

CHAHAL SEMI TRUCK/TRAILER REPAIR FACILITY

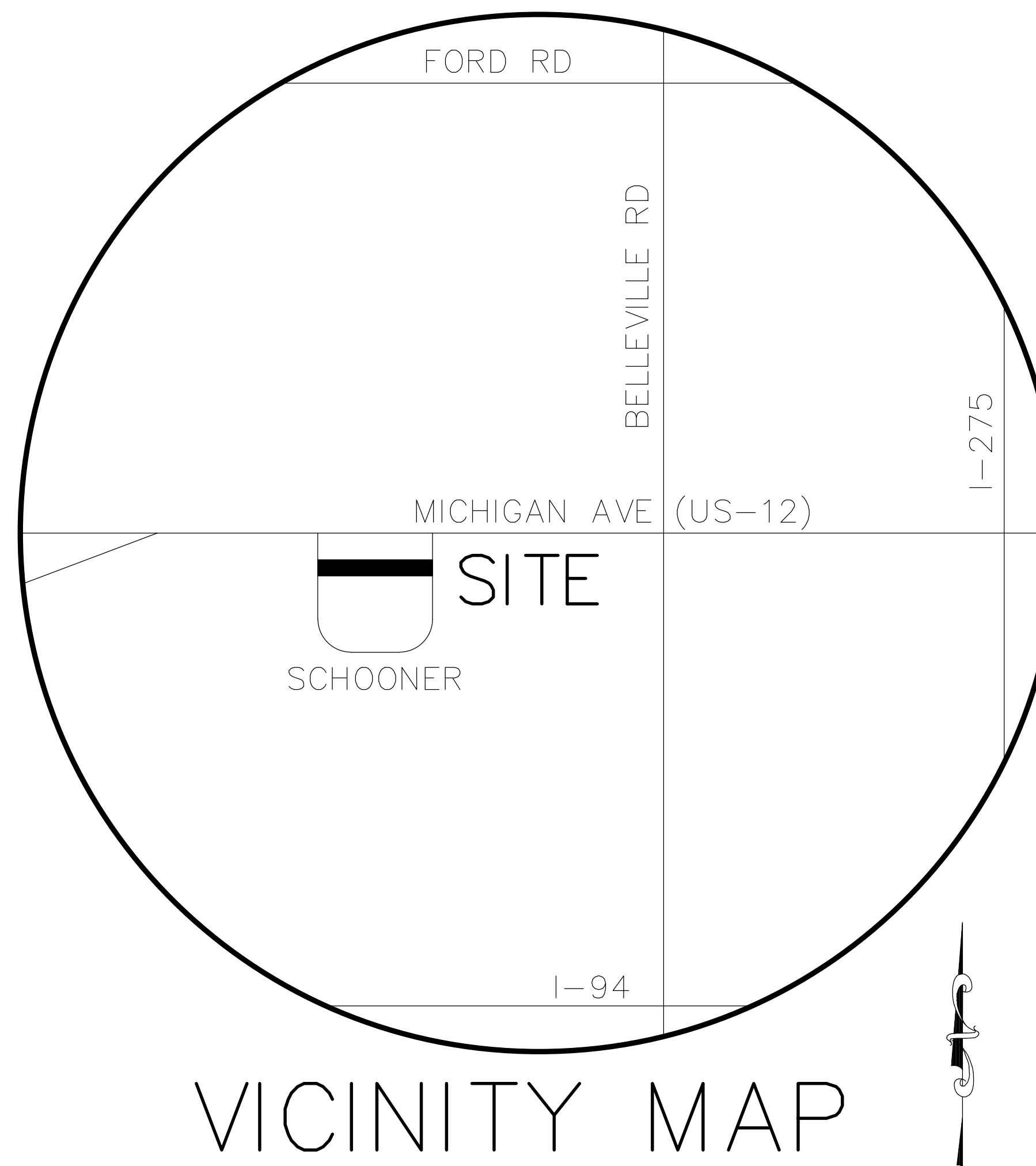
6100 SCHOONER DRIVE
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

DESIGN ENGINEERS

HARDY CIVIL DESIGN SERVICES LLC
4996 MOORE
WAYNE MI 48184
Ph. (734) 756-2196
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CONTACT: KEVIN HARDY

GENERAL CONTRACTOR

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301 INDUSTRIAL PARK DRIVE
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Ph. (313) 350-0369
E-MAIL: joe@davenportbrothers.com



VICINITY MAP

LEGAL DESCRIPTION

COMMENCING AT THE SOUTH 1/4 CORNER OF SECTION 32, TOWN 2 SOUTH, RANGE 8 EAST, VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN; THENCE S.87°37'34"W., 61.08 FEET ALONG THE SOUTH LINE OF SAID SECTION 32, ALSO BEING THE NORTH LINE OF SECTION 5, TOWN 3 SOUTH, RANGE 8 EAST, VAN BUREN TOWNSHIP, M WAYNE COUNTY, MICHIGAN; THENCE ALONG THE WESTERLY LINE OF SCHOONER DRIVE (60' RIGHT OF WAY) THE FOLLOWING TWO COURSES: (1) SOUTHERLY 27.29 FEET ALONG THE ARC OF A 370 FOOT RADIUS CURVE TO THE RIGHT, THROUGH A CENTRAL ANGLE OF 04°13'31" AND HAVING A CHORD BEARING S.07°20'55"E., 27.28 FEET AND (2) S.05°14'10"E., 476.68 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING S.05°14'10"E., 274.00 FEET; THENCE S.85°10'54"W., 1010.75 FEET; THENCE N.04°49'18"W., 216.33 FEET ALONG THE EASTERLY LINE OF SAID SCHOONER DRIVE; THENCE N.88°17'04"E., 217.19 FEET; THENCE N.05°42'41"W., 69.43 FEET; THENCE N.85°10'54"E., 792.98 FEET TO THE POINT OF BEGINNING. BEING A PART OF THE NORTH 1/2 OF SECTION 5, TOWN 3 SOUTH, RANGE 8 EAST, VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN.

TAX ID #83-017-99-0014-714

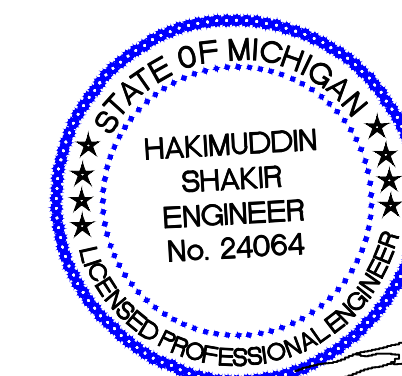
Land Characteristic	Existing	Proposed
Total Development Area (ac)	6.03	4.99
Impervious Area (ac)	1	3.24
Total Pervious Area (ac)	5	1.75
Pervious Area Breakdown by Cover Type		
Non-cultivated	4	0
Impervious Area (ac)	N/A	N/A
Improved area (grass/landscape)	6.03	1.19
Predominant NRCS Soil Type	type B	type B
Wooded Area (ac)	0	0
Predominant NRCS Soil Type	N/A	N/A
	Required Volume	Provided Vol
CPVC	13,042	0
CPRC	24,780	0
Flood Control	49,641	49,767
Total Volumes	49,641	49,767

CERTIFICATION

THE PROFESSIONAL ENGINEER WHO SIGNS AND SEALS THIS SITE PLAN CERTIFIES THAT THE VALUES IN THIS TABLE REFLECT THE WAYNE COUNTY STORMWATER CALCULATIONS REQUIRED FOR THIS DEVELOPMENT AND THAT GEOTECHNICAL INVESTIGATIONS WERE PERFORMED THAT PROVIDE CONCLUSIVE DOCUMENTATION THAT DEMONSTRATES WHETHER INFILTRATION (I.E., CPVC VOLUME CONTROL) IS PRACTICABLE.

PROPERTY OWNER

SUKHDEV SINGH
8385 OPAL
WESTLAND, MI 48185
Ph. (734) 419-3060
E-MAIL: suksingh363@gmail.com



SHEET INDEX

1. SITE PLAN
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4. STORM SEWER DESIGN PLAN
5. PROFILES
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7. DETAILS
8. TOWNSHIP DETAILS
9. TOWNSHIP DETAILS
- LP-1 LANDSCAPING PLAN
- LP-2 LANDSCAPING DETAILS
- PH-1 PHOTOMETRICS PLAN
- PH-2 PHOTOMETRICS BUILDING
- A1.0 FLOOR PLAN
- A2.0 BUILDING ELEVATIONS

REQUIRED PERMITS

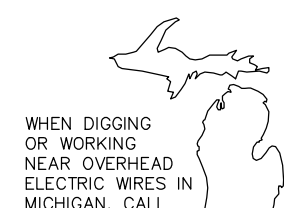
WAYNE COUNTY (STORM WATER PERMIT)
WAYNE COUNTY SESC PERMIT
VAN BUREN TOWNSHIP (SITE DEVELOPMENT PERMIT)

PROPOSED USE

THE PROPOSED USE OF THE FACILITY IS FOR MAJOR TRUCK REPAIR.

VEHICLES AND THEIR TRAILERS MAY REQUIRE AND RECEIVE REPLACEMENT OR REPAIR TO MAY COMPONENT, SUCH AS ENGINES, EXHAUST SYSTEMS, TRANSMISSIONS, AND OR SUSPENSIONS.

NEW AND USED VEHICLES AND TRAILER COMPONENTS WILL BE REMOVED WITHIN THE PROPOSED BUILDING AND ALL NEW AND USED COMPONENTS WILL BE STORED WITHIN THE PROPOSED BUILDING.



MISS DIG

3 WORKING DAYS
BEFORE STARTING YOUR PROJECT

811
(TOLL FREE)

ZONING & SETBACKS

SUBJECT PROPERTY ZONED M2 (GENERAL INDUSTRIAL)
PROPOSED USE: SEMI TRUCK/TRAILER REPAIR

ADJACENT PROPERTY ZONING:

NORTH M1 & M2
EAST M2
SOUTH M2
WEST M1

SCHEDULE OF REGULATIONS FOR M2 ZONING

LOT SIZE NONE
BUILDING HEIGHT 4 - STORY
LOT COVERAGE 35%

SETBACKS

FRONT 60'(o)
REAR 50'
SIDES 50'(p), TOTAL 100'

SETBACK FOOTNOTES

(o) OFF-STREET PARKING FOR VISITORS, OVER AND ABOVE THE NUMBER OF SPACES REQUIRED UNDER SECTION 9.102 MAY BE PERMITTED WITHIN THE REQUIRED FRONT YARD PROVIDED THAT SUCH OFF-STREET PARKING IS NOT LOCATED WITHIN TWENTY (20) FEET OF THE FRONT LINE.

(p) OFF-STREET PARKING SHALL BE PERMITTED IN A REQUIRED SIDE YARD SETBACK.

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6100 SCHOONER DRIVE
TAX ID #83-017-99-0014-714

REQUIRED PARKING

PER TOWNSHIP ORDINANCE:

5 SPACES + EITHER 1 SPACE PER 550 S.F. GROSS FLOOR AREA OR 1 SPACE PER EACH EMPLOYEE AT PEAK SHIFT, WHICHEVER IS GREATER.

= 5+(MAX EMPLOYEE "5") = 10 REQUIRED SPACES OR
= 5+(8320sf/550) = 20 REQUIRED SPACES

TOTAL SPACES REQUIRED = 20
PROVIDED REGULAR SPACES 21
PROVIDED BARRIER FREE SPACES 01
TOTAL SPACES 22

GENERAL NOTES

- PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.
- PHASING OF THE PROJECT IS NOT PROPOSED.
- THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.
- PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY MAINTAINED IN A CLEARLY VISIBLE CONDITION.

SITE SPECIFIC NOTES

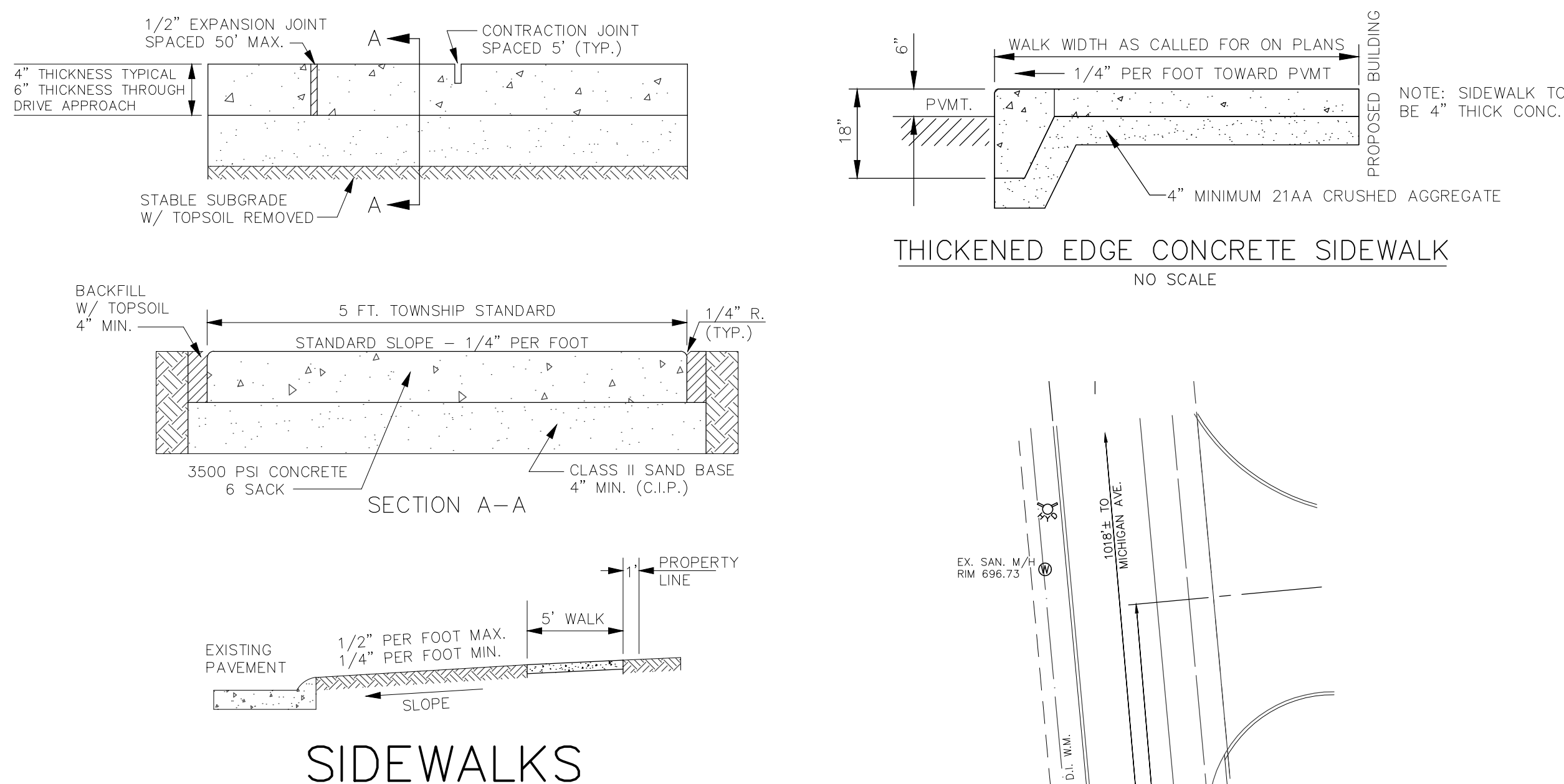
- PROPOSED SEMI TRUCK REPAIR FACILITY. THERE WILL BE NO LONG TERM PARKING WITHIN THE SUBJECT PROPERTY.
- TRUCKS PARKED ON THIS PROPERTY ARE FUNCTIONAL AND AWAITING REPAIR I.E., NO JUNK TRUCKS FOR PARTS SALVAGE.
- THERE WILL BE NO HAZARDOUS WASTE GENERATED FROM THE SITE.
- OILS, SOLVENTS AND OTHER CHEMICALS WILL BE REMOVED FROM THE SITE BY APPROVED HAULING METHODS.
- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS, SPECIFICATIONS, AND GENERAL CONDITIONS OF THE TOWNSHIP.
- THE APPLICANT IS RESPONSIBLE FOR RESOLVING ANY DRAINAGE PROBLEMS ON ADJACENT PROPERTIES WHICH ARE THE RESULT OF THE APPLICANTS ACTIONS.
- PROPOSED GATE TO BE SUPPLIED A FIRE DEPARTMENT LOCK.
- SITE FENCING IS NOT PROPOSED AS PART OF THIS PLAN.
- THERE IS NO PROPOSED SIGNAGE FOR THE SITE.

REQUIRED PERMITS

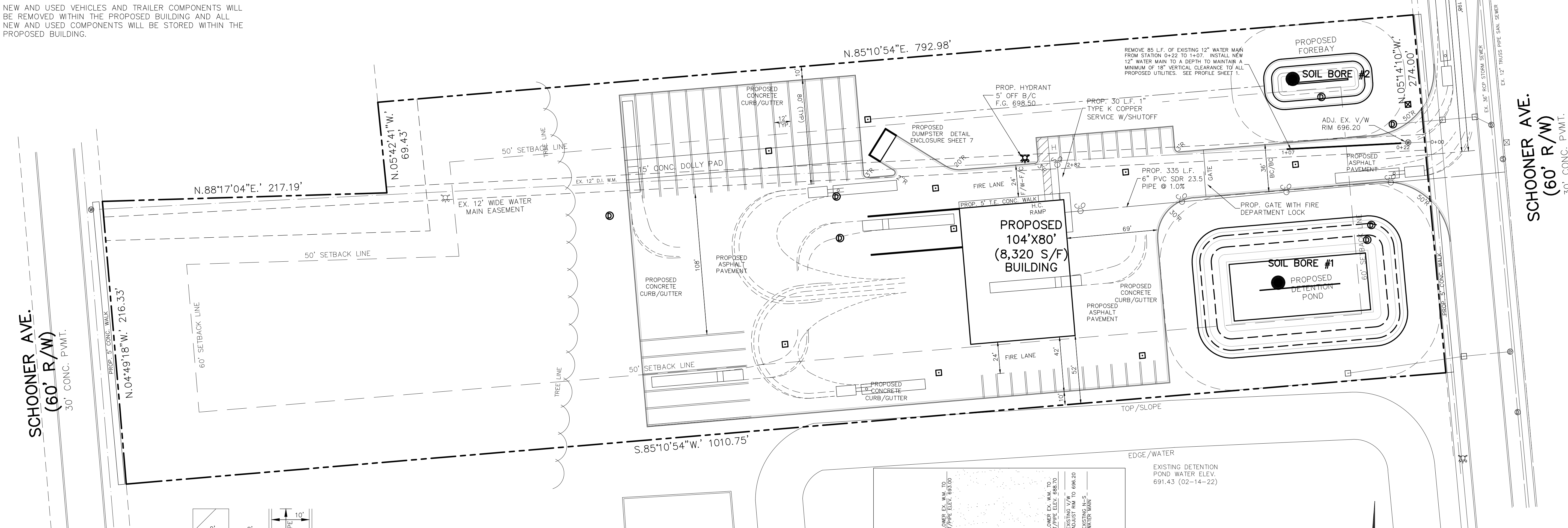
- WAYNE COUNTY STORM MANAGEMENT PERMIT.
- VAN BUREN DEVELOPMENT PERMIT

NOTE

SOIL BORE INFORMATION LOCATED ON SHEET #7.

