

CHAHAL SEMI TRUCK/TRAILER REPAIR FACILITY

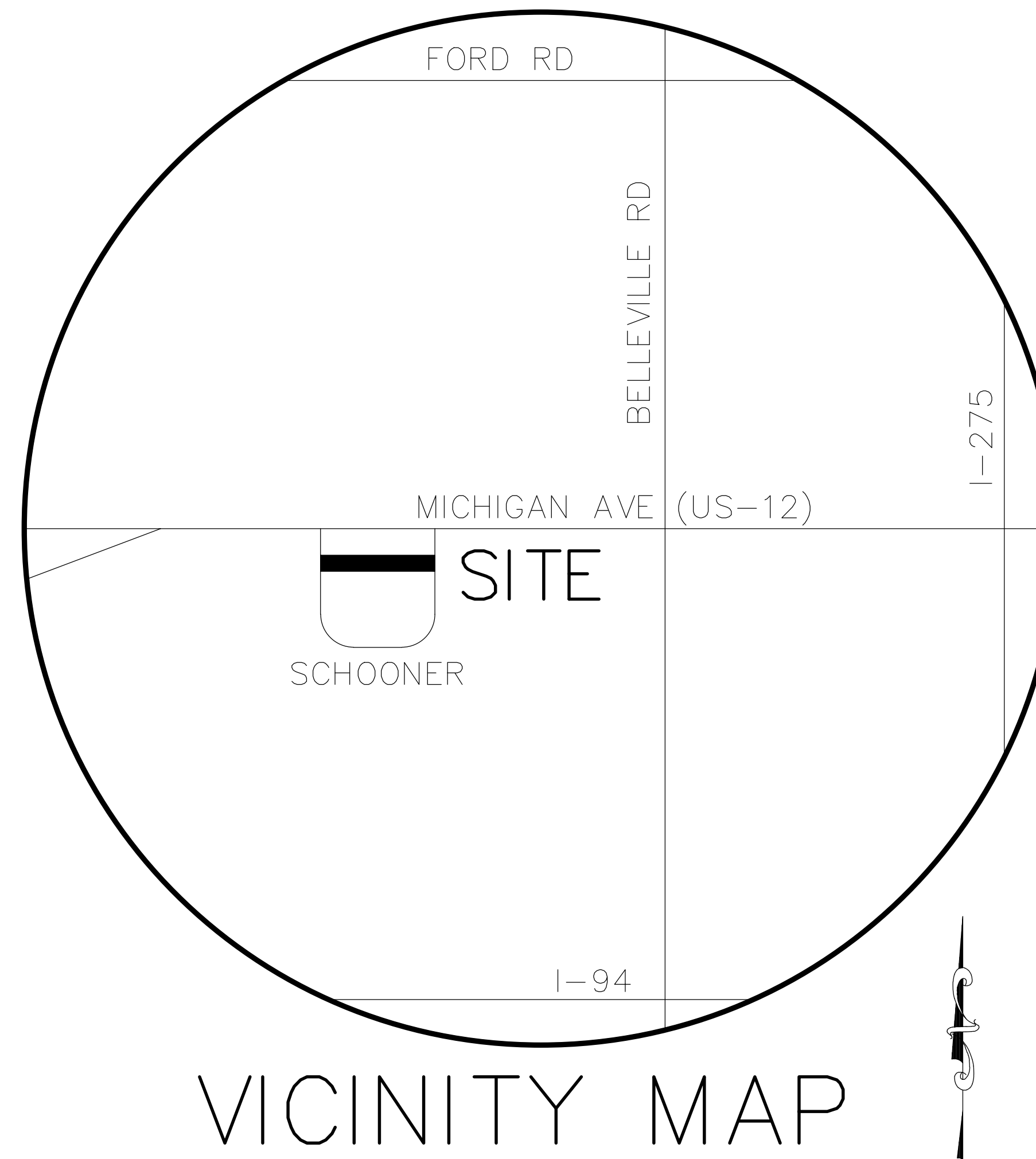
6100 SCHOONER DRIVE
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

DESIGN ENGINEERS

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WAYNE MI 48184
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CONTACT: KEVIN HARDY

GENERAL CONTRACTOR

JOE DAVENPORT
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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

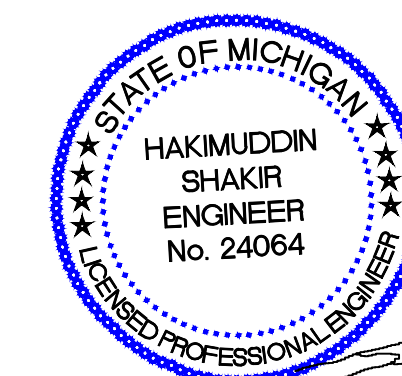
Land Characteristic	Existing	Proposed
Total Development Area (ac)	6.03	4.99
Impervious Area (ac)	1	3.24
Total Pervious Area (ac)	5	1.75
Pervious Area Breakdown by Cover Type		
Non-cultivated	4	0
Impervious Area (ac)	N/A	N/A
Improved area (grass/landscape)	6.03	1.19
Predominant NRCS Soil Type	type B	type B
Wooded Area (ac)	0	0
Predominant NRCS Soil Type	N/A	N/A
	REQUIRED VOLUME	UNIT PROVIDED VOLUME
CPVC	13,042	cf 1,956
CPRC	24,780	cf 0
Flood control vol. =	33,268	cf 31,312
Total volumes =	31,312	cf 33,268

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
2. TOPOGRAPHIC SURVEY & REMOVALS PLAN
3. GRADING & SOIL EROSION PLAN
4. STORM SEWER DESIGN PLAN
5. PROFILES
6. DETAILS
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

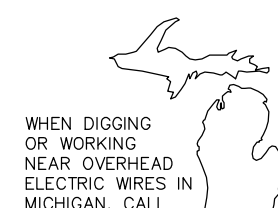
WAYNE COUNTY (STORM WATER PERMIT)
WAYNE COUNTY SESC PERMIT
VAN BUREN TOWNSHIP (SITE DEVELOPMENT PERMIT)

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)

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

ADJACENT PROPERTY ZONING:
NORTH M1 & M2
EAST M2
SOUTH M2
WEST M1

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

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

(c) 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.

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.

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°33'34"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' RADIUS OF WAY) THE FOLLOWING TWO CURVES: (1) SOUTHERLY 129.22 FEET ALONG THE ARC OF A 370' 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., 274.0 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.

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

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

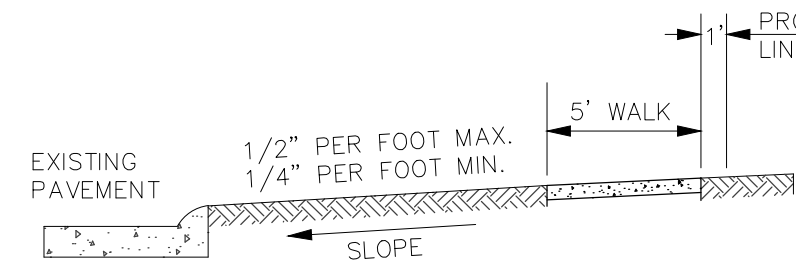
TOTAL SPACES REQUIRED =	20
PROVIDED REGULAR SPACES	21
PROVIDED BARRIER FREE SPACES	01
<u>TOTAL SPACES</u>	<u>22</u>

1. PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.
2. PHASING OF THE PROJECT IS NOT PROPOSED.
3. THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.
4. 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.

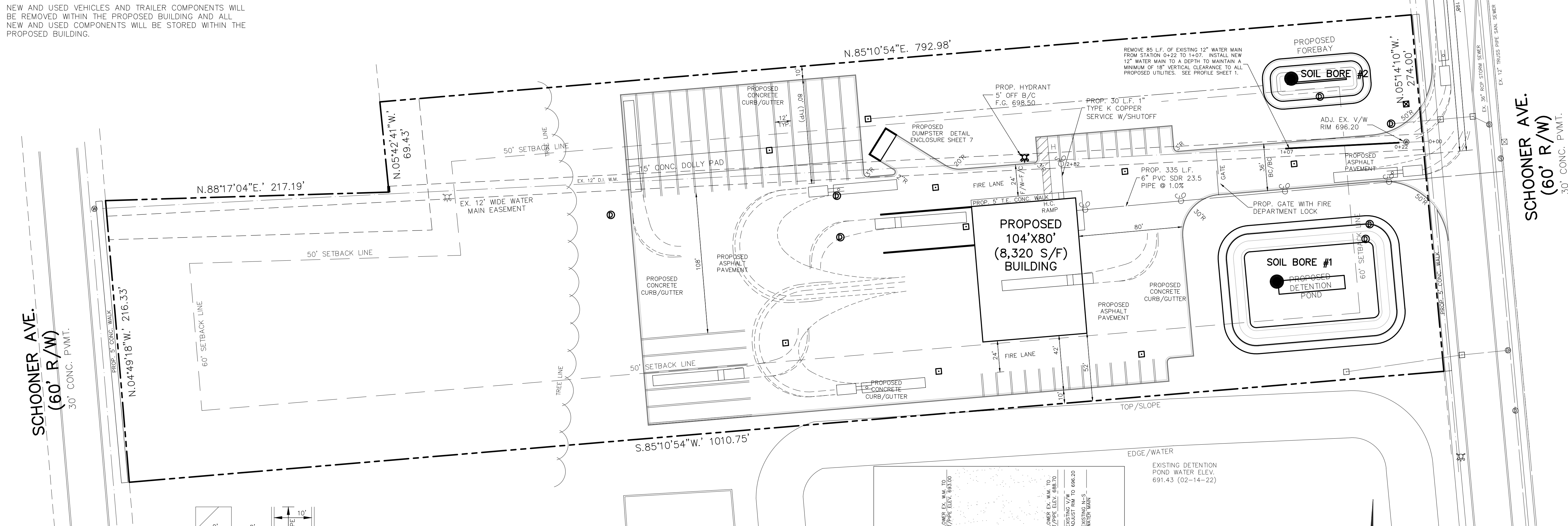
1. PROPOSED SEMI TRUCK REPAIR FACILITY. THERE WILL BE NO LONG TERM PARKING WITHIN THE SUBJECT PROPERTY.
2. TRUCKS PARKED ON THIS PROPERTY ARE FUNCTIONAL AND AWAITING REPAIR I.E., NO JUNK TRUCKS FOR PARTS SALVAGE.
3. THERE WILL BE NO HAZARDOUS WASTE GENERATED FROM THE SITE.
4. OILS, SOLVENTS AND OTHER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

1. WAYNE COUNTY STORM MANAGEMENT PERMIT.
2. VAN BUREN DEVELOPMENT PERMIT

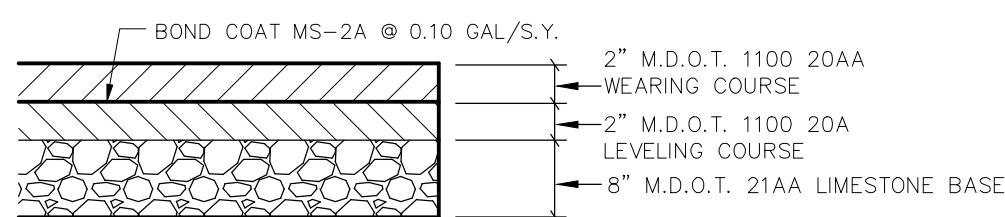
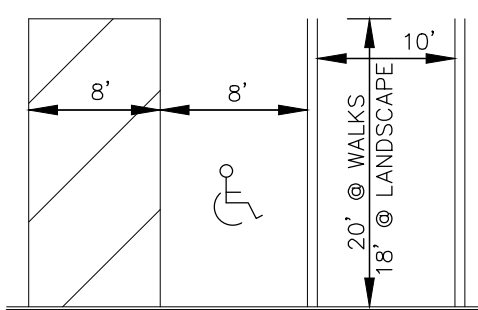
SOIL BORE INFORMATION LOCATED ON SHEET #7.



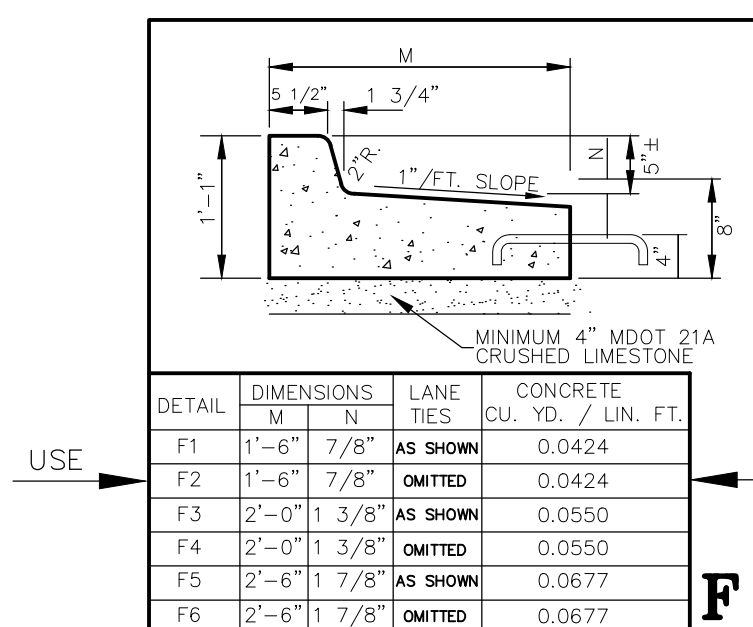
NOTE: SIDEWALK TO
BE 4" THICK CONC.



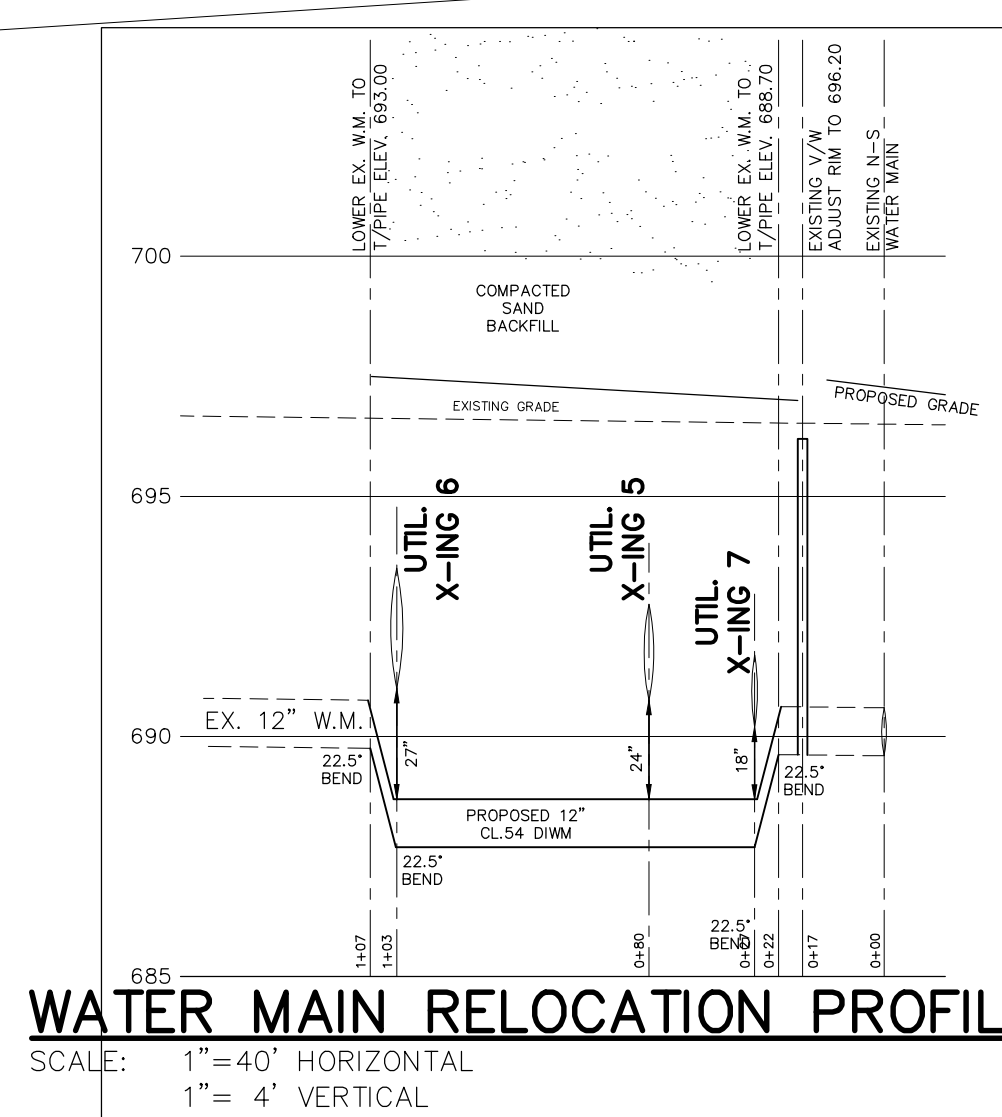
NOT TO SCALE



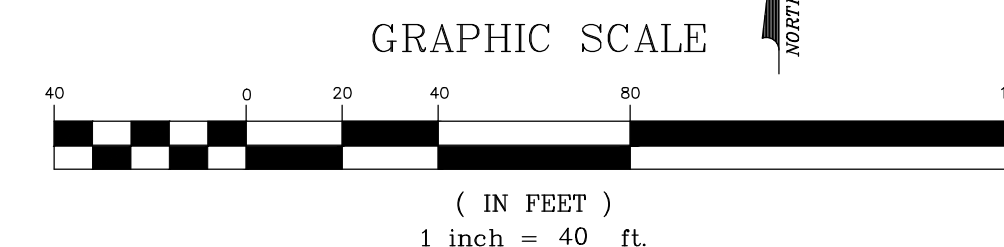
NOT TO SCALE



USE CURB DETAIL 'F2'



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



SDUKHDEV SINGH
8385 OPAL DRIVE
WESTALND, 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 |



SUBJECT PROPERTY ZONED M2 (GENERAL INDUSTRIAL)

SCHEDULE OF REGULATIONS FOR M2 ZONING

SETBACKS

SETBACK FOOTNOTES

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

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.

