOT ELEVATION
	U.P.	EXIST. UTILITY POLE W/ TRANS.
	GUY WIRE	GUY WIRE
	ELEC. TRANSFORMER	ELEC. TRANSFORMER
	AC UNIT	EXIST. AC UNIT
	GENERATOR	EXIST. GENERATOR
	OH	EXIST. OVERHEAD UTILITY LINE
	L.P.	EXIST. LIGHT POLE
	T.P.	PROP. LIGHT POLE
	E.L.	EXIST. TELEPHONE LINE
	G.L.	EXIST. ELECTRIC LINE
	G.V.	EXIST. GAS LINE
	F.O.	EXIST. GAS VALVE
	W.M.	EXIST. FIBER OPTIC LINE
	W.M.	EXIST. WATER MAIN
	H.	PROP. WATER MAIN
	H.V.	EXIST. HYDRANT
	G.V.B.	PROP. HYDRANT
	G.V.B.V.	EXIST. GATE VALVE IN BOX
	G.V.W.	PROP. GATE VALVE IN BOX
	G.V.W.V.	EXIST. GATE VALVE IN WELL
	C.S.B.	PROP. GATE VALVE IN WELL
	C.S.B.V.	EXIST. CURB STOP & BOX
	R.	PROP. CURB STOP & BOX
	B.O.	REDUCER
	P.I.V.	EXIST. BLOW-OFF
	P.I.V.V.	PROP. BLOW-OFF
	T.B.	EXIST. POST INDICATOR VALVE
	F.D.C.	PROP. POST INDICATOR VALVE
	F.D.C.V.	THRUST BLOCK
	F.D.C.V.V.	PROP. KNOXBOX
	F.D.C.V.V.V.	EXIST. FIRE DEPARTMENT CONNECTION
	F.D.C.V.V.V.V.	PROP. FIRE DEPARTMENT CONNECTION
	S.S.	EXIST. STORM SEWER
	S.S.V.	PROP. STORM SEWER
	C.B.	EXIST. CATCH BASIN OR INLET
	C.B.V.	PROP. CATCH BASIN OR INLET
	B.I.	EXIST. BEEHIVE INLET
	B.I.V.	PROP. BEEHIVE INLET
	R.D.	EXIST. ROOF DRAIN END SECTION
	R.D.V.	PROP. ROOF DRAIN END SECTION
	H.W.	EXIST. HEAD WALL
	H.W.V.	PROP. HEAD WALL
	C.	EXIST. CULVERT
	C.V.	PROP. CULVERT
	D.S.	EXIST. DOWNSPOUT
	D.S.V.	PROP. DOWNSPOUT
	S.S.	EXIST. SANITARY SEWER
	S.S.V.	PROP. SANITARY SEWER
	S.C.	EXIST. CLEANOUT
	S.C.V.	PROP. CLEANOUT
	C/L	EXIST. C/L OF DITCH
	D.D.	PROP. DRAINAGE DIRECTION
	E.V.C.	EXIST. ELECTRIC VEHICLE CHARGING
	S.	PROP. SIGN
	ST	EXIST. SINGLE TREE
	T.B.L.	PROP. TREE OR BRUSH LIMIT
	F.	EXIST. FENCE
	S.F.	PROP. SILT FENCE
	L.O.D.	EXIST. LIMITS OF DISTURBANCE
	C.F.	PROP. CONSTRUCTION FENCE
	F.F.E.	EXIST. FINISH FLOOR ELEVATION
	P.S.	PROP. SIGN
	S.E.C.M.	EXIST. SOIL EROSION CONTROL MEASURE
	S.E.C.M.	PROP. SOIL EROSION CONTROL MEASURE
	B.P.	EXIST. PROP. BITUMINOUS PAVEMENT
	C.S.	PROP. CONCRETE SURFACE
	H.D.C.	EXIST. PROP. HEAVY DUTY CONCRETE

NOTES

- FOR FIRE DEPT. TO SUPPORT BUILDING PERMITS FOR INDIVIDUAL BUILDINGS: SUPPORTING HYDRANT SHALL BE IN PLACE & OPERATING AND ACCESS ROAD ACCEPTABLE TO THE FIRE MARSHAL SHALL BE IN PLACE PRIOR TO PERMIT ISSUANCE. SUPPORTING HYDRANTS SHALL BE IN SERVICE DURING CONSTRUCTION.
- ALL PRE-EXISTING UTILITY LEADS SLATED FOR REMOVAL WILL BE ABANDONED/REMOVED IN ACCORDANCE WITH CITY STANDARDS (CUT/CAPPED AT MAIN).
- THERE ARE NO FIREWALLS IN THE PROPOSED BUILDINGS.
- BOOSTER PUMPS WILL BE PROVIDED FOR DOMESTIC WATER SERVICES IF NEEDED.
- IF BOOSTER PUMPS ARE REQUIRED, THE BOOSTER PUMP DETAILS WILL BE REVIEWED ALONG WITH BACKFLOW PREVENTION AND METERING ARRANGEMENTS DURING THE CONSTRUCTION PLAN REVIEW OF THE PROJECT.
- ANY NEW OR RELOCATED HYDRANTS WITH STEAMER CONNECTIONS MUST BE INSTALLED SUCH THAT THE STEAMER CONNECTION IS FACING THE FIRE LANE.
- THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE CITY'S DEVELOPER OFFSET-MITIGATION PROGRAM.
- USE OF LINE STOPS IS REQUIRED WHERE EXISTING WATER MAINS CANNOT BE SUFFICIENTLY ISOLATED TO COMPLETE THE WORK. THE COST OF ANY LINE STOP INSTALLATION IS THE RESPONSIBILITY OF THE DEVELOPER AND/OR CONTRACTOR.
- TAPS TO EXISTING STORM STRUCTURES ARE ALLOWED IF THE STRUCTURE IS AT LEAST THREE-FOOT IN DIAMETER AND IN GOOD CONDITION AS DETERMINED BY THE CITY. REPLACEMENT OF THE STRUCTURE MAY BE REQUIRED TO MAKE A CONNECTION. THIS DETERMINATION WILL BE MADE AT THE CONSTRUCTION PHASE.
- ALL ROOF DRAINS AND SUMP DRAINAGE SHALL TIE DIRECTLY TO NEAREST CATCH BASIN CONNECTED TO ON-SITE STORM WATER MANAGEMENT SYSTEM.
- THE PROPOSED STORM OUTLET RUNNING SOUTH ALONG NORTH MAPLE SHALL BE CONSTRUCTED WITH TRENCH BOX TO MINIMIZE ROW IMPACTS. THIS WORK WILL REQUIRE RIGHT-OF-WAY PERMIT.

SANITARY SEWER FLOW MITIGATION CALCULATIONS

Design Flow
Based on the City of Ann Arbor's sanitary sewer flow evaluation Table 'A', the design dry weather flow rate will be:

67 units - Apartments 0-600 sf gross floor area	175.00	gpd/unit	11,725	gpd
16 units - Apartments 601-1,200 sf gross floor area	250.00	gpd/unit	4,000	gpd
1,043 sf. ft. - Non-Medical Office space	0.06	gpd/sq.ft.	63	gpd
671 sf. ft. - Gym	0.06	gpd/sq.ft.	40	gpd
		Total	15,828	gpd

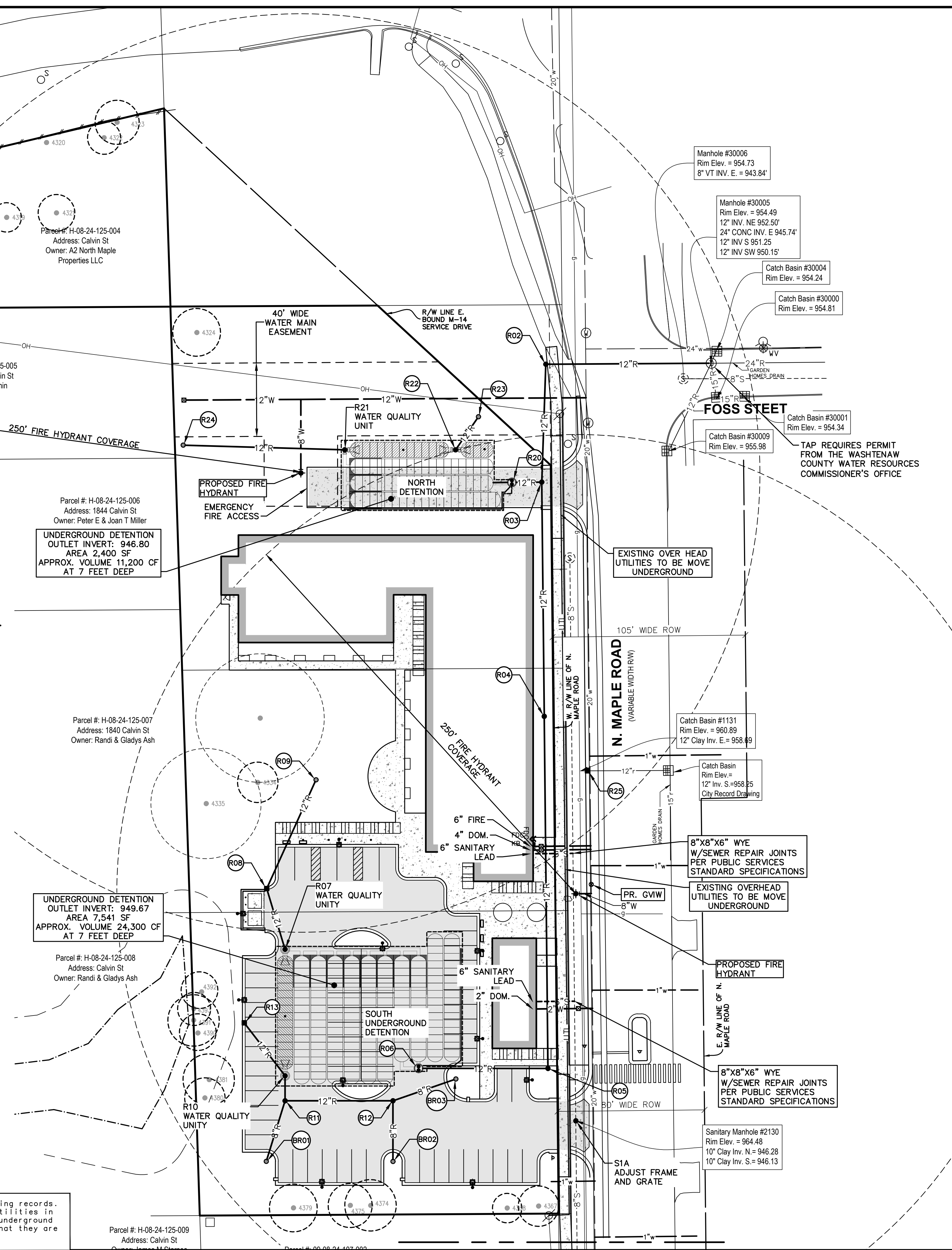
Existing Flow
Based on the City of Ann Arbor's sanitary sewer flow evaluation Table 'A', the existing design dry weather flow rate

3 Single Family Residence	300.00	gpd/unit	900	gpd
			0	gpd
		Total	900	gpd

Mitigation Flow
Mitigation Flow = (Proposed Flow - Existing Flow) * 4(peaking factor) * 1.1(recovery)
Mitigation Peak Flow = 14928 gpd x 4(peaking factor) x 1.1(recovery) = **65,682.6 gpd**
46.0 gpm

If footing drains for the existing building are connected to the sanitary sewer system, disconnection will be required in accordance with current city specifications. Footing drains removed from an existing building will offset required mitigation. Footing drain connections to the sanitary sewer must be verified by Engineering in order to receive credit.