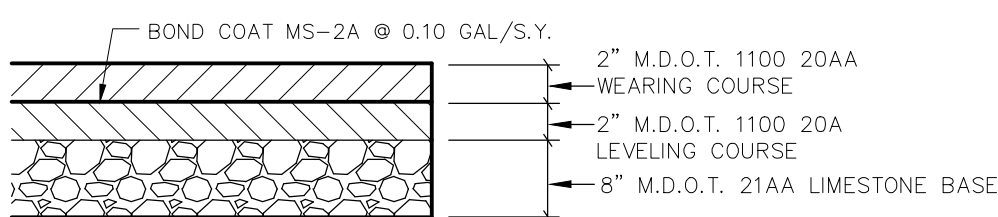


SIDEWALKS



TYPICAL 90° PARKING SPACE DETAIL

NOT TO SCALE



ASPHALT PAVEMENT SECTION

NOT TO SCALE

DETAIL	DIMENSIONS	LANE	CONCRETE
F1	1'-6" 7/8"	AS SHOWN	0.0424
F2	1'-6" 7/8"	OMITTED	0.0424
F3	2'-0" 1 3/8"	AS SHOWN	0.0550
F4	2'-0" 1 3/8"	OMITTED	0.0550
F5	2'-6" 1 7/8"	AS SHOWN	0.0677
F6	2'-6" 1 7/8"	OMITTED	0.0677

CURB & GUTTER DETAIL

USE CURB DETAIL 'F2'

WATER MAIN RELOCATION PROFILE

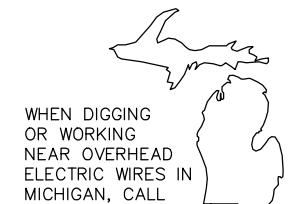
SCALE: 1"=40' HORIZONTAL
1"= 4' VERTICAL

PROPERTY OWNER

SUDKHDEV SINGH
8385 OPAL DRIVE
WESTLAND, MI 48185

LEGEND

- EX. CATCH BASIN
- EX. SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. HYDRANT
- EX. UTILITY POLE
- EX. VALVE WELL
- EX. FENCE
- EX. STREET SIGN
- EX. LIGHT POLE



MISS DIG

3 WORKING DAYS BEFORE STARTING YOUR PROJECT

811

(TOLL FREE)

SEMI-TRUCK REPAIR FACILITY
6100 SCHOONER ROAD
VAN BUREN TOWNSHIP, MI

SITE PLAN

HARDY CIVIL DESIGN SERVICES LLC
4996 MOORE ST. WAYNE, MI 48184
(734) 756-2196
E-mail: khardy196@hotmail.com

REVISIONS
02-02-23
02-15-23
03-07-23

DATE
01-10-22

DRAWING No.
A-

JOB No.
2022-01

SHEET No.
1 OF 9

ZONING & SETBACKS

SUBJECT PROPERTY ZONED M2 (GENERAL INDUSTRIAL)

ADJACENT PROPERTY ZONING:

NORTH M1 & M2
EAST M2
SOUTH M2
WEST M1

SCHEDULE OF REGULATIONS FOR M2 ZONING

LOT SIZE NONE
BUILDING HEIGHT 4 - STORY
LOT COVERAGE 35%

SETBACKS

FRONT 60'(o)
REAR 50'
SIDES 50'(p), TOTAL 100'

SETBACK FOOTNOTES

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(p) OFF-STREET PARKING SHALL BE PERMITTED IN A REQUIRED SIDE YARD SETBACK.

FLOODZONE

THE SUBJECT PROPERTY IS LOCATED IN ZONE "C" (AREAS OF MINIMAL FLOODING) AS SHOWN ON FLOOD INSURANCE RATE MAP PANEL 26163C0195E, DATED FEBRUARY 02, 2012.

PARCEL SOILS TYPE

Ba BELLEVILLE LOAMY FINE SAND
Tfa TEDROW LOAMY FINE SAND, LOAMY SUBSTRATUM, 0 TO 2 PERCENT SLOPES
PER USDA SOILD SURVEY OF SOUTHEAST MICHIGAN.

LAND AREA

THE SUBJECT PROPERTY CONTAINS 262,924 S/F - 6.02 AC.

GENERAL NOTES

- PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.
- PHASING OF THE PROJECT IS NOT PROPOSED.
- THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.
- PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY MAINTAINED IN A CLEARLY VISIBLE CONDITION.
- CONTRACTOR MUST PICK UP ANY FLOW FROM OFFSITE THAT CONTRIBUTES TO THE SITE.

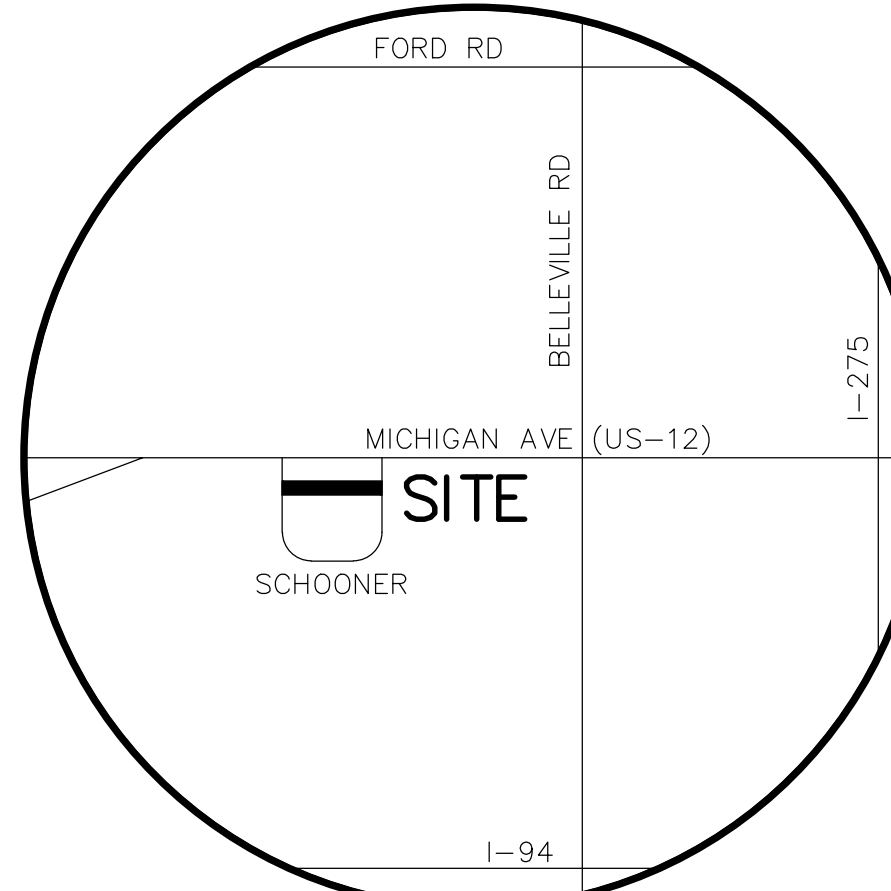
BENCHMARKS (USGS NAVD29)

RIM ON EXISTING MANHOLE LOCATED ON THE EAST SIDE OF SCHOONER DRIVE 115' SOUTH OF NORTHERLY PROPERTY LINE OF SUBJECT PARCEL...
ELEVATION - 696.16

ARROW ON HYDRANT LOCATED ON THE WEST SIDE OF SCHOONER DRIVE 65' SOUTH OF SOUTHERLY PROPERTY LINE OF SUBJECT PARCEL...
ELEVATION - 699.27

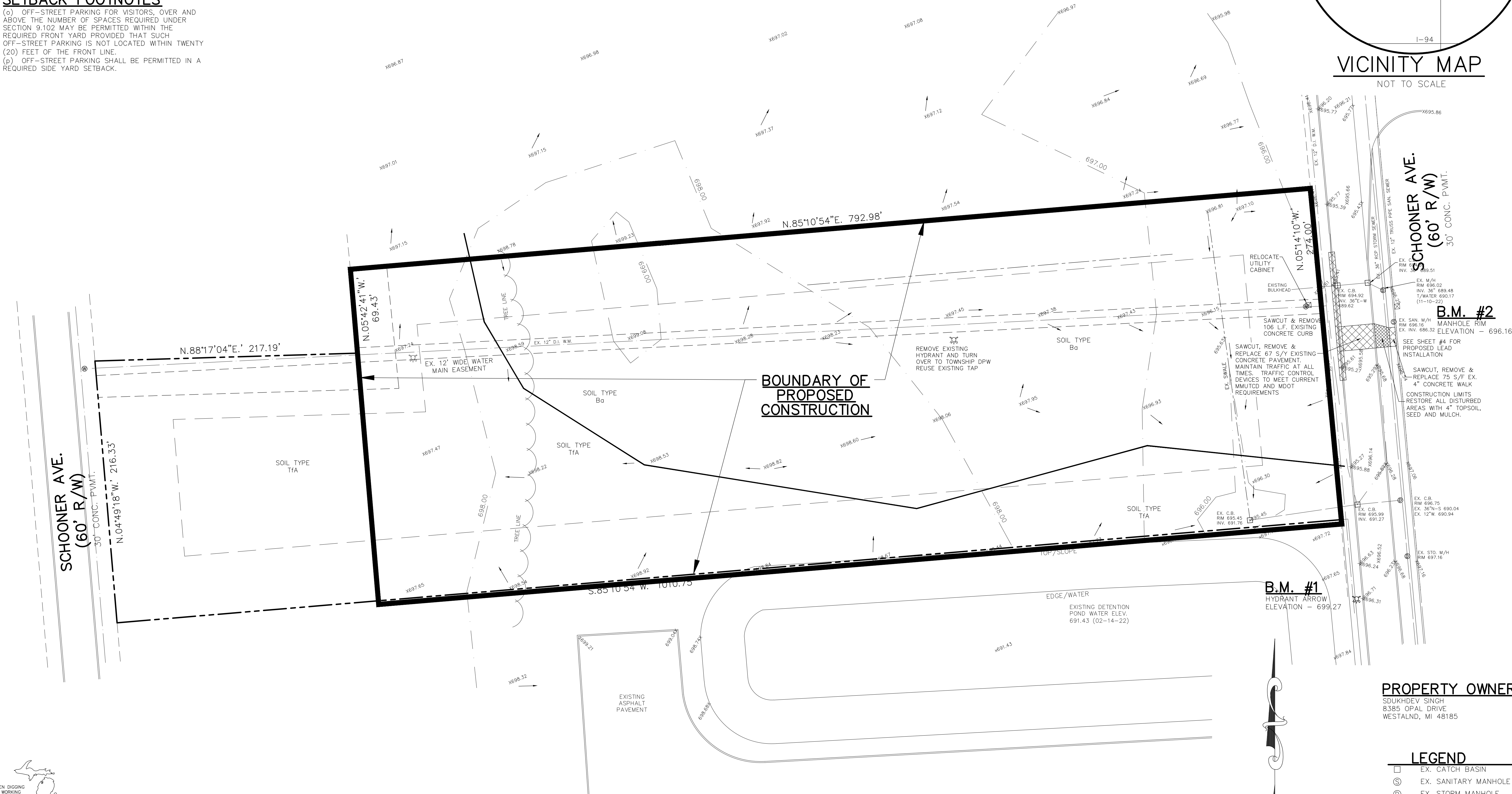
TRAFFIC CONTROL/SIGNAGE NOTES

- TWO-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES.
- ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS OF MDOT, MMUTCD AND TOWNSHIP REQUIREMENTS.



VICINITY MAP

NOT TO SCALE

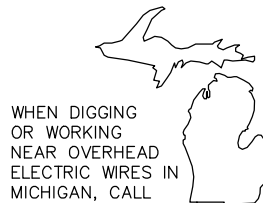
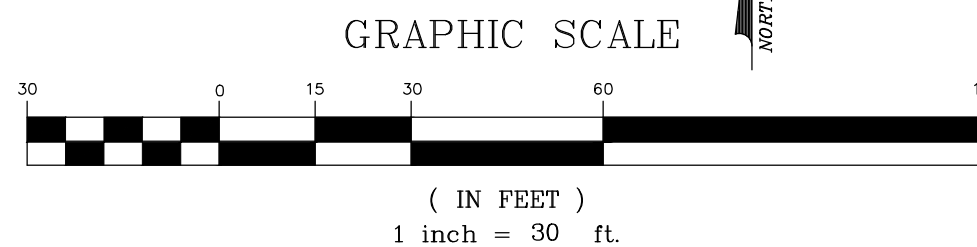


PROPERTY OWNER

SDUKHDEV SINGH
8385 OPAL DRIVE
WESTLAND, MI 48185

LEGEND

- EX. CATCH BASIN
- EX. SANITARY MANHOLE
- EX. STORM MANHOLE
- EX. HYDRANT
- EX. UTILITY POLE
- EX. VALVE WELL
- EX. FENCE
- EX. STREET SIGN
- EX. LIGHT POLE



MISS DIG

3 WORKING DAYS
BEFORE STARTING YOUR PROJECT

811

(TOLL FREE)

TOPOGRAPHIC
SURVEY

SEMI-TRUCK REPAIR FACILITY
6100 SCHOONER ROAD
VAN BUREN TOWNSHIP, MI

REVISIONS
02-02-23
02-15-23
03-07-23

DATE
01-10-22

DRAWING No.
A-

JOB No.
2022-01

SHEET No.
2 OF 9

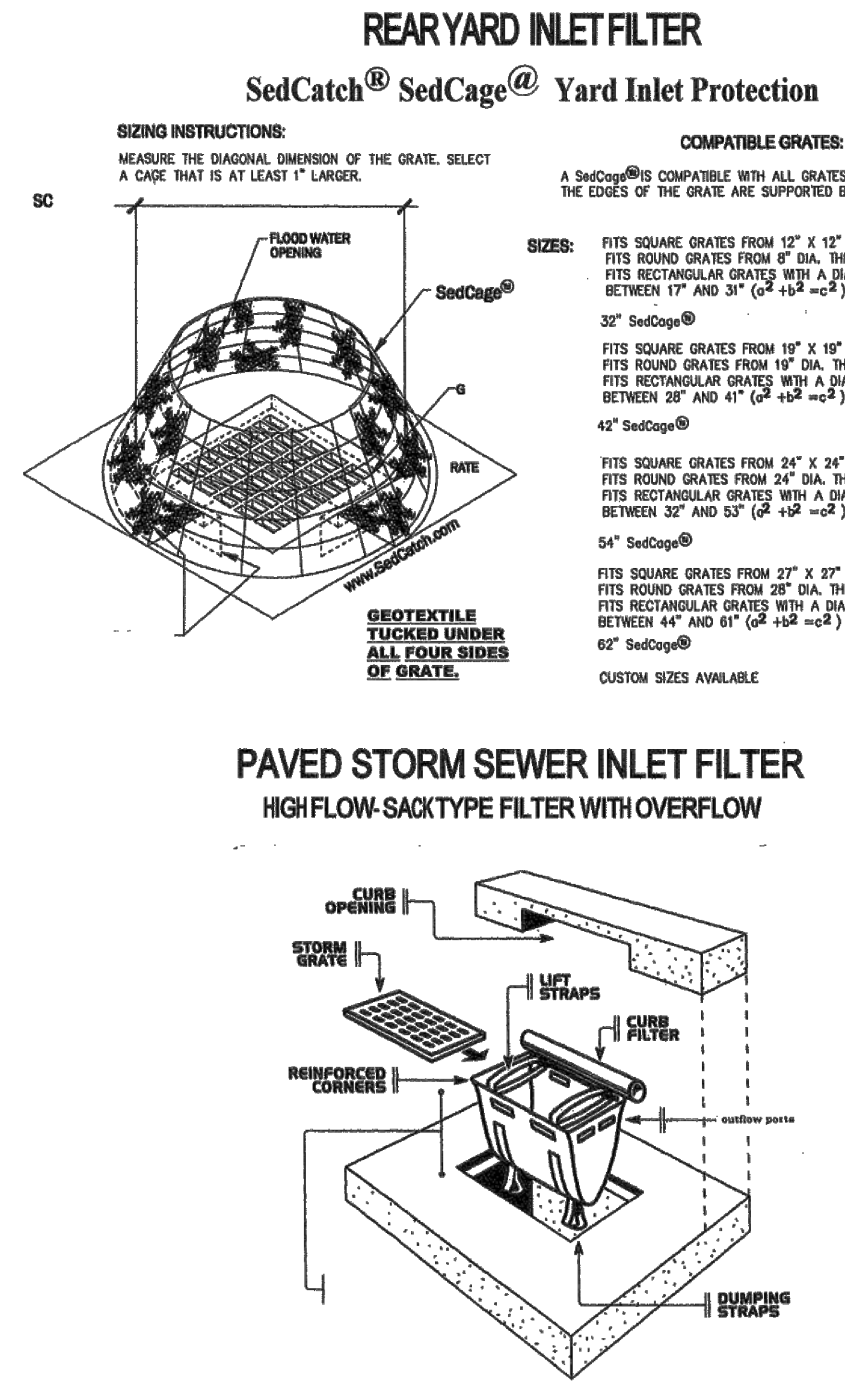
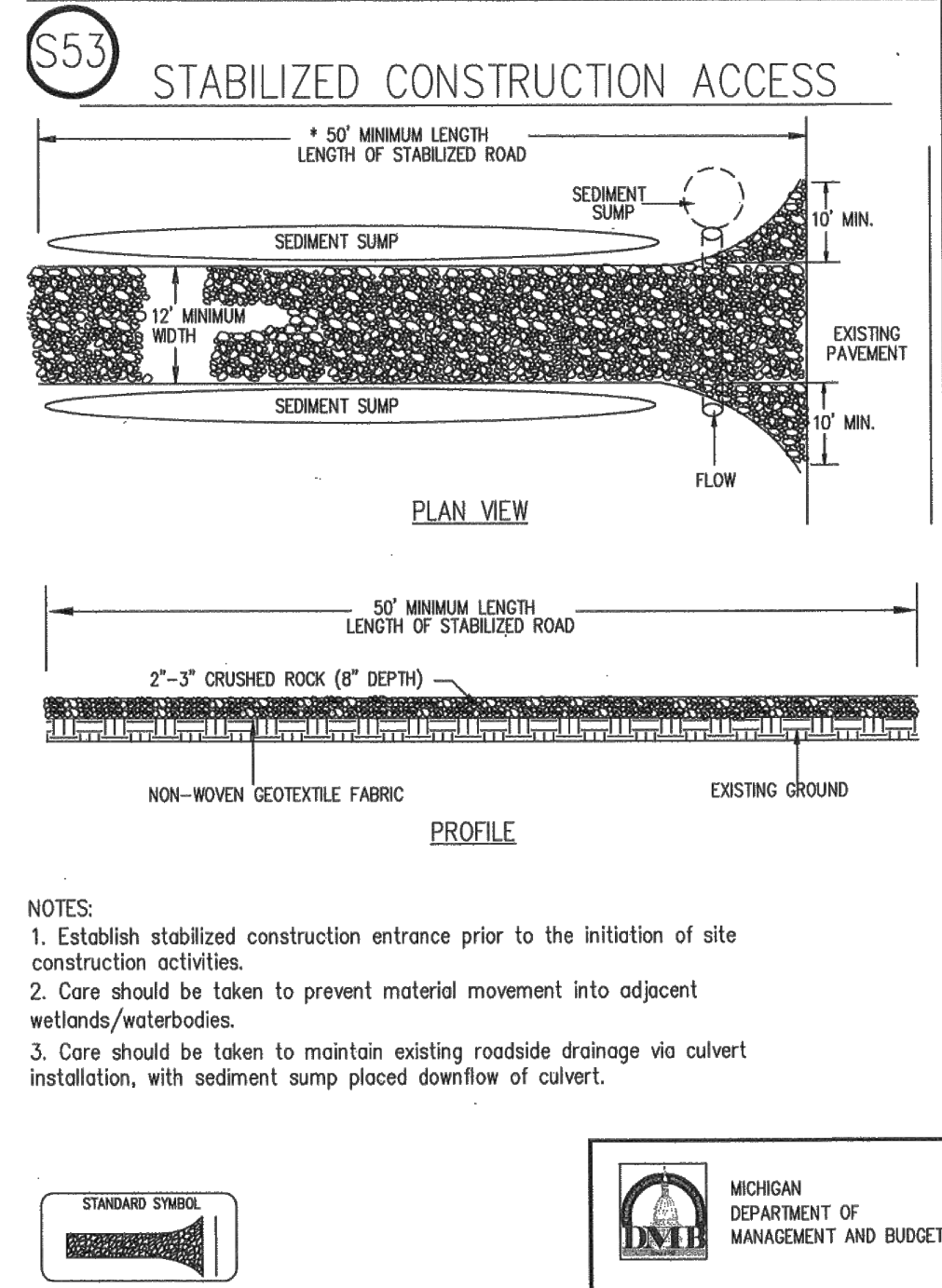
CHECKED BY:

DRAWN BY:

DATE

DATE

HARDY CIVIL DESIGN SERVICES LLC
4996 MOORE ST. WAYNE, MI 48184
(734) 756-2196
E-mail: kbhardy1964@hotmail.com



SOIL EROSION SEQUENCE OF CONSTRUCTION

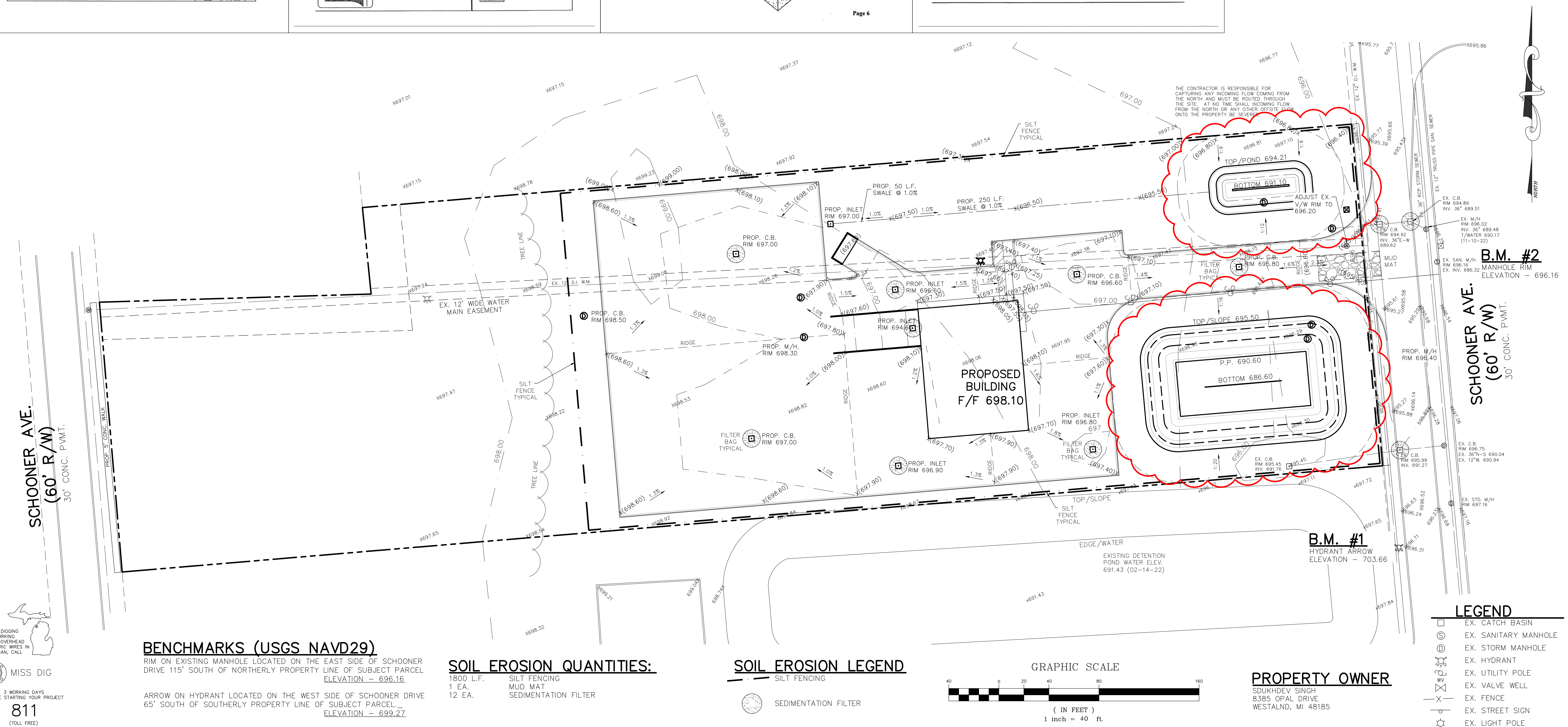
START DAY	END DAY
8-14	11-30
8-14	11-30
8-14	8-18
8-14	9-02
8-21	9-02
9-05	9-16
8-01	11-13
9-19	10-06
10-09	10-10
10-16	
11-01	
11-30	

1. STONE TRACKING PAD ATOP GEOTEXTILE LINER (MUD-MAT).
2. INSTALL SILT FENCING AND PROTECTIVE FENCING.
3. STRIP AND STOCKPILE TOPSOIL.
4. GRADE AND BALANCE AS REQUIRED. STABILIZE DITCHES, SWALES, COMMON AREAS AND SLOPES PER PLAN WITHIN 5 DAYS OF GRADE.
5. EXCAVATE DETENTION BASIN, INSTALL APPROVED OUTLET, STABILIZE BEFORE PAVING IS STARTED.
6. INSTALL UNDERGROUND UTILITIES (I.E. SANITARY, STORM AND WATER MAIN).
7. PLACE INLET FILTERS.
8. INSTALL PAVEMENT COMPLETE.
9. INSTALL ALL PUBLIC UTILITIES COMPLETE (ELECTRIC, TELEPHONE, AND CABLE T.V.)
10. ESTABLISH VEGETATION FOR ALL DISTURBED AREAS AND ROAD / R.O.W.s.
11. CLEAN OUT STORM SEWERS SYSTEM.
12. CLEAN OUT AND RESTORE SEDIMENT FOREBAY AND DETENTION POND TO DESIGN SPECIFICATIONS.
13. REMOVE SILT FENCE FOLLOWING W.C.D.O.E. APPROVAL.

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
SCRAPE STREETS		X	X	X	X	X	X
SWEEP STREETS				X			

SOIL EROSION SEQUENCE OF CONSTRUCTION

- (1) INSTALL SILT FENCE AS SHOWN HERE ON.
- (2) COMPLETE MASS GRADING AND UNDERGROUND UTILITIES.
- (3) COMPLETE BIOSWALE INSTALLATION
- (4) CONSTRUCT PARKING AREA.
- (5) RESTORE ALL DISTURBED AREAS WITH SOD OR TOPSOIL, SEED AND MULCH.
- (6) REMOVE SILT FROM FROM BEHIND SILT FENCE AND REMOVE SILT FENCE.



SHEET No. 3 OF 9 2022-01	JOB No. 2022-01	DRAWING No. A-	DATE	01-10-22
			REVISIONS	02-02-23 02-15-23 03-07-23
			CHECKED BY:	
			DRAWN BY:	
SEMI-TRUCK REPAIR FACILITY 6100 SCHOONER ROAD VAN BUREN TWP, MI				
GRADING AND SOIL EROSION PLAN				
HARDY CIVIL DESIGN SERVICES LLC 4996 MOORE ST. WAYNE, MI 48184 (734) 756-2196 E-mail: khardy1954@hotmail.com				

REQUIREMENTS FOR NEW OPEN POND PROJECT

TOTAL DISRUPTIVE AREA:

6.03 acres

LAND USE SUMMARY

Land Characteristic

	Existing	Proposed	Coeff.	A°C
Total Development Area (ac)	6.03	4.99		
Roof Area (ac)	0	0.39	0.95	0.37
Pavement Area (ac)	0	3	0.95	2.85
Gravel (ac)	0	0	0.95	0
Total Pervious Area (ac)	0.86	1.6	0.25	0.4
totals:	0.86	4.99		3.62

Pervious Area Breakdown by Cover Type

Non-cultivated	4	0
Improved Area (ac)	N/A	N/A
Improved area (grass/landscape)	1.67	7.62
Predominant NRCS Soil Type	B	B
	(Type A, B, C, C)	
Wooded Area (ac)	10	0
Predominant NRCS Soil Type	N/A	N/A
	(Type A, B, C, C)	

Calculated CPVC Volume (cf)=

CALCULATE RUNOFF COEFFICIENT

C=(A1°CI)/A 0.72

TIME OF CONCENTRATION CALCULATIONS

V (sheet flow)=	0.34	0.5	%slope
Flow time=	1.5	30	flow length
V(shallow flow)=	1.2	1	%slope
Flow time=	2.8	200	flow length
V(sewer flow)=		3	fps
Flow time=	3.19	575	flow length

concentration time= 7 min. 10 minutes (site minimum)
T= 10 min.

CALCULATE 100-YEAR PEAK INTENSITY

I10= 4.6 in/hr

CHANNEL PROTECTION VOLUME CONTROL (CPVC)

Vcpcv= 13,042 cf

CHANNEL PROTECTION RATE CONTROL (CPRC)

Vcprc= 24,780 cf

NOTE

SOIL BORE INFORMATION LOCATED ON SHEET #7

UTILITY CROSSING SCHEDULE

No.	INFO.	ELEVATION	ACTION
1	BOTTOM EX. 36" TOP PROP. 6" SAN.	689.70± 687.10	
2	BOTTOM EX. W.M. TOP PROP. 6" SAN.	690.70± 688.20	
3	BOT. PROP. 24" TOP PROP. 6" SAN.	690.25 688.45	
4	BOT. PROP. 12" TOP PROP. 6" SAN.	692.25 689.85	
5	TOP EX. W.M. BOT. PROP. 24".	690.50± 690.75	(LOWER W.M. to 688.70)
6	TOP EX. W.M. PROP. 30" INV.	690.50± 691.05	(LOWER W.M. to 688.70)
7	TOP EX. W.M. PROP. 18" INV.	690.80± 690.20	(LOWER W.M. TO 688.70)

STRUCTURE SCHEDULE

No.	INFO.	No.	INFO.	No.	INFO.
1	INV. 24" 691.10	6.	4" DIA. MANHOLE RIM 698.30	11	2" DIA. INLET RIM 696.80
2	4" DIA. C.B. RIM 695.80		INV. 18"N. 692.45		INV. 12"N. 692.80
	INV. 24"N. 691.25		INV. 15"SW. 692.45		
	INV. 24"W. 691.25		INV. 12"E. 692.45	12	INV. 15"W. 691.10
3	4" DIA. C.B. RIM 697.00	7	4" DIA. C.B. RIM 697.00	13	4" DIA. C.B. RIM 697.00
	RIM 696.60		INV. 15"NE. 692.72		INV. 15" 691.89
	INV. 24"E-W. 691.64		INV. 12"SE. 692.72		
	INV. 12"S. 692.35			14	42" DIA. INLET RIM 697.00
4	4" DIA. C.B. RIM 696.60	8	2" DIA. INLET RIM 696.90		INV. 15"NE. 692.08
	INV. 24"E-W. 691.93		INV. 12"NW. 693.10		
5	4" DIA. MANHOLE RIM 697.80	9	2" DIA. INLET RIM 694.60		
	INV. 24"E. 692.07		INV. 12"W. 692.76		
	INV. 24"W. 692.65	10	4" DIA. C.B. RIM 698.50		
	INV. 18"S. 692.38		INV. 24"E. 692.65		

100-YEAR FLOOD CONTROL VOLUME CALCS

Qallow,calc=	0.73 cfs/acre	0.1 cfs, max allowable release rate
Tributary area=	4.99 acres	a site less than 2 acres must use a variable release rate of 1.00cfs/acre
100-year release, Qo=	0.499 cfs/acre	
Q=	16.53 cfs	
Vr=	67,904 cf	
Storage Ratio(Vr/Vs)=	0.731	
100-year (req), Vs=	49,641 cf	

SUMMARY OF CALCULATED VOLUMES:

cpvc=	13,042 cf
cprc=	24,780 cf
Flood Control Volume=	36,599 cf if CPVC volume is met
Flood Control Volume=	49,641 cf if CPVC volume is not met

REQ. DETENTION VOL. DETERMINATION

CPVC	13,042 cf	
CPRC	24,780 cf	SITE MINIMUM
Flood control vol.=	49,641 cf	IF CPVC CAN NOT BE MET

15% of CPVC in Forebay 1,956 cf

Design CPRC Vol.= 22,823 cf

Design control vol.= 47,685 cf (Control flood - Forebay)

FOREBAY DESIGN (15% of CPVC Vol.)

contour elevation	area	volume	surface depth	cumulative depth
691.10	55	0	0	0.00
692.00	672	364	0.90	0.90
693.00	1,587	1,130	1.493	1.90
694.00	2,730	2,159	3.652	2.90

Total Vol. Provided 5,508

Total Vol bioretention Prov. 5,508

Forebay (High Water) ELEV= LOWER EL. + (UPPER EL. - LOWER EL.) * (REQ VOL - CUM VOL LOWER EL.) / (CUM VOL UPPER EL - CUM VOL LOWER EL.)

ELEV= 693.21

ORRIFICE CALCULATIONS

Orifice (CPVC) rate control

Q(ave)=	0.075 cfs
H(ed)=	2.11 ft
average head H(ave)=	1.06 ft
Orifice Area A=	0.015 sq/ft
Orifice Dia, D100=	1.644 inches
number holes req.=	1 ea
Calculated D(100-year)=	0.137 ft

Therefore use, number of holes=

Actual (D100)= 0.1333 ft

DETENTION POND OUTLET ELEVATION

elev=	690.60 ft
Qres, req. Flood Control=	47,685 cf

OPEN DETENTION POND DESIGN

contour elevation	area	volume	surface depth	cumulative depth
690.60	5,443	0	0	0.00
691.00	6,172	5,807	0.40	0.40
692.00	8,460	7,316	1.00	1.40
693.00	10,942	9,701	1.00	2.40
694.00	13,693	12,317	1.00	3.40
694.50	15,558	14,626	0.50	3.90

CPVC High Water ELEV= LOWER EL. + (UPPER EL. - LOWER EL.) * (REQ VOL - CUM VOL LOWER EL.) / (CUM VOL UPPER EL - CUM VOL LOWER EL.)

ELEV= 693.00

Flood Control (High Water) ELEV= LOWER EL. + (UPPER EL. - LOWER EL.) * (REQ VOL - CUM VOL LOWER EL.) / (CUM VOL UPPER EL - CUM VOL LOWER EL.)

ELEV= 694.50

ORRIFICE CALCULATIONS

Orifice (CPRC) rate control

Q(ave)=	0.14 ft
H(ed)=	1.95 ft
Orifice Area A=	0.021 sq/ft
Orifice Dia, D100=	1.95 inches

Therefore use =

2.00 inch hole @ 690.60

FLOOD CONTROL ORIFICE

100-Year Head H(res)=	1.50 ft
H100=	3.90 ft
Q(ed)=	0.0540 cfs
Q(res)=	0.445 cfs
Flood control orifice (a)=	0.073 sf
Flood control orifice diameter (d)=	3.660 inches

Therefore use =

3.70 inch hole @ 693.00

Required Volume	Units	Provided Vol
13,042	cf	0
24,780	cf	0
Flood Control	49,641	49,767

Total Volumes 49,641 cf 49,767

UTILITY PLAN NOTES

- PROPOSED HYDRANT TO BE MINIMUM OF 5' OFF BACK OF CURB
- OLD HYDRANT SHALL BE DELIVERED TO VAN BUREN TOWNSHIP DPW DEPARTMENT.
- NEW HYDRANT SHALL UTILIZE THE EXISTING HYDRANT TEE.

GENERAL NOTES

- PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.
- PHASING OF THE PROJECT IS NOT PROPOSED.
- THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.
- PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAVE, ATTRACTIVE CONDITION AS ORIGINALLY MAINTAINED IN A CLEARLY VISIBLE CONDITION.

SANITARY SEWER BASIS OF DESIGN

BUILDING AREA = 8,320 S/F (ROUND UP TO 9,000 S/F)

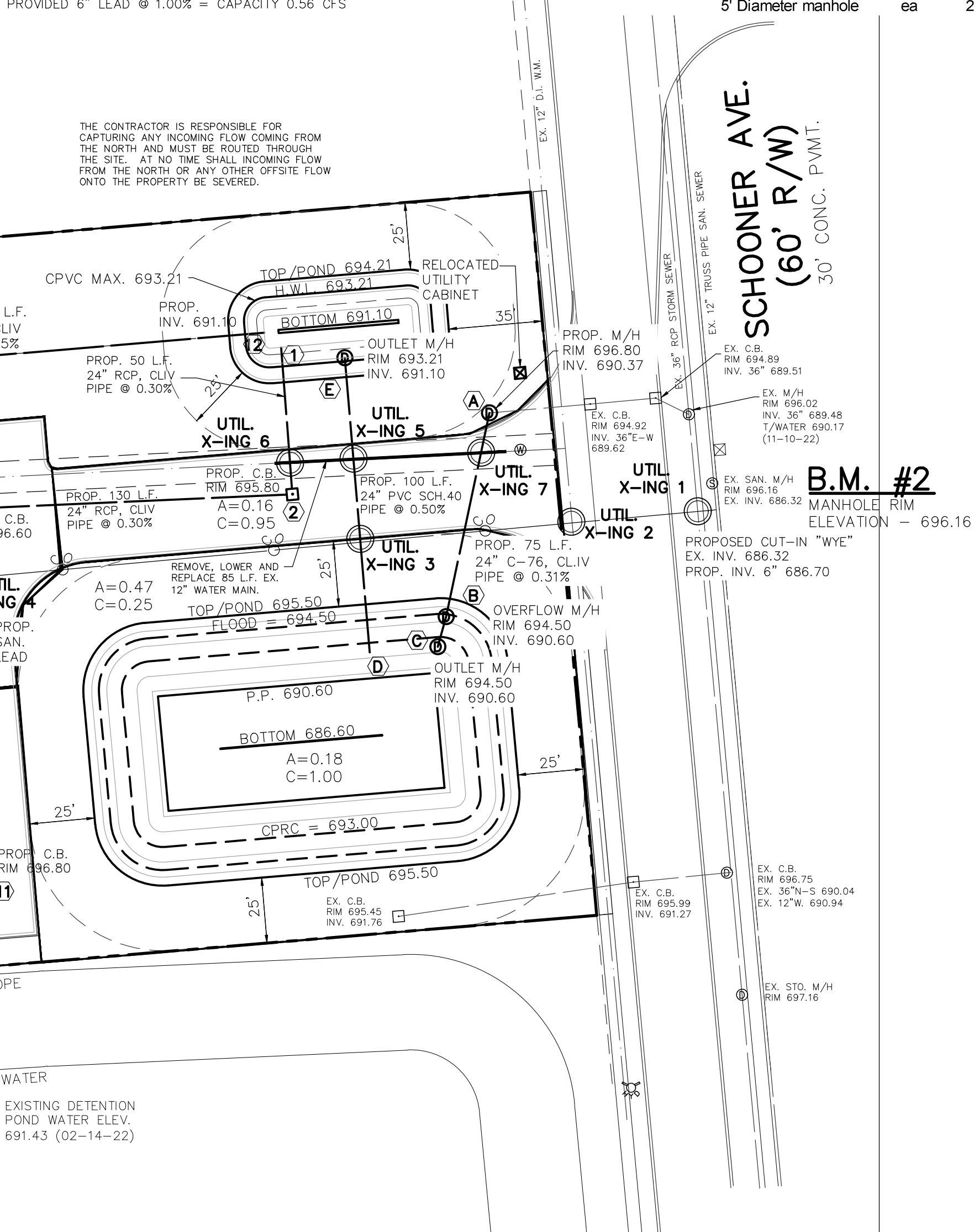
0.15 UNITS PER 1000 S/F = 0.15 * 9,000 = 1,350 UNITS