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

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

1. PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.
2. PHASING OF THE PROJECT IS NOT PROPOSED.
3. THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.
4. 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.
5. CONTRACTOR MUST PICK UP ANY FLOW FROM OFFSITE THAT CONTRIBUTES TO THE SITE.

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

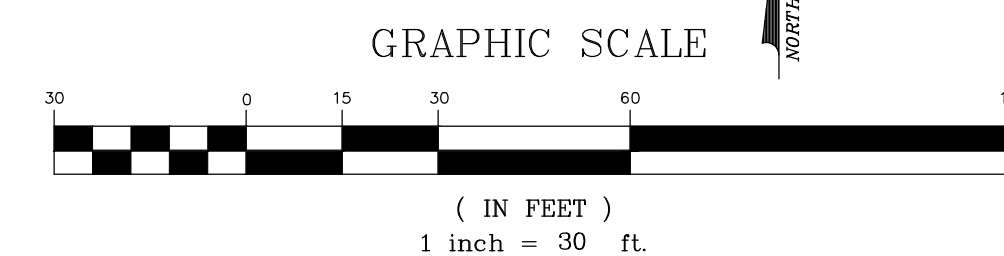
ARROW ON HYDRANT LOCATED ON THE WEST SIDE OF SCHOONER DRIVE
65' SOUTH OF SOUTHERLY PROPERTY LINE OF SUBJECT PARCEL.
ELEVATION - 699.27

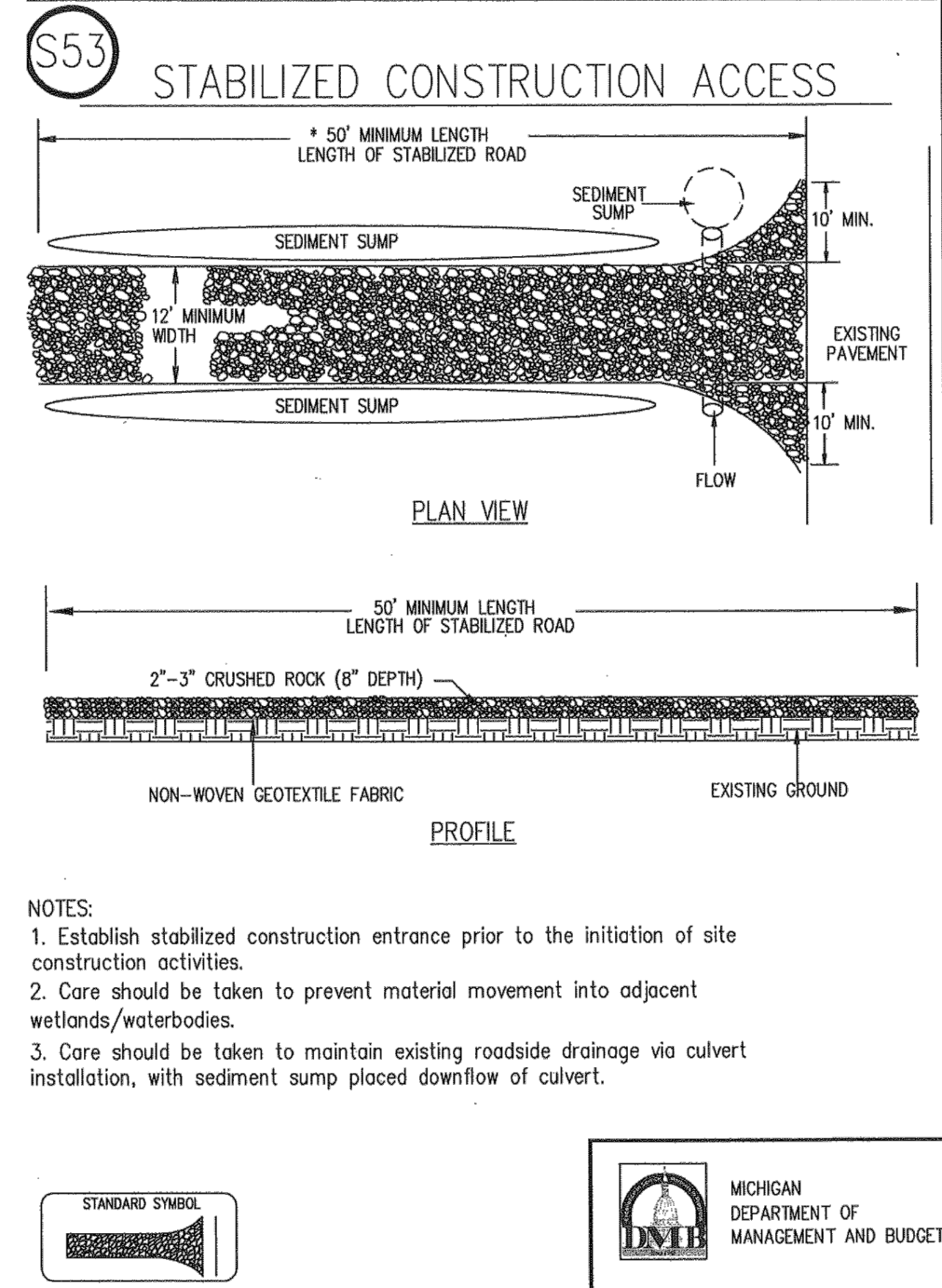
1. TWO-WAY TRAFFIC MUST BE MAINTAINED AT ALL TIMES.
2. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS OF MDOT, MMUTCD AND TOWNSHIP REQUIREMENTS.



SDUKHDEV SINGH
8385 OPAL DRIVE
WESTALND, MI 48185

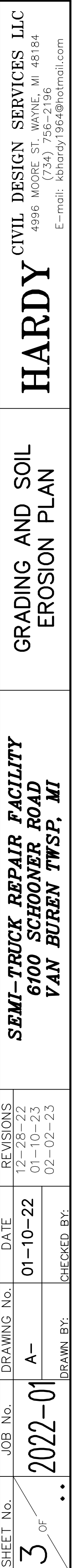
	EX. CATCH BASIN
	EX. SANITARY MANHOLE
	EX. STORM MANHOLE
	EX. HYDRANT
	EX. UTILITY POLE
	EX. VALVE WELL
	EX. FENCE
	EX. STREET SIGN
	EX. LIGHT POLE





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 FENCE FROM BEHIND SILT FENCE AND REMOVE SILT FENCE.



REQUIREMENTS FOR NEW OPEN POND PROJECT

TOTAL LAND AREA:

6.03

acres

TOTAL DISRUPTIVE AREA:

4.99

acres

LAND USE SUMMARY

Land Characteristic

Existing

Proposed

Coeff.

A*C

Total Development Area (ac)

6.03

4.99

0.95

0.37

Roof Area (ac)

0

0.39

0.95

2.85

Pavement Area (ac)

0

3

0.95

0

Gravel (ac)

0

0

0.95

0

Total Pervious Area (ac)

6.03

1.6

0.25

0.4

totals:

6.03

4.99

3.62

Pervious Area Breakdown by Cover Type

Non-cultivated

4

0

Impervious Area (ac)

N/A

N/A

Improved area (grass/landscape)

4.99

1.76

Predominant NRCS Soil Type

B

B

(Type A, B, C, C)

Wooded Area (ac)

0

0

Predominant NRCS Soil Type

N/A

N/A

(Type A, B, C, C)

Calculated CPVC Volume (cf)=

CALCULATE RUNOFF COEFFICIENT

C=(A1*C1)/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=

7.5

min.

10

minutes (site minimum)

T=

10

min.

CALCULATE 100-YEAR PEAK INTENSITY

I10=

4.6

in/hr

CHANNEL PROTECTION VOLUME CONTROL (CPVC)

Vcpvc=

13,042

cf

CHANNEL PROTECTION RATE CONTROL (CPRC)

Vcprc=

24,780

cf

100-YEAR FLOOD CONTROL VOLUME CALCS

Qallow,calc=

0.73

cfs/acre

0.10

cfs/acre, max allow. release rate

1.00

cfs/acre

a site less than 2 acres must use a variable release rate of

Tributary area=

4.99

acres

100-year release, Q(allow)

0.499

cfs

Qo=

2.49

cfs

Qj=

16.53

cfs

Vr=

67,904

cf

Storage Ratio(Vs/Vr)=

0.5

100-year (req), Vs=

33,268

cf

SUMMARY OF CALCULATED VOLUMES:

cpvc=

13,042

cf

cprc=

24,780

cf

Flood Control Volume=

20,226

cf if CPVC volume is met

Flood Control Volume=

33,268

cf if CPVC volume is not met

REQ. DETENTION VOL. DETERMINATION

CPVC

13,042

cf

CPRC

24,780

cf

Flood control vol.=

33,268

cf

SITE MINIMUM

In lieu of Bioretention swales the site is designed with Forebay

Required Forebay Design Volume = 15% of CPVC volume

15% of CPVC volume =

1,956

cf

FOREBAY OUTLET ELEVATION

elev=

691.10

ft

FOREBAY POND DESIGN

contour elevation

area

volume

volume

691.10

55

0

0

692.00

680

368

368

693.00

1,580

1,130

1,498

694.00

2,730

2,155

3,653

CPRC (High Water) ELEV = LOWER EL. + (UPPER EL. - LOWER EL.)*

(REQ. VOL.-CUM. VOL. LOWER EL.)/(CUM. VOL. UPPER EL.-CUM. VOL. LOW EL.)

693.00

694.00

1,497.50

3,652.50

ELEV=

693.21

ft

Total Vol bioretention Prov.

1,956

cf

ORRIFICE CALCULATIONS

Orifice (CPVC) rate control

Q(ave)=

0.01

ft

H(ed)=

2.11

ft

Average Head, H(ed)

1.055

ft

Orifice Area A=

0.002

sq/ft

Orifice Dia, D100=

0.64

inches

number holes req.=

1

ea

Calculated D(100-year)=

0.053

ft

Therefore use, number of holes=

1

ea

hole size=

1.0

inch

place hole at CPVC elev=

691.10

ft

Actual (D100)=

0.0833

ft

DETENTION POND OUTLET ELEVATION

elev=

690.60

ft

Required Flood Control after removing CPVC volume

Required Flood Control=

31,312

cf

OPEN DETENTION POND DESIGN

contour elevation

area

volume

volume

690.60

5,735

0

0

691.00

6,490

6,113

6,113

692.00

8,532

7,511

13,624

692.42

9,910

9,221

22,845

693.00

10,800

10,355

33,200

5,400

38,600

0

38,600

CPRC (High Water) ELEV = LOWER EL. + (UPPER EL. - LOWER EL.)*

(REQ. VOL.-CUM. VOL. LOWER EL.)/(CUM. VOL. UPPER EL.-CUM. VOL. LOW EL.)

692.42

693.00

22,844.50

33,199.50

ELEV=

692.89

ft

NOTE

SOIL BORE INFORMATION LOCATED ON SHEET #7

ORRIFICE CALCULATIONS

Orifice Flood Rate Control

Q(ave)=

0.18

ft

H(ed)=

2.29

ft

Average Head, H(ed)

1.145

ft

Orifice Area A=

0.042

sq/ft

Orifice Dia, D100=

2.78

inches

number holes req.=

1

ea

Calculated D(100-year)=

0.231

ft

Therefore use, number of holes=

1

ea

hole size=

2.8

inch

place hole at elev=

690.60

ft

Actual (D100)=

0.2317

ft

REQUIRED VOLUME

13,042

cf

UNIT

1,956

cf

PROVIDED VOLUME

0

cf

CPVC

24,780

cf

Flood control vol.=

33,268

cf

Total volumes=

31,312

cf

33,268

cf

1.062 %

SANITARY SEWER BASIS OF DESIGN

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

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

1,350 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

- UTILITY PLAN NOTES
1. PROPOSED HYDRANT TO BE MINIMUM OF 5' OFF BACK OF CURB

2. OLD HYDRANT SHALL BE DELIVERED TO VAN BUREN TOWNSHIP DPW DEPARTMENT.

3. NEW HYDRANT SHALL UTILIZE THE EXISTING HYDRANT TEE.
- GENERAL NOTES

1. PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.

2. PHASING OF THE PROJECT IS NOT PROPOSED.

3. THERE ARE NO WETLANDS LOCATED ON SUBJECT PROPERTY.

4. 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.

ITEM

UNIT

QTY

Soil Erosion

if

1,800

Soil Fence

ea

1

Mud mat

Mass grading

complete

1

Water main system

if

12

6" CL 54 DIWVM

ea

1

Hydrant Asam

complete

1

1" Copper water serv.

if

85

12" DIWVM (Vertical relocation)

Sanitary Sewer lead

complete

1

Detention areas

complete

1

Paving:

s/v

10,400

21AA Aggregate Base

s/v

10,400

4" Asphalt Pavement

if

1,700

Concrete Curbingutter

Storm Sewer:

if

356

12" C-76 CL/IV RCP

if

483

15" C-76 CL/IV RCP

if

30

18" C-76 CL IV RCP

if

744

24" C-76 CL/IV RCP

2" Diameter inlet

ea

4

4" Diameter manhole

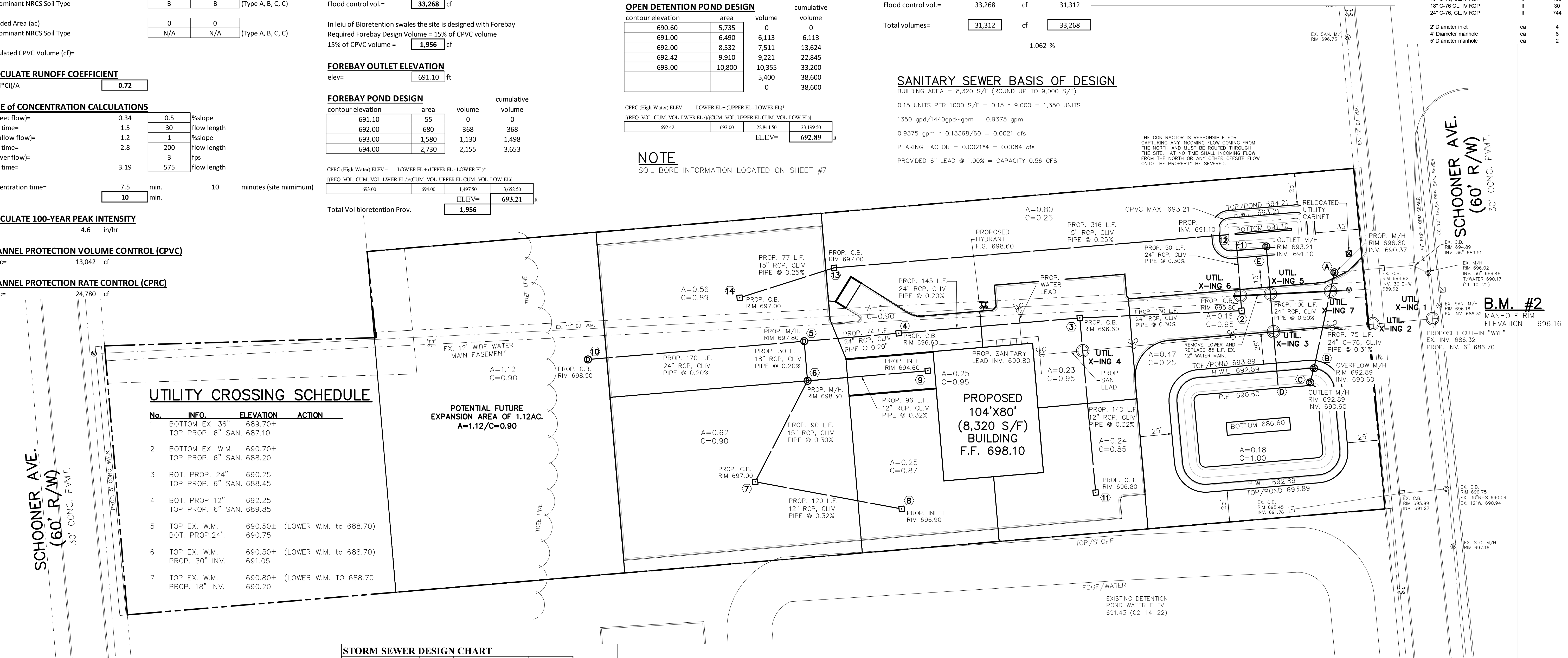
ea

6

5" Diameter manhole

ea

2



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

7

INV. 18"N. 692.45

12

INV. 15"W. 691.10

3

INV. 24"N. 691.25

8

INV. 15"SW. 692.45

13

4" DIA. C.B. RIM 697.00

4

INV. 24"W. 691.25

9

INV. 12"E. 692.45

14

INV. 15"NE. 691.89

5

4" DIA. C.B. RIM 696.60

10

INV. 12"SE. 692.72

15

42" DIA. INLET RIM 697.00

6

INV. 24"E-W. 691.64

11

INV. 12"W. 692.72

16

INV. 15"NE. 692.08

7

INV. 12"S. 692.35

12

2" DIA. INLET RIM 694.60

17

INV. 12"W. 692.76

8

4" DIA. C.B. RIM 696.60

13

INV. 24"E-W. 691.93

18

4" DIA. C.B. RIM 698.50

9

INV. 24"E-W. 691.93

14

INV. 24"E. 692.65

19

INV. 18"S. 692.38

STORM SEWER DESIGN CHART

Roughness Coefficient

0.013

Initial Time (T)=

10

Rain Intensity (I)=

4.64

Storm Sewer Line

From Structure

To Structure

Increment

C

Factor

Equivalent Area 100% C*A

Total Area 100% C*A

t Time (min)

I Inch Per Hour

Q C*^{1.48}A (cfs)

Pipe Dia. (in)