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JEFF WILKERSON
(989) 529-5858

NORTH MAPLE APARTMENTS
UTILITY PLAN

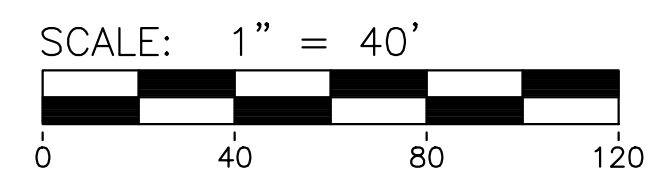
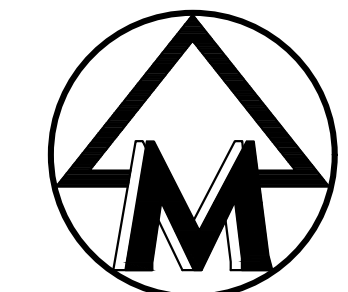
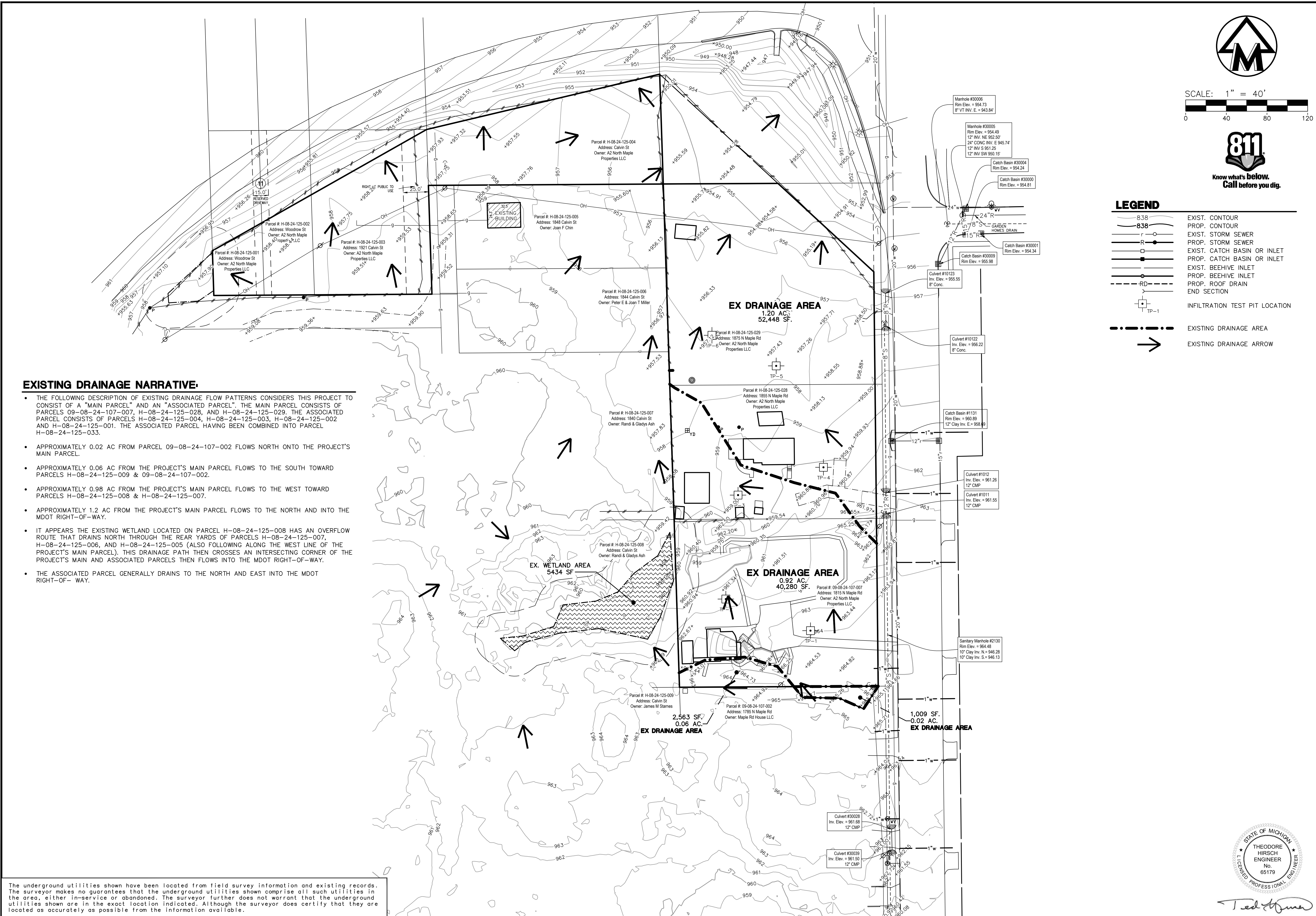
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JOB No.	21147
DATE	2/1/22
REV. DATE	4/20/22
REV. DATE	6/25/22
REV. DATE	7/15/22
REV. DATE	7/22/22
REV. DATE	7/21/2021

THEODORE HIRSCH
ENGINEER
No. 65179
LICENSED PROFESSIONAL ENGINEER
STATE OF MICHIGAN

Ted Hirsch

M:\CIVIL\3D_Plan\121147D02.dwg, 7/22/2022 3:35 PM, Ted P. Hirsch, C3.0 EXISTING STORMWATER DRAINAGE, MCLLC PDF.plt
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LEGEND

	EXIST. CONTOUR
	PROP. CONTOUR
	EXIST. STORM SEWER
	PROP. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. CATCH BASIN OR INLET
	EXIST. BEEHIVE INLET
	PROP. BEEHIVE INLET
	PROP. ROOF DRAIN END SECTION
	INFILTRATION TEST PIT LOCATION
	EXISTING DRAINAGE AREA
	EXISTING DRAINAGE ARROW

EXISTING DRAINAGE NARRATIVE:

- THE FOLLOWING DESCRIPTION OF EXISTING DRAINAGE FLOW PATTERNS CONSIDERS THIS PROJECT TO CONSIST OF A "MAIN PARCEL" AND AN "ASSOCIATED PARCEL". THE MAIN PARCEL CONSISTS OF PARCELS 09-08-24-107-007, H-08-24-125-028, AND H-08-24-125-029. THE ASSOCIATED PARCEL CONSISTS OF PARCELS H-08-24-125-004, H-08-24-125-003, H-08-24-125-002 AND H-08-24-125-001. THE ASSOCIATED PARCEL HAVING BEEN COMBINED INTO PARCEL H-08-24-125-033.
- APPROXIMATELY 0.02 AC FROM PARCEL 09-08-24-107-002 FLOWS NORTH ONTO THE PROJECT'S MAIN PARCEL.
- APPROXIMATELY 0.06 AC FROM THE PROJECT'S MAIN PARCEL FLOWS TO THE SOUTH TOWARD PARCELS H-08-24-125-009 & 09-08-24-107-002.
- APPROXIMATELY 0.98 AC FROM THE PROJECT'S MAIN PARCEL FLOWS TO THE WEST TOWARD PARCELS H-08-24-125-008 & H-08-24-125-007.
- APPROXIMATELY 1.2 AC FROM THE PROJECT'S MAIN PARCEL FLOWS TO THE NORTH AND INTO THE MDOT RIGHT-OF-WAY.
- IT APPEARS THE EXISTING WETLAND LOCATED ON PARCEL H-08-24-125-008 HAS AN OVERFLOW ROUTE THAT DRAINS NORTH THROUGH THE REAR YARDS OF PARCELS H-08-24-125-007, H-08-24-125-006, AND H-08-24-125-005 (ALSO FOLLOWING ALONG THE WEST LINE OF THE PROJECT'S MAIN PARCEL). THIS DRAINAGE PATH THEN CROSSES AN INTERSECTING CORNER OF THE PROJECT'S MAIN AND ASSOCIATED PARCELS THEN FLOWS INTO THE MDOT RIGHT-OF-WAY.
- THE ASSOCIATED PARCEL GENERALLY DRAINS TO THE NORTH AND EAST INTO THE MDOT RIGHT-OF-WAY.

