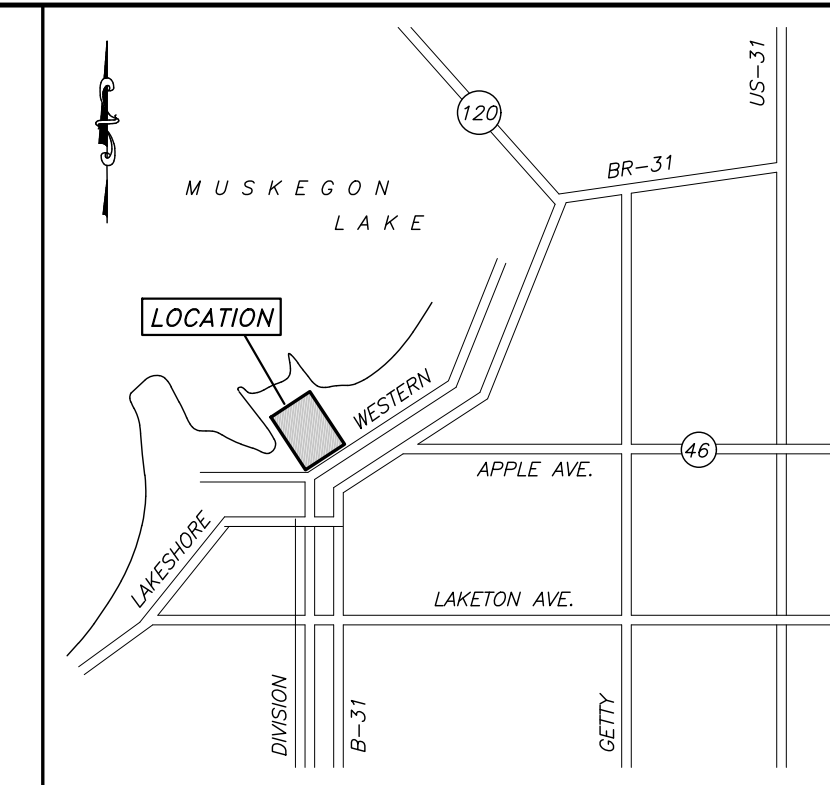
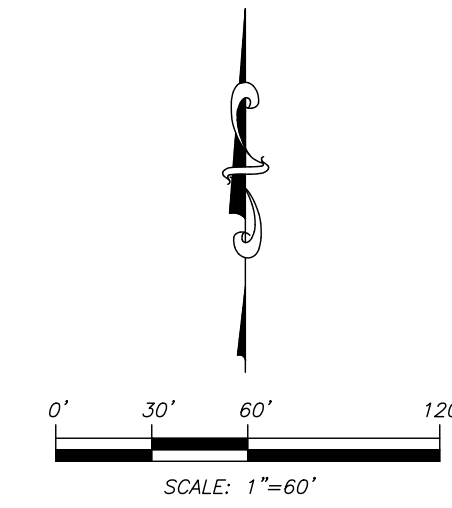