Slope %

Length of Line (ft)

Manning Velocity in Pipe (ft/sec)

Time of Flow (min)

Manning Capacity of Sewer (cfs)

Energy Loss

V²/(2g)

H.G. Elev. Upper End

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

0.25

0.20

0.698

10.49

4.55

3.18

15

0.25

316

2.63

2.00

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

0.11

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

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

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

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

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

0.07

693.85

692.45

692.38

693.95

5

4

0.00

0.00

0.00

2.021

11.50

4.39

8.87

24

0.20

74

3.22

0.38

0.11

693.98

692.07

691.93

694.07

4

3

0.11

0.90

0.10

2.120

11.88

4.33

9.18

24

0.20

145

3.22

0.75

0.11

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

0.16

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

0.22

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

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

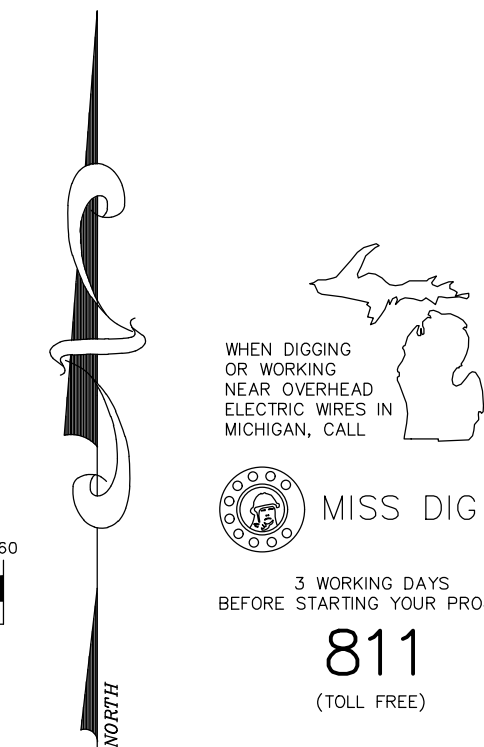
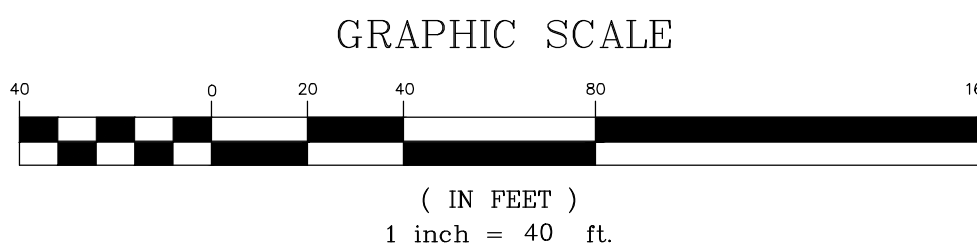
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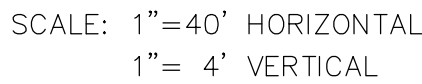
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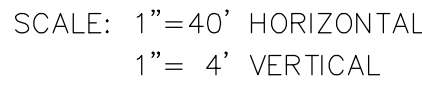
690.37

692.89





Storm Sewer Line			Increment		Equivalent Area 100%	Total Area 100%	t	I	Q	Pipe		Length	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 %	of 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	693.14
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	693.97
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)

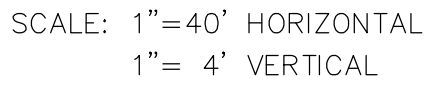
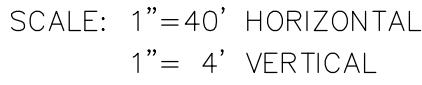
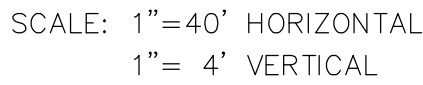
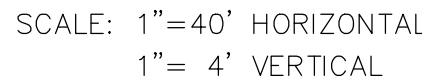
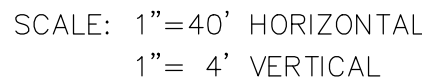
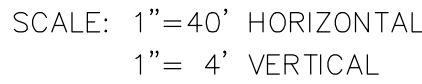
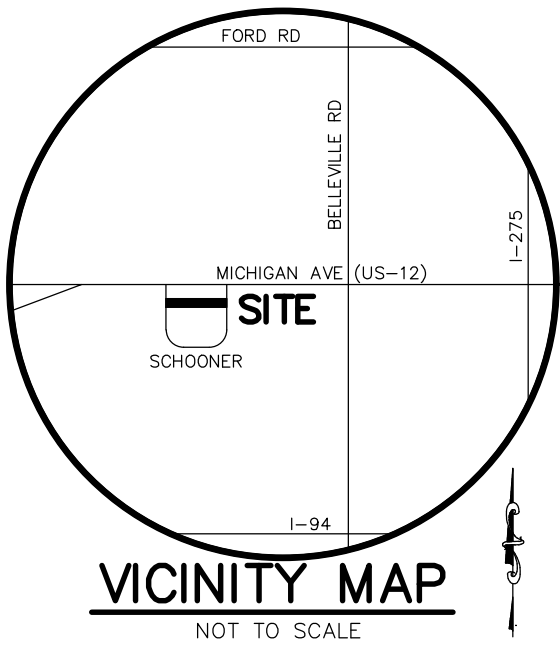


EXHIBIT "A"

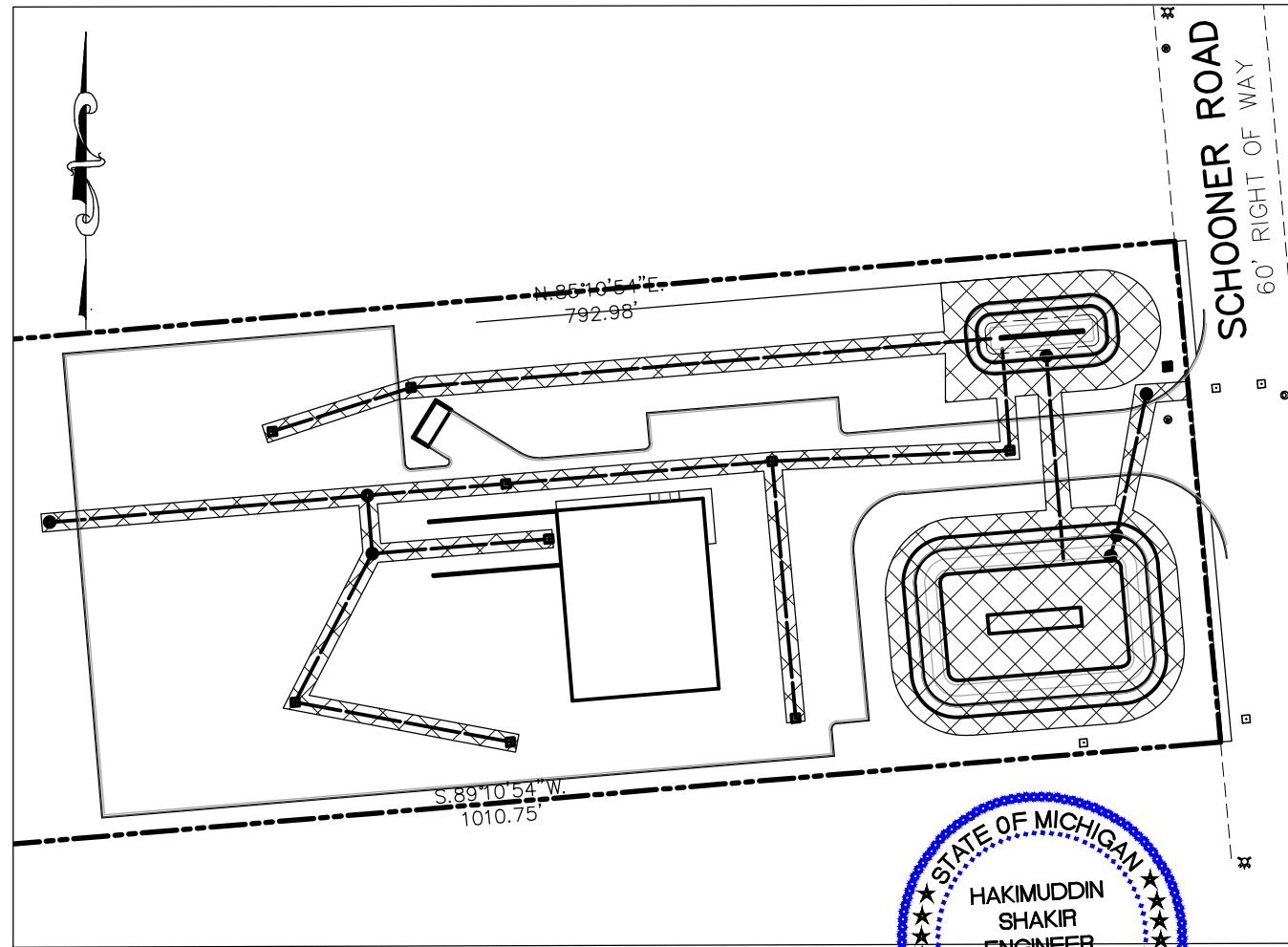
PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM

LEGEND
VAN BUREN TOWNSHIP
MAINTENANCE
RESPONSIBILITY



PROPERTY OWNER
SOUKHEDEV 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	VAN BUREN TOWNSHIP CHANNELS AND SWALES INLETS TO FOREBAY BUFFER STRIP SEDIMENT POND & DETENTION BASIN OUTLET PIPE OVERFLOW STRUCTURES PAVEMENT AREAS	FREQUENCY
MONITORING/INSPECTION		
INSPECT FOR SEDIMENT ACCUMULATION	XXXX	AS NEEDED / SEMI-ANNUALLY
INSPECT FOR FLOATABLES, DEAD VEGETATION AND DEBRIS	XXXX	ANNUALLY & AFTER MAJOR EVENTS
INSPECT FOR EROSION AND INTEGRITY OF SYSTEM	XXXX	ANNUALLY & AFTER MAJOR EVENTS
INSPECT ALL COMPONENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS	XXXX	ANNUALLY
ENSURE MAINTENANCE ACCESS REMAIN OPEN/CLEAR	XXXX	ANNUALLY
PREVENTATIVE MAINTENANCE		
REMOVE ACCUMULATED SEDIMENTS	XXXX	AS NEEDED, SELECT AREAS ONLY
REMOVE FLOATABLES, INVASIVE & DEAD VEGETATION & DEBRIS	XXXX	AS NEEDED
RE-APPLY / REPLACE MULCH LAYER	XXXX	RE-APPLY EVERY 6 MONTHS, REPLACE EVERY 2 YEARS
REPLACE SUBSURFACE COMPONENTS (SOILS, STONES, 6" UNDERDRAIN)	XXXX	REPLACE EVERY 2 YEARS DURING SCHEDULED MAINT. WITH WATER
SWEEPING OF PAVED SURFACES	XXXX	AS NEEDED / SEMI-ANNUALLY
REMEDIAL ACTIONS		
REPAIR/STABILIZE AREAS OF EROSION, RESEED BARE AREAS	XXXX	AS NEEDED
REPLACE DEAD PLANTINGS, LAWN	XXXX	AS NEEDED
STRUCTURAL REPAIRS	XXXX	AS NEEDED
MAKE ADJUSTMENTS/REPAIRS TO ENSURE PROPER FUNCTIONING	XXXX	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
SOUKHEDEV 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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SHEET: 1 of 1
SCALE: 1"=100'

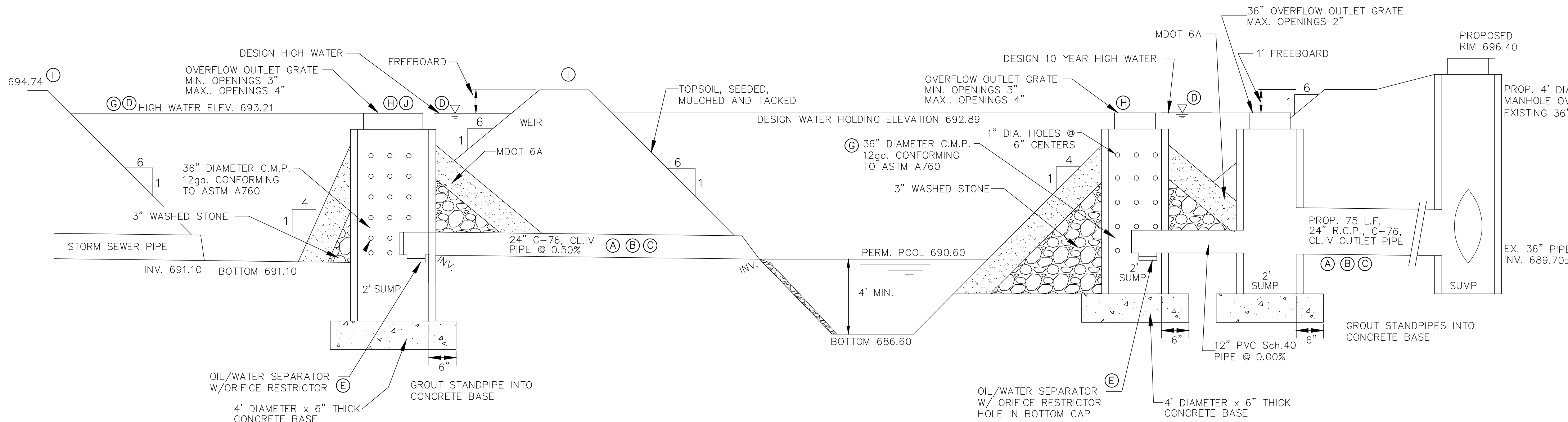
EXHIBIT "B"
STORM MAINTENANCE
CHAHAL TRUCKING
VAN BUREN TWP., WAYNE
COUNTY, MICHIGAN

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

WETLANDS DATA

WAYNE COUNTY DPS GENERAL NOTES:

1. 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.
2. 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
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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".
9. 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.
10. 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.
11. MAINTAIN A SAFE AND ADEQUATE TRAVEL ROUTE FOR PEDESTRIANS AT ALL TIMES THROUGHOUT THE PROJECT DURATION.
12. TUNNELING, BORING AND JACKING OPERATIONS SHALL BE IN ACCORDANCE WITH THE WAYNE COUNTY SPECIFICATIONS AND DETAILS.
13. BORE PITS SHALL BE PLACED AT MINIMUM 10 FEET FROM THE BACK OF CURB OR EDGE OF PAVEMENT.
14. REMOVE ALL ABANDONED CONDUITS FROM THE COUNTY ROADS ROW OR AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
15. CONTRACTOR SHALL PROVIDE COLD WEATHER PROTECTION FOR ALL PROPOSED CONCRETE WORK (PAVEMENTS, SIDEWALKS, DRIVE APPROACHES, ETC.) AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
16. OVERNIGHT VEHICLE PARKING AND STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENTS ARE NOT PERMITTED WITHIN THE WAYNE COUNTY ROADS RIGHTS-OF-WAY.
17. 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.
18. 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.
19. CONTRACTOR SHALL NOTIFY WAYNE COUNTY 72 HOURS PRIOR TO START OF CONSTRUCTION. CONTACT THE PERMIT OFFICE AT (734) 858-2764



FOREBAY OUTLET STRUCTURE

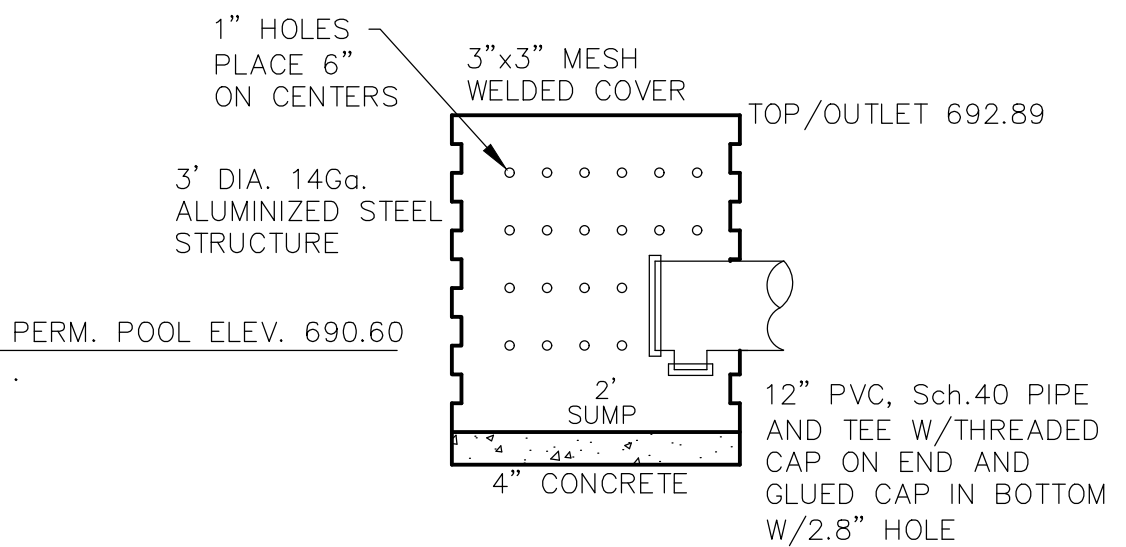
FORBAY OUTLET SCHEDULE									
OUTLET PIPE LENGTH (A)	OUTLET PIPE SLOPE (B)	OUTLET PIPE SIZE (C)	FOREBAY STORAGE ELEVATION (D)	CPVC DISCHARGE ORIFICE SIZE (E)	STANDPIPE DIAMETER (G)	TOP OF STANDPIPE ELEVATION (H)	FOREBAY CREST ELEVATION (I)	EMERGENCY SPILLWAY ELEVATION (J)	
100'	0.50%	24" @ 691.10	693.21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