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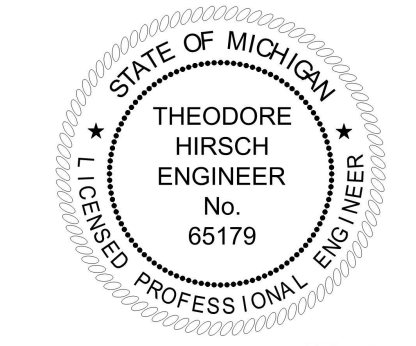
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 ANN ARBOR, MI 48104
 JEFF WILKERSON
 (989) 529-5858

NORTH MAPLE APARTMENTS
 EXISTING STORMWATER DRAINAGE

C3.0

DATE: 2/1/22	REV. DATE: 4/20/22	REV. DATE: 5/7/22	REV. DATE: 7/15/22	REV. DATE: 7/22/22
SHEET OF	CADD	ENG. TYP	PM. TJC	TECH. TJC
				7/21/2022
JOB No. 21147				
PER MUNICIPAL REVIEW				
PER WATER RESOURCES REVIEW				



Ted Hirsch

M:\Civil\132_Pros\132\1147041.dwg, 7/22/2022 3:35 PM, Ted P. Hirsch, C3.1 STORMWATER MANAGEMENT PLAN, MCLC PDF #3
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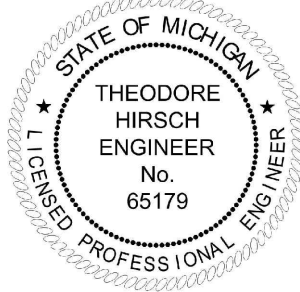
ENGINEER'S CERTIFICATE OF OUTLET

Date: July 22, 2022

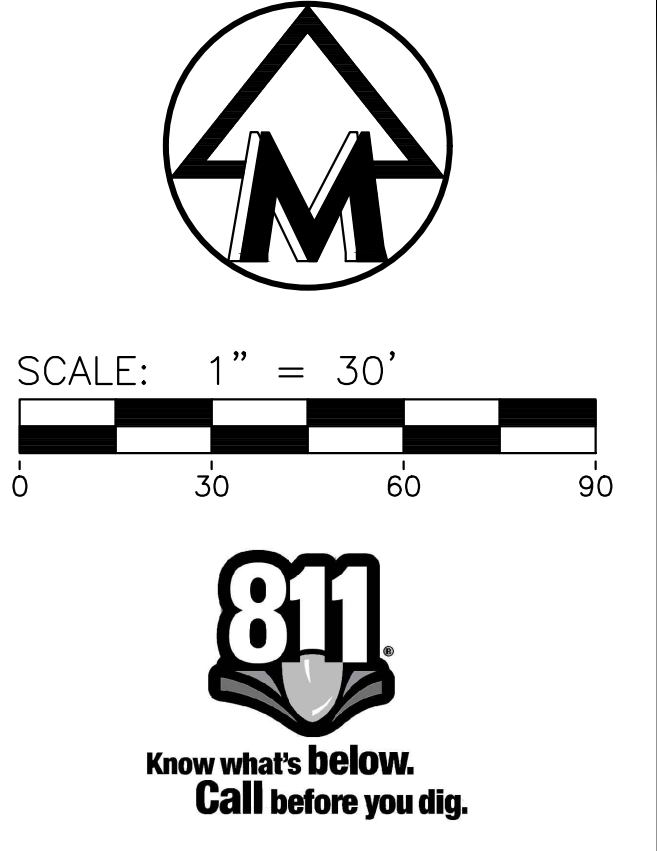
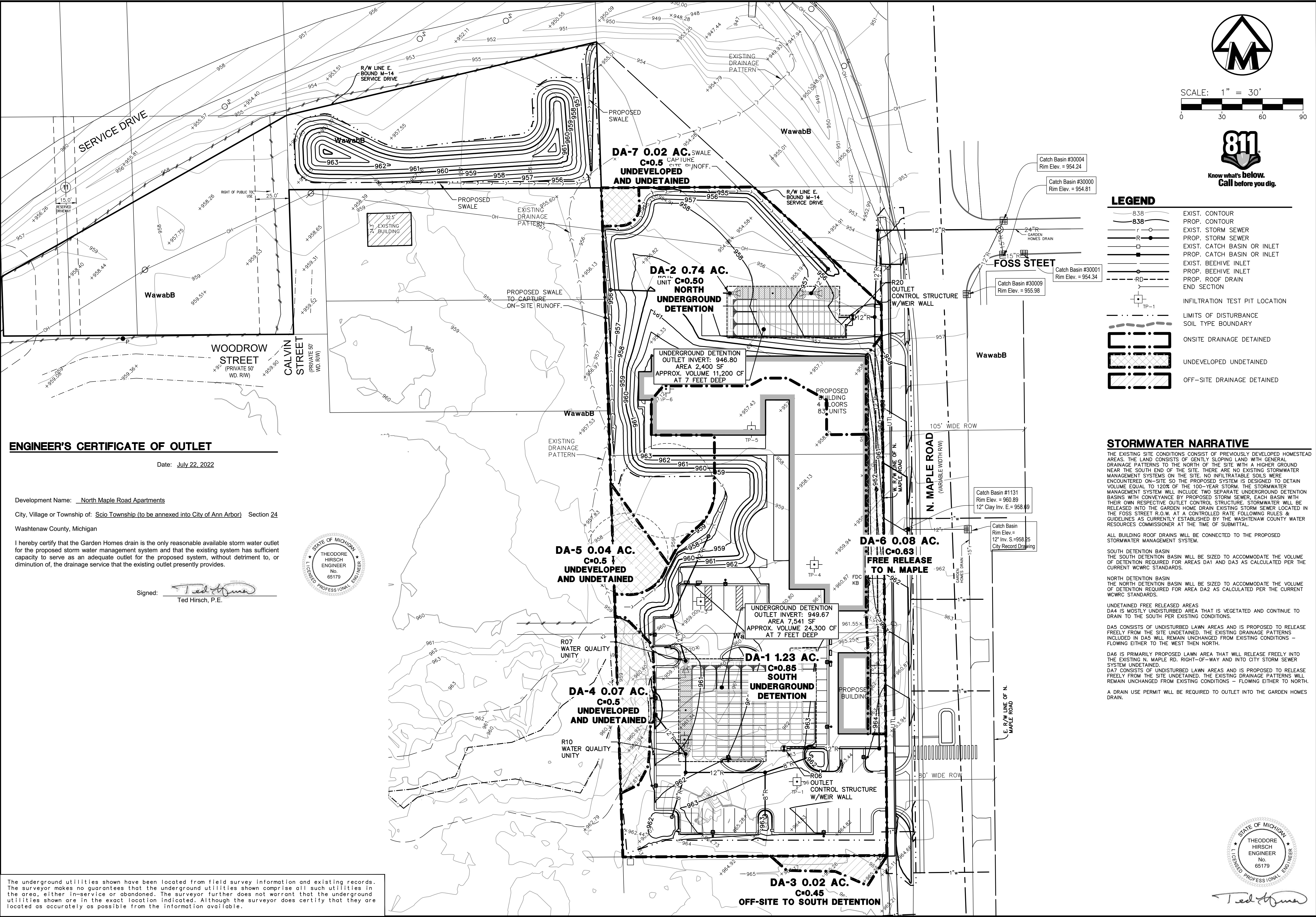
Development Name: North Maple Road Apartments
 City, Village or Township of: Scio Township (to be annexed into City of Ann Arbor) Section 24
 Washtenaw County, Michigan

I hereby certify that the Garden Homes drain is the only reasonable available storm water outlet for the proposed storm water management system and that the existing system has sufficient capacity to serve as an adequate outlet for the proposed system, without detriment to, or diminution of, the drainage service that the existing outlet presently provides.

Signed: 
 Ted Hirsch, P.E.



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- LEGEND**
- 838 --- EXIST. CONTOUR
 - 838 --- PROP. CONTOUR
 - EXIST. STORM SEWER
 - PROP. STORM SEWER
 - EXIST. CATCH BASIN OR INLET
 - PROP. CATCH BASIN OR INLET
 - EXIST. BEEHIVE INLET
 - PROP. BEEHIVE INLET
 - PROP. ROOF DRAIN
 - END SECTION
 - TP-1 --- INFILTRATION TEST PIT LOCATION
 - LIMITS OF DISTURBANCE
 - SOIL TYPE BOUNDARY
 - ONSITE DRAINAGE DETAINED
 - UNDEVELOPED UNDETECTED
 - OFF-SITE DRAINAGE DETAINED

STORMWATER NARRATIVE

THE EXISTING SITE CONDITIONS CONSIST OF PREVIOUSLY DEVELOPED HOMESTEAD AREAS. THE LAND CONSISTS OF GENTLY SLOPING LAND WITH GENERAL DRAINAGE PATTERNS TO THE NORTH OF THE SITE WITH A HIGHER GROUND NEAR THE SOUTH END OF THE SITE. THERE ARE NO EXISTING STORMWATER MANAGEMENT SYSTEMS ON THE SITE. NO INFILTRABLE SOILS WERE ENCOUNTERED ON-SITE SO THE PROPOSED SYSTEM IS DESIGNED TO DETAIN VOLUME EQUAL TO 120% OF THE 100-YEAR STORM. THE STORMWATER MANAGEMENT SYSTEM WILL INCLUDE TWO SEPARATE UNDERGROUND DETENTION BASINS WITH CONVEYANCE BY PROPOSED STORM SEWER. EACH BASIN WITH THEIR OWN RESPECTIVE OUTLET CONTROL STRUCTURE. STORMWATER WILL BE RELEASED INTO THE GARDEN HOME DRAIN EXISTING STORM SEWER LOCATED IN THE FOSS STREET R.O.W. AT A CONTROLLED RATE FOLLOWING RULES & GUIDELINES AS CURRENTLY ESTABLISHED BY THE WASHTENAW COUNTY WATER RESOURCES COMMISSIONER AT THE TIME OF SUBMITTAL.

ALL BUILDING ROOF DRAINS WILL BE CONNECTED TO THE PROPOSED STORMWATER MANAGEMENT SYSTEM.

SOUTH DETENTION BASIN
 THE SOUTH DETENTION BASIN WILL BE SIZED TO ACCOMMODATE THE VOLUME OF DETENTION REQUIRED FOR AREAS DA1 AND DA3 AS CALCULATED PER THE CURRENT WCWR STANDARDS.

NORTH DETENTION BASIN
 THE NORTH DETENTION BASIN WILL BE SIZED TO ACCOMMODATE THE VOLUME OF DETENTION REQUIRED FOR AREA DA2 AS CALCULATED PER THE CURRENT WCWR STANDARDS.

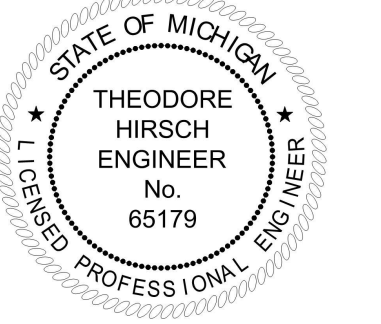
UNDETECTED FREE RELEASED AREAS
 DA4 IS MOSTLY UNDISTURBED AREA THAT IS VEGETATED AND CONTINUE TO DRAIN TO THE SOUTH PER EXISTING CONDITIONS.