Hartshorn Village

PHASE I

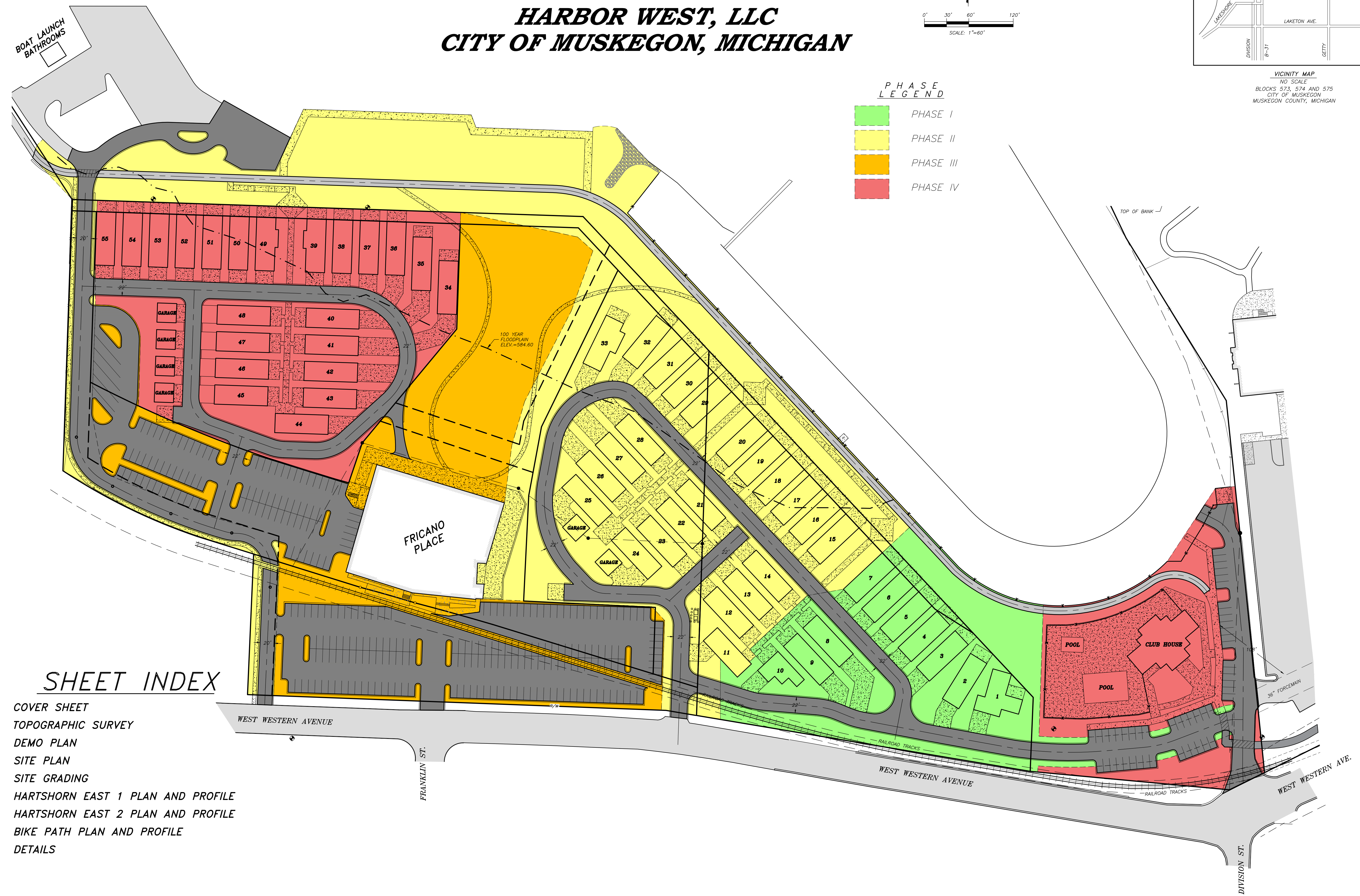
HARBOR WEST, LLC
CITY OF MUSKEGON, MICHIGAN



VICINITY MAP
NO SCALE
BLOCKS 573, 574 AND 575
CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