DETENTION OUTLET STRUCTURE

DETENTION OUTLET SCHEDULE									
OUTLET PIPE LENGTH (A)	OUTLET PIPE SLOPE (B)	OUTLET PIPE SIZE (C)	100 YEAR STORAGE (D)	100 YEAR STORM RELEASE INV./ORIFICE SIZE (E)	STANDPIPE DIAMETER (G)	TOP OF STANDPIPE ELEVATION (H)	POND CREST ELEVATION (I)	EMERGENCY SPILLWAY ELEVATION (J)	
100'	0.50%	24"	692.89	(1) 2.8" HOLE @ 690.60	36"	692.89	693.89	693.89	

DETAIL FOREBAY OUTLET STRUCTURE "E"

NOT TO SCALE



DETAIL DETENTION OUTLET STRUCTURE "C"

NOT TO SCALE

DETAILS

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

REVISIONS
12-28-22
01-10-23
02-02-23

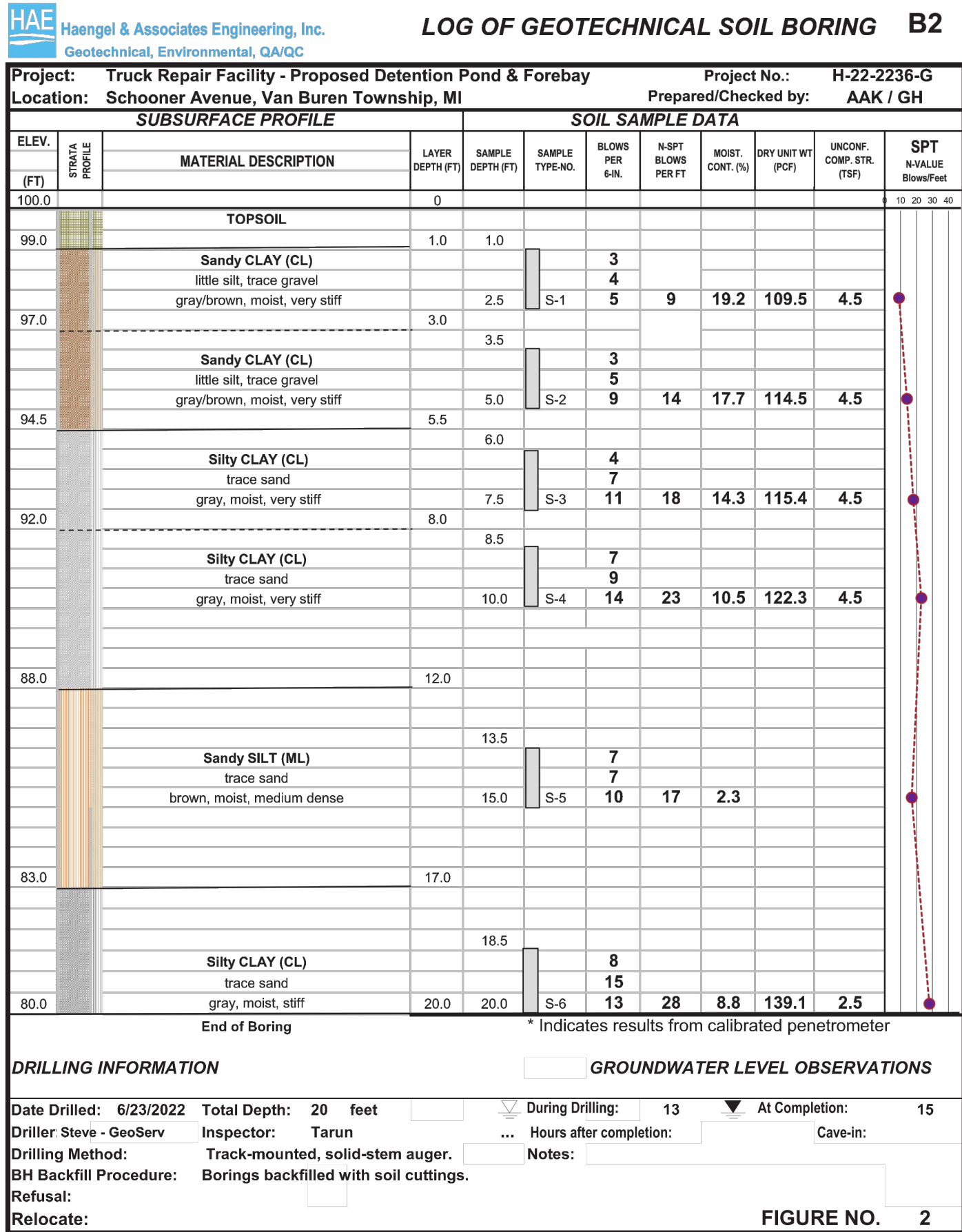
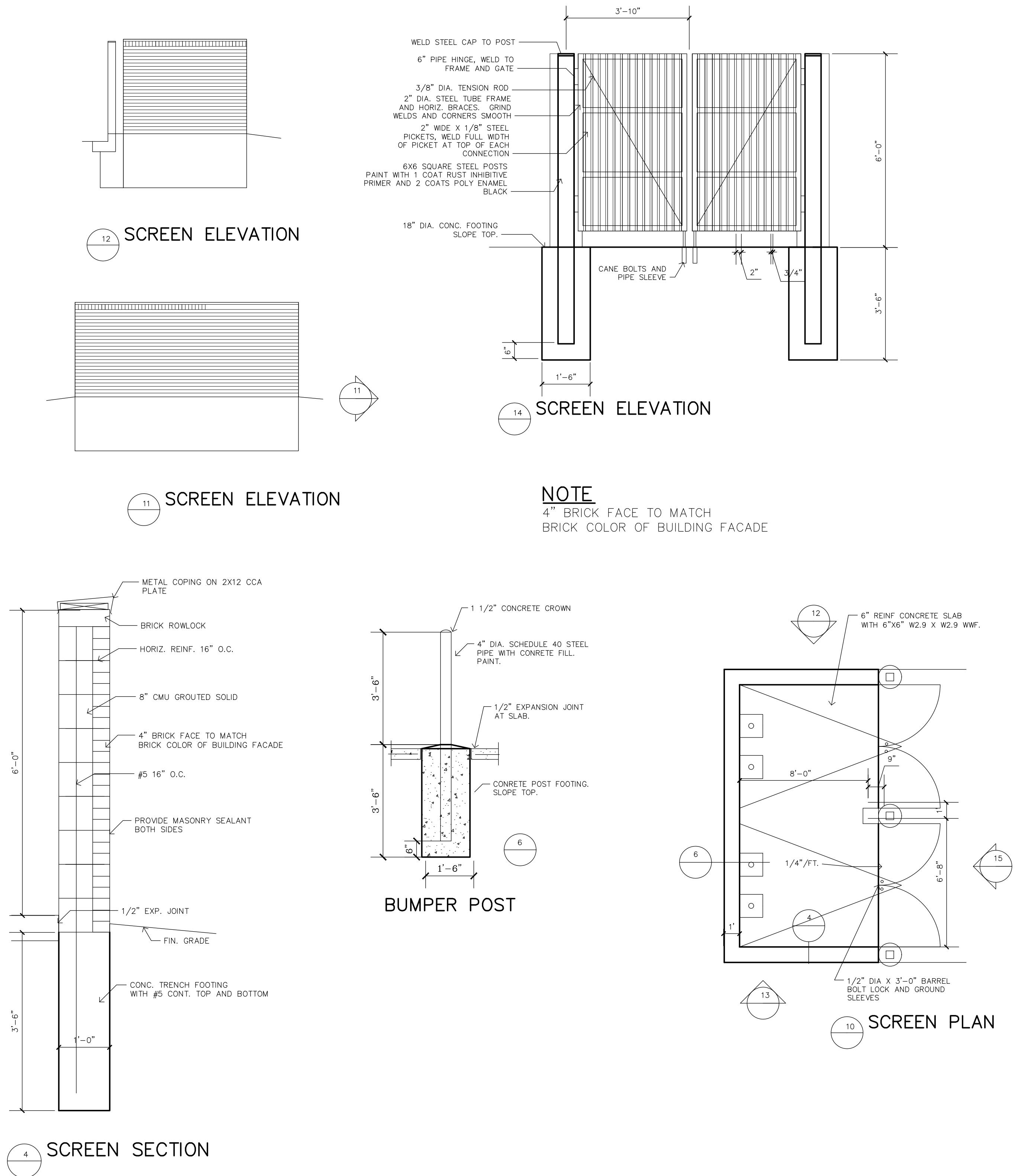
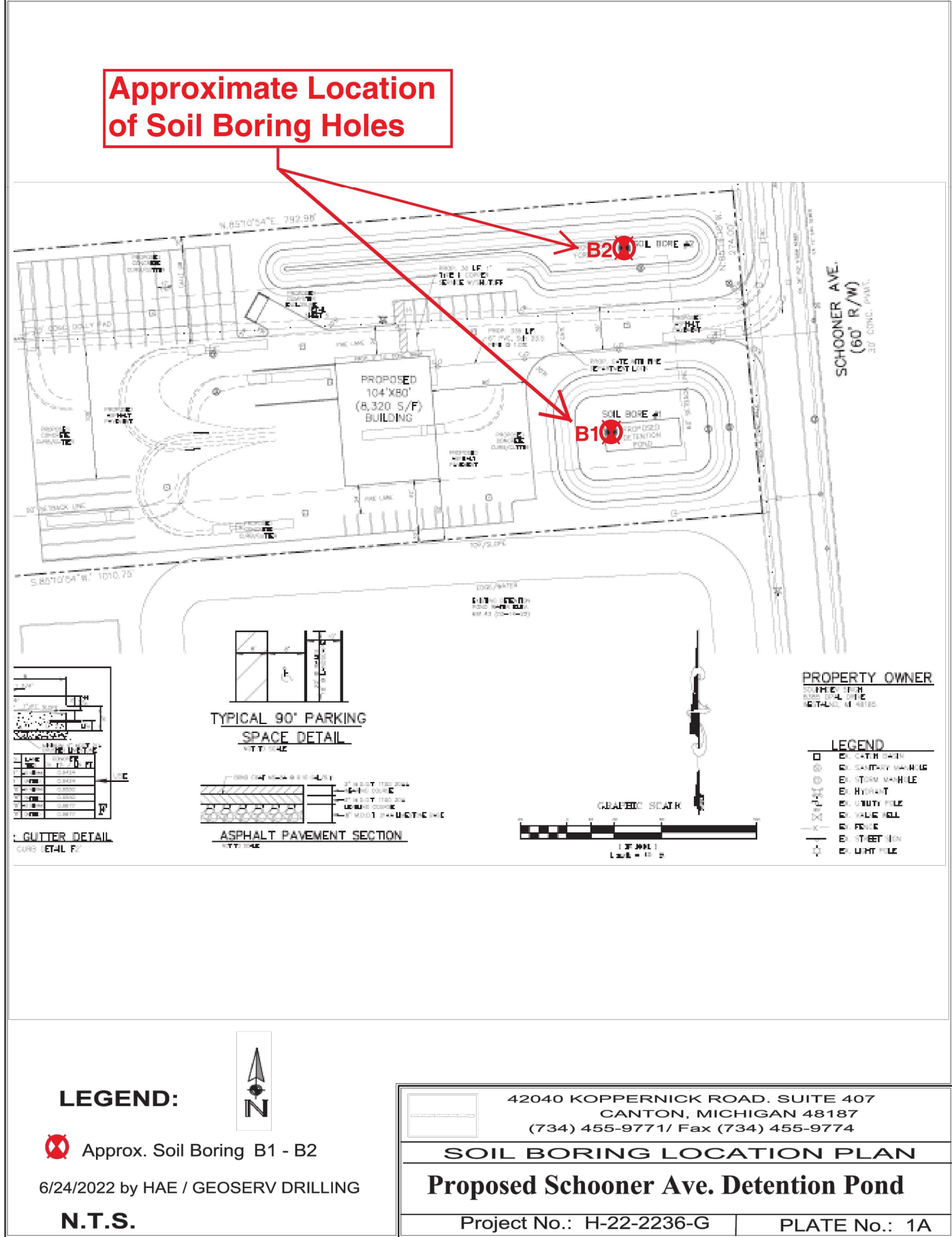
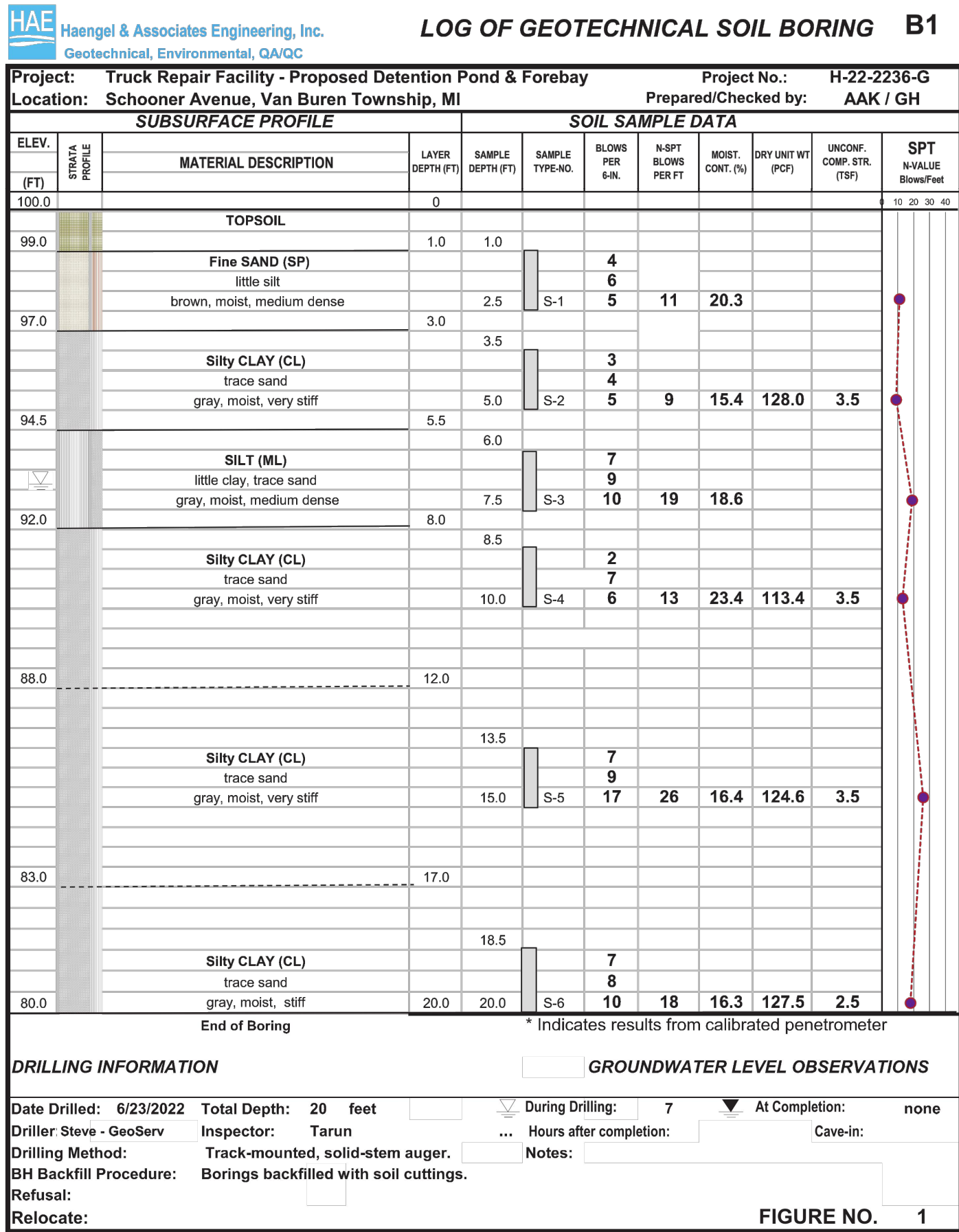
DATE
01-10-22