DA5 CONSISTS OF UNDISTURBED LAWN AREAS AND IS PROPOSED TO RELEASE FREELY FROM THE SITE UNDETECTED. THE EXISTING DRAINAGE PATTERNS INCLUDED IN DA5 WILL REMAIN UNCHANGED FROM EXISTING CONDITIONS - FLOWING EITHER TO THE WEST THEN NORTH.

DA6 IS PRIMARILY PROPOSED LAWN AREA THAT WILL RELEASE FREELY INTO THE EXISTING N. MAPLE RD. RIGHT-OF-WAY AND INTO CITY STORM SEWER SYSTEM UNDETECTED.

DA7 CONSISTS OF UNDISTURBED LAWN AREAS AND IS PROPOSED TO RELEASE FREELY FROM THE SITE UNDETECTED. THE EXISTING DRAINAGE PATTERNS WILL REMAIN UNCHANGED FROM EXISTING CONDITIONS - FLOWING EITHER TO NORTH.

A DRAIN USE PERMIT WILL BE REQUIRED TO OUTLET INTO THE GARDEN HOMES DRAIN.



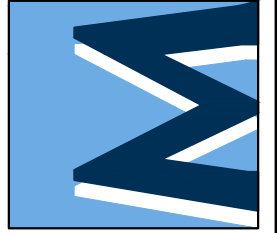
NORTH MAPLE APARTMENTS

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 ANN ARBOR, MI 48104
 JEFF WILKERSON
 (989)-529-5858

STORMWATER MANAGEMENT PLAN

JOB No. 21147

REV.	DATE	BY	APP.	DESCRIPTION
1	4/20/22	RMH	RMH	ADD: RMH
2	6/25/22	RMH	RMH	ENG. TPH
3	7/15/22	RMH	RMH	PER. TJC
4	7/22/22	RMH	RMH	PER. RMH
5	7/22/22	RMH	RMH	PER. RMH



C3.1

North Underground Stormwater Storage Rev 4/8/2022

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients. Rational Method Variables table.

NCRS Variables (Pervious) table showing Area, Curve Number, and Weighted C.

NCRS Variables (Impervious) table showing Area, Curve Number, and Weighted CN.

W2 - W2 - First Flush Runoff Calculations (Vf)
A. Vf = 1 * 1/12 * 43560 sft/ac x A x C where A= 0.74 and where C= 0.62

W3 - W3 - Pre-Development Bankfull Runoff Calculations (Vf-pre)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pre-Development CN (Meadow, Type D Soils) CN= 78

W4 - W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vf-post)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pervious Cover CN From Worksheet 1 CN= 80

W5 - W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vf-imp-post)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Impervious Cover CN From Worksheet 1 CN= 98

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Pervious Cover CN From Worksheet 1 CN= 80

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Impervious Cover CN From Worksheet 1 CN= 98

W8 - W8 - Time of Concentration (Tc-hrs)
A. Assume 15-minute minimum time of concentration Tc= 0.25 hr

W9 - W9 - Runoff Summary & On-Site Infiltration Requirement
A. Summary from Previous Worksheets
First Flush Volume (Vf) 1,671 cft

W10 - W10 - Detention/Retention Requirement
A. Qp = 238.6 Tc^-0.82 Qp = 743.63 cfs/(n x sq. mi)
B. Total Site Area excluding "Self-Crediting" BMPs 0.74 ac

W11 - W11 - Determine Applicable BMPs and Associated Volume Credits
Infiltration test pits were excavated and review of the subsurface conditions disclosed clay material.

W12 - W12 - Natural Features Inventory
Refer to Natural Features Overlay Plan for location and size of natural features.

W13 - W13 - Site Summary of Infiltration & Detention
A. Stormwater Management Summary
Min Infiltration Requirement (Vinf) 1,671 cft

Detention Outlet Calculations
A. Required Detention Volumes (Reduced by 6-hour infiltration)
Storm Event Req'd Volume less Infil. Credit = Final Volume

North Detention table with columns for Footprint Area, Storage Depth, Volume Provided, and Elevation.

First Flush Elevation (Xf) = 947.8 - 0 = 947.8
Bankfull Elevation (Xbf) = 948.8 - 3.867 = 944.93
100-Year Elevation (X100) = 952.8 - 11.365 = 941.43

South Underground Stormwater Storage Rev 4/8/2022

W1 - Determining Post-Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients. Rational Method Variables table.

NCRS Variables (Pervious) table showing Area, Curve Number, and Weighted C.

NCRS Variables (Impervious) table showing Area, Curve Number, and Weighted CN.

W2 - W2 - First Flush Runoff Calculations (Vf)
A. Vf = 1 * 1/12 * 43560 sft/ac x A x C where A= 1.21 and where C= 0.86

W3 - W3 - Pre-Development Bankfull Runoff Calculations (Vf-pre)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pre-Development CN (Meadow, Type D Soils) CN= 78

W4 - W4 - Pervious Cover Post-Development Bankfull Runoff Calculations (Vf-post)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Pervious Cover CN From Worksheet 1 CN= 80

W5 - W5 - Impervious Cover Post-Development Bankfull Runoff Calculations (Vf-imp-post)
A. 2 year / 24 hour storm event: P= 2.35 in
B. Impervious Cover CN From Worksheet 1 CN= 98

W6 - W6 - Pervious Cover Post-Development 100-Year Runoff Calculations (V100-per-post)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Pervious Cover CN From Worksheet 1 CN= 80

W7 - W7 - Impervious Cover Post-Development 100-Year Runoff Calculations (V100-imp-post)
A. 100 year / 24 hour storm event: P= 5.11 in
B. Impervious Cover CN From Worksheet 1 CN= 98

W8 - W8 - Time of Concentration (Tc-hrs)
A. Assume 15-minute minimum time of concentration Tc= 0.25 hr

W9 - W9 - Runoff Summary & On-Site Infiltration Requirement
A. Summary from Previous Worksheets
First Flush Volume (Vf) 3,764 cft

W10 - W10 - Detention/Retention Requirement
A. Qp = 238.6 Tc^-0.82 Qp = 812.1 cfs/(n x sq. mi)
B. Total Site Area excluding "Self-Crediting" BMPs 1.21 ac

W11 - W11 - Determine Applicable BMPs and Associated Volume Credits
Infiltration test pits were excavated and review of the subsurface conditions disclosed clay material.

W12 - W12 - Natural Features Inventory
Refer to Natural Features Overlay Plan for location and size of natural features.

W13 - W13 - Site Summary of Infiltration & Detention
A. Stormwater Management Summary
Min Infiltration Requirement (Vinf) 3,764 cft

Detention Outlet Calculations
A. Required Detention Volumes (Reduced by 6-hour infiltration)
Storm Event Req'd Volume less Infil. Credit = Final Volume

South Detention table with columns for Footprint Area, Storage Depth, Volume Provided, and Elevation.

First Flush Elevation (Xf) = 950.0 - 0 = 950.0
Bankfull Elevation (Xbf) = 952.0 - 10.991 = 941.01
100-Year Elevation (X100) = 955.0 - 25.102 = 929.90

MA\Civil\3d_Proj\12\14\Site Plan\21147D01.dwg, 7/22/2022 3:35 PM, Ted P. Hirsch, C3.2 STORMWATER CALCULATIONS, MLLC PDF.p3

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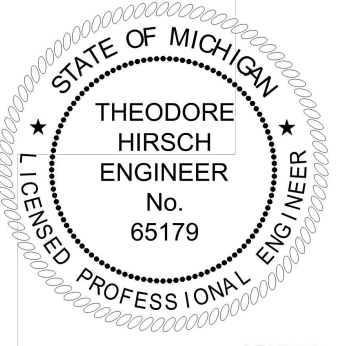
CLIENT
A2 NORTH MAPLE PROPERTIES LLC
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ANN ARBOR, MI 48104
JEFF WILKERSON
(989) - 529 - 5858

NORTH MAPLE APARTMENTS STORMWATER CALCULATIONS

C3.2

Revision table with columns for Date, Sheet, Of, Rev, Date, Add, RMLI, Per, Municipal, Rev, Eng, TPH, 7/15/22, PM, TJC, 7/22/22, TECH, RMLI, 7/21/22, PER, WATER, RESOURCES, REVIEW

JOB No. 21147
DATE: 2/1/22
SHEET OF



Theodore Hirsch Engineer 65179

C. Two-Stage Outlet Design

First Flush Discharge (24-36 hours for the detention of first flush storm event)
Average Head (H_{ave}) = 2/3 (X₁₀₀ - X₀₀) = 2/3 (847.92 - 946.8) = 0.75 ft
First Flush Max. Flowrate (Q_{max}) = V_r / 24 hrs = 167.73 cfs (24 hrs=3600) = 0.1933 cfs
Res Area (A_r) = Q_{max} / 0.62 / sqrt(2*g*H_{ave}) = 0.01934/0.62/sqrt(2*32.2*0.75/0.5) = 0.0045 sft
Orifice Diameter, Proposed = 0.6250 in
Orifice Area = 0.0021 sft

Bankfull Discharge (36-48 hours)
Average Head (H_{ave}) = 2/3 (X₀₅ - X₀₀) = 2/3 (0 - 948.8) = 1.13 ft
Actual Flow (Q_{av}) = 0.62 * A_r * sqrt(2*g*H_{ave}) = 0.62 * 0.0043 * sqrt(2 * 32.2 * 1.13) = 0.0233 cfs
Actual Time (T₀) = V_r / Q_{av} = 3600 cfs / 0.0233 cfs = 37.66 hr

100-year Discharge (0.15 cfs/acre max. allowed)
Max Head to Lowest Holes (H_{max100yr}) = X₁₀₀ - X₀₀ = 952.58 - 946.8 = 5.78 ft
Max Flow at Lowest Holes (Q_{max100yr}) = 0.62 * A_r * sqrt(2 * g * H_{max}) = 0.62 * 0.0043 * sqrt(2 * 32.2 * 5.78) = 0.051 cfs

100-year Drawdown Time (72-hour max. to the lowest orifice)
Average head to first flush holes with all orifices in use (H_{ave}) = 2/3 (X₁₀₀ - X₀) + (X₀ - X₀₀) = 4.42 ft
Average flow through lowest holes to bankfull elevation = 0.62 * A_r * sqrt(2 * g * H_{ave}) = 0.045 cfs

Project: North Maple - North - 04112022

Stormtech MC-4500 Cumulative Storage Volumes table showing Height of Storage, Chamber, Incremental Storage, Incremental Elevation, etc.