PHASE LEGEND

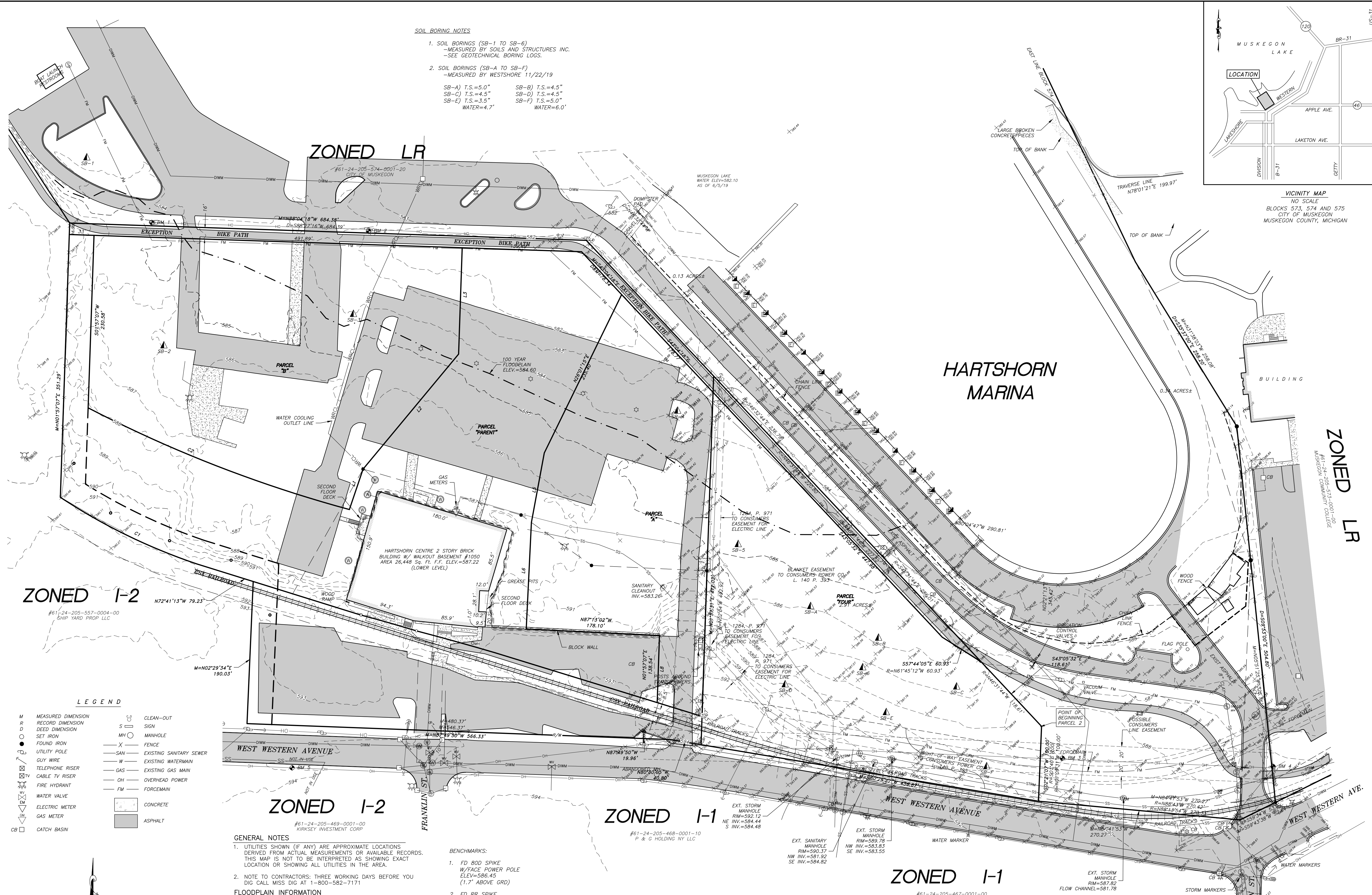
- PHASE I
- PHASE II
- PHASE III
- PHASE IV



SHEET INDEX

1. COVER SHEET
2. TOPOGRAPHIC SURVEY
3. DEMO PLAN
4. SITE PLAN
5. SITE GRADING
6. HARTSHORN EAST 1 PLAN AND PROFILE
7. HARTSHORN EAST 2 PLAN AND PROFILE
8. BIKE PATH PLAN AND PROFILE
9. DETAILS

DATE:	7-19-19	DRAWN BY:	TUB	PHASE 1
CHECKED BY:	TWD	DESIGNED BY:	TUB/WAV	
2534 Black Creek Road Muskegon, MI 49444 Ph: (231) 777-3447 Fax: (231) 773-3453 Service@WestshoreConsulting.com				
WESTSHORE ENGINEERING & SURVEYING ENVIRONMENTAL				
PROJECT NAME:	HARTSHORN VILLAGE PORTION OF BLOCKS 573, 574 AND 575 OF THE REVISED PLAT (OF 1903) CITY OF MUSKEGON MUSKEGON COUNTY, MICHIGAN			
	COVER SHEET			
PROJECT:	04311-0001			
	(REF: 02015-0155, 00023-00334)			
SHEET:	1 OF 8			