1350 gpd/1440gpd-gpm = 0.9375 gpm

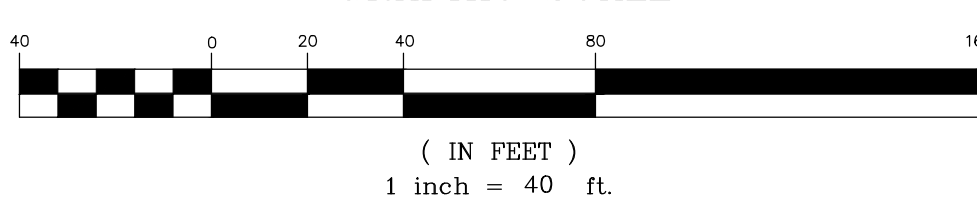
0.9375 gpm * 0.13368/60 = 0.0021 cfs

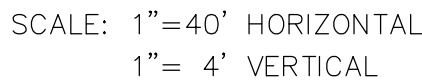
PEAKING FACTOR = 0.0021*4 = 0.0084 cfs

PROVIDED 6" LEAD @ 1.00% = CAPACITY 0.56 CFS

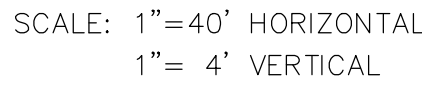


GRAPHIC SCALE





Storm Sewer Line			Increment		Equivalent Area 100%	Total Area 100%	t	I	Q	Pipe		Length of	Manning	Time of	Manning			H.G.	Upper	Lower	Upper
From Structure	To Structure	**	Acres A	C Factor	Acres C*A	Acres C*A	Time (min)	Inch Per Hour	C*I*A (cfs)	Dia. (in)	Slope %	Line (ft)	Velocity in Pipe (ft/sec)	Flow (cfs)	Capacity of Sewer (cfs)	Energy Loss	V ² /(2g)	Upper Elev. (ft)	Upper invert Elev. (ft)	Lower invert Elev. (ft)	Upper Structure t/pipe (ft)
14	13		0.56	0.89	0.50	0.498	10.00	4.64	2.31	15	0.25	77	2.63	0.49	3.23	0.20	0.11	693.23	692.08	691.89	693.33
13	12		0.80	0.95	0.20	0.698	10.49	4.55	3.18	15	0.25	316	2.63	2.00	3.23	0.84	0.11	693.08	691.89	691.10	693.14
11	3		0.24	0.95	0.23	0.228	10.00	4.64	1.06	12	0.32	140	2.56	0.91	2.01	0.41	0.10	693.66	692.80	692.35	693.80
10	5		1.12	0.90	1.01	1.008	10.00	4.64	4.68	24	0.20	170	3.22	0.88	10.11	0.49	0.16	694.64	692.65	692.31	694.65
9	6		0.25	0.95	0.24	0.238	10.00	4.64	1.10	12	0.32	96	2.56	0.62	2.01	0.28	0.10	693.63	692.76	692.45	693.76
8	7		0.25	0.87	0.22	0.218	10.00	4.64	1.01	12	0.32	120	2.56	0.78	2.01	0.35	0.10	693.96	693.10	692.72	694.10
7	6		0.62	0.90	0.56	0.776	10.78	4.51	3.50	15	0.30	90	2.88	0.52	3.53	0.29	0.13	693.85	692.72	692.45	693.97
6	5		0.00	0.00	0.00	1.013	11.30	4.42	4.48	18	0.20	31	2.66	0.19	4.69	0.07	0.11	693.85	692.45	692.38	694.05
5	4		0.00	0.00	0.00	2.021	11.50	4.39	8.87	24	0.20	74	3.22	0.38	10.11	0.21	0.16	693.98	692.07	691.93	694.97
4	3		0.11	0.90	0.10	2.120	11.88	4.33	9.18	24	0.20	145	3.22	0.75	10.11	0.42	0.16	693.89	691.93	691.64	693.93
3	2		0.23	0.95	0.22	2.567	12.63	4.22	10.83	24	0.30	130	3.94	0.55	12.38	0.56	0.24	693.57	691.64	691.25	693.64
2	1		0.16	0.95	0.15	2.719	13.18	4.15	11.28	24	0.30	50	3.94	0.21	12.38	0.22	0.24	693.07	691.25	691.10	693.25
E	D		0	0	0.00	2.719	13.39	4.12	11.20	24	0.50	100	5.09	0.33	15.98	0.72	0.40	692.92	691.10	690.60	693.21
B	A		0	0	0.00	2.719	13.72	4.07	11.06	24	0.31	75	4.01	0.31	12.58	0.34	0.25	692.45	690.60	690.37	692.88



No.	INFO.	ELEVATION	ACTION
1	BOTTOM EX. 36" TOP PROP. 6" SAN.	689.70± 687.10	
2	BOTTOM EX. W.M. TOP PROP. 6" SAN.	690.70± 688.20	
3	BOT. PROP. 24" TOP PROP. 6" SAN.	690.25 688.45	
4	BOT. PROP 12" TOP PROP. 6" SAN.	692.85 689.85	
5	TOP EX. W.M. BOT. PROP. 24".	690.50± 690.75	(LOWER W.M. to 688.70)
6	TOP EX. W.M. BOT. PROP. 30"	690.50± 691.05	(LOWER W.M. to 688.70)
7	TOP EX. W.M. BOT. PROP. 18"	690.80± 690.20	(LOWER W.M. to 688.70)

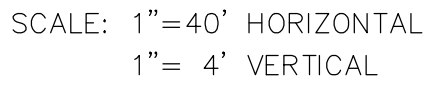
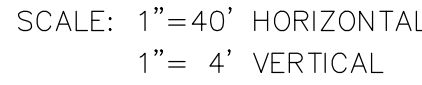
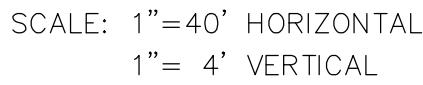
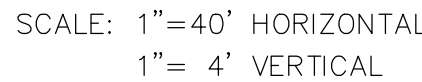
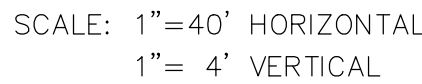
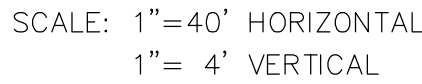
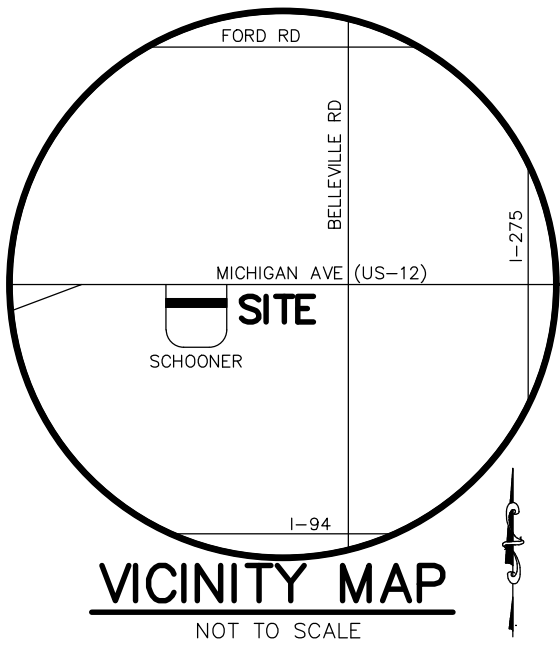


EXHIBIT "A"

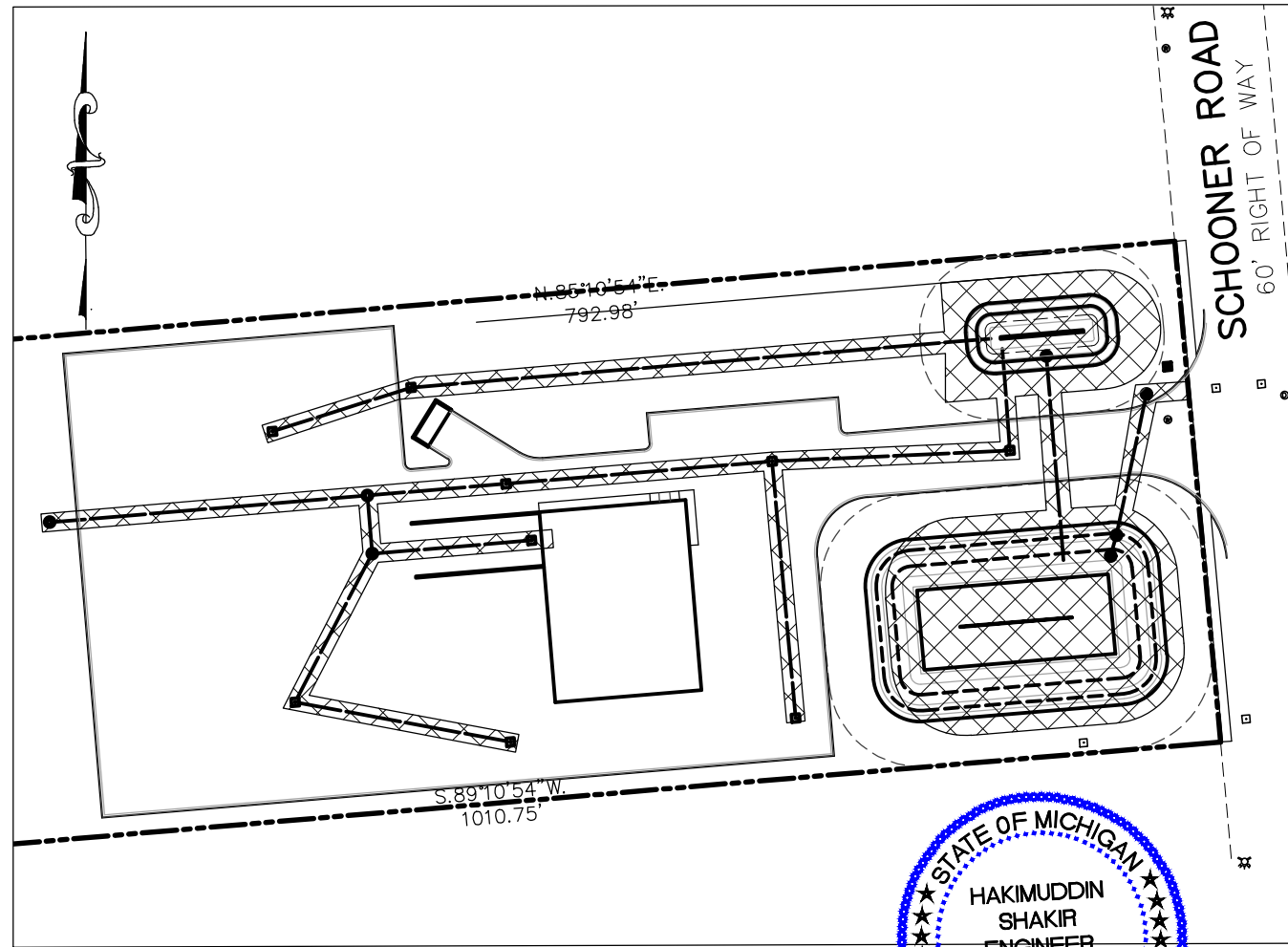
PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM

LEGEND
VAN BUREN TOWNSHIP
MAINTENANCE
RESPONSIBILITY



PROPERTY OWNER
SOUKHDEV SINGH
8385 OPAL DRIVE
WESTLAND, MI 48185

ENGINEER
HAKIM SHAKIR
ENGINEERING SERVICES
32190 SCHOOLCRAFT RD
LIVONIA, MI 48150
CONTACT: KEVIN HARDY
(734) 756-2196



DATE: 12-08-22
JOB No. 2022-01
DWG No. D-
SHEET: 1 of 1
SCALE: 1"=100'

EXHIBIT "A"
STORM MAINTENANCE
CHAHAL TRUCKING
VAN BUREN TWP., WAYNE
COUNTY, MICHIGAN

HARDY CIVIL DESIGN SERVICES LLC
4996 MOORE ST.
WAYNE, MI 48184
(734) 756-2196 // kbhardy1964@hotmail.com

EXHIBIT "B"

LONG TERM MAINTENANCE SCHEDULE CHART

* NOT TO EXCEED THE LENGTH ALLOWED BY LOCAL COMMUNITY ORDINANCE.

MAINTENANCE ACTIVITIES	ACTIVITY CATEGORIES										FREQUENCY
	CHANNELS AND SWALES	INLETS TO FOREBAY	BUFFER STRIP	DETENTION BASIN & FOREBAY	OUTLET PIPE	OVERFLOW STRUCTURES	PAVEMENT AREAS	SEDIMENTATION CONTROL	VEGETATION	OTHER	
MONITORING/INSPECTION											
INSPECT FOR SEDIMENT ACCUMULATION	X	X	X	X	X	X	X	X	X	X	AS NEEDED / SEMI-ANNUALLY
INSPECT FOR FLOATABLES, DEAD VEGETATION AND DEBRIS	X	X	X	X	X	X	X	X	X	X	ANNUALLY & AFTER MAJOR EVENTS
INSPECT FOR EROSION AND INTEGRITY OF SYSTEM	X	X	X	X	X	X	X	X	X	X	ANNUALLY & AFTER MAJOR EVENTS
INSPECT ALL COMPONENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS	X	X	X	X	X	X	X	X	X	X	ANNUALLY
ENSURE MAINTENANCE ACCESS REMAIN OPEN/CLEAR	X	X	X	X	X	X	X	X	X	X	ANNUALLY
PREVENTATIVE MAINTENANCE											
REMOVE ACCUMULATED SEDIMENTS	X	X	X	X	X	X	X	X	X	X	AS NEEDED, SELECT AREAS ONLY
REMOVE FLOATABLES, INVASIVE & DEAD VEGETATION & DEBRIS	X	X	X	X	X	X	X	X	X	X	AS NEEDED
RE-APPLY / REPLACE MULCH LAYER	X	X	X	X	X	X	X	X	X	X	RE-APPLY EVERY 6 MONTHS
REPLACE SUBSURFACE COMPONENTS (SOILS, STONES, 6" UNDERDRAIN)	X	X	X	X	X	X	X	X	X	X	REPLACE EVERY 2-3 YEARS
SWEEPING OF PAVED SURFACES	X	X	X	X	X	X	X	X	X	X	AS NEEDED / SEMI-ANNUALLY
REMEDIAL ACTIONS											
REPAIR/STABILIZE AREAS OF EROSION, RESEED BARE AREAS	X	X	X	X	X	X	X	X	X	X	AS NEEDED
REPLACE DEAD PLANTINGS, LAWN	X	X	X	X	X	X	X	X	X	X	AS NEEDED
STRUCTURAL REPAIRS	X	X	X	X	X	X	X	X	X	X	AS NEEDED
MAKE ADJUSTMENTS/REPAIRS TO ENSURE PROPER FUNCTIONING	X	X	X	X	X	X	X	X	X	X	AS NEEDED

* NOT TO EXCEED THE LENGTH ALLOWED BY LOCAL COMMUNITY ORDINANCE.

A. PHYSICAL LIMITS OF THE STORM WATER MANAGEMENT SYSTEM

THE STORM WATER MANAGEMENT SYSTEM (SWMS) SUBJECT TO THIS LONG-TERM MAINTENANCE PLAN (PLAN) IS DEPICTED ON EXHIBIT A TO THE PERMIT AND INCLUDES WITHOUT LIMITATION THE STORM SEWERS, CATCH BASINS, MANHOLES, INLETS, SWALES, SPILLWAYS, FOREBAY, DETENTION BASIN, OUTLET CONTROL STRUCTURE AND OUTLET PIPE THAT CONVEYS FLOW FROM THE DETENTION BASIN INTO THE VAN BUREN TOWNSHIP STORM SEWER. FOR PURPOSES OF THIS PLAN, THIS STORM WATER MANAGEMENT SYSTEM AND ALL OF ITS COMPONENTS AS SHOWN ON EXHIBIT A IS REFERRED TO AS CHAHAL TRUCKING.

B. TIME FRAME FOR LONG-TERM MAINTENANCE RESPONSIBILITY

AS CHAHAL TRUCKING IS RESPONSIBLE FOR MAINTAINING THE CHAHAL TRUCKING SWMS, INCLUDING COMPLYING WITH APPLICABLE REQUIREMENTS OF THE LOCAL OR WAYNE COUNTY SOIL EROSION AND SEDIMENTATION CONTROL PROGRAM, UNTIL WAYNE COUNTY RELEASES THE CONSTRUCTION PERMIT. LONG-TERM MAINTENANCE RESPONSIBILITY FOR THE CHAHAL TRUCKING SWMS COMMENCES WHEN DEFINED BY THE MAINTENANCE PERMIT ISSUED BY THE COUNTY. LONG-TERM MAINTENANCE CONTINUES IN PERPETUITY.

C. MANNER OF ENSURING MAINTENANCE RESPONSIBILITY

THE TOWNSHIP OF VAN BUREN HAS ASSUMED RESPONSIBILITY FOR LONG-TERM MAINTENANCE OF AS CHAHAL TRUCKING SWMS. THE RESOLUTION BY WHICH THE CITY HAS ASSUMED MAINTENANCE RESPONSIBILITY IS ATTACHED TO THE PERMIT AS EXHIBIT C. AS CHAHAL TRUCKING THROUGH A MAINTENANCE AGREEMENT WITH THE CITY, HAS AGREED TO PERFORM THE MAINTENANCE ACTIVITIES REQUIRED BY THIS PLAN. VAN BUREN TOWNSHIP RETAINS THE RIGHT TO ENTER THE PROPERTY AND PERFORM THE NECESSARY MAINTENANCE OF THE AS CHAHAL TRUCKING SWMS IF AS CHAHAL TRUCKING FAILS TO PERFORM THE REQUIRED MAINTENANCE ACTIVITIES. TO ENSURE THAT THE AS CHAHAL TRUCKING SWMS IS MAINTAINED IN PERPETUITY, THE MAP OF THE PHYSICAL LIMITS OF THE STORM WATER MANAGEMENT SYSTEM (EXHIBIT A), THIS PLAN (EXHIBIT B), THE RESOLUTION ATTACHED AS EXHIBIT C, AND THE MAINTENANCE AGREEMENT BETWEEN THE TOWNSHIP OF VAN BUREN AND THE PROPERTY OWNER(S) WILL BE RECORDED WITH THE WAYNE COUNTY REGISTER OF DEEDS. UPON RECORDING, A COPY OF THE RECORDED DOCUMENTS WILL BE PROVIDED TO THE COUNTY.