Stormtech MC-4500 Cumulative Storage Volumes table (continued) showing detailed storage volume calculations for various elevations.

C. Two-Stage Outlet Design

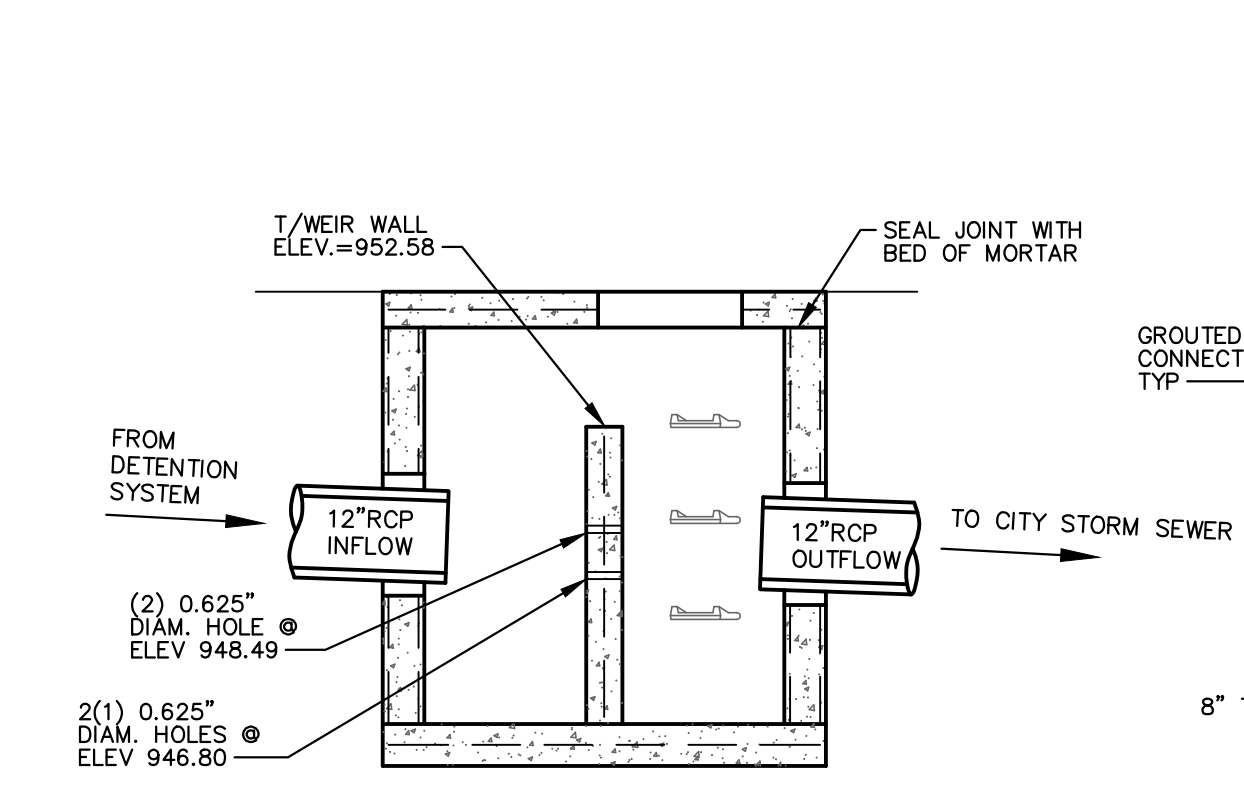
First Flush Discharge (24-36 hours for the detention of first flush storm event)
Average Head (H_{ave}) = 2/3 (X₁₀₀ - X₀₀) = 2/3 (950.68 - 949.67) = 0.67 ft
First Flush Max. Flowrate (Q_{max}) = V_r / 24 hrs = 3704cfs / (24 hrs=3600) = 0.04 cfs
Res Area (A_r) = Q_{max} / 0.62 / sqrt(2*g*H_{ave}) = 0.04356/0.62/sqrt(2*32.2*0.67/0.5) = 0.011 sft
Orifice Diameter, Proposed = 0.9375 in
Orifice Area = 0.0048 sft

Bankfull Discharge (36-48 hours)
Average Head (H_{ave}) = 2/3 (X₀₅ - X₀₀) = 2/3 (951.51 - 952) = 1.23 ft
Actual Flow (Q_{av}) = 0.62 * A_r * sqrt(2*g*H_{ave}) = 0.62 * 0.0096 * sqrt(2 * 32.2 * 1.23) = 0.0503 cfs
Actual Time (T₀) = V_r / Q_{av} = 3600 cfs / 0.0503 cfs = 42.84 hr

100-year Discharge (0.15 cfs/acre max. allowed)
Max Head to Lowest Holes (H_{max100yr}) = X₁₀₀ - X₀₀ = 954.52 - 949.67 = 4.85 ft
Max Flow at Lowest Holes (Q_{max100yr}) = 0.62 * A_r * sqrt(2 * g * H_{max}) = 0.62 * 0.0096 * sqrt(2 * 32.2 * 4.85) = 0.105 cfs

100-year Drawdown Time (72-hour max. to the lowest orifice)
Average head to first flush holes with all orifices in use (H_{ave}) = 2/3 (X₁₀₀ - X₀) + (X₀ - X₀₀) = 3.85 ft
Average flow through lowest holes to bankfull elevation = 0.62 * A_r * sqrt(2 * g * H_{ave}) = 0.078 cfs

NORTH DETENTION ORIFICE CALCULATIONS

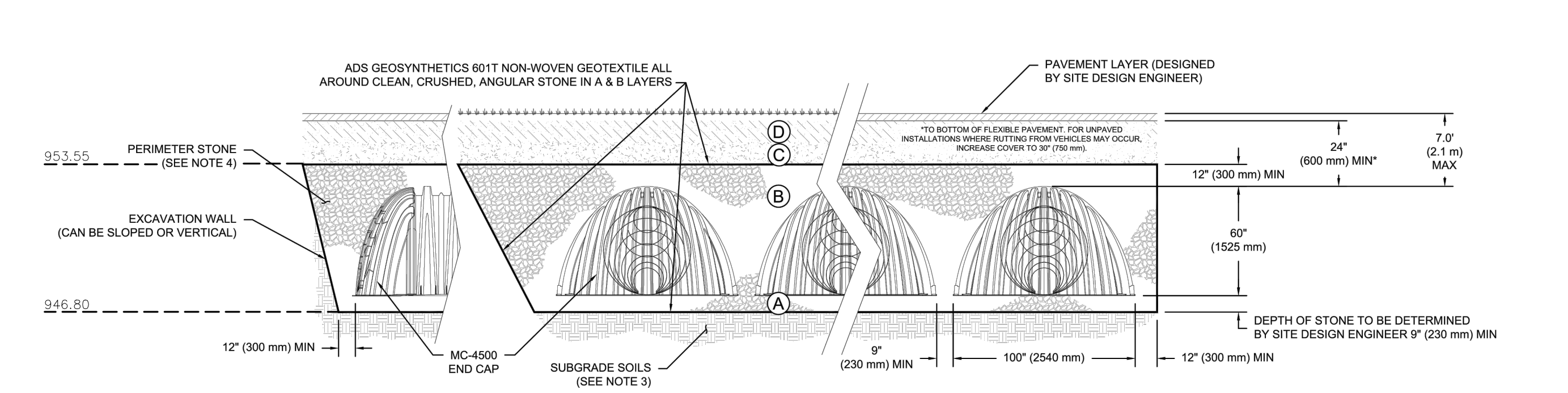


OUTLET CONTROL STRUCTURE DETAIL (NORTH DETENTION) SCALE : NTS

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

Table with 4 columns: MATERIAL LOCATION, DESCRIPTION, AASHTO MATERIAL CLASSIFICATIONS, and COMPACTION / DENSITY REQUIREMENT.

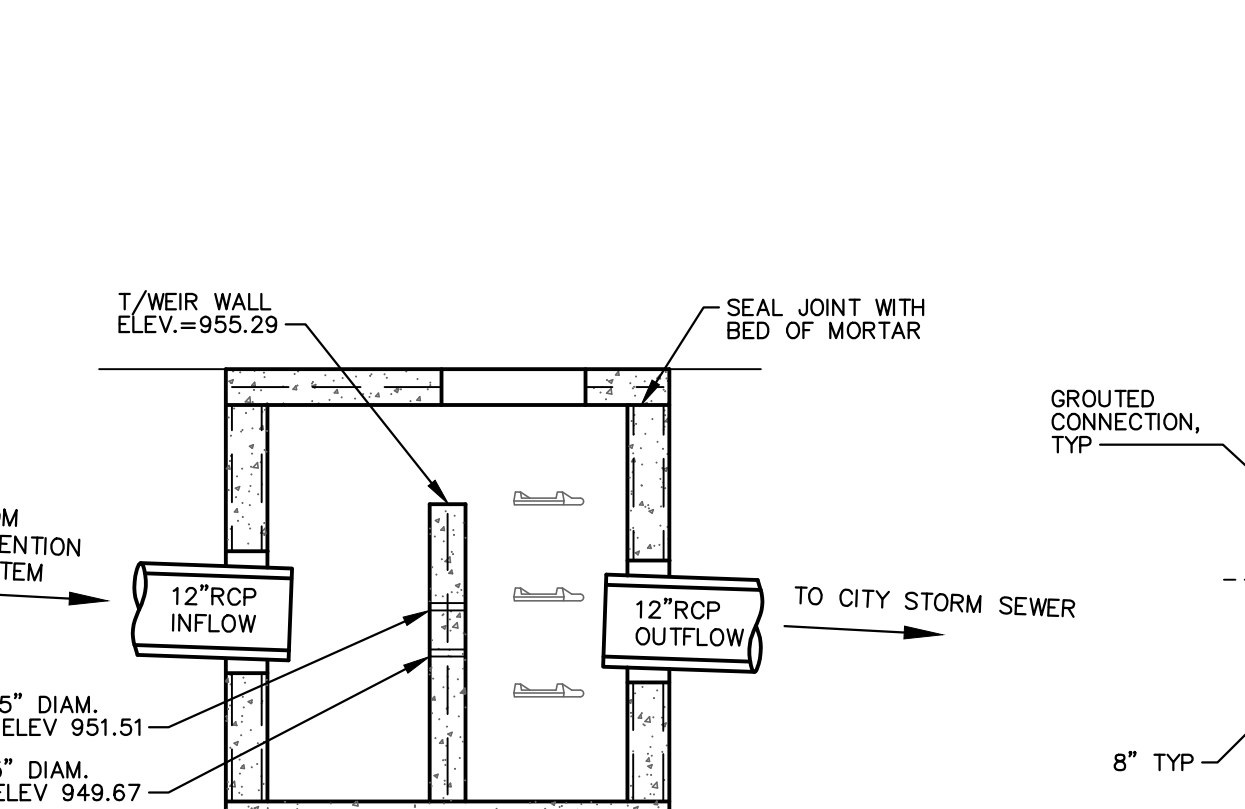
PLEASE NOTE: 1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR...