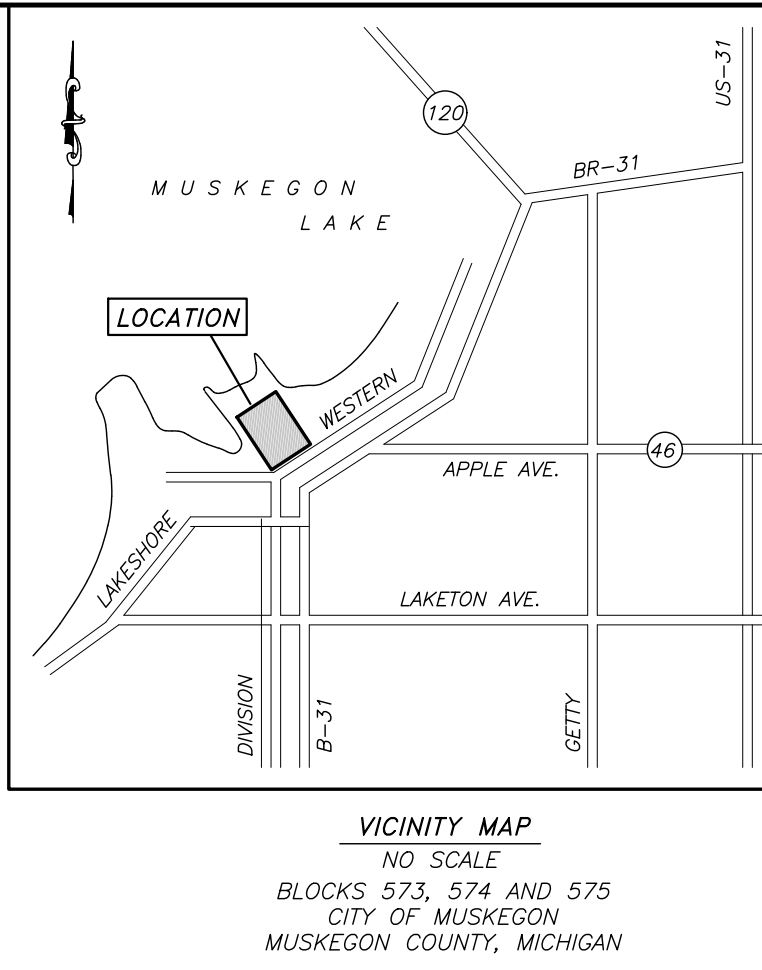


SOIL BORING NOTES

1. SOIL BORINGS (SB-1 TO SB-6)
 -MEASURED BY SOILS AND STRUCTURES INC.
 -SEE GEOTECHNICAL BORING LOGS.

2. SOIL BORINGS (SB-A TO SB-F)
 -MEASURED BY WESTSHORE 11/22/19

SB-A) T.S.=5.0" SB-B) T.S.=4.5"
 SB-C) T.S.=4.5" SB-D) T.S.=4.5"
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 WATER=4.7" WATER=6.0"



DATE:	7-30-18	DESIGNED BY:	TUB
DRAWN BY:	NS5/TUB	CHECKED BY:	TWD
DATE:	11/12/19	ENGINEER UTILITY REVISIONS:	T.B
DATE:	11/12/19	BY:	CHK'D
DATE:		NO.	
DATE:		DATE:	

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DATE:		DATE:	

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 ENGINEERING & SURVEYING
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HARTSHORN VILLAGE
 PORTION OF BLOCKS 573, 574 AND 575
 OF THE REVISED PLAN
 (OF 1903) CITY OF MUSKEGON
 MUSKEGON COUNTY, MICHIGAN

TOPOGRAPHIC SURVEY

PROJECT: 04311-0001
 (REF: 02015-0155, 00023-0033H)
 SHEET: 2 OF 9

LEGEND

M	MEASURED DIMENSION	CS	CLEAN-OUT
R	RECORD DIMENSION	S	SIGN
D	DEED DIMENSION	MH	MANHOLE
O	SET IRON	X	FENCE
●	FOUND IRON	—SAN	EXISTING SANITARY SEWER
○	UTILITY POLE	—W	EXISTING WATERMAIN
○	GUY WIRE	—GAS	EXISTING GAS MAIN
○	TELEPHONE RISER	—OH	OVERHEAD POWER
○	CABLE TV RISER	—FM	FORCEMAIN
○	FIRE HYDRANT	■	CONCRETE
○	WATER VALVE	■	ASPHALT
○	ELECTRIC METER		
○	GAS METER		
○	CATCH BASIN		

GENERAL NOTES

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2. NOTE TO CONTRACTORS: THREE WORKING DAYS BEFORE YOU DIG CALL MISS DIG AT 1-800-582-7171

FLOODPLAIN INFORMATION

SUBJECT LIES WITHIN FLOOD ZONE AREAS "A" (AREAS OF 100 YEAR FLOOD), "B" (AREAS BETWEEN LIMITS OF 100 YEAR FLOOD ZONE AND 500 YEAR FLOOD ZONE) AND "C" (AREAS OF OUTSIDE 500-YEAR FLOOD) COMMUNITY NUMBER 1601618 PANEL H&I-03 PAGE 2 OF 2 CITY OF MUSKEGON DATED JUNE 1, 1977

UTILITY INFORMATION

CITY OF MUSKEGON
 SANITARY SEWER, STORM SEWER AND WATER 231-724-4100

COMCAST—CABLE 888-266-2278

VERIZON—TELEPHONE 800-483-5600

CONSUMERS ENERGY 800-477-5050

MICH—CON 800-477-5000

BENCHMARKS:

1. FD 800 SPIKE W/FACE POWER POLE ELEV=586.45 (1.7' ABOVE GRD)

2. FD RR SPIKE S/FACE UTILITY POLE ELEV=583.95 (2' ABOVE GRD)

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5. SET BM SPINDLE N/FACE POWER POLE ELEV=594.25

EXISTING LAND SUMMARY

PARCEL	"PARENT"	"YOUR"	"A"	"B"	"BIKE PATH"	TOTAL
TOTAL ACRES	5.7458	2.9144	2.1501	3.1740	0.5018	14.4861
BUILDING	0.6072 (10.6%)	—	—	—	0.3316 (66.1%)	0.9388 (6.50%)
ASPHALT	2.2649 (39.4%)	—	0.8969 (41.7%)	0.9973 (31.4%)	—	4.1591 (28.6%)
CONCRETE	0.1489 (2.60%)	—	—	0.1574 (5.00%)	—	0.3063 (2.20%)
GREEN SPACE	2.7248 (47.4%)	2.9144 (100%)	1.2532 (58.3%)	2.0193 (63.6%)	0.1702 (33.9%)	9.0819 (62.7%)

EASEMENTS:

27' INGRESS AND EGRESS EASEMENT LIBER 1145, PAGE 117

31' 20' PERMANENT EASEMENT 2013, P. 62

31' 30' CONSTRUCTION EASEMENT L. 2013, P. 62

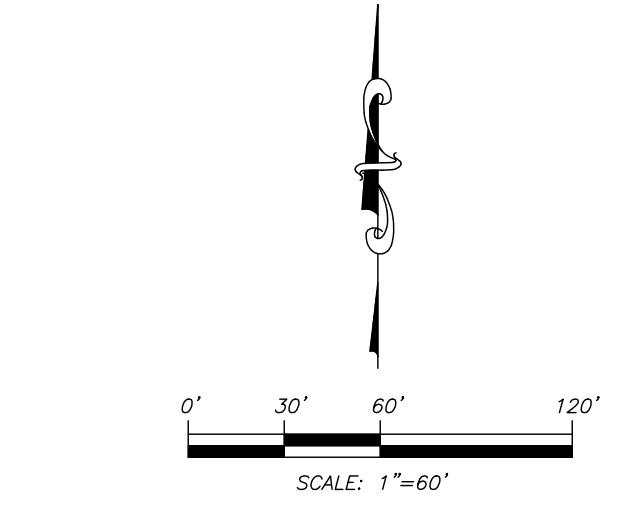
CURVE CHART

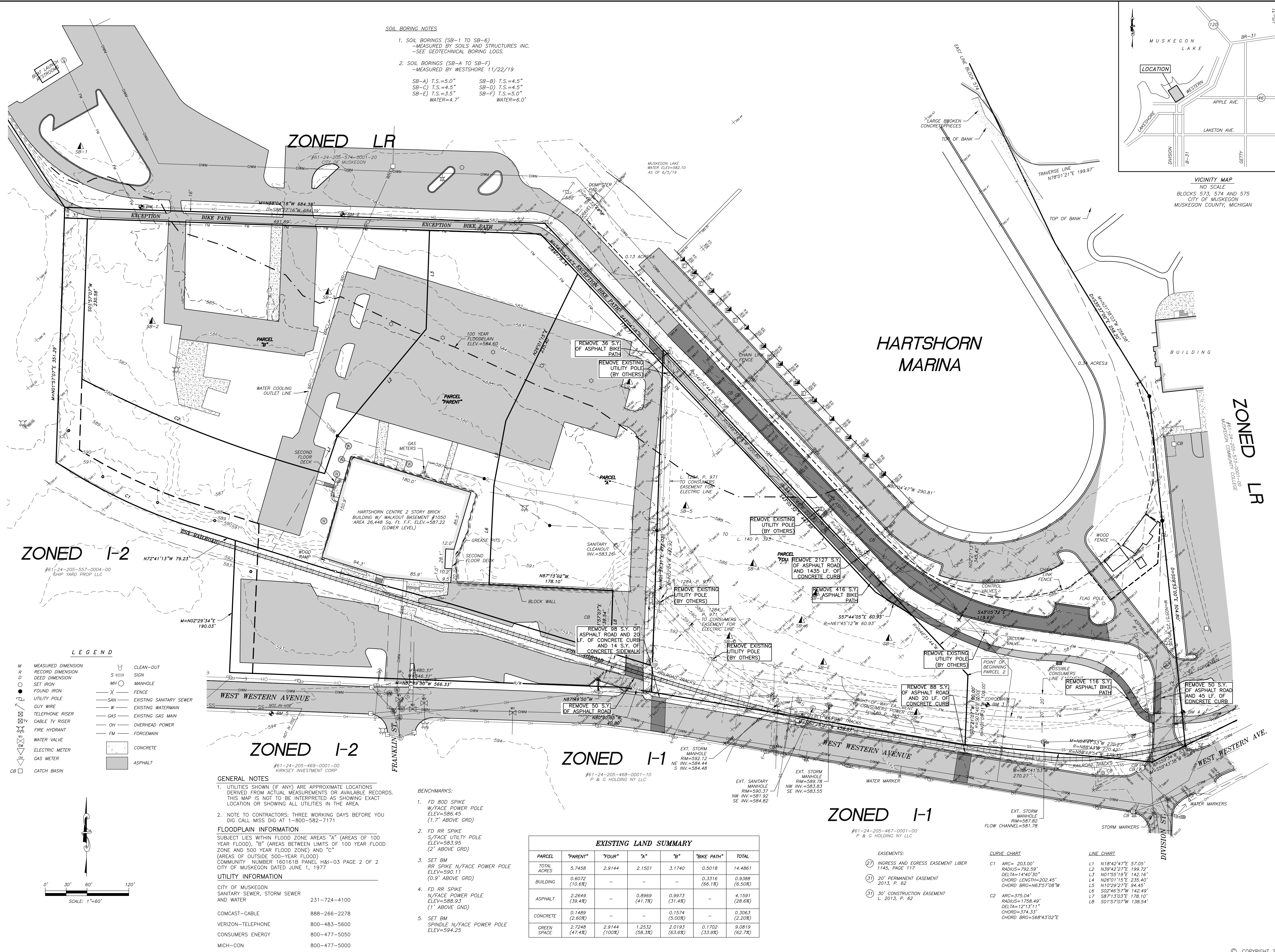
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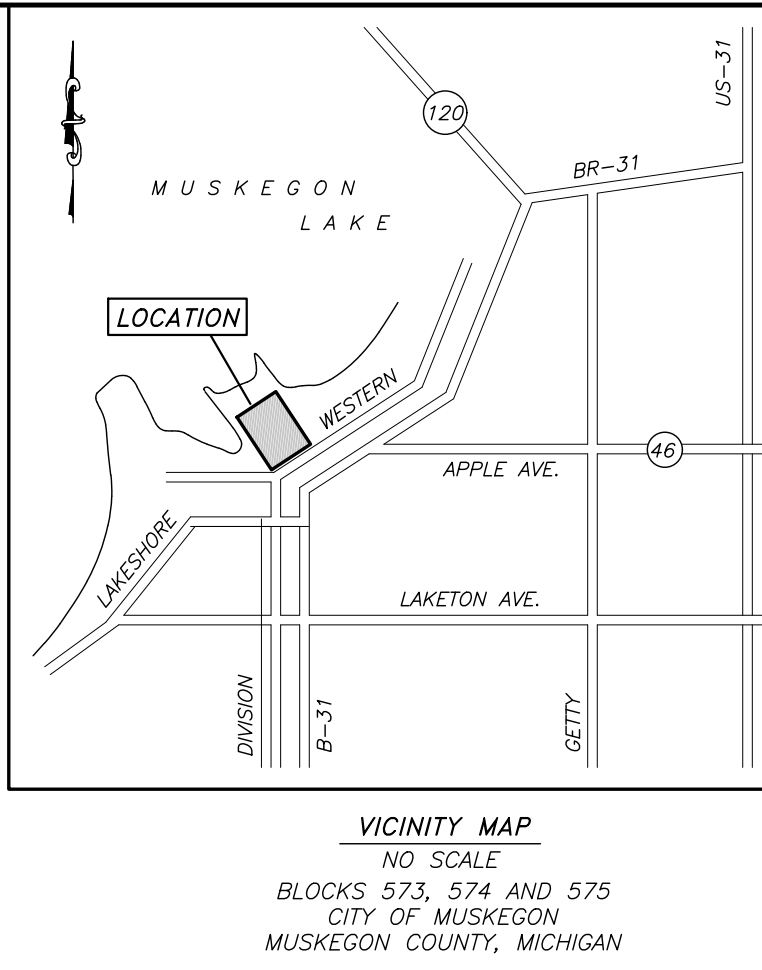