DRAWING No.
A-

JOB No.
2022-01

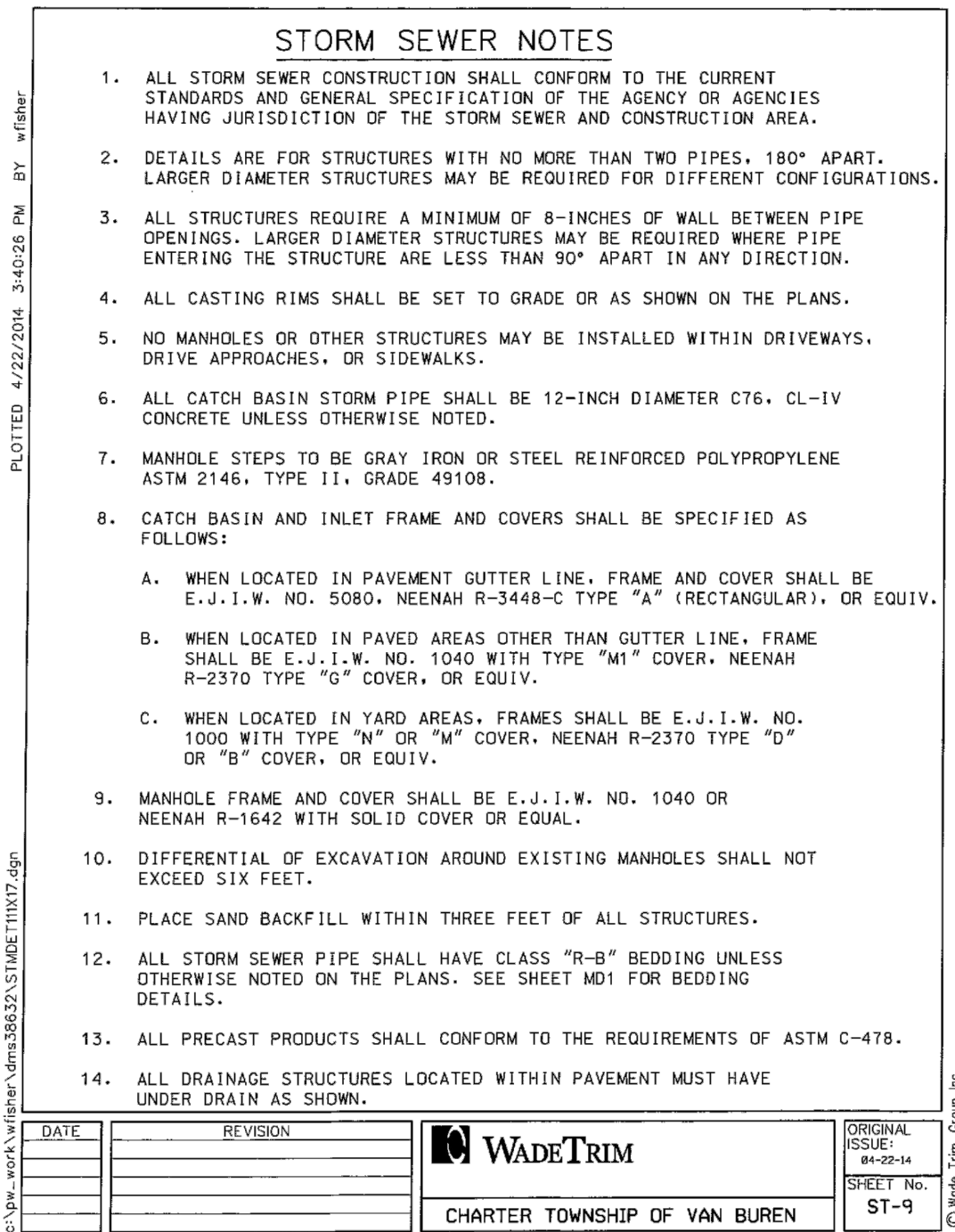
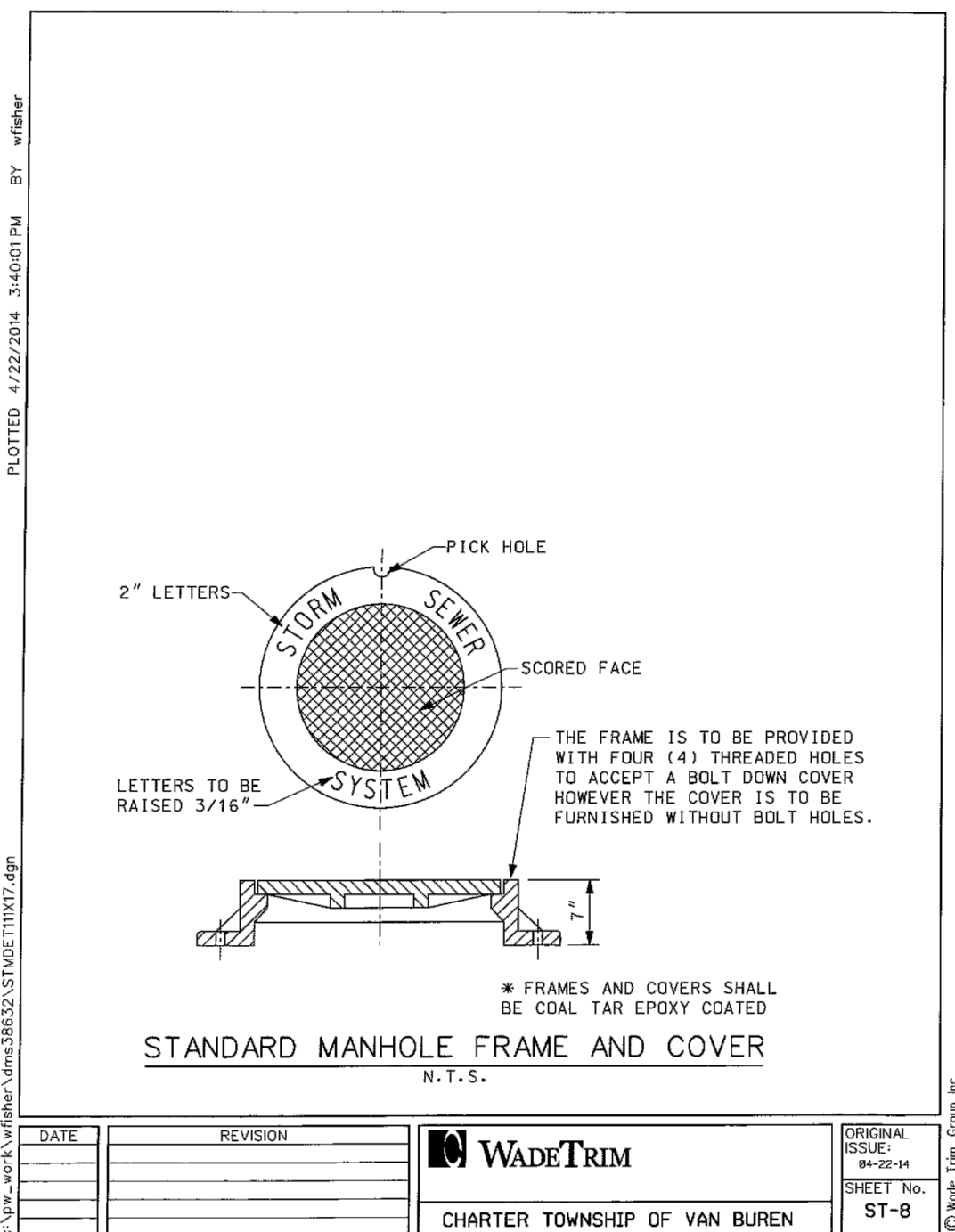
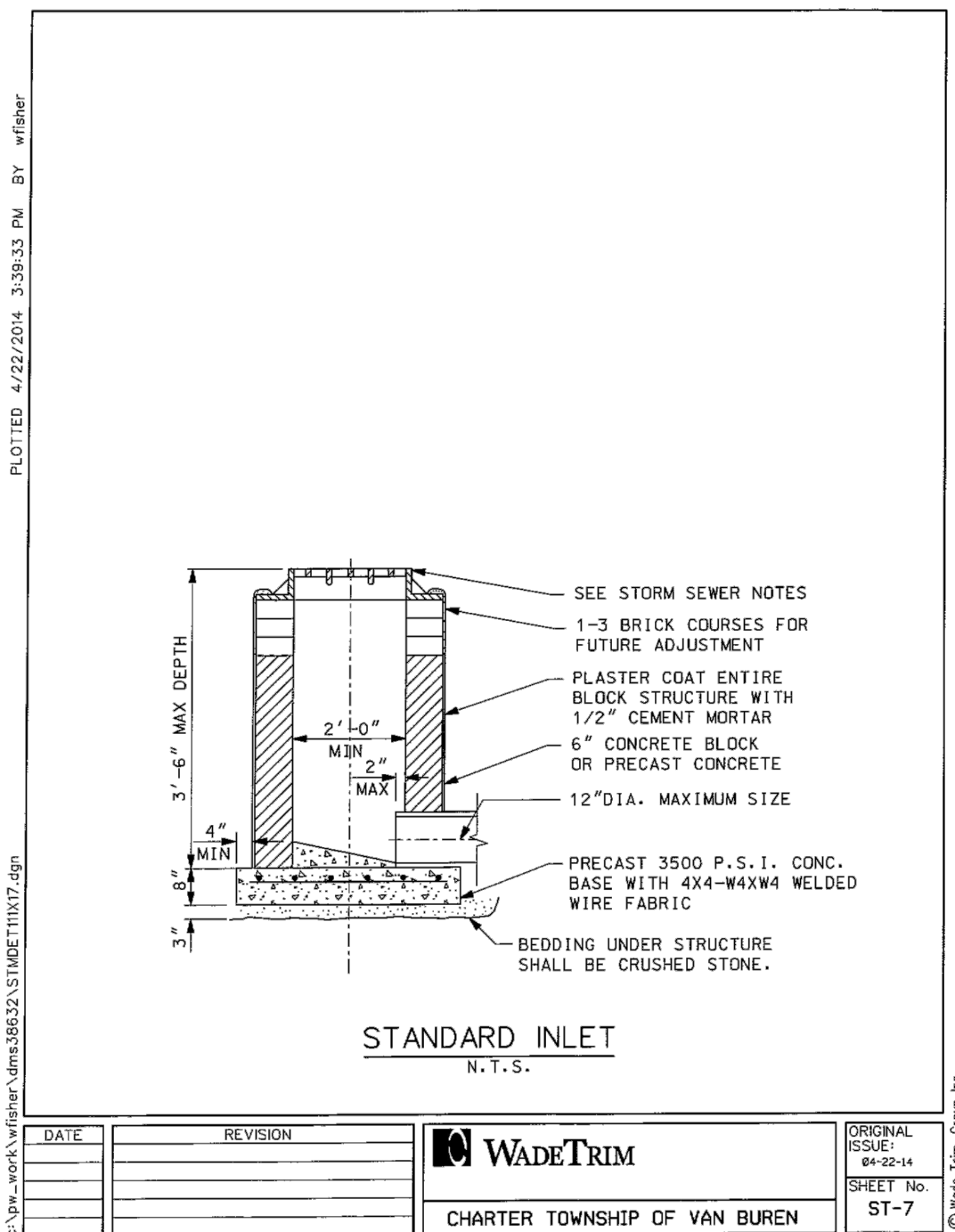
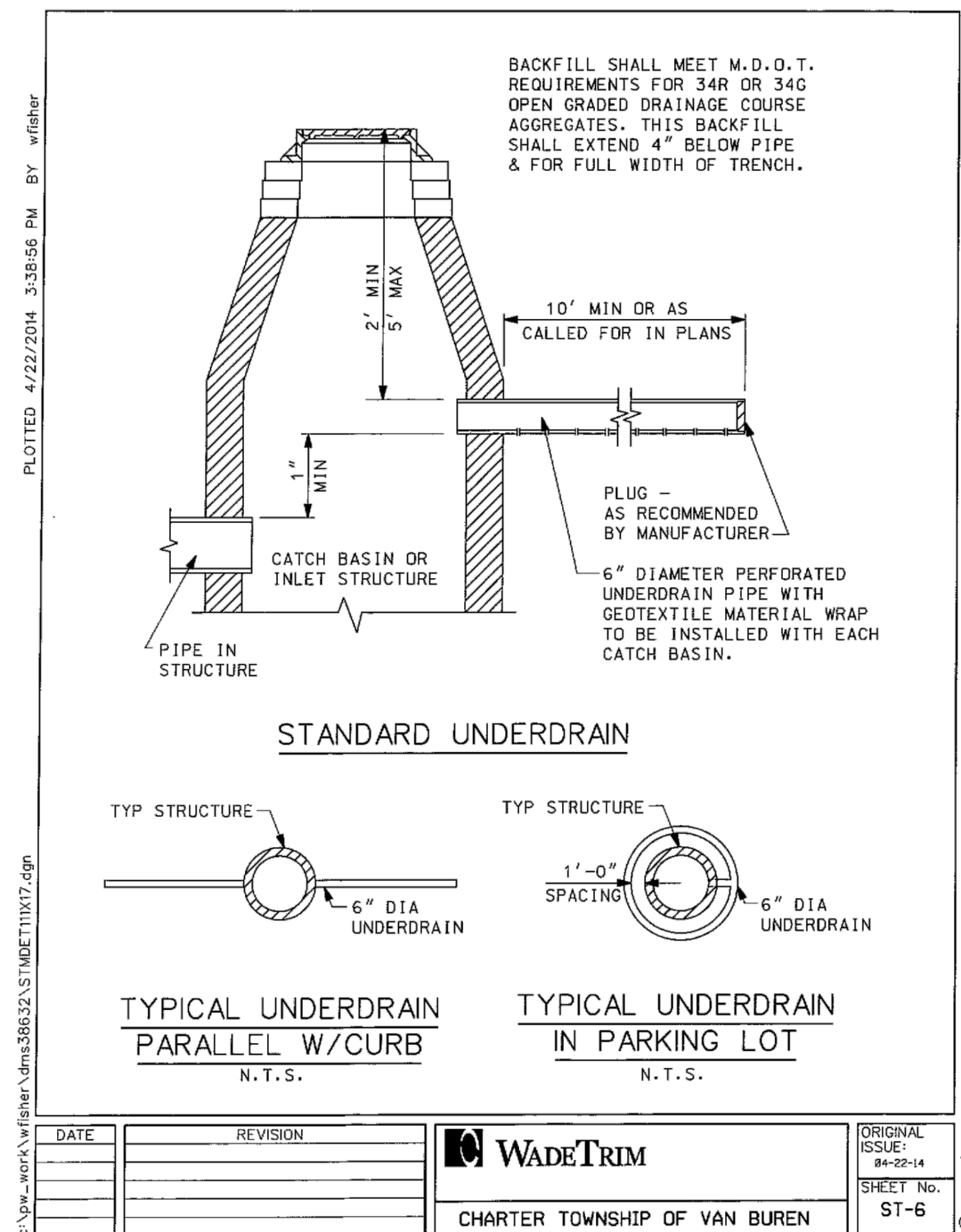
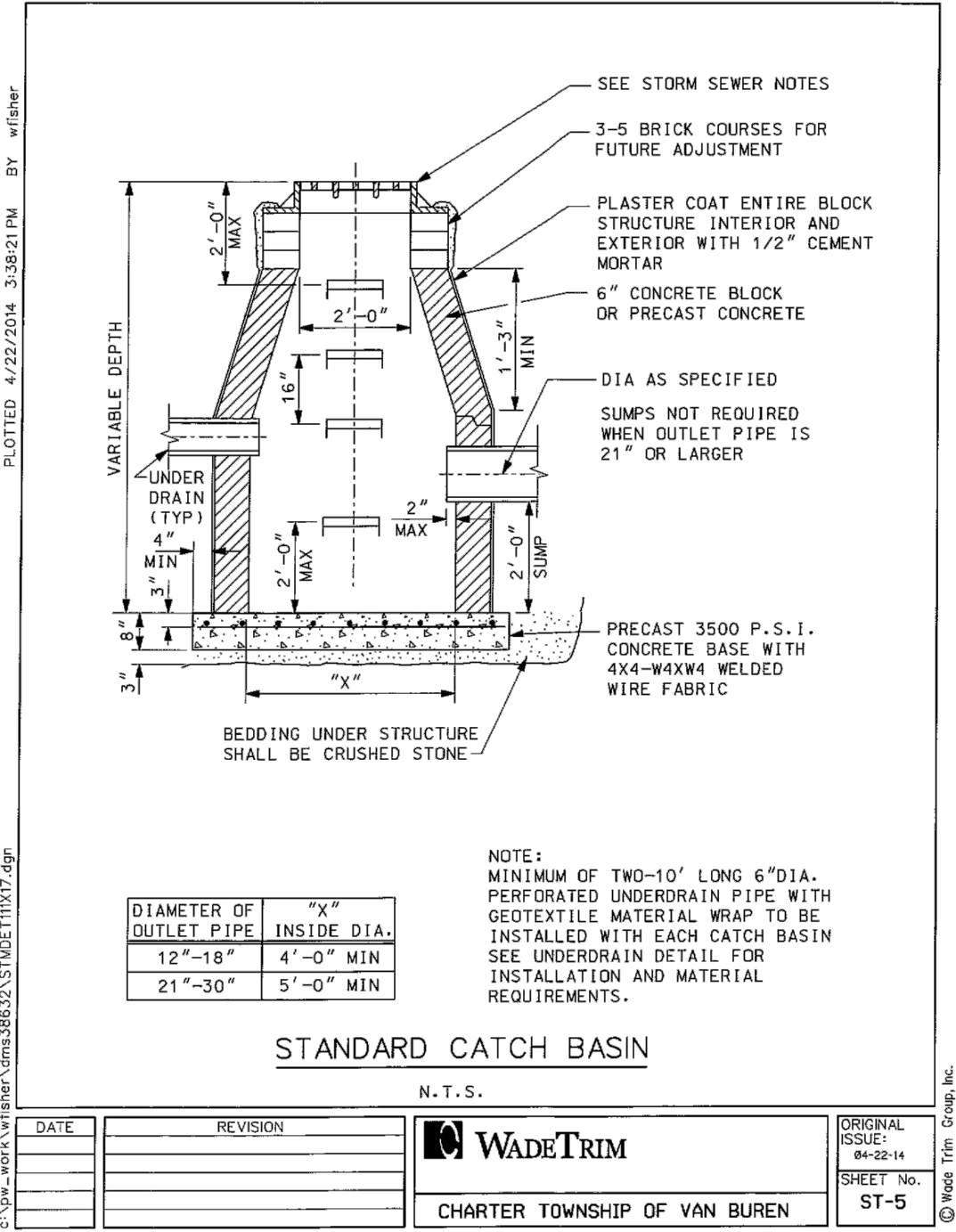
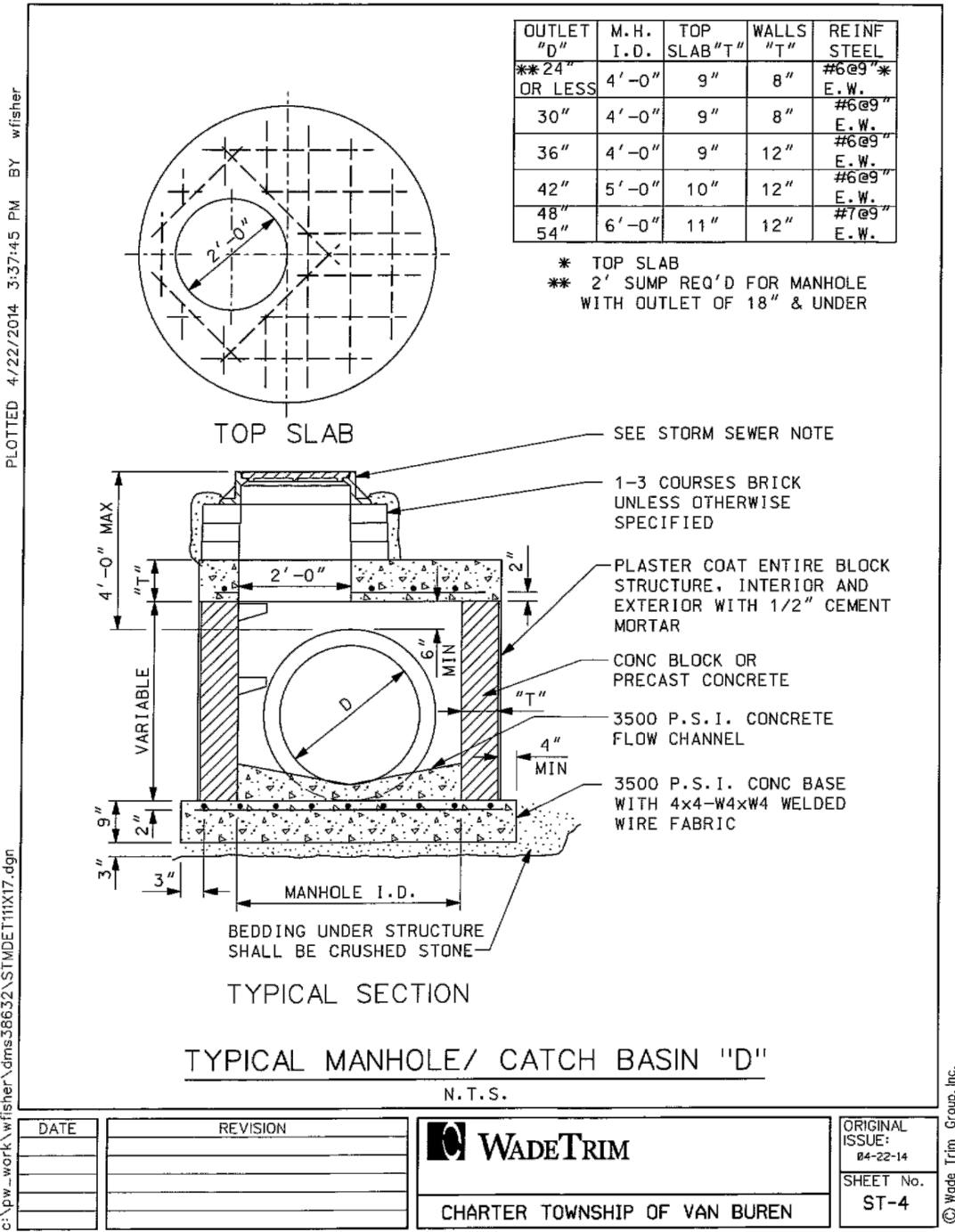
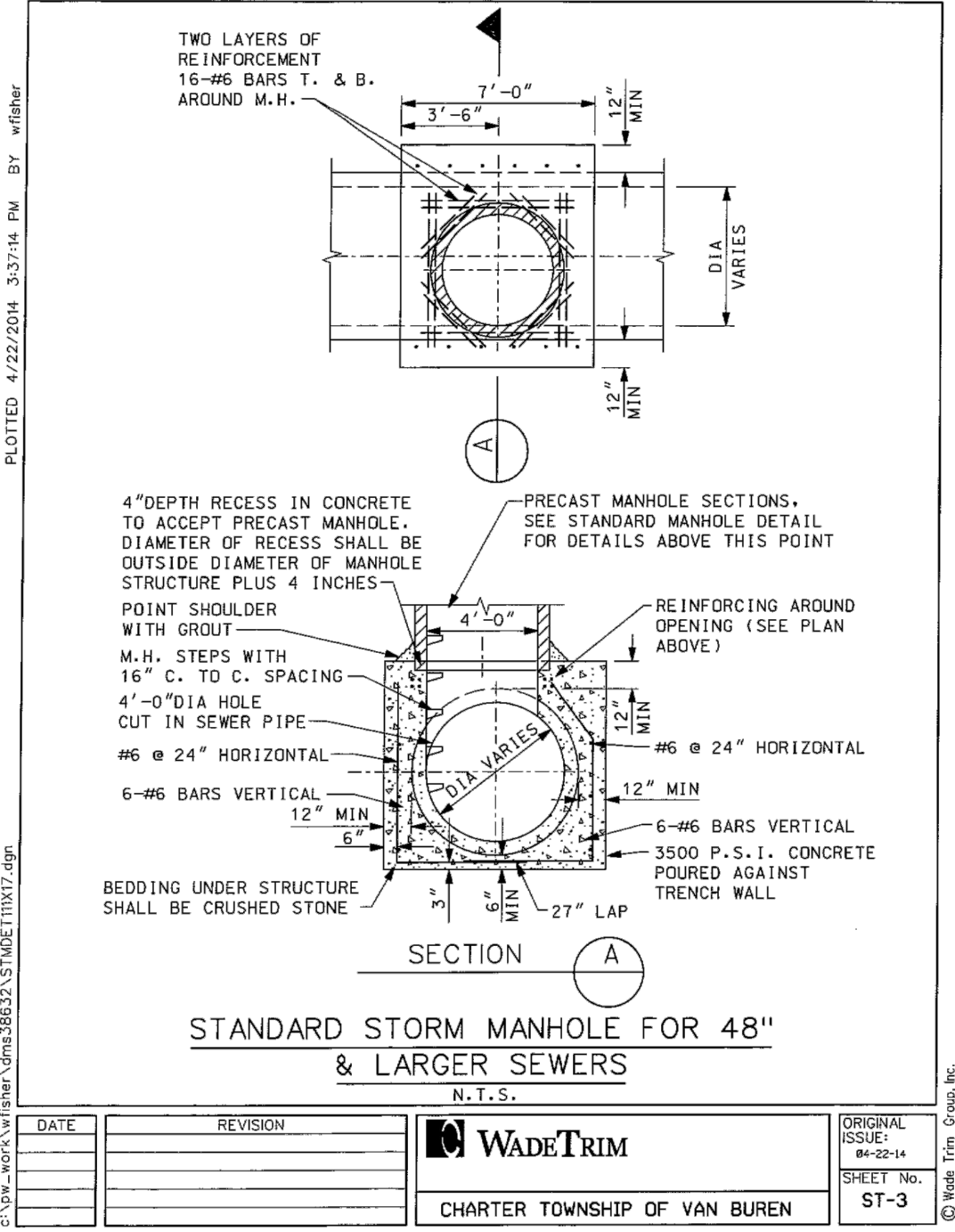
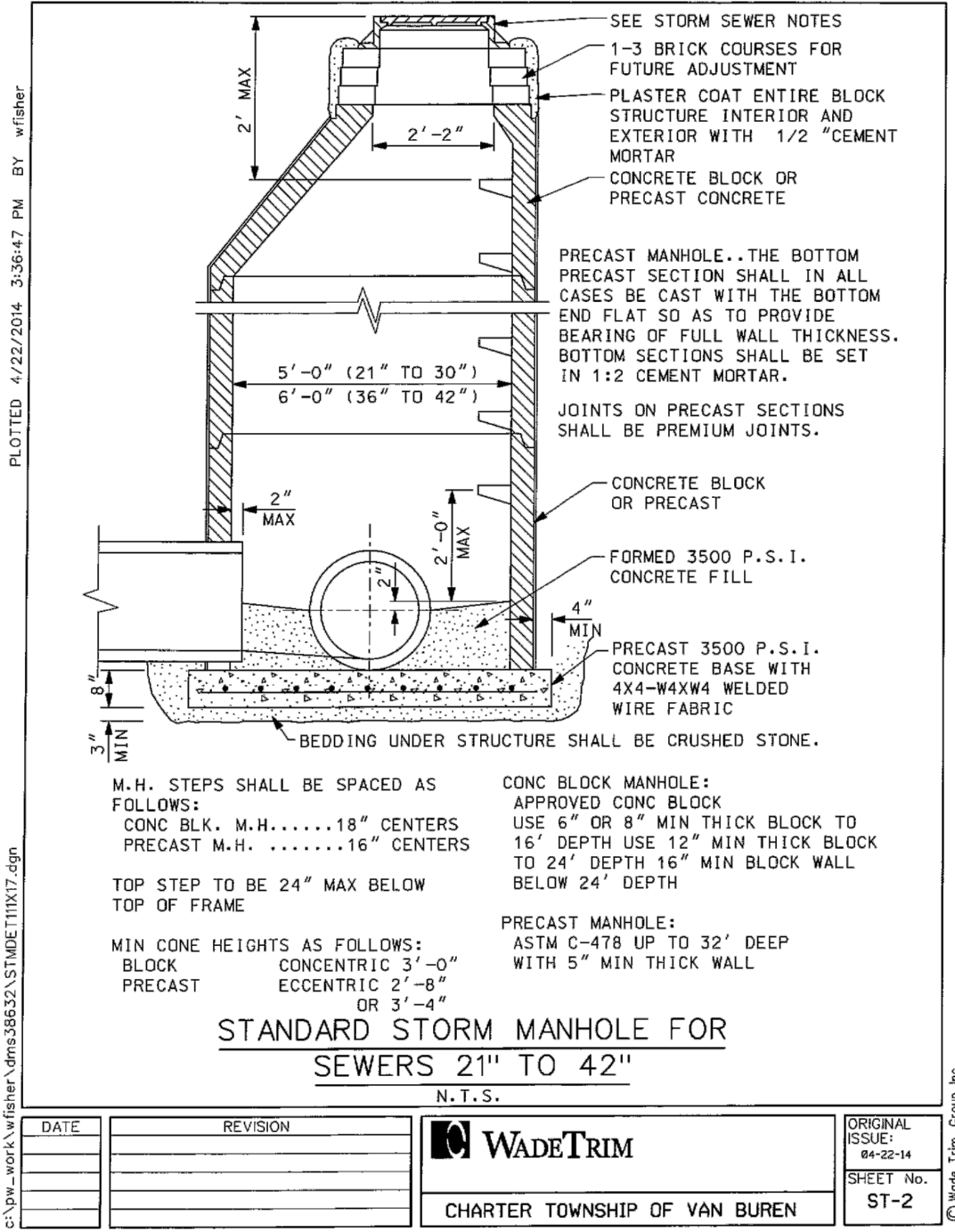
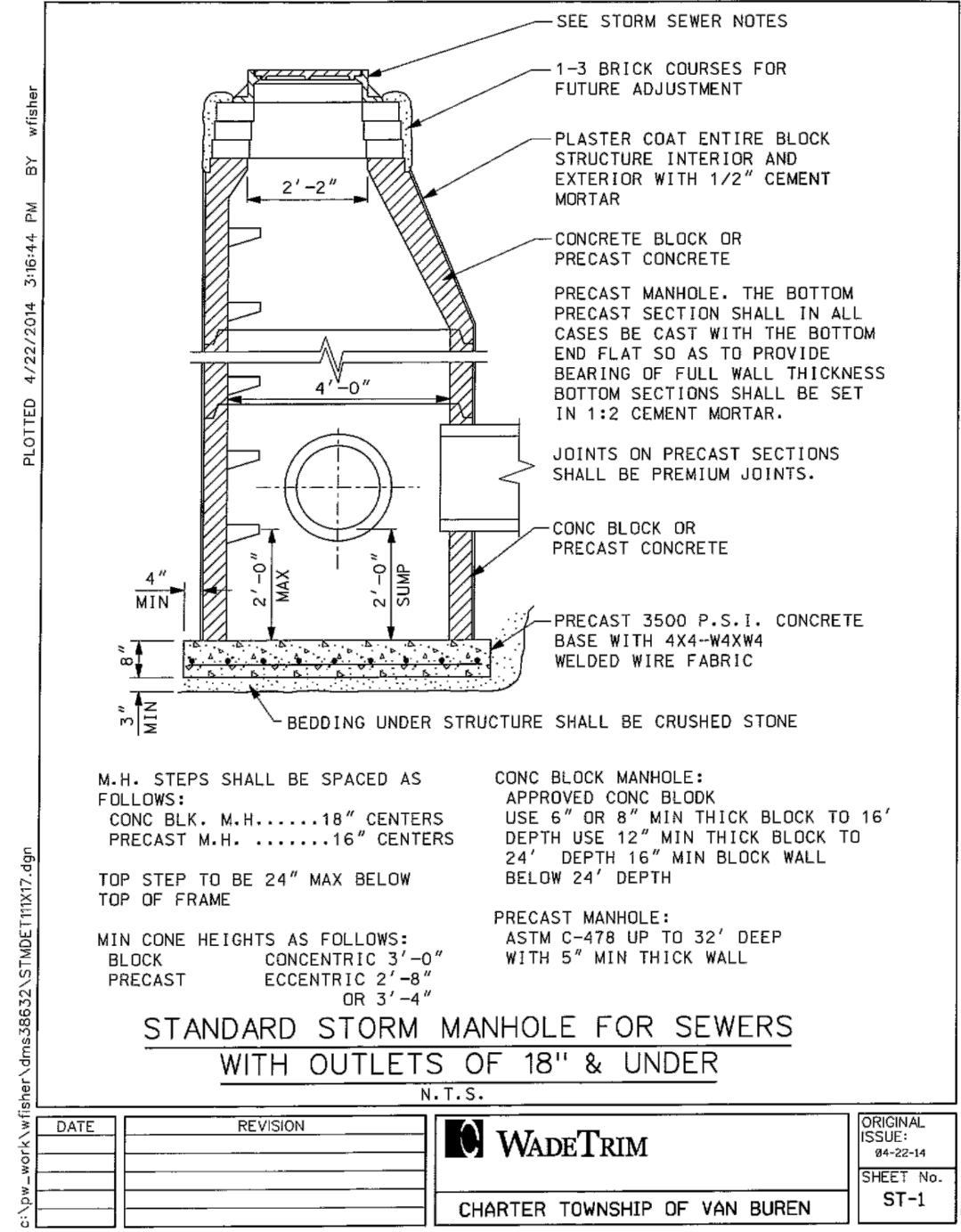
SHEET No.
6 OF 6