NORTH DETENTION CHAMBER DETAIL

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown are in the exact location indicated.

SOUTH DETENTION ORIFICE CALCULATIONS

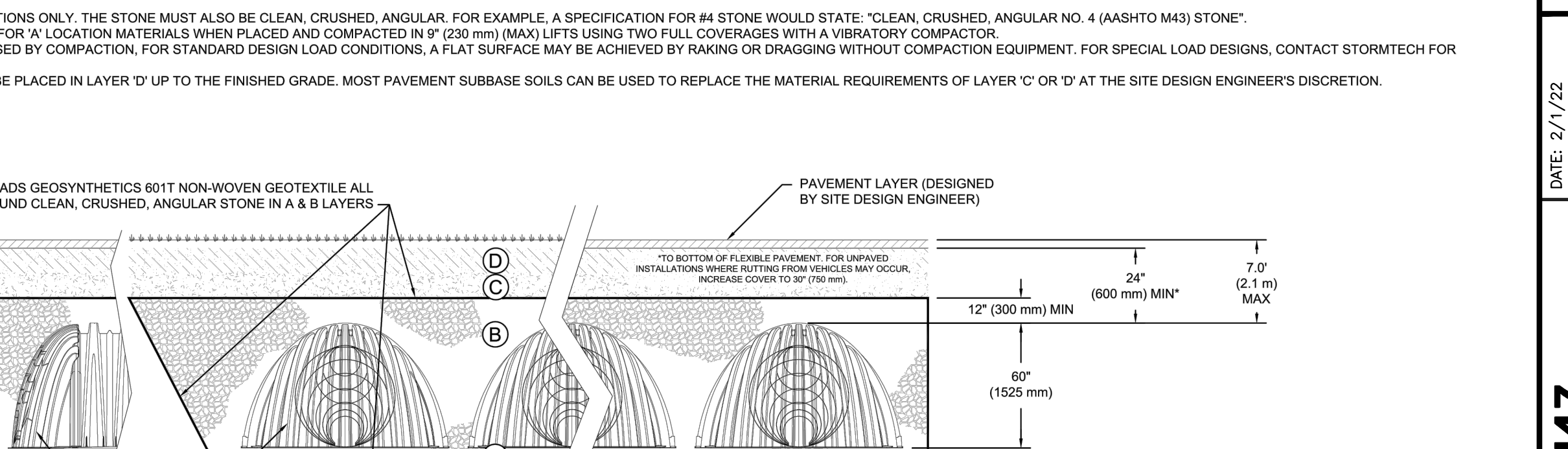


OUTLET CONTROL STRUCTURE DETAIL (SOUTH DETENTION) SCALE : NTS

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

Table with 4 columns: MATERIAL LOCATION, DESCRIPTION, AASHTO MATERIAL CLASSIFICATIONS, and COMPACTION / DENSITY REQUIREMENT.

PLEASE NOTE: 1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR...



SOUTH DETENTION CHAMBER DETAIL

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Job No. 21147, Date: 2/1/22, and a table of review dates and personnel.

M:\CIVIL\2022\21147\Site Plan\21147L1.0.dwg, 7/22/2022 3:36 PM, Ted P. Hirsch, L1.0 LANDSCAPE PLAN, MCLC PDF, ps3
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Know what's below.
 Call before you dig.
 SCALE: 1" = 30'
 0 30 60 90

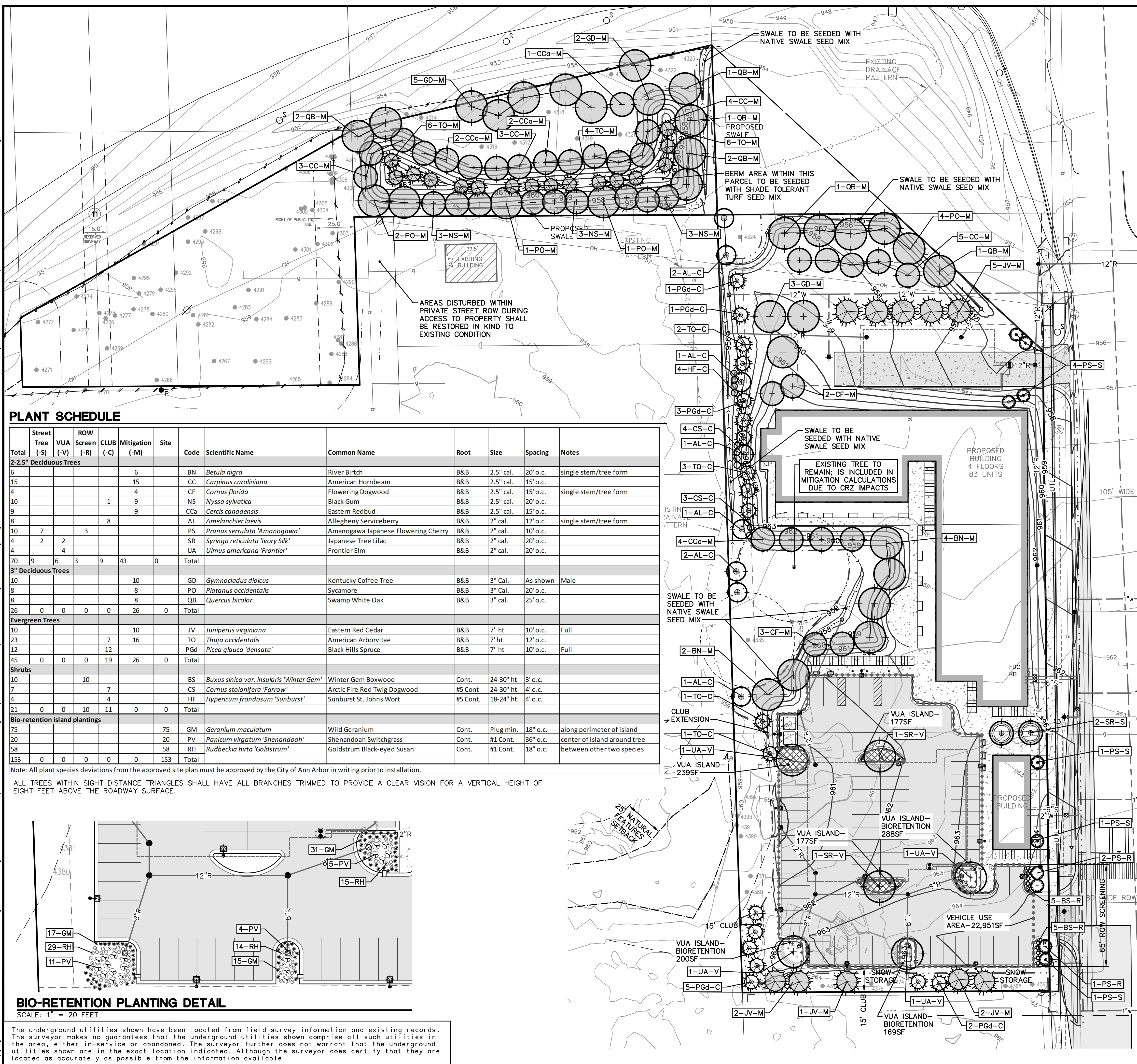
LANDSCAPE LEGEND

	-V	PROPOSED CANOPY TREE (INTERIOR VUA)
	-R	PROPOSED CANOPY TREE (RIGHT-OF-WAY SCREEN)
	-R	PROPOSED EVERGREEN SHRUBS (RIGHT-OF-WAY SCREEN)
	-C	PROPOSED CANOPY TREE (CONFLICTING LAND USE BUFFER)
	-C	PROPOSED EVERGREEN TREE (CONFLICTING LAND USE BUFFER)
	-C	PROPOSED DECIDUOUS SHRUBS
	-M	PROPOSED CANOPY TREE (MITIGATION)
	-M	PROPOSED EVERGREEN TREE (MITIGATION)
	-S	PROPOSED CANOPY TREE (STREET TREE)
	-	EXISTING TREE TO REMAIN
	-	VEHICLE USE AREA - NON-BIORETENTION
	-	VEHICLE USE AREA - BIORETENTION
	-	VEHICULAR USE AREA LIMITS
	-	GRADING LIMITS

LANDSCAPE REQUIREMENTS

	Required	Proposed
Right-of-way screening	10ft when VUA viewed from ROW 1 tree per 30ft; continuous hedge/screen 30inches in ht 65ft / 30 = 3 trees, shrubs	3 trees and 10 shrubs proposed
Vehicle Use Area		
Interior islands	1:20sf ratio for island, 22,951sf / 20 = 1,147sf island	1,250sf proposed
Bio-retention island	if >750sf island; 50% bioretention 1,147sf / 2 = 574sf bioretention island	657sf proposed
Interior island trees	1 tree per island; 1 tree per 250sf island; 1,147sf / 250; 1 per island = 5 trees	6 trees proposed
Snow pile storage	identify locations on plan	identified on landscape plan
Street Trees		
Street trees	1 tree per 45f - N. Maple Road - 407 lf / 45 = 9 trees required	9 trees provided on site due to existing utilities - PUD deviation requested
Street tree escrow	\$1.30 per linear foot frontage 407lf x \$1.30 = \$529.10	\$529.10 to City Tree Fund prior to issuing building permits.*
Street tree canopy loss fee	total dbh removed - caliper replacement trees x \$194 per tree	Not applicable
Conflicting Land Use Buffer		
when adjacent to public park and R4 adjacent to residential purposes	15ft wide; 1 tree per 15ft, 50% evergreen; continuous screening 4ft high - West - 495 lf / 15 = 33 trees required (17 evergreen required) South - 195/15 = 13 trees required (7 evergreen required)	West - 8 existing trees to remain; 17 evergreen trees proposed; 8 deciduous proposed, shrubs proposed South - 4 existing evergreen trees; 1 deciduous tree to remain; 2 evergreens proposed
Tree Mitigation		
	50% DBH of Woodland and LM removed; Landmark-376' impact x 0.5 = 188' req. Woodland-412' impact x 0.5 = 206' req. Total required = 394 inches	26 deciduous 3" cal. Trees = 78" 43 deciduous 2.5" cal. Trees = 107.5" 26 evergreen (2.5" equiv.) trees = 65" Total on-site = 250.5" Total off-site = 143.5" X \$200 = \$28,700 as contribution to City Tree Planting Fund
Outdoor refuse	screening required	screening wall around dumpster
Private streets and shared driveways	Not applicable	Not applicable

*Checks for street tree escrow are to be made payable to City of Ann Arbor and mailed to Systems Planning Unit, 301 E. Huron Street, PO Box 8647, Ann Arbor, Michigan 48107-8647. Attn: Tiffany Giacobazzi. Include the project name and number on the check.