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DRAWN BY:	ANS/TUB	CHECKED BY:	TUB
DATE:	11/12/19	ENGINEER UTILITY REVISIONS:	TUB
NO.	1	DATE	11/12/19
BY	CHW	DATE	11/12/19

2534 Black Creek Road
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 Service@WestshoreConsulting.com

WESTSHORE
 ENGINEERING & SURVEYING
 ENVIRONMENTAL



HARTSHORN VILLAGE
 PORTION OF BLOCKS 573, 574 AND 575
 OF THE REVISED PLAN
 (OF 1903) CITY OF MUSKEGON
 MUSKEGON COUNTY, MICHIGAN

PROJECT NAME:
DEMO PLAN

PROJECT:
04311-0001
 (REF: 02015-0155,
 00023-00334)

SHEET:
3 OF 9

LEGEND

M	MEASURED DIMENSION	CS	CLEAN-OUT
R	RECORD DIMENSION	S	SIGN
D	DEED DIMENSION	MH	MANHOLE
O	SET IRON	X	FENCE
●	FOUND IRON	SAN	EXISTING SANITARY SEWER
○	UTILITY POLE	W	EXISTING WATERMAIN
○	GUY WIRE	GAS	EXISTING GAS MAIN
○	TELEPHONE RISER	OH	OVERHEAD POWER
○	CABLE TV RISER	FM	FORCEMAIN
○	FIRE HYDRANT	CONCRETE	CONCRETE
○	WATER VALVE	ASPHALT	ASPHALT
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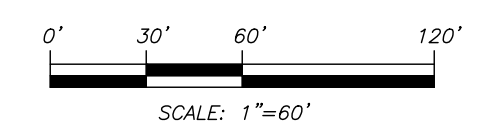
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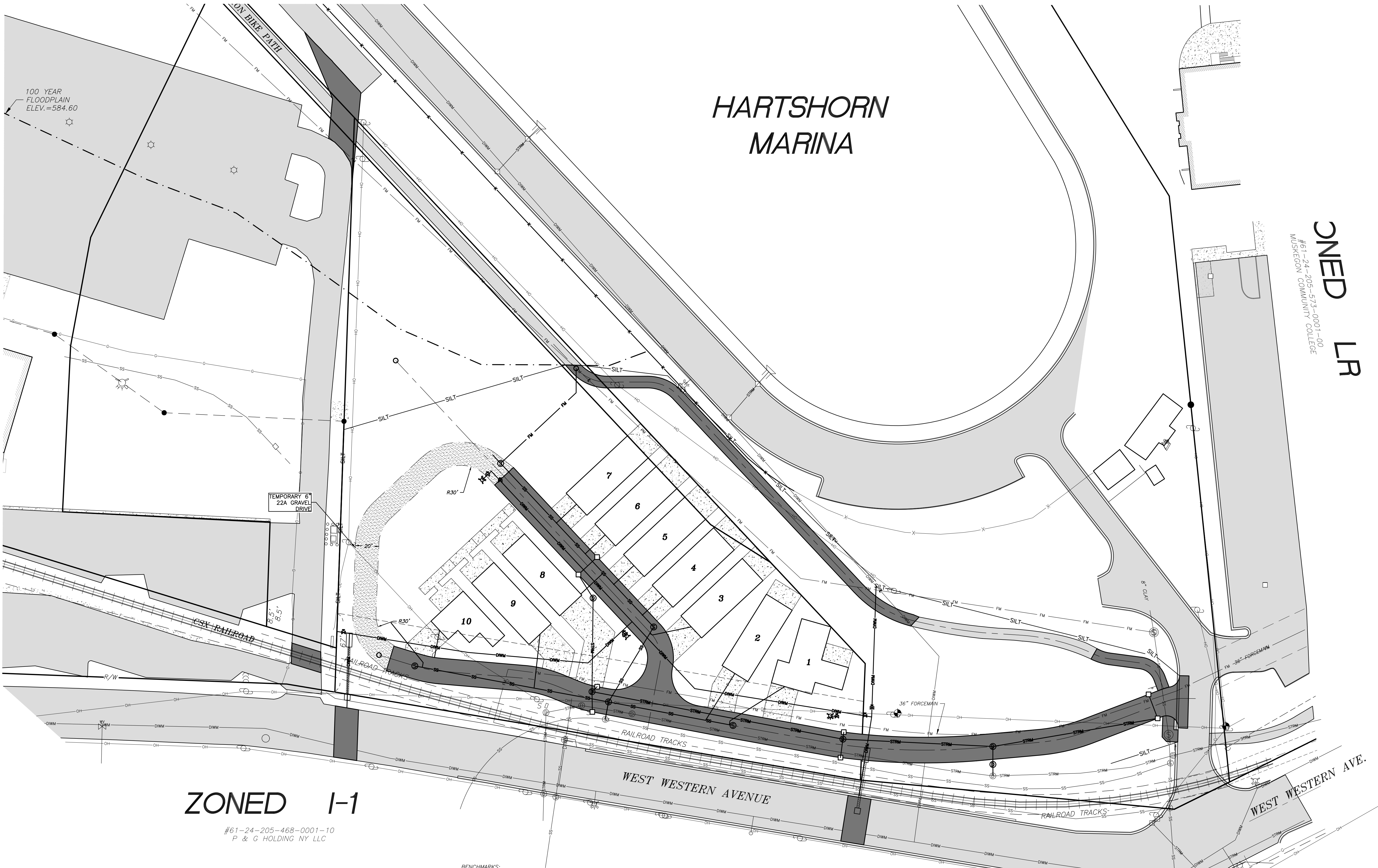
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HARTSHORN MARINA