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.



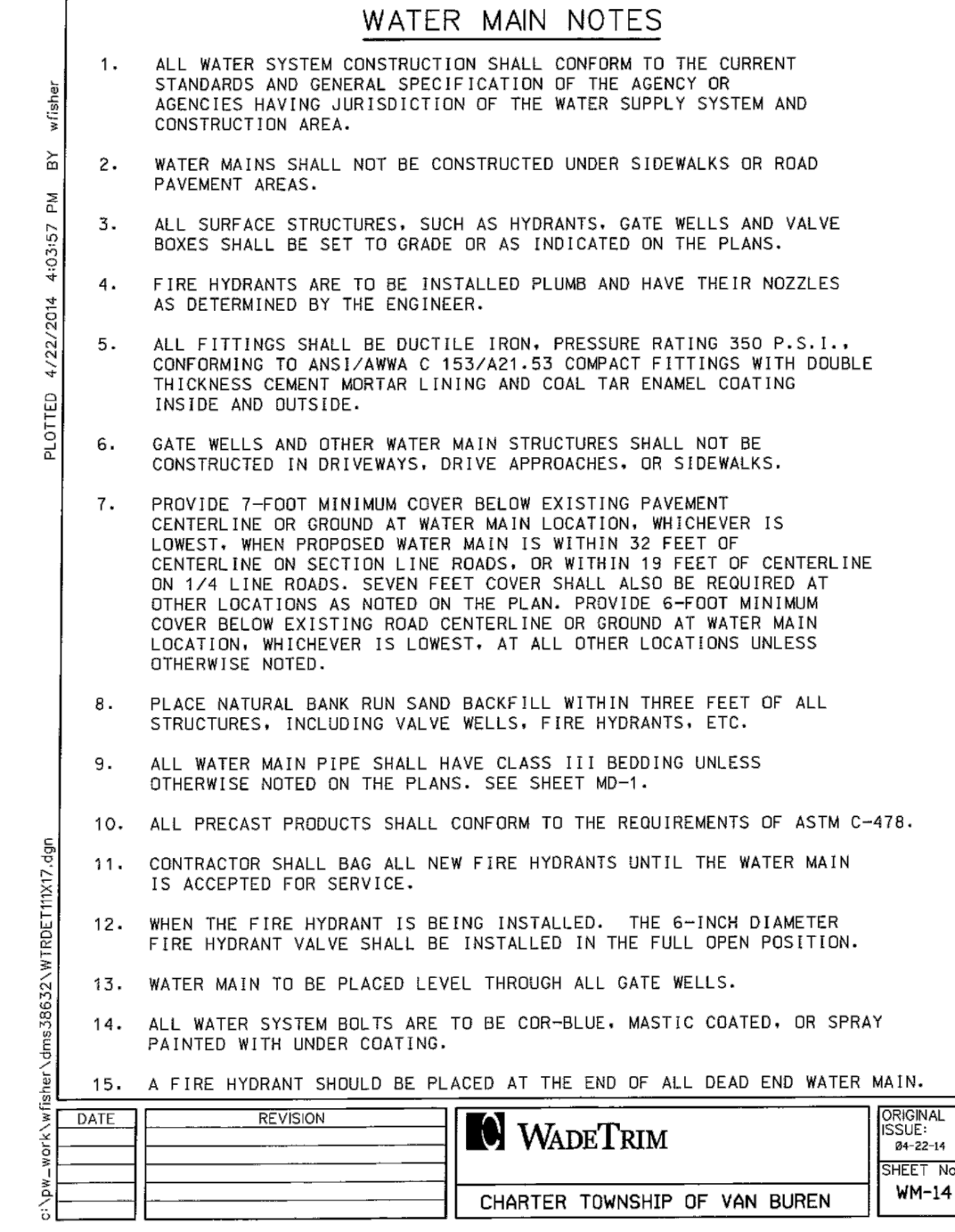
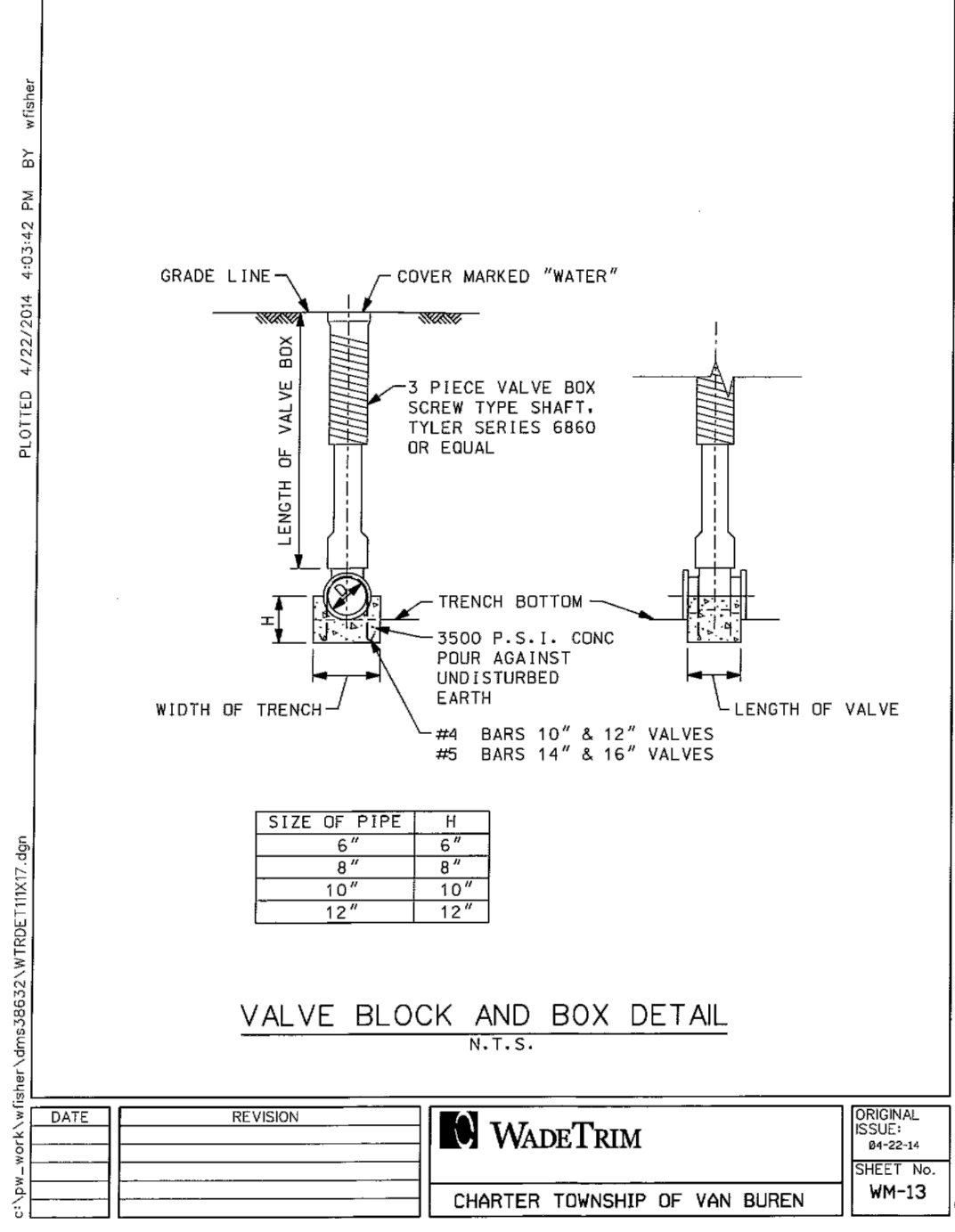
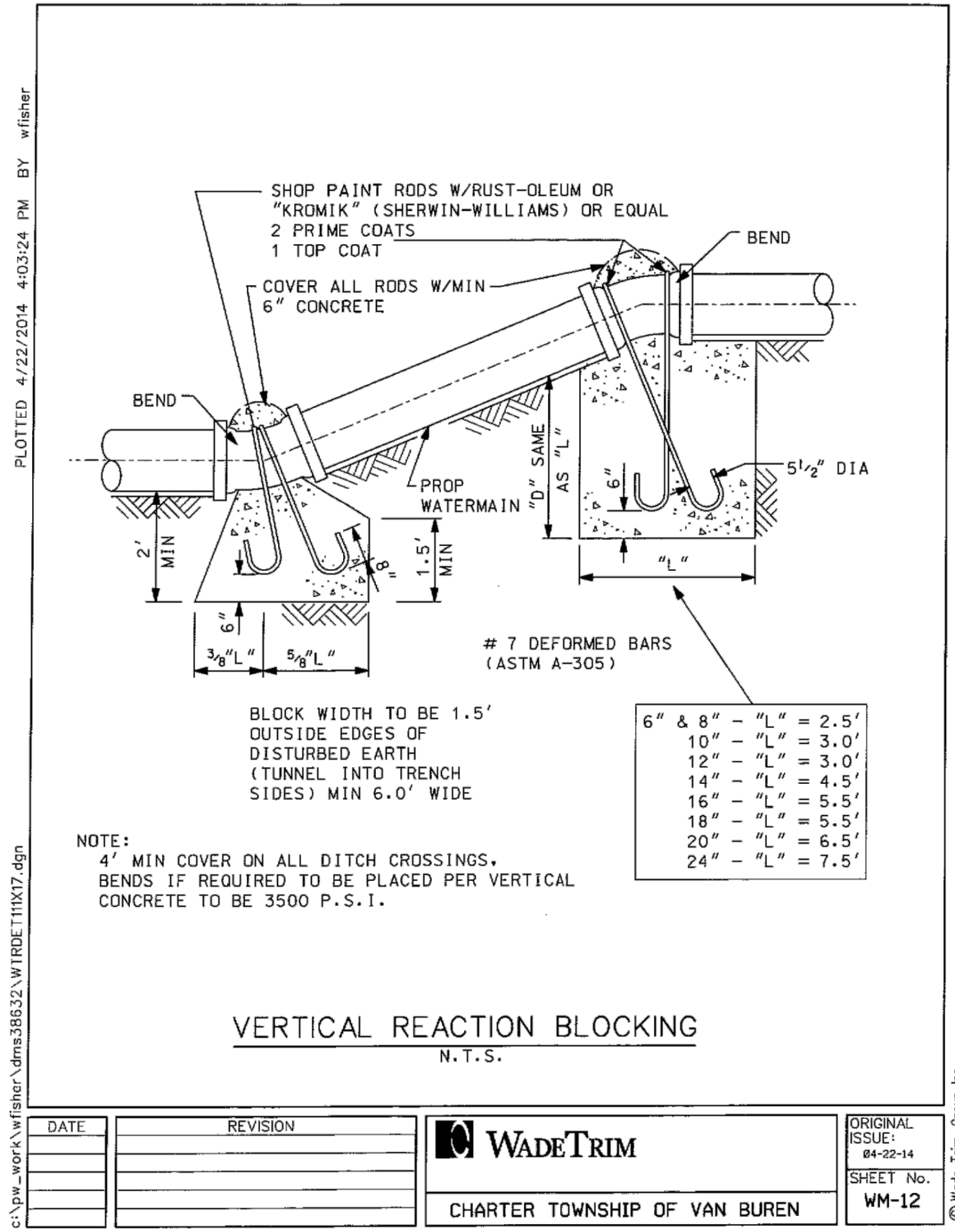
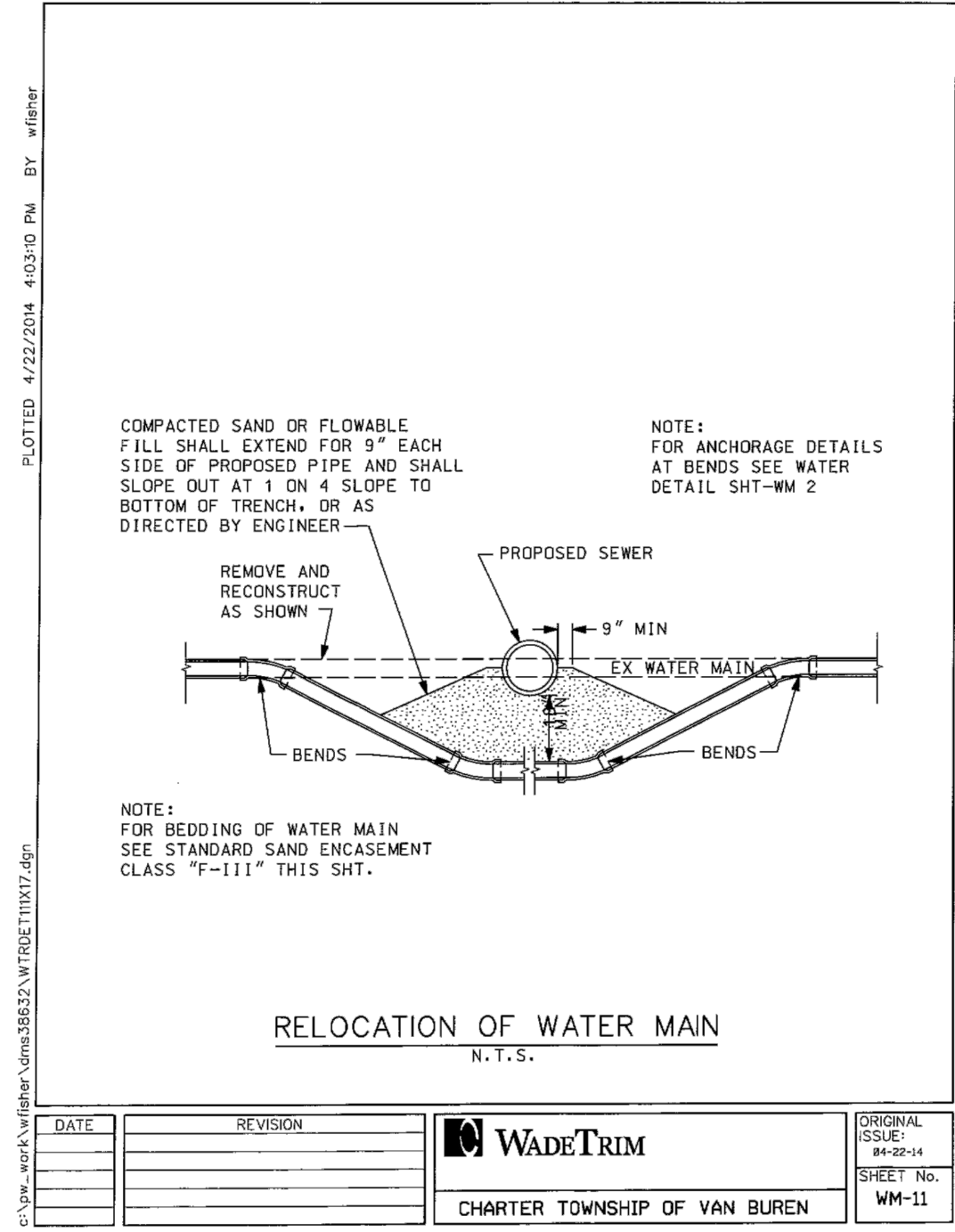