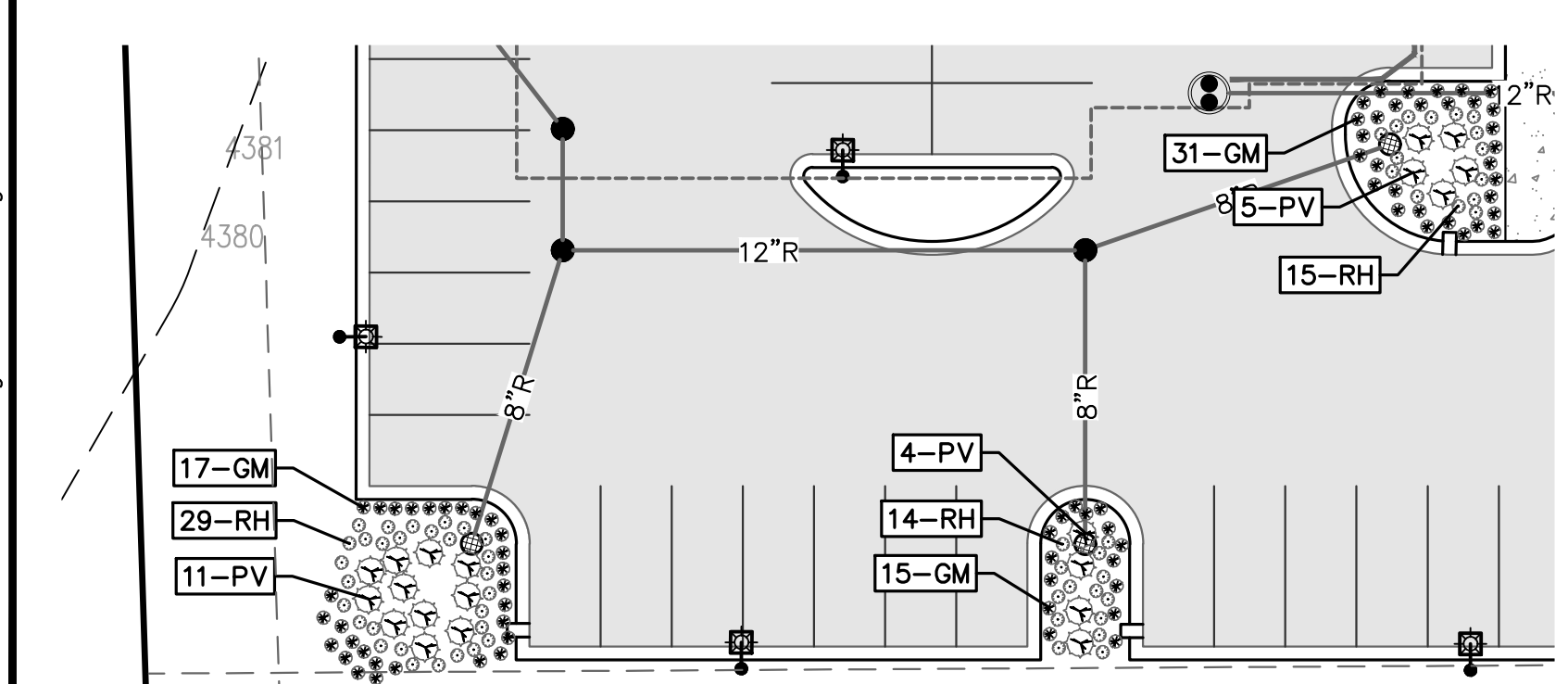


PLANT SCHEDULE

Total	Street Tree (-S)	VUA (-V)	Screen (-R)	CLUB (-C)	Mitigation (-M)	Site	Code	Scientific Name	Common Name	Root	Size	Spacing	Notes
2-2.5" Deciduous Trees													
6					6		BN	<i>Betula nigra</i>	River Birch	B&B	2.5" cal.	20' o.c.	single stem/tree form
15					15		CC	<i>Cornus caroliniana</i>	American Hornbeam	B&B	2.5" cal.	15' o.c.	
4					4		CF	<i>Cornus florida</i>	Flowering Dogwood	B&B	2.5" cal.	15' o.c.	single stem/tree form
10				1	9		NS	<i>Nyssa sylvatica</i>	Black Gum	B&B	2.5" cal.	20' o.c.	
9					9		CCa	<i>Cercis canadensis</i>	Eastern Redbud	B&B	2.5" cal.	15' o.c.	
8				8			AL	<i>Amelanchier laevis</i>	Allegheny Serviceberry	B&B	2" cal.	12' o.c.	single stem/tree form
10	7		3				PS	<i>Prunus serrulata 'Amanogawa'</i>	Amanogawa Japanese Flowering Cherry	B&B	2" cal.	10' o.c.	
4	2	2					SR	<i>Syringa reticulata 'Ivory Silk'</i>	Japanese Tree Lilac	B&B	2" cal.	20' o.c.	
4		4					UA	<i>Ulmus americana 'Frontier'</i>	Frontier Elm	B&B	2" cal.	20' o.c.	
70	9	6	3	9	43	0	Total						
3" Deciduous Trees													
10					10		GD	<i>Gymnocladia dioica</i>	Kentucky Coffee Tree	B&B	3" Cal.	As shown	Male
8					8		PO	<i>Platanus occidentalis</i>	Sycamore	B&B	3" cal.	20' o.c.	
8					8		QB	<i>Quercus bicolor</i>	Swamp White Oak	B&B	3" cal.	25' o.c.	
26	0	0	0	0	26	0	Total						
Evergreen Trees													
10					10		JV	<i>Juniperus virginiana</i>	Eastern Red Cedar	B&B	7' ht	10' o.c.	Full
23				7	16		TO	<i>Thuja occidentalis</i>	American Arborvitae	B&B	7' ht	12' o.c.	
12				12			PGd	<i>Picea glauca 'densata'</i>	Black Hills Spruce	B&B	7' ht	10' o.c.	Full
45	0	0	0	19	26	0	Total						
Shrubs													
10			10				BS	<i>Buxus sinica var. insularis 'Winter Gem'</i>	Winter Gem Boxwood	Cont.	24-30" ht	3' o.c.	
7			7				CS	<i>Cornus stolonifera 'Farrow'</i>	Arctic Fire Red Twig Dogwood	#5 Cont.	24-30" ht	4' o.c.	
4			4				HF	<i>Hypericum frondosum 'Sunburst'</i>	Sunburst St. Johns Wort	#5 Cont.	18-24" ht.	4' o.c.	
21	0	0	10	11	0	0	Total						
Bio-retention island plantings													
75					75		GM	<i>Geranium maculatum</i>	Wild Geranium	Cont.	Plug min.	18" o.c.	along perimeter of island
20					20		PV	<i>Panicum virgatum 'Shenandoah'</i>	Shenandoah Switchgrass	Cont.	#1 Cont.	36" o.c.	center of island around tree
58					58		RH	<i>Rudbeckia hirta 'Goldstrum'</i>	Goldstrum Black-eyed Susan	Cont.	#1 Cont.	18" o.c.	between other two species
153	0	0	0	0	153	Total							

Note: All plant species deviations from the approved site plan must be approved by the City of Ann Arbor in writing prior to installation.

ALL TREES WITHIN SIGHT DISTANCE TRIANGLES SHALL HAVE ALL BRANCHES TRIMMED TO PROVIDE A CLEAR VISION FOR A VERTICAL HEIGHT OF EIGHT FEET ABOVE THE ROADWAY SURFACE.



BIO-RETENTION PLANTING DETAIL
SCALE: 1" = 20 FEET

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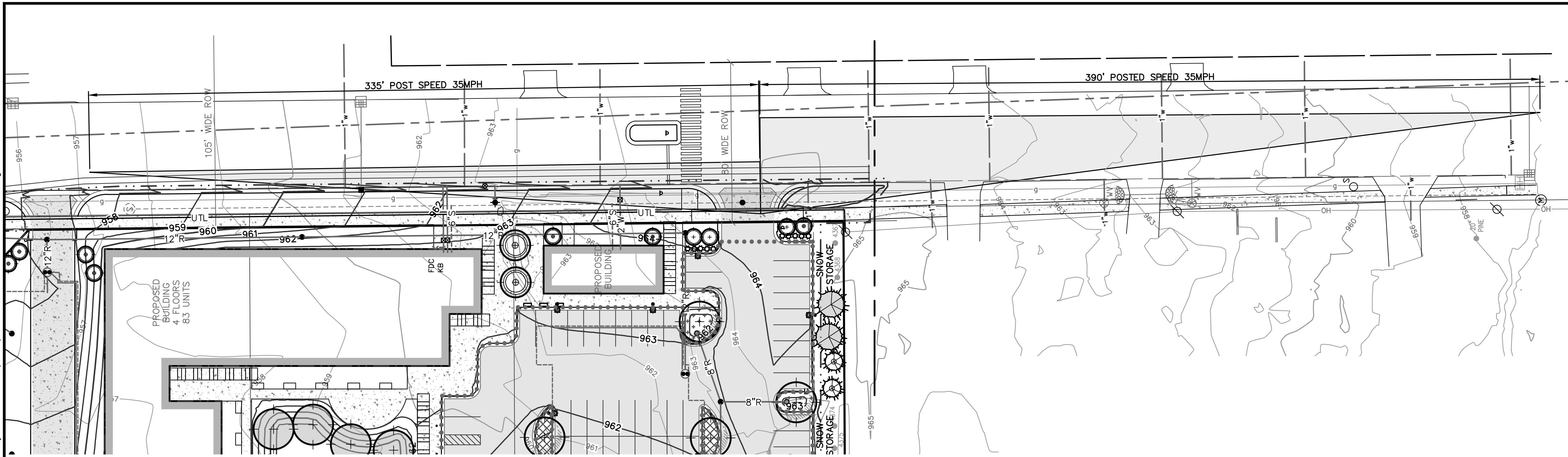
CLIENT
 A2 NORTH MAPLE PROPERTIES LLC
 2370 E. STADIUM BLVD. # 505
 ANN ARBOR, MI 48104
 JEFF WILKERSON
 (989) 529-5858