D. LONG TERM MAINTENANCE PLAN AND SCHEDULE

TABLE 1 IDENTIFIES THE MAINTENANCE ACTIVITIES TO BE PERFORMED, ORGANIZED BY CATEGORY (MONITORING/INSPECTION, PREVENTATIVE MAINTENANCE, AND REMEDIAL ACTIONS). WHILE PERFORMING MAINTENANCE, CHEMICALS SHOULD NOT BE APPLIED TO THE FOREBAY, DETENTION BASIN, BUFFER STRIP, OR WATERCOURSES. TABLE 1 ALSO IDENTIFIES SITE-SPECIFIC WORK NEEDED TO ENSURE THAT THE STORM WATER MANAGEMENT SYSTEM FUNCTION PROPERLY AS DESIGNED.

PROPERTY OWNER
SOUKHDEV SINGH
8385 OPAL DRIVE
WESTLAND, MI 48185

ENGINEER
HAKIM SHAKIR
ENGINEERING SERVICES
32190 SCHOOLCRAFT RD
LIVONIA, MI 48150
CONTACT: KEVIN HARDY
(734) 756-2196



DATE: 12-08-22
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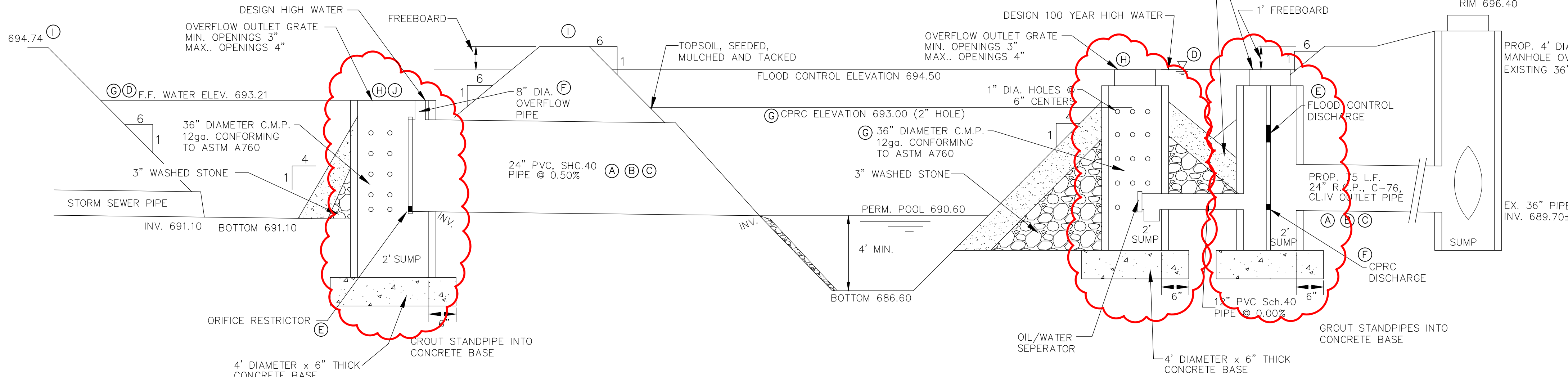
EXHIBIT "B"
STORM MAINTENANCE
CHAHAL TRUCKING
VAN BUREN TWP., WAYNE
COUNTY, MICHIGAN

HARDY CIVIL DESIGN SERVICES LLC
4996 MOORE ST.
WAYNE, MI 48184
(734) 756-2196 // kbhardy1964@hotmail.com

WETLANDS DATA

WAYNE COUNTY DPS GENERAL NOTES:

- ALL WORK WITHIN THE WAYNE COUNTY ROAD RIGHT-OF-WAY (ROW) AND DRAIN EASEMENT SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND GENERAL SPECIFICATIONS, INCLUDING SOIL EROSION AND SEDIMENTATION CONTROL OF THE WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES, AND MDOT 2012 SPECIFICATIONS FOR CONSTRUCTION.
- THESE PLANS ARE NOT VALID WITHOUT ATTACHMENT OF THE WAYNE COUNTY PERMIT SPECIFICATIONS FOR CONSTRUCTION WITHIN THE ROAD ROW, PARKS, DRAIN EASEMENT OR SANITARY SEWER UNDER JURISDICTION OF THE WAYNE COUNTY (07/01/93) REVISED 12/15/2004
- CONTRACTOR SHALL CONTACT MISS DIG AT 811 TO IDENTIFY AND FLAG / MARK THE LOCATIONS OF ALL UNDERGROUND UTILITIES AT THE PROPOSED CONSTRUCTION AREAS PRIOR TO START OF CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND UTILITIES, AND RESOLVE ANY CONFLICT BETWEEN THE PROPOSED WORK AND THE EXISTING UNDERGROUND OR ABOVEGROUND UTILITIES.
- CONTRACTOR SHALL MAINTAIN 18" MINIMUM VERTICAL CLEARANCE AND 3 FEET MINIMUM HORIZONTAL CLEARANCE BETWEEN THE PROPOSED AND EXISTING UTILITIES. ANY PROPOSED UTILITY PERMITTED TO CROSS UNDER THE ROAD OR DRAIN, MUST BE PLACED A MINIMUM OF 7 FEET BELOW THE LOWEST POINT OF THE ROAD, OR 6 FEET BELOW THE DRAIN BOTTOM. OVERHEAD WIRES/CABLES MUST BE INSTALLED 18 FEET MINIMUM ABOVE THE ROAD CENTERLINE. TO RELOCATE ANY UTILITY WITHIN THE ROAD ROW, THE CONTRACTOR SHALL COORDINATE THE RELOCATION WITH THE UTILITY COMPANY AND AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- ALL SURVEY MONUMENTS / CORNERS AND BENCH MARKS LOCATED WITHIN THE CONSTRUCTION AREA MUST BE PRESERVED IN ACCORDANCE WITH PUBLIC ACT 74 AS AMENDED (INCLUDING ACT 34, P.A. 2000) AND AS PER WAYNE COUNTY PERMIT RULE 1.5. THE PERMIT HOLDER AND CONTRACTOR SHALL COORDINATE THE WORK WITH A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF MICHIGAN DURING CONSTRUCTION ACTIVITIES FOR THE PURPOSE OF WITNESSING, PRESERVING OR REPLACING SURVEY MONUMENTS AND MONUMENT BOXES.
- EXPOSURE OF ANY UTILITIES UNDER THE PAVEMENT WILL NOT BE PERMITTED, UNLESS APPROVED BY THE WAYNE COUNTY ENGINEER. PAVEMENT REMOVAL AND REPLACEMENT SHALL BE PERFORMED PER APPLICABLE WAYNE COUNTY STANDARD DETAILS AN AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE WAYNE COUNTY ROAD ROW AND DRAIN EASEMENT WITH 3" TOPSOIL, THM SEED MIX AND MULCH. SLOPES STEEPER THAN 1 ON 3 SHALL BE RESTORED BY PLACING SOD ON 2" TOPSOIL.
- ALL BACKFILLS UNDER OR WITHIN 3 FEET OF THE PROPOSED OR EXISTING PAVEMENT, CURB OR SIDEWALK SHALL CONFORM TO THE WAYNE COUNTY TRENCH "B" BACKFILL REQUIREMENTS. TRENCH "A" BACKFILL MAY BE USED WITHIN THE ROAD ROW AREAS UNDER CONDITIONS OTHER THAN THOSE SPECIFIED FOR TRENCH "B".
- CONTRACTOR IS RESPONSIBLE FOR RESTORING OR REPLACING ALL DISTURBED LANDSCAPED AREAS, SPRINKLER SYSTEMS, FENCES, SIGNS, MAIL BOXES, ETC. WITHIN THE WAYNE COUNTY ROAD ROW AND / OR AS DIRECTED BY THE COUNTY ENGINEER.
- CONTRACTOR SHALL MAINTAIN TWO-WAY TRAFFIC AT ALL TIMES. OTHERWISE, DETOURING TRAFFIC MUST BE PER APPROVED PLANS. ALL SIGNING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF M.M.U.T.C.D.
- MAINTAIN A SAFE AND ADEQUATE TRAVEL ROUTE FOR PEDESTRIANS AT ALL TIMES THROUGHOUT THE PROJECT DURATION.
- TUNNELING, BORING AND JACKING OPERATIONS SHALL BE IN ACCORDANCE WITH THE WAYNE COUNTY SPECIFICATIONS AND DETAILS.
- BORE PITS SHALL BE PLACED AT MINIMUM 10 FEET FROM THE BACK OF CURB OR EDGE OF PAVEMENT.
- REMOVE ALL ABANDONED CONDUITS FROM THE COUNTY ROADS ROW OR AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- CONTRACTOR SHALL PROVIDE COLD WEATHER PROTECTION FOR ALL PROPOSED CONCRETE WORK (PAVEMENTS, SIDEWALKS, DRIVE APPROACHES, ETC.) AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- OVERNIGHT VEHICLE PARKING AND STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENTS ARE NOT PERMITTED WITHIN THE WAYNE COUNTY ROADS RIGHTS-OF-WAY.
- CONTRACTOR SHOULD OBTAIN SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM THE WAYNE COUNTY DPS. CONTACT THE WAYNE COUNTY SOIL EROSION OFFICE AT (734) 326-5565, OR THE COMMUNITY HAVING JURISDICTION OVER THE SOIL EROSION PERMIT.
- CONTRACTOR SHALL NOTIFY THE WAYNE COUNTY TRAFFIC SIGNAL SHOP AT (734) 955-2154 AT LEAST 72 HOURS PRIOR TO START OF WORK AT OR NEAR ANY SIGNALIZED INTERSECTIONS.
- CONTRACTOR SHALL NOTIFY WAYNE COUNTY 72 HOURS PRIOR TO START OF CONSTRUCTION. CONTACT THE PERMIT OFFICE AT (734) 858-2764



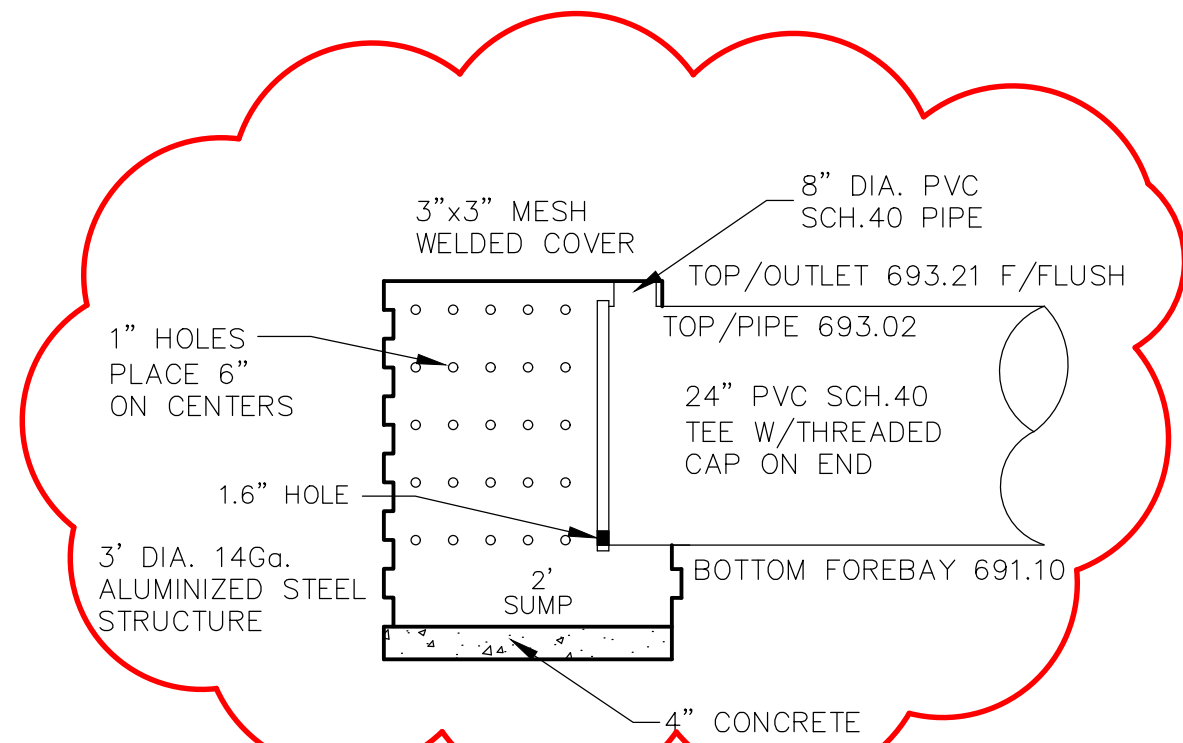
FOREBAY OUTLET STRUCTURE

FOREBAY OUTLET SCHEDULE									
OUTLET PIPE LENGTH (A)	OUTLET PIPE SLOPE (B)	OUTLET PIPE SIZE (C)	FOREBAY STORAGE ELEVATION (D)	CPVC DISCHARGE ORIFICE SIZE (E)	OVERFLOW PIPE VERTICAL (F)	STANDPIPE DIAMETER (G)	TOP OF STANDPIPE ELEVATION (H)	FOREBAY CREST ELEVATION (I)	EMERGENCY SPILLWAY ELEVATION (J)
100'	0.50%	24" @ 691.10	693.21	(1) 1.6" HOLE IN CAP	8" DIA. CAPACITY 14.88cfs	36"	693.21	694.21	693.21

MAXIMUM CALCULATED VOLUME FROM STORM WATER COLLECTION SYSTEM IS 11.28cfs

DETENTION OUTLET STRUCTURE

DETENTION OUTLET SCHEDULE									
OUTLET PIPE LENGTH (A)	OUTLET PIPE SLOPE (B)	OUTLET PIPE SIZE (C)	100 YEAR STORAGE (D)	100 YEAR FLOOD RELEASE INV./ORIFICE SIZE (E)	CPVC DISCHARGE ORIFICE SIZE (F)	STANDPIPE DIAMETER (G)	TOP OF STANDPIPE ELEVATION (H)	POND CREST ELEVATION (I)	EMERGENCY SPILLWAY ELEVATION (J)
100'	0.50%	24"	694.50	(1) 3.7" HOLE @ 693.00	2" HOLE @ 690.60	36"	694.50	695.50	694.50



DETAIL FOREBAY OUTLET STRUCTURE "E"