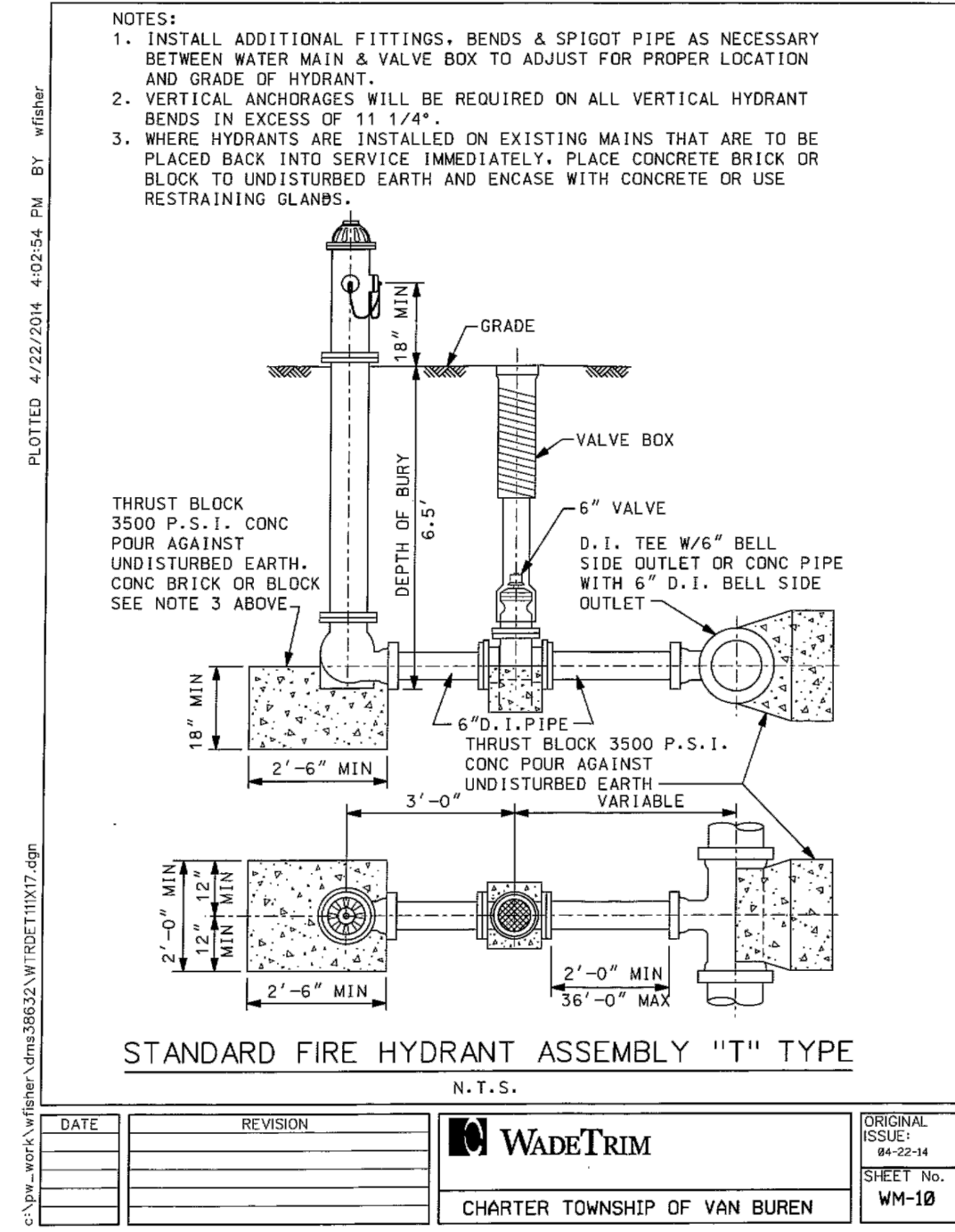
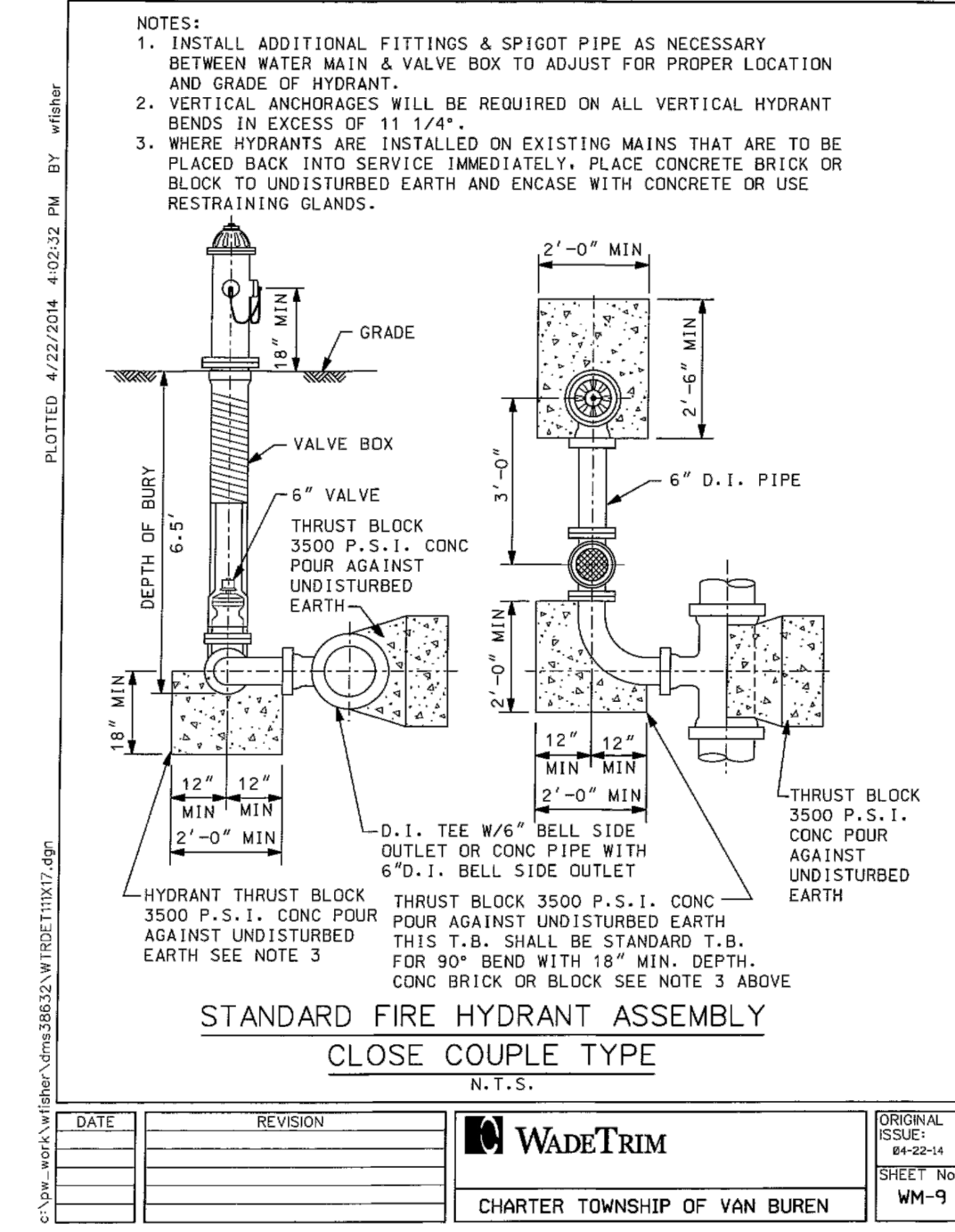
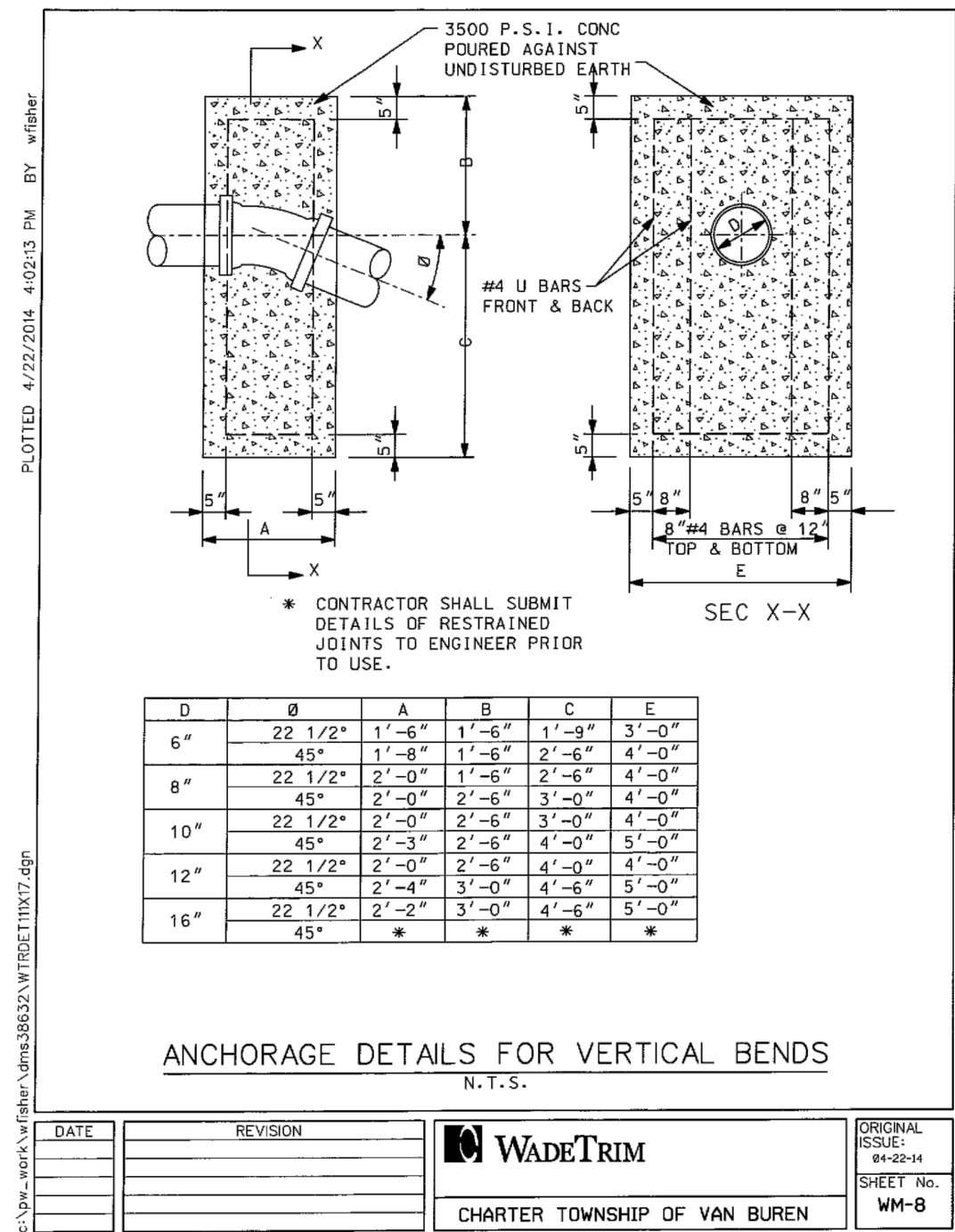
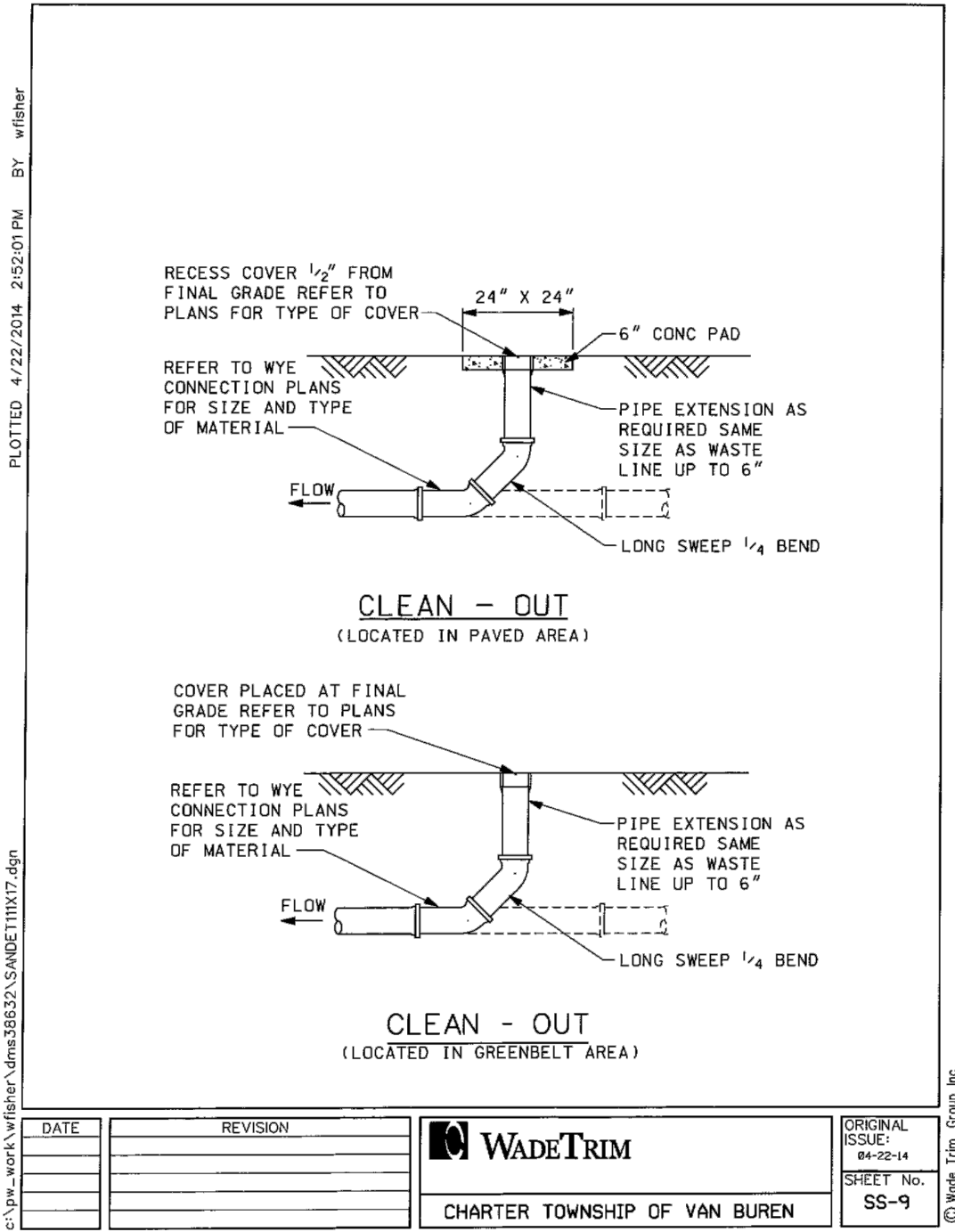
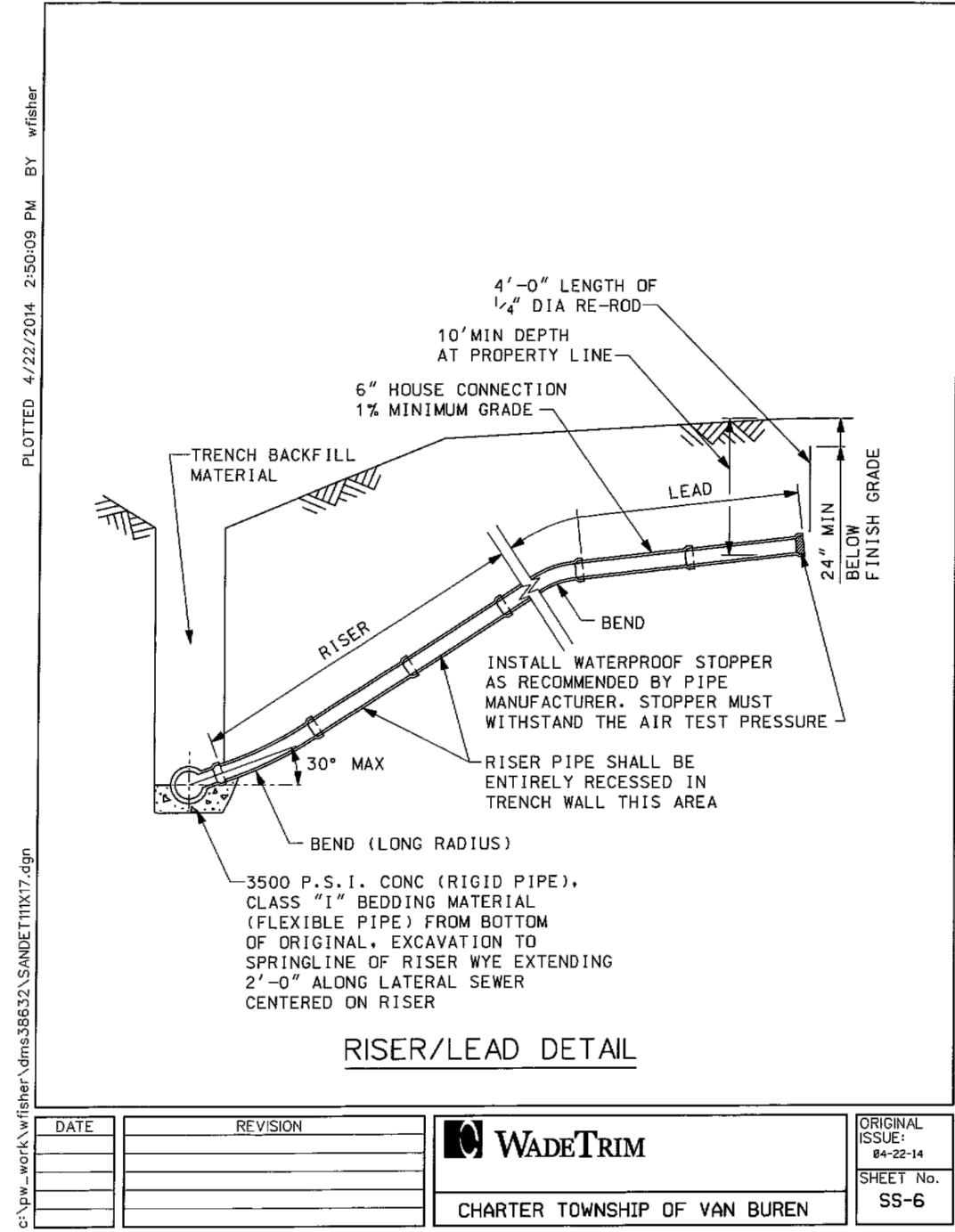
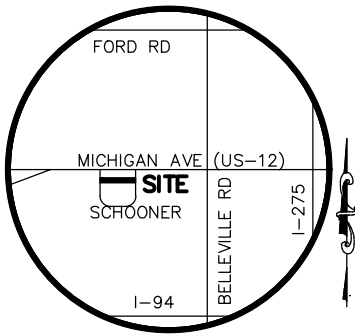