NORTH MAPLE APARTMENTS
 LANDSCAPE PLAN

L1.0

JOB No.	21147
DATE	2/17/22
REV. DATE	4/20/22
REV. DATE	5/17/22
REV. DATE	5/25/22
REV. DATE	7/15/22
REV. DATE	7/22/22

M:\CIVIL\3D_Proj\12114\Site Plan\12114\Site Plan.dwg, 7/22/2022 3:37 PM, Ted P. Hirsch, L1.2 LANDSCAPE DETAILS AND SIGHT DISTANCE, MCLC PDF.pc3
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SWALE SEED MIX

SOURCE: CARDNO NATIVE PLANT NURSERY

Botanical Name	Common Name	P15 Qty/Acre
Permanent Grasses/Sedges		
<i>Andropogon gerardii</i>	Big Bluestem	4.00
<i>Carex crinita</i>	Orchard Grass Sedge	18.00
<i>Carex lurida</i>	Bottlebrush Sedge	3.00
<i>Carex spp.</i>	Prairie Sedge Species	8.00
<i>Carex vulpinoidea</i>	Brown Fox Sedge	3.00
<i>Elymus canadensis</i>	Canada Wild Rye	16.00
<i>Elymus virginicus</i>	Virginia Wild Rye	16.00
<i>Juncus canadensis</i>	Canada Rush	1.00
<i>Panicum virgatum</i>	Switch Grass	3.00
<i>Scirpus atrovirens</i>	Dark Green Rush	2.00
<i>Scirpus cyperinus</i>	Wood Grass	0.50
<i>Spartina pectinata</i>	Prairie Cord Grass	3.00
	Total	90.00
Temporary Grasses		
<i>Avena sativa</i>	Common oat	512.00
	Total	512.00
Forbs		
<i>Alisma subcordatum</i>	Common Water Plantain	1.00
<i>Achillea millefolium</i>	Swamp Milkweed	2.00
<i>Cynopsis rigida</i>	Tall Conegrass	1.00
<i>Euthamia graminifolia</i>	Common Grass Leaved Goldenrod	0.50
<i>Eragrostis maculata</i>	Spotted Joe-Pye Weed	1.00
<i>Hor. virginica s. abnorme</i>	Star Flag	4.00
<i>Liatris spicata</i>	Marsh Blazing Star	1.00
<i>Lycopus americanus</i>	Common Water Honeysuckle	0.50
<i>Melilotus virginicus</i>	Blackfoot	3.50
<i>Pentstemon sedoides</i>	Ditch Stonecrop	1.00
<i>Pycnanthemum virginianum</i>	Common Mountain Mint	0.50
<i>Rudbeckia hirta</i>	Brown-Eyed Susan	1.00
<i>Sisyrinchium albidum</i>	Wild Senna	1.00
<i>Siphium terrestris</i>	Prairie Dock	1.00
<i>Symphoricarpos roseae-anglica</i>	New England Aster	0.50
<i>Verbena hastata</i>	Blue Veranda	1.50
<i>Zizia aurea</i>	Golden Alexander	2.00
	Total	29.00

LANDSCAPE NOTES

- For any plant quantity discrepancies between the plan view and the plant schedules, the plant schedule shall take precedence.
 - Plant materials shall be selected and installed in accordance with standards established by City of Ann Arbor.
 - All diseased, damaged or dead material shown on the site plan as proposed plantings shall be replaced by the end of the following growing season.
 - Restore disturbed areas with a minimum of four (4) inches of topsoil and then seed/ fertilize/mulch.
 - All disturbed areas not to be seeded with seed mixes identified on the Landscape Plan shall be lawn areas. Fertilizer for the initial installation of lawns shall provide not less than one (1) pound of actual nitrogen per 1,000 sq ft of lawn area and shall contain not less than two percent (2%) potassium and four percent (4%) phosphoric acid.
Lawn (turfgrass) seed mix shall consist of:
15% Rugby Kentucky Bluegrass
10% Park Kentucky Bluegrass
40% Ruby Creeping Red Fescue
15% Pennine Perennial Ryegrass
20% Scaldis Hard Fescue
 - Seed shall be applied at a rate of five pounds (5 lbs) per 1000 sq ft. Mulch within 24 hours with two (2) tons of straw per acre, or 71 bales of excelsior mulch per acre. Anchor straw mulch with spray coating of adhesive material applied at the rate of 150 gals. / acre.
 - After the first growing season, only fertilizers that contain NO phosphorus shall be used on the site.
 - Areas identified on the Landscape Plan with seed mixes shall be seeded with specified seed mixes from Cardno Native Plant Nursery, or equivalent as approved by landscape architect. Temporary cover crop shall be included with all seed mixes. Seeding rates and installation techniques shall be confirmed with supplier.
 - All seeded areas with slopes less than 1:3 (one vertical foot for every 3 horizontal feet) shall be mulched with straw mulch at the rate of two (2) bales per 1,000 square feet. All seeded areas with slopes greater than 1:3 shall be seeded and biodegradable erosion control blanket North American Green SC150, or equivalent, shall be applied with biodegradable stakes.
 - Deciduous plants shall be planted between March 1 and May 15 and from October 1 until the prepared soil becomes frozen. Evergreen plants shall be planted between March 1 and June 1 and from August 15 to September 15.
 - Native seeding areas shall be seeded after May 1, (when soil is free of frost and in workable condition), but before June 15 or after October 1, but before November 30 (or prior to ground freezing) or as approved by Landscape Architect or guaranteed by the supplier. If seeding is performed outside planting window, contractor shall perform regularly scheduled watering for installed seed and as needed based on weather conditions to ensure germination and establishment of seed.
 - All planting beds are to receive four (4) inches of shredded hardwood bark mulch.
 - All trees to be located a minimum of 10 feet from public utilities.
 - All single trunk, deciduous trees shall have a straight and a symmetrical crown with a central leader. One sided trees or those with thin or open crowns shall not be accepted.
 - All evergreen trees shall be branched fully to the ground, symmetrical in shape and have not been sheared in the last three (3) growing seasons.
 - All compacted subgrade soils in proposed landscape bed areas shall be tilled to a minimum 12-inch depth prior to placement of topsoil, geotextile fabric, or other planting media as specified.
 - Proposed trees will be planted a minimum of 15 feet apart.
 - Planting Soil: Existing, in-place or stockpiled topsoil. Supplement with imported topsoil as needed. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments to produce planting soil:
 - Ratio of Loose Compost to Topsoil by Volume: 1:4.
 - Weight of Lime per 1000 Sq. Ft.: Amend with lime only on recommendation of soil test to adjust soil pH.
 - Weight of Sulfur or Aluminum Sulfate per 1,000 Sq. Ft.: Amend with sulfur or aluminum sulfate only on recommendation of soil test to adjust soil pH.
 - Volume of Sand: Amend with sand only on recommendation of Landscape Architect to adjust soil texture.
 - Weight of Slow-Release Fertilizer per 1,000 Sq. Ft.: Amend with fertilizer only on recommendation of soil test to adjust soil fertility.
 - Native seeding installation shall be performed by a qualified contractor with documented experience of successful established native seeding. Seed shall be installed per manufacturer's specification via hand broadcast.
 - At the time of plant and seed delivery for the infiltration basins, including native seed and live plantings, a Washtenaw County Water Resource Commissioner landscape reviewer must be present. Contact Katie Wytchak at wytchak@washtenaw.org or 734-222-6813 to coordinate.
 - Snow cannot be pushed onto interior islands unless they are designated on the plan for snow storage. Bio-retention islands can be used for snow storage.
 - Snow storage areas is located in the courtyard area as shown on the landscape plan.
 - No chemicals are allowed in stormwater features or buffer zones with the following exception: invasive species may be treated with chemicals by a certified applicator.
- Maintenance:
- Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
 - Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
 - Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
 - Contractor shall warranty all plant material and trees to remain alive and be in healthy, vigorous and like new condition for the specified period from installation to Substantial Completion. The entire Landscaping Project, including but not limited to: plants (perennials), trees, shrubs, mulches, shrubs, etc. are to be under Warranty for One Year after Substantial Completion date of the Project. At the end of the specified One Year Warranty period the Owner's Representative will inspect plant material for compliance. Contractor shall replace, in accordance with the drawings and specifications, all plants, trees, shrubs, etc. or as determined by the Owner's Representative, are in an unhealthy or unsightly condition. Warranty shall not include damage or loss of plants, trees, and shrubs caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, acts of vandalism or negligence on the part of the owner, or any other incident beyond landscape contractor's control.
 - Long-term maintenance of the bio-retention islands shall be performed by the Owner. Maintenance shall include seasonal trimming and removal of dead foliage, removal of weeds, and removal or mulching of leaves and stems. Spot treatment/removal of invasive weeds may be necessary if localized areas become dominated by invasive weeds. Bio-retention islands shall be inspected by owner following any storm event exceeding 1". Trash and debris shall be removed as needed. Shredded hardwood mulch must be re-spread when erosion is evident and be replenished annually. Once every 2 to 3 years, the entire bio-retention/rain garden area may require mulch replacement.
 - Turf installations shall meet the following criteria as determined by Owner:
 - Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
 - Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
 - Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

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(989) 529-5858

NORTH MAPLE APARTMENTS

LANDSCAPE DETAILS AND SIGHT DISTANCE

JOB No. 21147

DATE: 2/1/22

SHEET OF

REV. DATE

ADD: RM/LL

PER MUNICIPAL REVIEW

ENG: TPJ

PER MUNICIPAL REVIEW

PM: TJC

PER WATER RESOURCES REVIEW

TECH: TRW

7/22/22

7/21/22