NOT TO SCALE

DETAILS

SEMI-TRUCK REPAIR FACILITY
6100 SCHOONER ROAD
VAN BUREN TWP., MI

REVISIONS
02-02-23
02-15-23
03-07-23

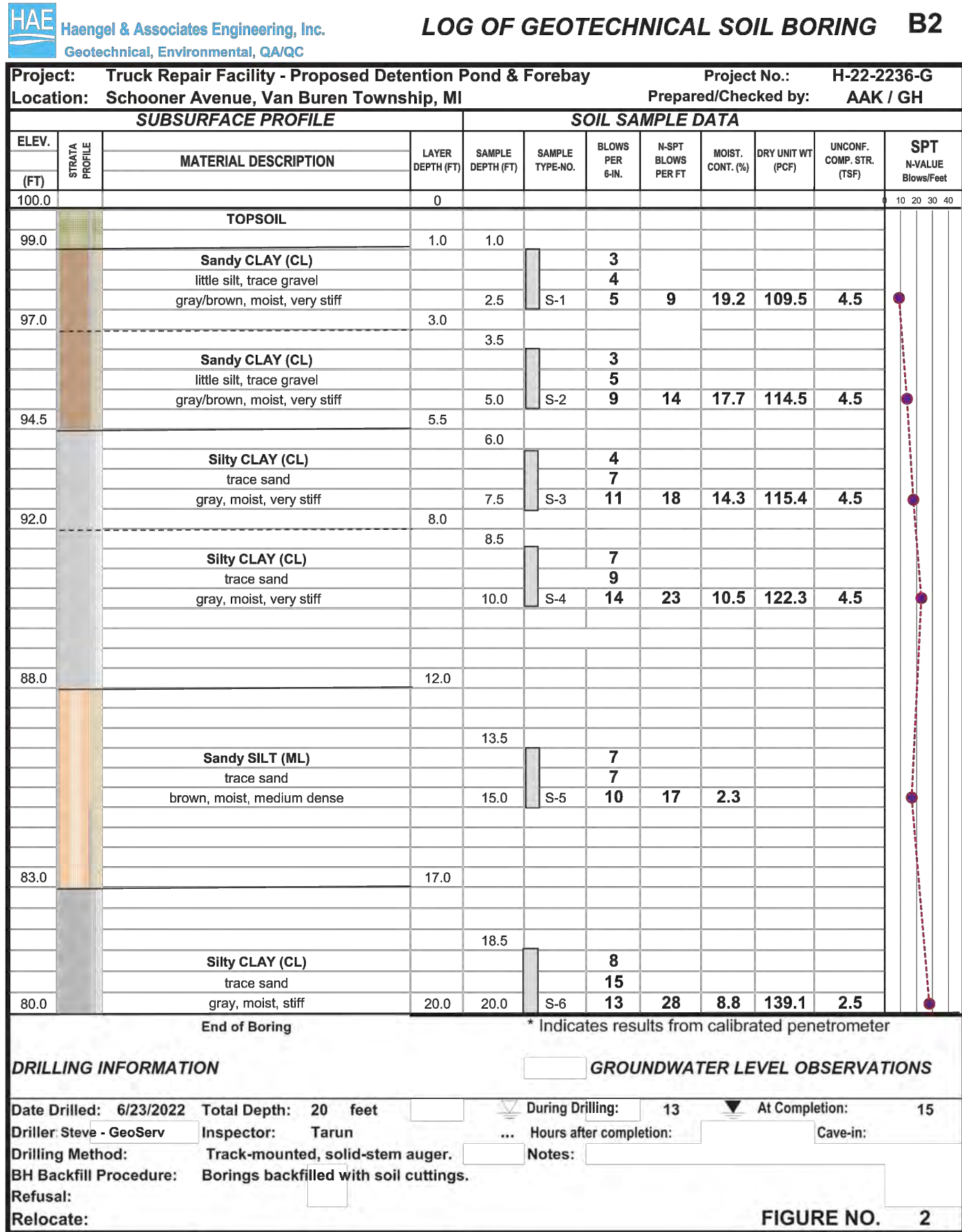
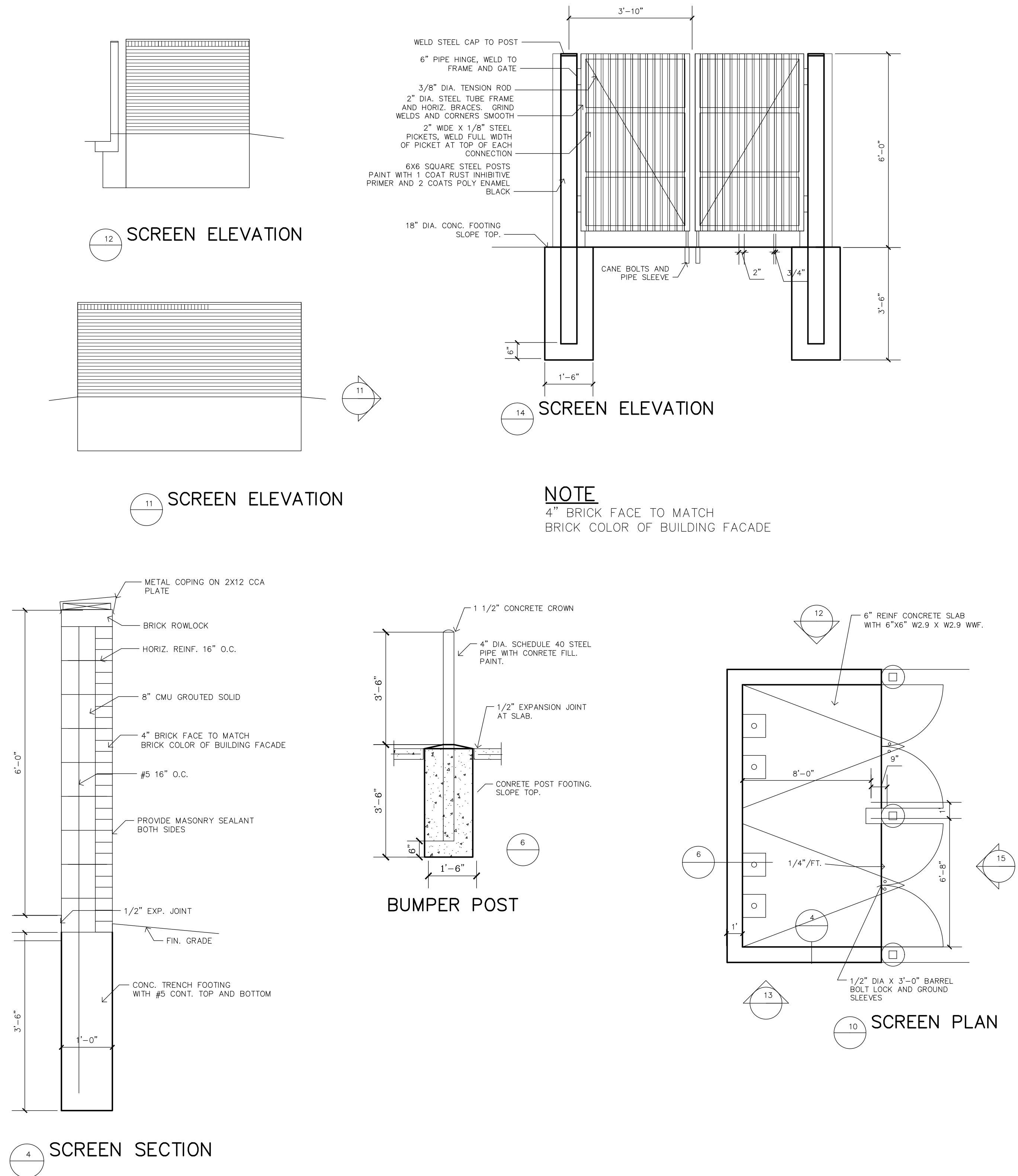
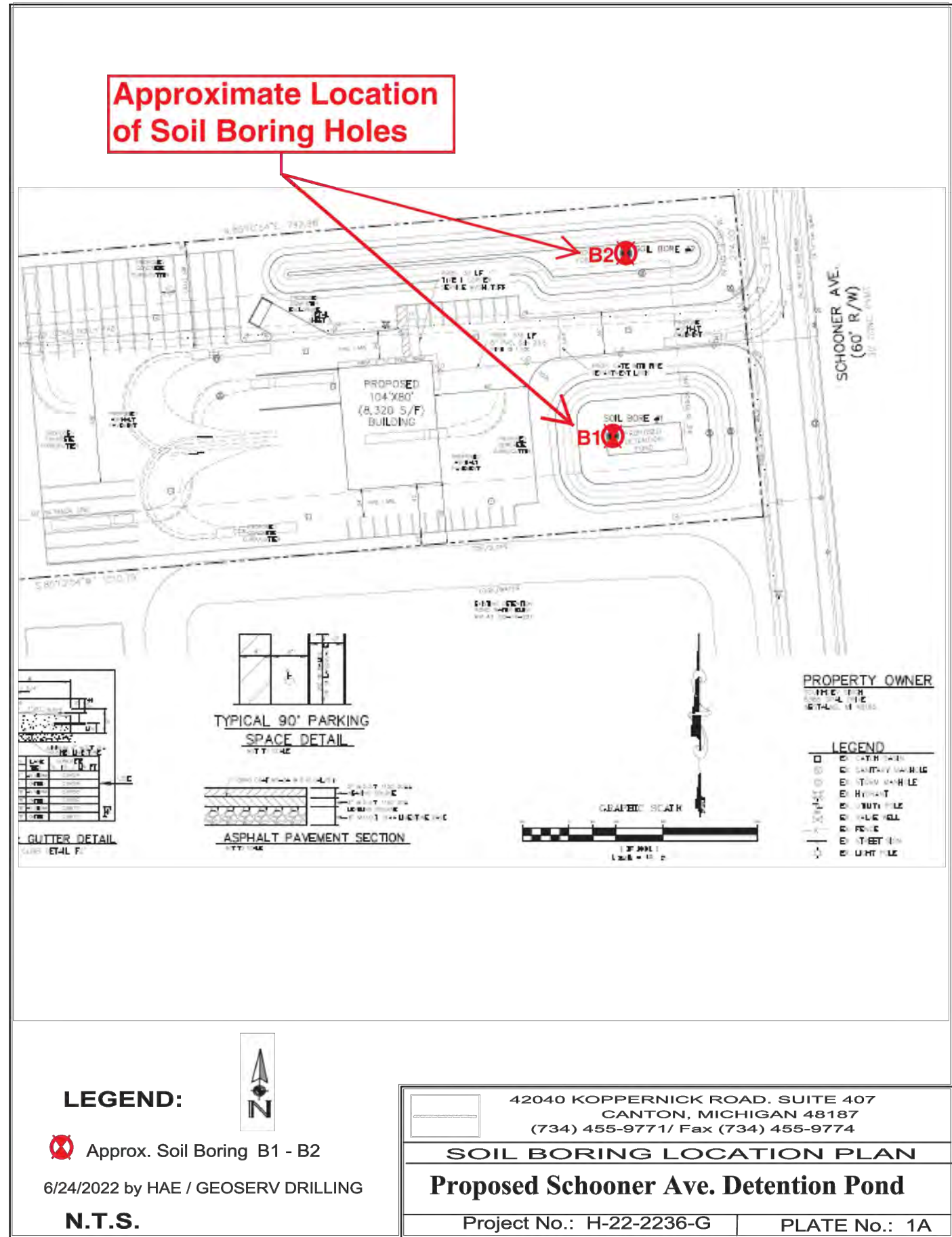
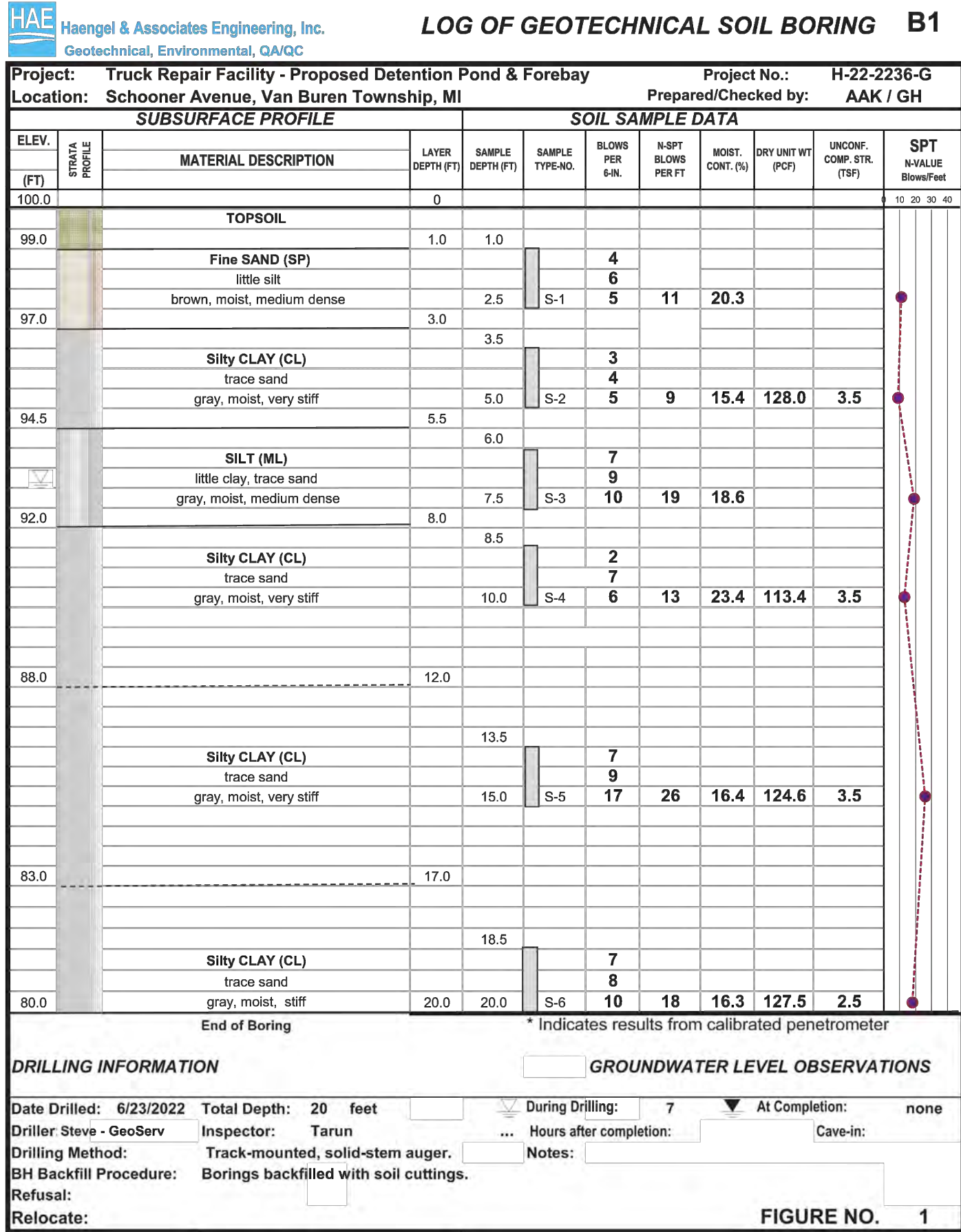
DATE
01-10-22

DRAWING No.
A-

SHEET No.
6 OF 9
JOB No.
2022-01

CIVIL DESIGN SERVICES LLC
4996 MOORE ST. WAYNE, MI 48184
(734) 756-2196
E-mail: kbhardy1964@hotmail.com

HARDY



THE SOIL BORE REPORTS INDICATE A MEDIUM DENSITY FINE SAND MATERIAL FROM A DEPTH OF 1' TO 3' BELOW GROUND LEVEL OVER A VERY STIFF SILTY GRAY CLAY WITH TRACE OF SAND FROM A DEPTH OF 3' TO 5.5' OVER A MEDIUM STIFF SILTY GRAY CLAY WITH TRACE OF SAND FROM A DEPTH OF 5.5' TO 8' OVER A VERY STIFF SILTY GRAY CLAY WITH TRACE OF SAND FROM A DEPTH OF 8' TO 17' OVER A STIFF SILTY GRAY CLAY WITH TRACE OF SAND FROM A DEPTH OF 17' TO 20'.

THIS MATERIAL DOES NOT PROVIDE INFILTRATION INTO THE SUBSTRATA.