EXHIBIT "A"

PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM



VICINITY MAP

NOT TO SCALE

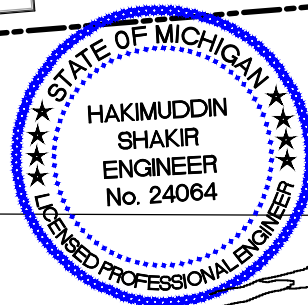
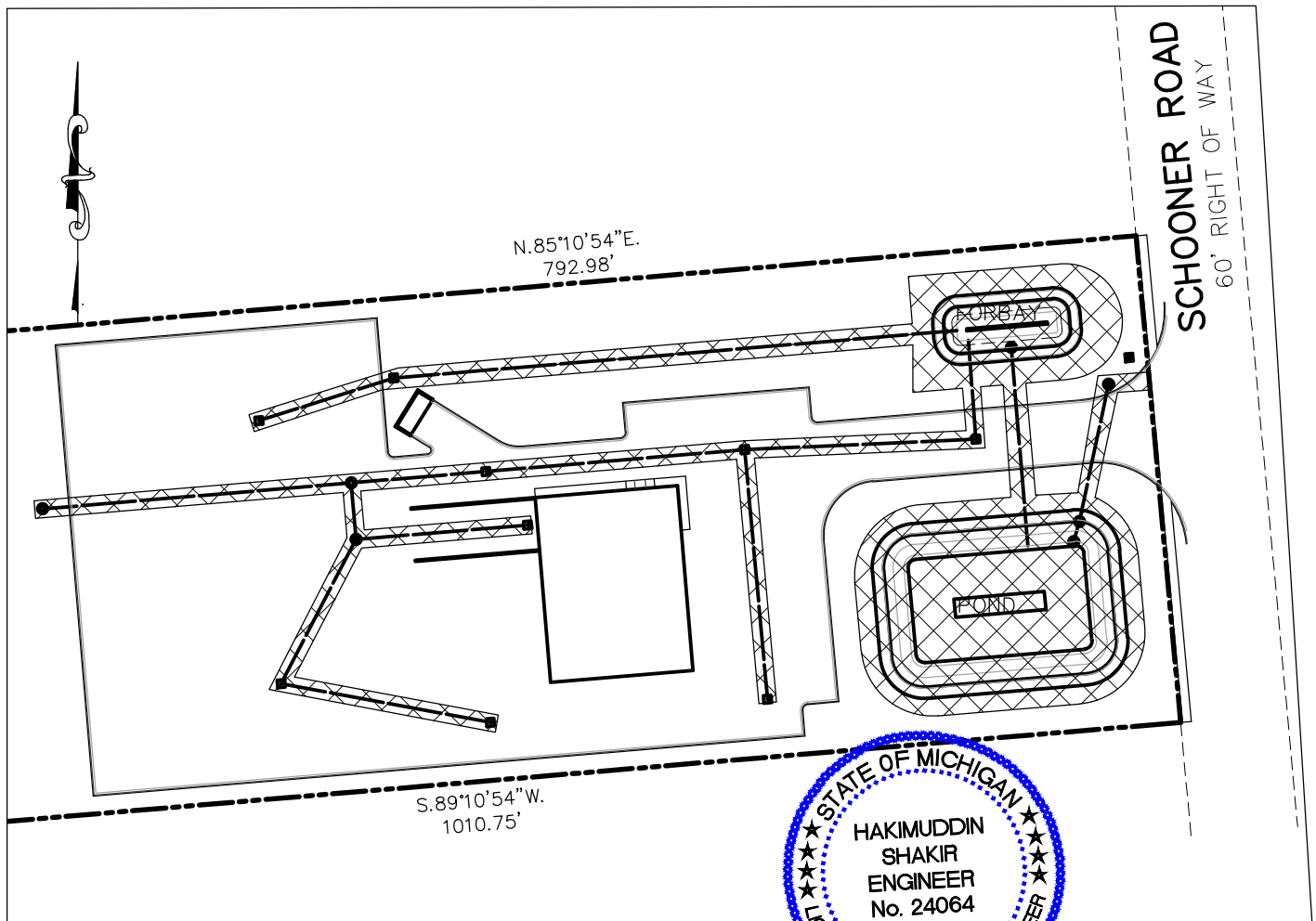


PROPERTY OWNER

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

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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

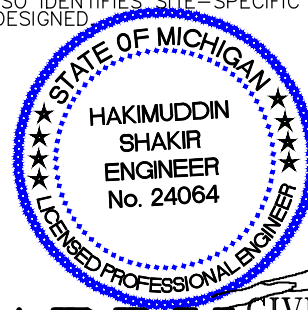
TABLE 1 IDENTIFIES THE MAINTENANCE ACTIVITIES TO BE PERFORMED, ORGANIZED BY CATEGORY (MONITORING/INSPECTION, PREVENTATIVE MAINTENANCE, AND REMEDIAL ACTIONS). WHILE PERFORMING MAINTENANCE, CHEMICALS SHOULD NOT BE APPLIED TO THE FOREBAY, DETENTION BASIN, BUFFER STRIP, OR WATERCOURSES. TABLE 1 ALSO IDENTIFIES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

PROPERTY OWNER

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WESTLAND, MI 48185

ENGINEER

HAKIM SHAKIR
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DATE: 12-08-2022
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SHEET: 1 of 1
SCALE: 1"=100'

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

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4996 MOORE ST.
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Hardy Civil Design Services, LLC

4996 Moore St., Wayne, MI 48184

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

February 02, 2023

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

To: OHM
County review R22-0560

OHM review #43 response letter:

Storm water management:

1. Noted
2. Orifice size has been revised.
3. Storm sewer design chart intensity calculations have been revised.

Kevin Hardy, Civil Design Services