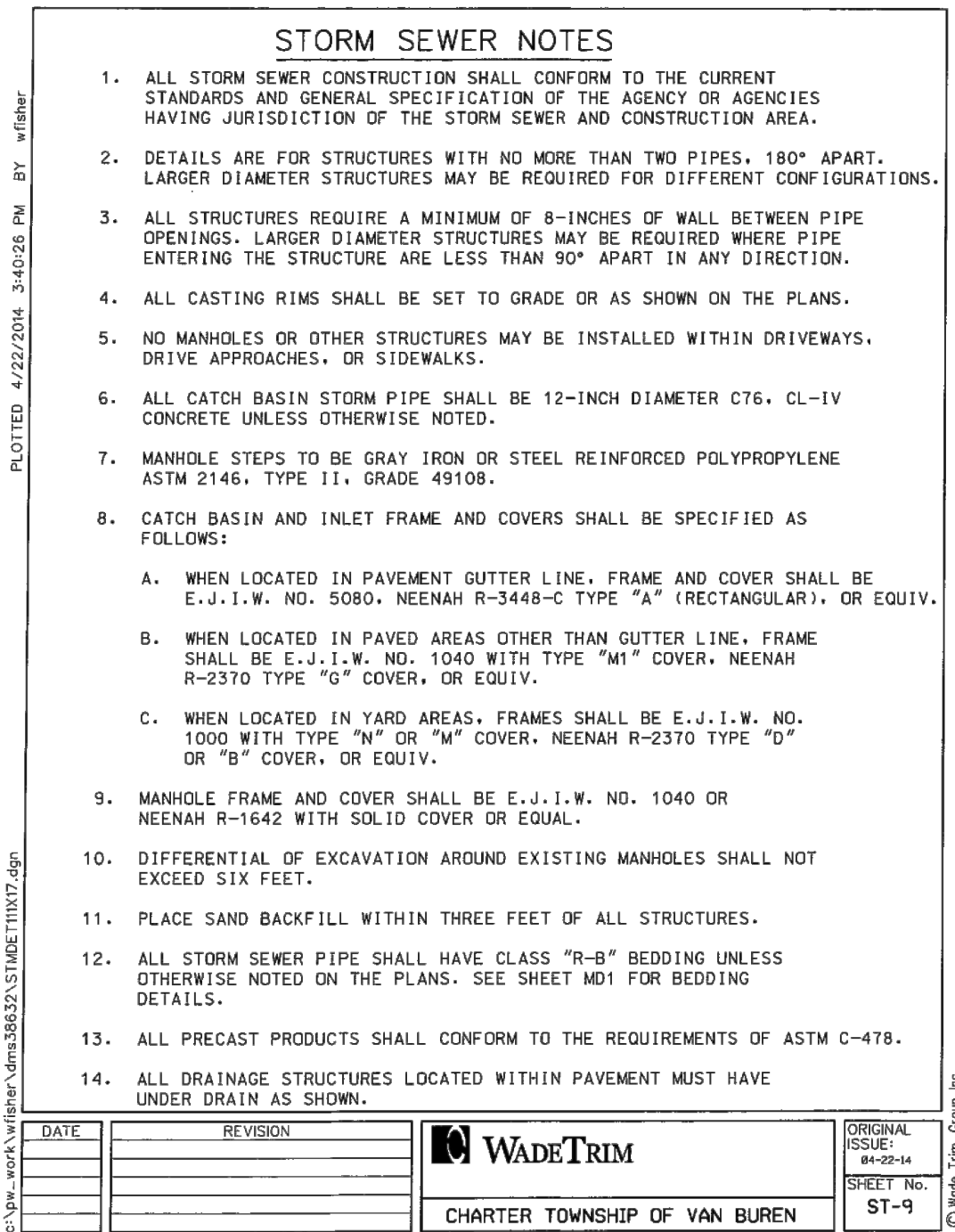
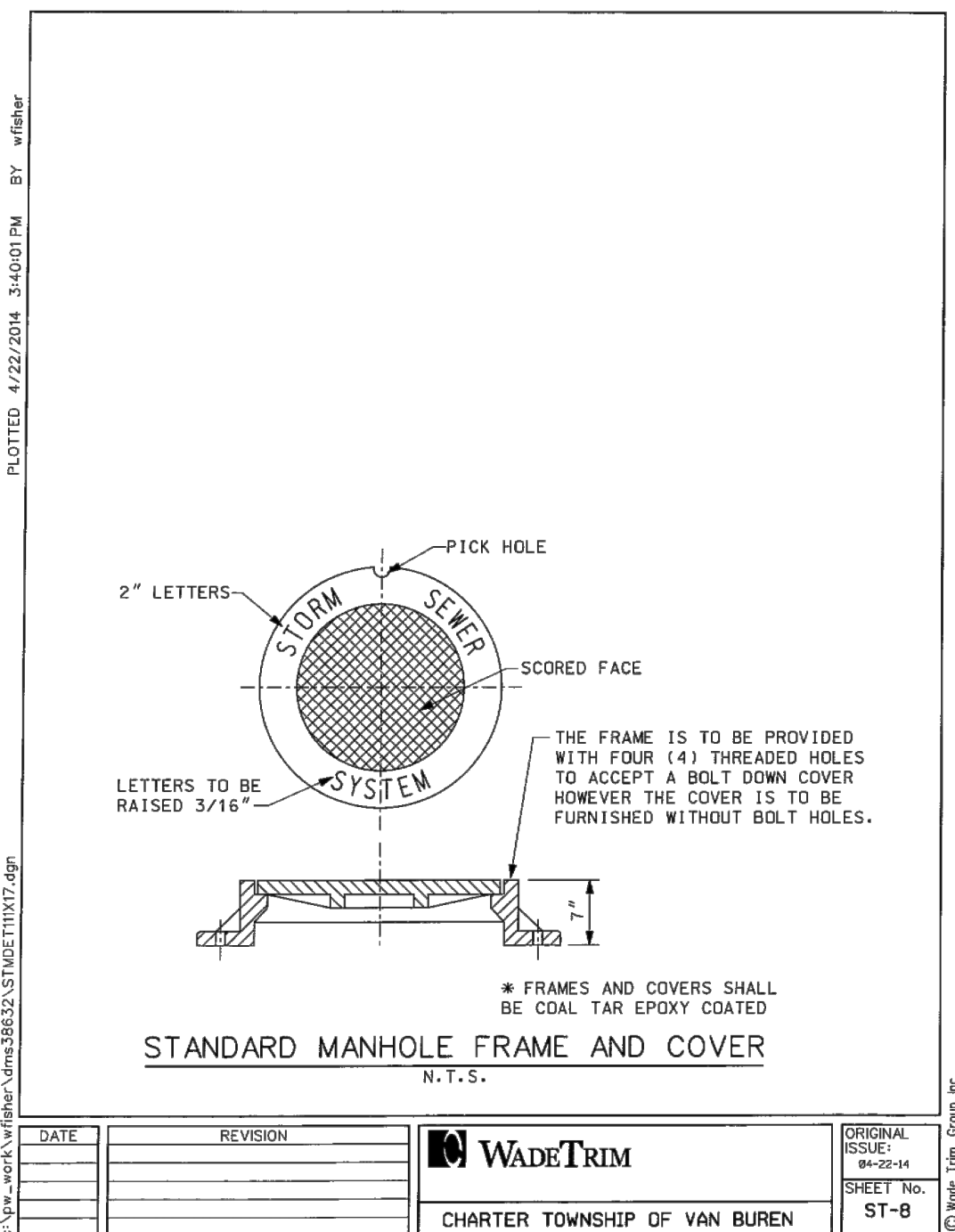
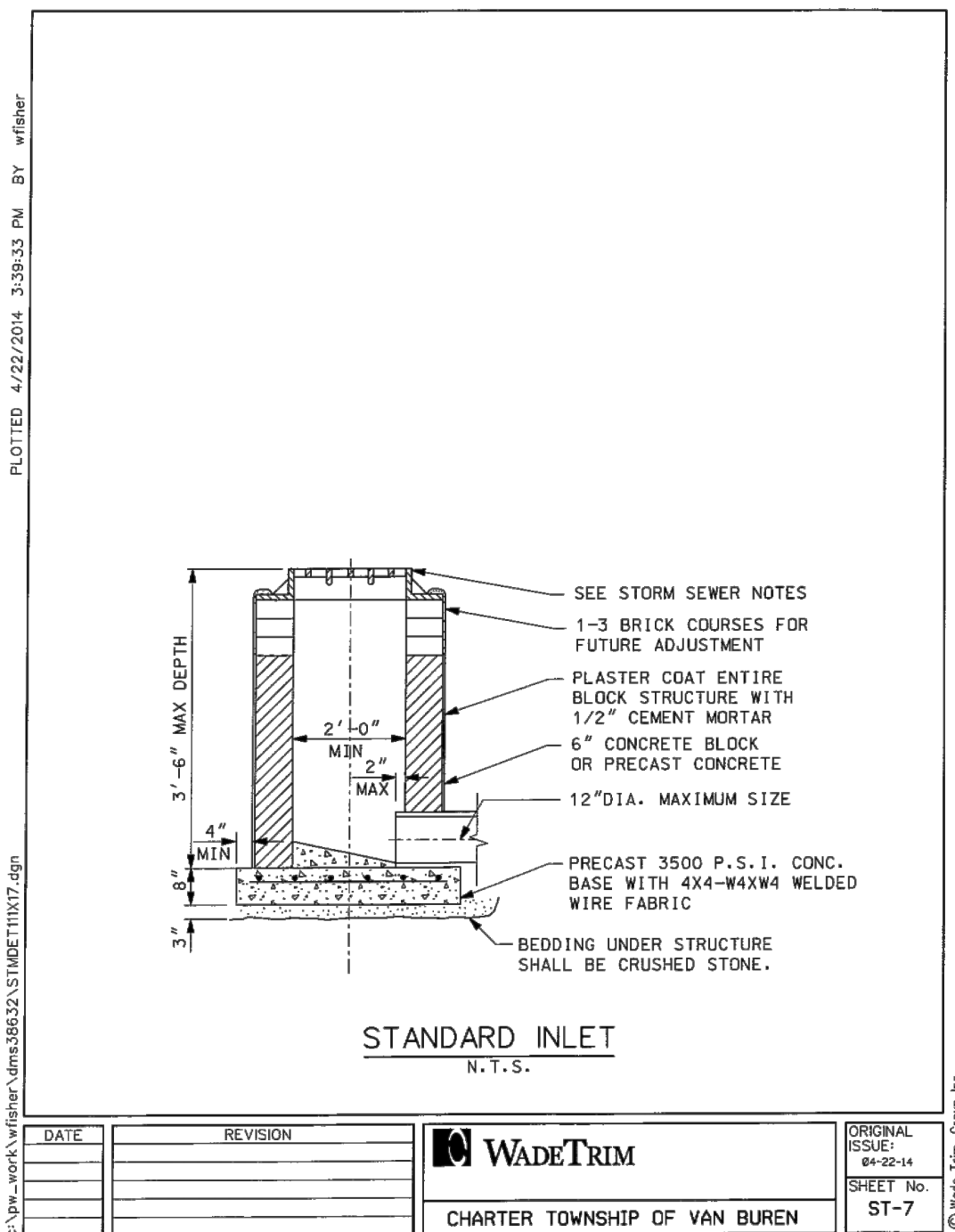
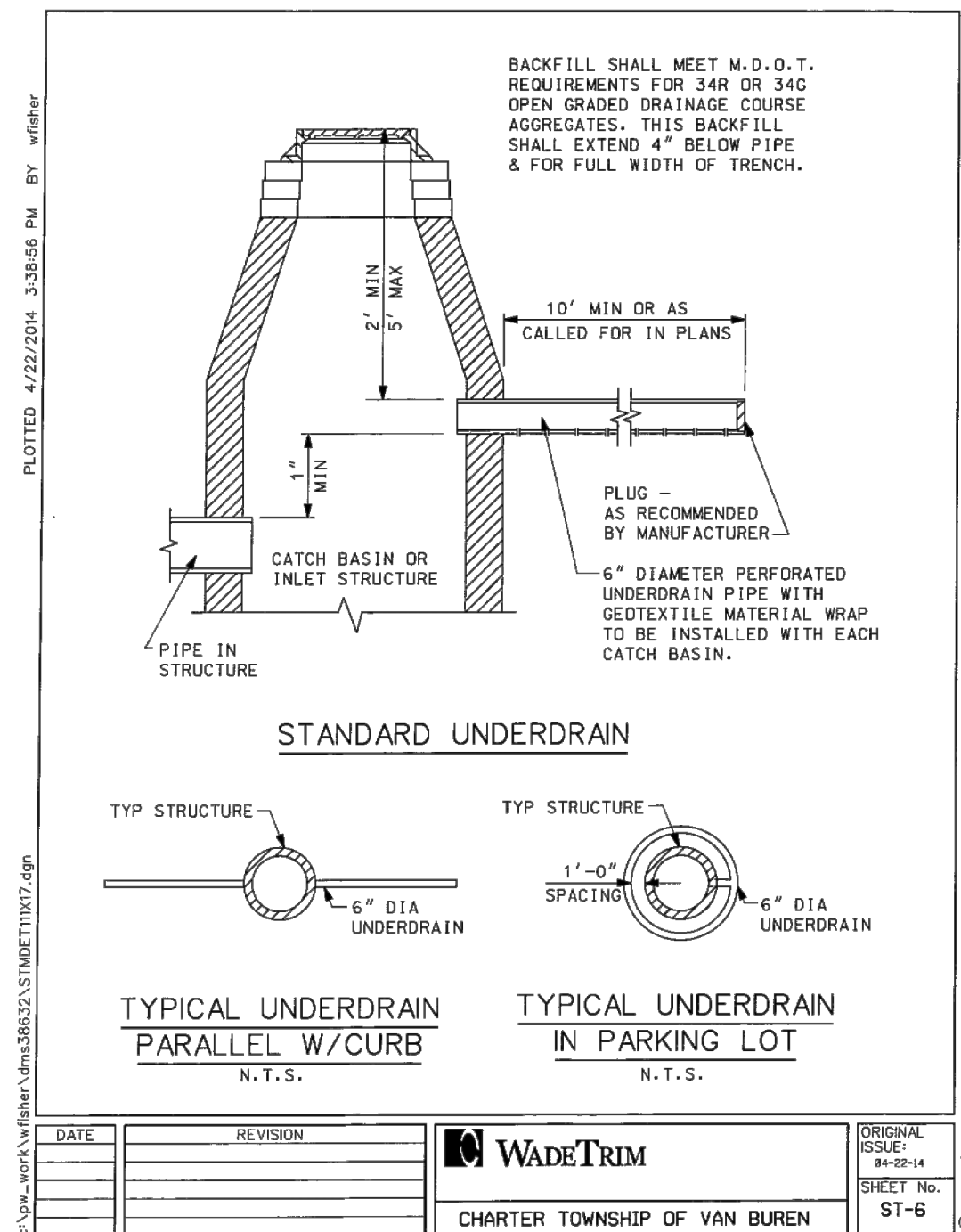
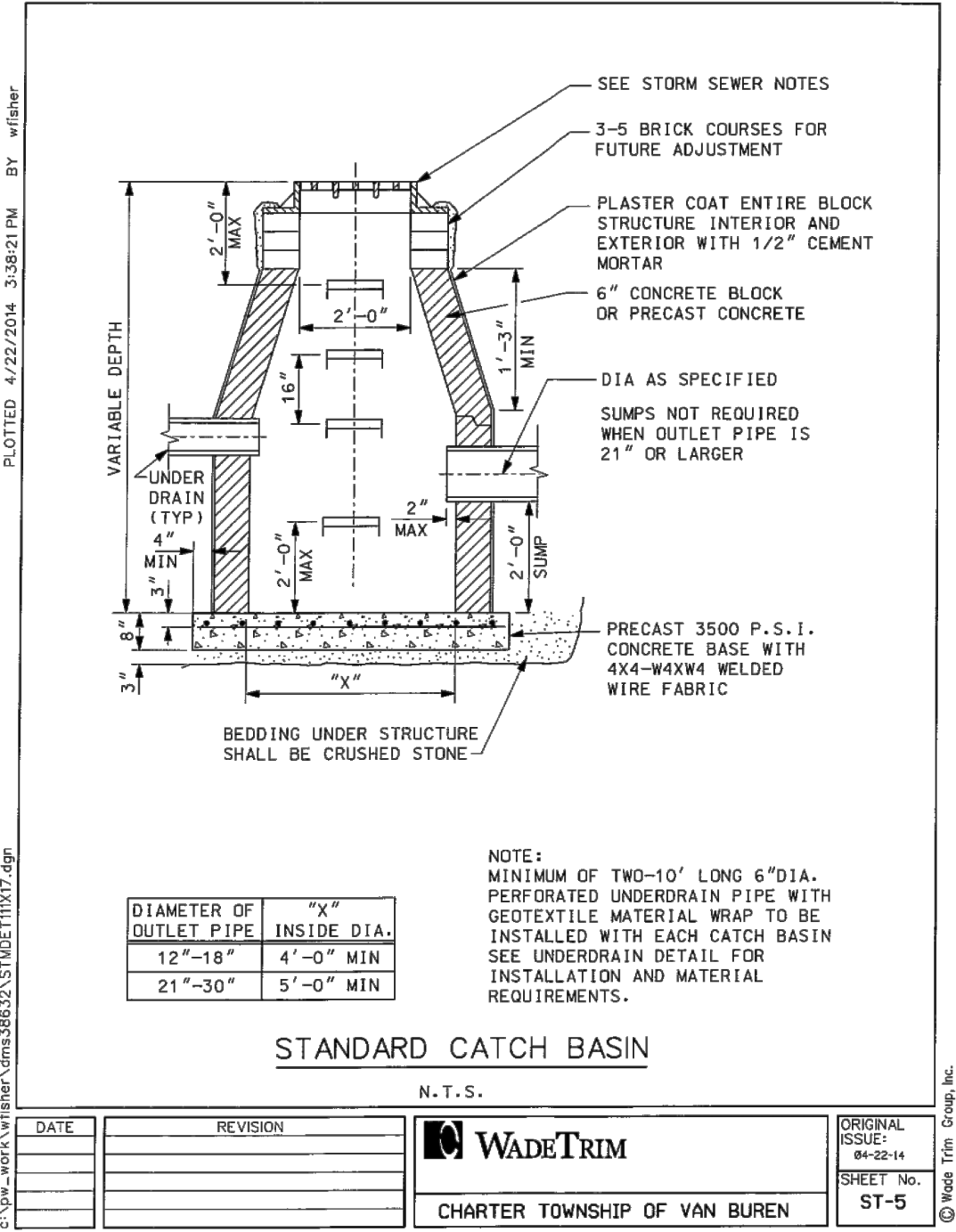
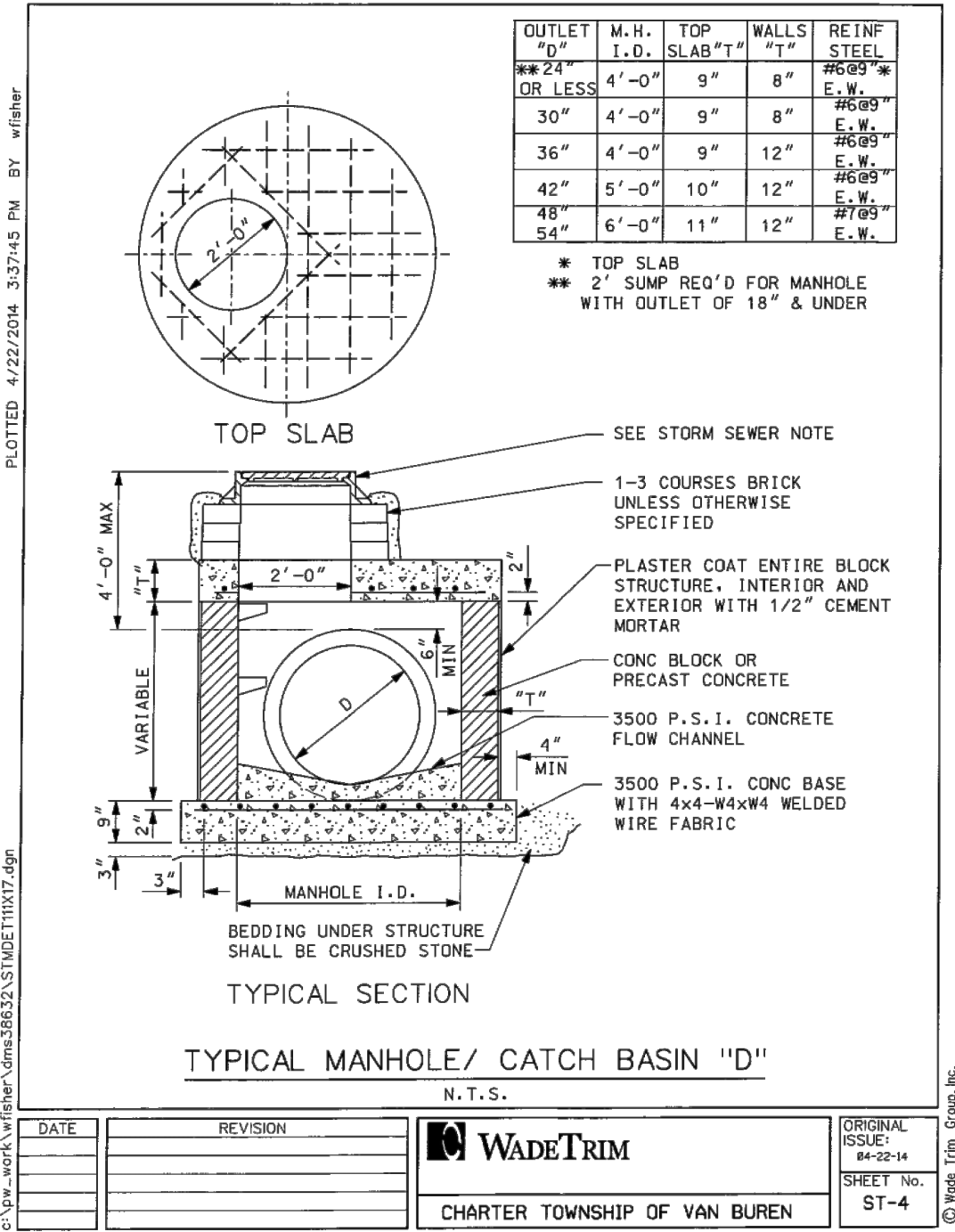
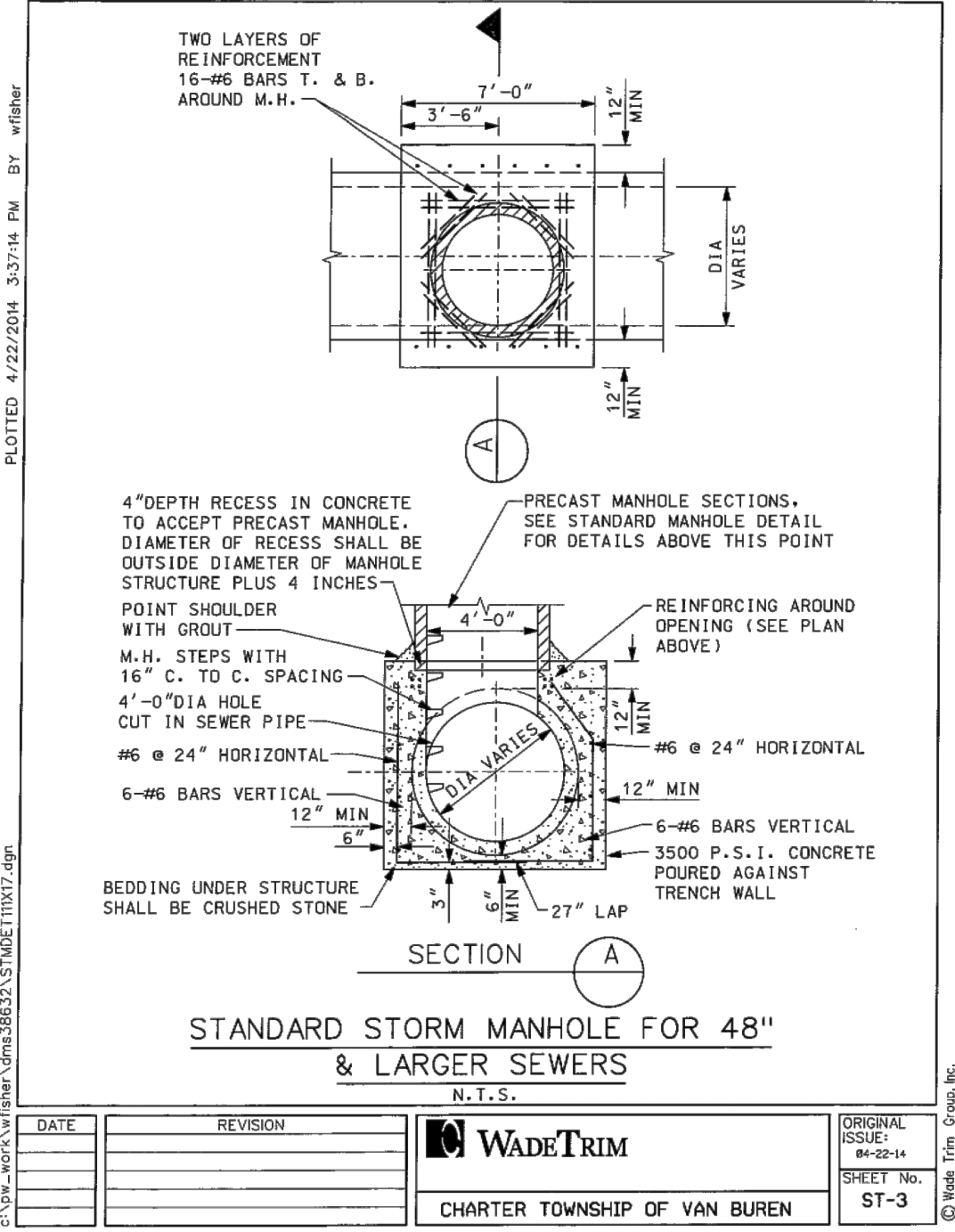
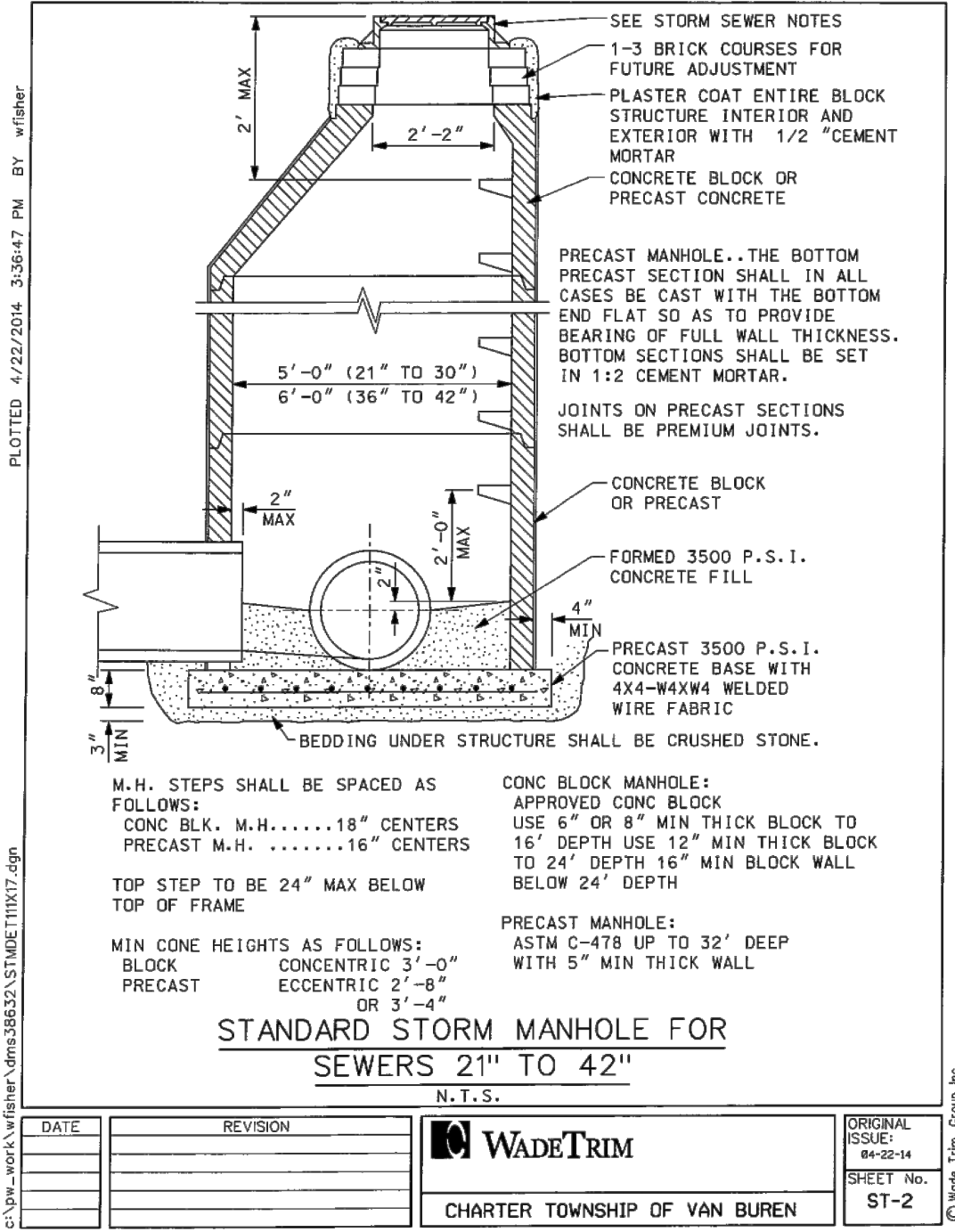
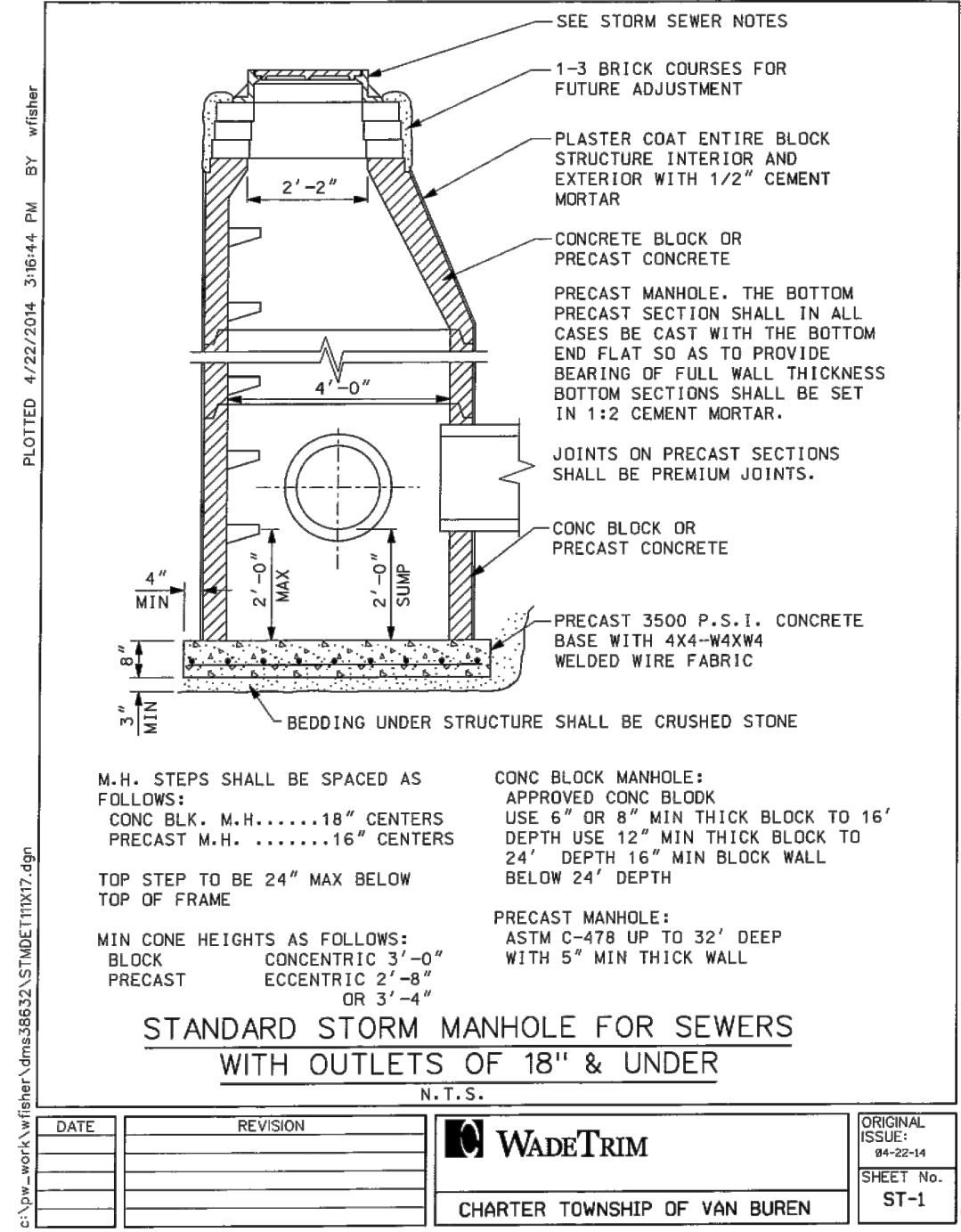
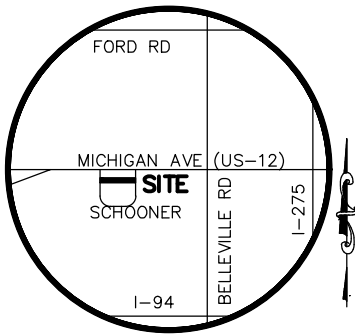


EXHIBIT "A"

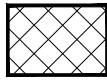
PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM



VICINITY MAP

NOT TO SCALE

LEGEND



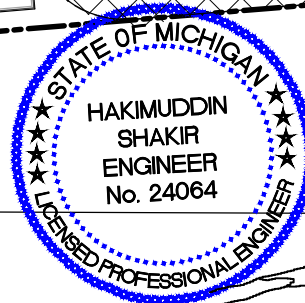
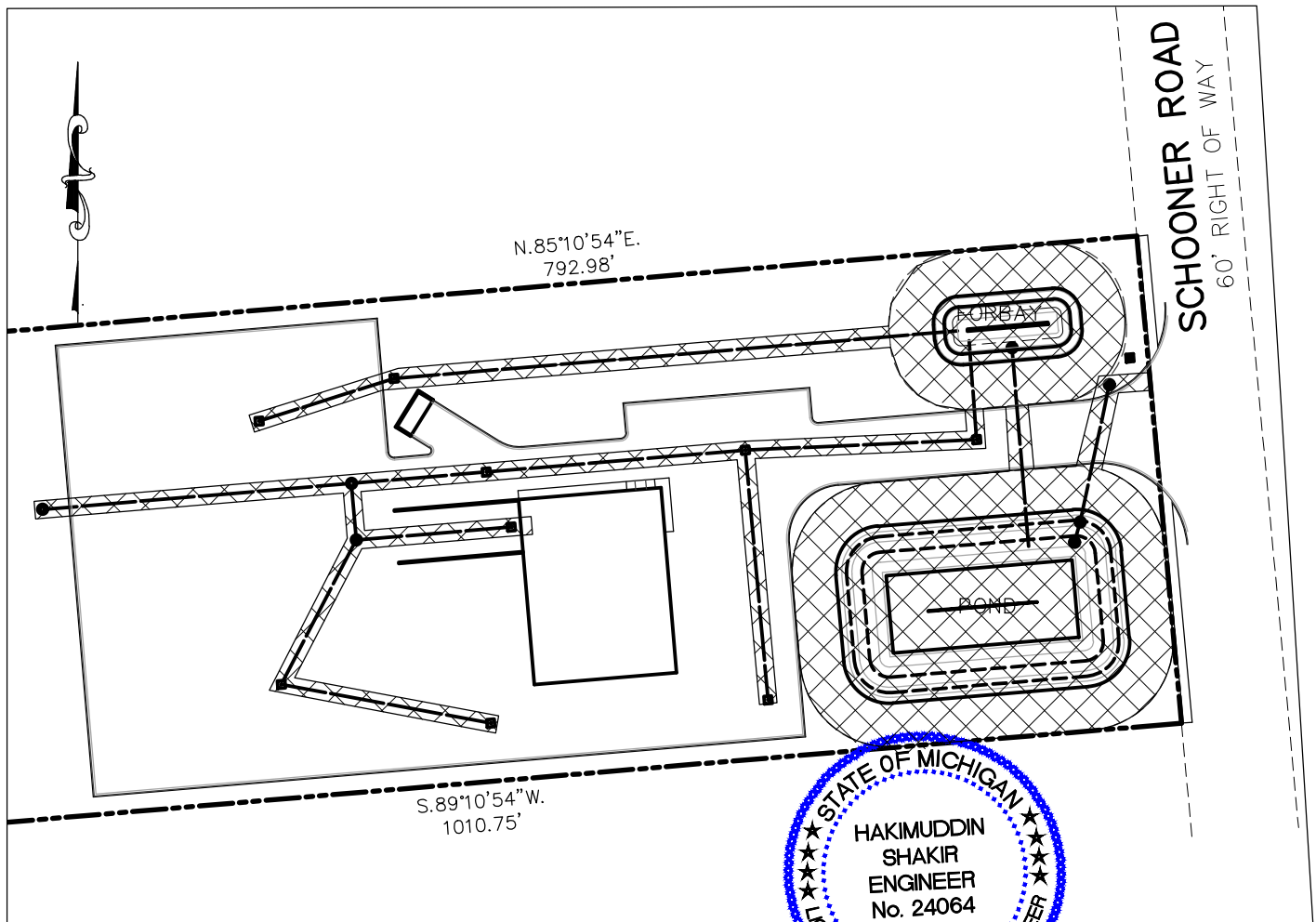
VAN BUREN TOWNSHIP
MAINTENANCE
RESPONSIBILITY

PROPERTY OWNER

SDUKHDEV SINGH
8385 OPAL DRIVE
WESTLAND, MI 48185

ENGINEER

HAKIM SHAKIR
ENGINEERING SERVICES
32190 SCHOOLCRAFT RD
LIVONIA, MI 48150
CONTACT: KEVIN HARDY
(734) 756-2196



DATE: 12-08-2022
JOB No. 2022-01
DWG No. D-
SHEET: 1 of 1
SCALE: 1"=100'

EXHIBIT "A"
STORM MAINTENANCE
CHAHAL TRUCKING
VAN BUREN TWSP, WAYNE
COUNTY, MICHIGAN

HARDY

CIVIL DESIGN
SERVICES LLC
4996 MOORE ST.
WAYNE, MI 48184

(734) 756-2196 // kbhardy1964@hotmail.com

EXHIBIT "B"

LONG TERM MAINTENANCE SCHEDULE CHART

* NOT TO EXCEED THE LENGTH ALLOWED BY LOCAL COMMUNITY ORDINANCE.

MAINTENANCE ACTIVITIES	CATCH BASINS, INLETS AND STORM SEWERS	CHANNELS AND SWALES	INLETS TO FOREBAY	BUFFER STRIP	SEDIMENT POND & DETENTION POND	OUTLET PIPE	OVERFLOW STRUCTURES	PAVEMENT AREAS	FREQUENCY
MONITORING/INSPECTION									
INSPECT FOR SEDIMENT ACCUMULATION	X	X	X	X	X	X	X		AS NEEDED / SEMI-ANNUALLY
INSPECT FOR FLOATABLES, DEAD VEGETATION AND DEBRIS	X	X	X	X	X	X	X		ANNUALLY & AFTER MAJOR EVENTS
INSPECT FOR EROSION AND INTEGRITY OF SYSTEM	X	X	X	X	X	X	X		ANNUALLY & AFTER MAJOR EVENTS
INSPECT ALL COMPONENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS	X	X	X	X	X	X	X		ANNUALLY
ENSURE MAINTENANCE ACCESS REMAIN OPEN/CLEAR	X	X	X	X	X	X	X		ANNUALLY
PREVENTATIVE MAINTENANCE									
REMOVE ACCUMULATED SEDIMENTS	X	X	X	X	X	X	X		AS NEEDED, SELECT AREAS ONLY
REMOVE FLOATABLES, INVASIVE & DEAD VEGETATION & DEBRIS	X	X	X	X	X	X	X		AS NEEDED
RE-APPLY / REPLACE MULCH LAYER				X	X				RE-APPLY EVERY 6 MONTHS, REPLACE EVERY 2-YEARS
REPLACE SUBSURFACE COMPONENTS (SOILS, STONES, 6" UNDERDRAIN)				X	X				EVERY 5-YEARS, OR WHEN WATER PONDS MORE THAN 6 HOURS
SWEEPING OF PAVED SURFACES				X			X		AS NEEDED / SEMI-ANNUALLY
REMEDIAL ACTIONS									
REPAIR/STABILIZE AREAS OF EROSION, RESEED BARE AREAS	X	X	X	X		X	X		AS NEEDED
REPLACE DEAD PLANTINGS, LAWN				X		X			AS NEEDED
STRUCTURAL REPAIRS	X	X	X	X	X	X	X		AS NEEDED
MAKE ADJUSTMENTS/REPAIRS TO ENSURE PROPER FUNCTIONING	X	X	X	X	X	X	X		AS NEEDED

A. PHYSICAL LIMITS OF THE STORM WATER MANAGEMENT SYSTEM

THE STORM WATER MANAGEMENT SYSTEM (SWMS) SUBJECT TO THIS LONG-TERM MAINTENANCE PLAN (PLAN) IS DEPICTED ON EXHIBIT A TO THE PERMIT AND INCLUDES WITHOUT LIMITATION THE STORM SEWERS, CATCH BASINS, MANHOLES, INLETS, SWALES, SPILLWAYS, FOREBAY, DETENTION BASIN, OUTLET CONTROL STRUCTURE AND OUTLET PIPE THAT CONVEYS FLOW FROM THE DETENTION BASIN INTO THE VAN BUREN TOWNSHIP STORM SEWER. FOR PURPOSES OF THIS PLAN, THIS STORM WATER MANAGEMENT SYSTEM AND ALL OF ITS COMPONENTS AS SHOWN ON EXHIBIT A IS REFERRED TO AS CHAHAL TRUCKING.

B. TIME FRAME FOR LONG-TERM MAINTENANCE RESPONSIBILITY

AS CHAHAL TRUCKING IS RESPONSIBLE FOR MAINTAINING THE CHAHAL TRUCKING SWMS, INCLUDING COMPLYING WITH APPLICABLE REQUIREMENTS OF THE LOCAL OR WAYNE COUNTY SOIL EROSION AND SEDIMENTATION CONTROL PROGRAM, UNTIL WAYNE COUNTY RELEASES THE CONSTRUCTION PERMIT. LONG-TERM MAINTENANCE RESPONSIBILITY FOR THE CHAHAL TRUCKING SWMS COMMENCES WHEN DEFINED BY THE MAINTENANCE PERMIT ISSUED BY THE COUNTY. LONG-TERM MAINTENANCE CONTINUES IN PERPETUITY.

C. MANNER OF ENSURING MAINTENANCE RESPONSIBILITY

THE TOWNSHIP OF VAN BUREN HAS ASSUMED RESPONSIBILITY FOR LONG-TERM MAINTENANCE OF AS CHAHAL TRUCKING SWMS. THE RESOLUTION BY WHICH THE CITY HAS ASSUMED MAINTENANCE RESPONSIBILITY IS ATTACHED TO THE PERMIT AS EXHIBIT C. AS CHAHAL TRUCKING THROUGH A MAINTENANCE AGREEMENT WITH THE CITY, HAS AGREED TO PERFORM THE MAINTENANCE ACTIVITIES REQUIRED BY THIS PLAN. VAN BUREN TOWNSHIP RETAINS THE RIGHT TO ENTER THE PROPERTY AND PERFORM THE NECESSARY MAINTENANCE OF THE AS CHAHAL TRUCKING SWMS IF AS CHAHAL TRUCKING FAILS TO PERFORM THE REQUIRED MAINTENANCE ACTIVITIES. TO ENSURE THAT THE AS CHAHAL TRUCKING SWMS IS MAINTAINED IN PERPETUITY, THE MAP OF THE PHYSICAL LIMITS OF THE STORM WATER MANAGEMENT SYSTEM (EXHIBIT A), THIS PLAN (EXHIBIT B), THE RESOLUTION ATTACHED AS EXHIBIT C, AND THE MAINTENANCE AGREEMENT BETWEEN THE TOWNSHIP OF VAN BUREN AND THE PROPERTY OWNER(S) WILL BE RECORDED WITH THE WAYNE COUNTY REGISTER OF DEEDS. UPON RECORDING, A COPY OF THE RECORDED DOCUMENTS WILL BE PROVIDED TO THE COUNTY.

D. LONG TERM MAINTENANCE PLAN AND SCHEDULE

TABLE 1 IDENTIFIES THE MAINTENANCE ACTIVITIES TO BE PERFORMED, ORGANIZED BY CATEGORY (MONITORING/INSPECTION, PREVENTATIVE MAINTENANCE, AND REMEDIAL ACTIONS). WHILE PERFORMING MAINTENANCE, CHEMICALS SHOULD NOT BE APPLIED TO THE FOREBAY, DETENTION BASIN, BUFFER STRIP, OR WATERCOURSES. TABLE 1 ALSO IDENTIFIES SITE-SPECIFIC WORK NEEDED TO ENSURE THAT THE STORM WATER MANAGEMENT SYSTEM FUNCTION PROPERLY AS DESIGNED.

PROPERTY OWNER

SDUKHDEV SINGH
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ENGINEER

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SHEET: 1 of 1
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EXHIBIT "B"
STORM MAINTENANCE
CHAHAL TRUCKING
VAN BUREN TWSP, WAYNE
COUNTY, MICHIGAN

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SERVICES LLC
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Hardy Civil Design Services, LLC

4996 Moore St., Wayne, MI 48184

(734) 756-2196, E-mail: hardy-cds@hotmail.com

March 03, 2023

Re: 6100 Schooner Drive
Van Buren Township, MI
Chahal trucking Facility.

To: OHM
County review R22-0560

OHM review #6 response letter:
Revisions are designed by red revision cloud.

Storm water management:

1. Noted
2. Land use summary table of cover sheet has been updated.
3. Limits of buffer strip are clearly defined with dimensions and slopes.
4. Storm Management calculations have been revised.
5. Details have been revised.
6. 24" vertical pipe has been revised to an 8" vertical pipe. An 8" vertical pipe has a capacity of of 14.88cfs as to the outlet volume as calculated, has a maximum flow of 11.28cfs. This revision will leave room within the riser for maintenance.
7. See response 6.
8. See response 6.
9. Outlet structures have been revised.

Kevin Hardy, Civil Design Services