CNED LR
 #61-24-205-573-0001-00
 MUSKOGEE COMMUNITY COLLEGE

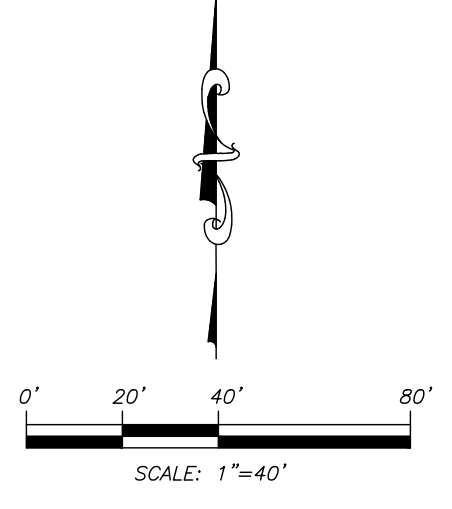


ZONED I-1

#61-24-205-468-0001-10
 P & G HOLDING NY LLC

ZONED I-1

#61-24-205-467-0001-00
 P & G HOLDING NY LLC



LEGEND			
M	MEASURED DIMENSION	○	CLEAN-OUT
R	RECORD DIMENSION	S	SIGN
D	DEED DIMENSION	MH	MANHOLE
○	SET IRON	-X-	FENCE
●	FOUND IRON	-SAN-	EXISTING SANITARY SEWER
○	UTILITY POLE	-W-	EXISTING WATERMAIN
○	GUY WIRE	-GAS-	EXISTING GAS MAIN
○	TELEPHONE RISER	-OH-	OVERHEAD POWER
○	CABLE TV RISER	-FM-	FORCEMAIN
○	FIRE HYDRANT	□	PROPOSED CATCH BASIN
○	WATER VALVE	-X-	PROPOSED FENCE
○	ELECTRIC METER	-SAN-	PROPOSED SANITARY SEWER
○	GAS METER	-DWM-	PROPOSED WATERMAIN
□	CATCH BASIN	-FM-	PROPOSED FORCEMAIN
		-STM-	PROPOSED STORM SEWER
		■	CONCRETE
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		■	PROPOSED ASPHALT

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 - SET BM
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 - FD RR SPIKE
N/FACE POWER POLE
ELEV=588.93
(1' ABOVE GRD)
 - SET BM
SPINDLE N/FACE POWER POLE
ELEV=594.25

CONSTRUCTION SIGNAGE NOTES:
 1. DETOUR ROUTE FOR WESTERN AVENUE CLOSURE WILL BE DIVISION-WASHINGTON-FRANKLIN.
 2. SIGNAGE SHALL BE IN ACCORDANCE WITH TYPICAL APPLICATION 20 (TA-20) OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
 3. ROAD CLOSURE AND DETOUR SHALL BE COORDINATED WITH CITY OF MUSKOGEE DEPARTMENT OF PUBLIC WORKS

DATE:	7-19-19	DATE:	11/12/19
DRAWN BY:	TUB	DESIGNED BY:	TUB/WAV
CHECKED BY:	TUB	DATE:	
DWG NAME:	PHASE 1	NO.:	
		DESCRIPTION:	
		BY:	
		CHK'D:	
		DATE:	

2534 Black Creek Road
 Muskegon, MI 49444
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WESTSHORE
 ENGINEERING & SURVEYING
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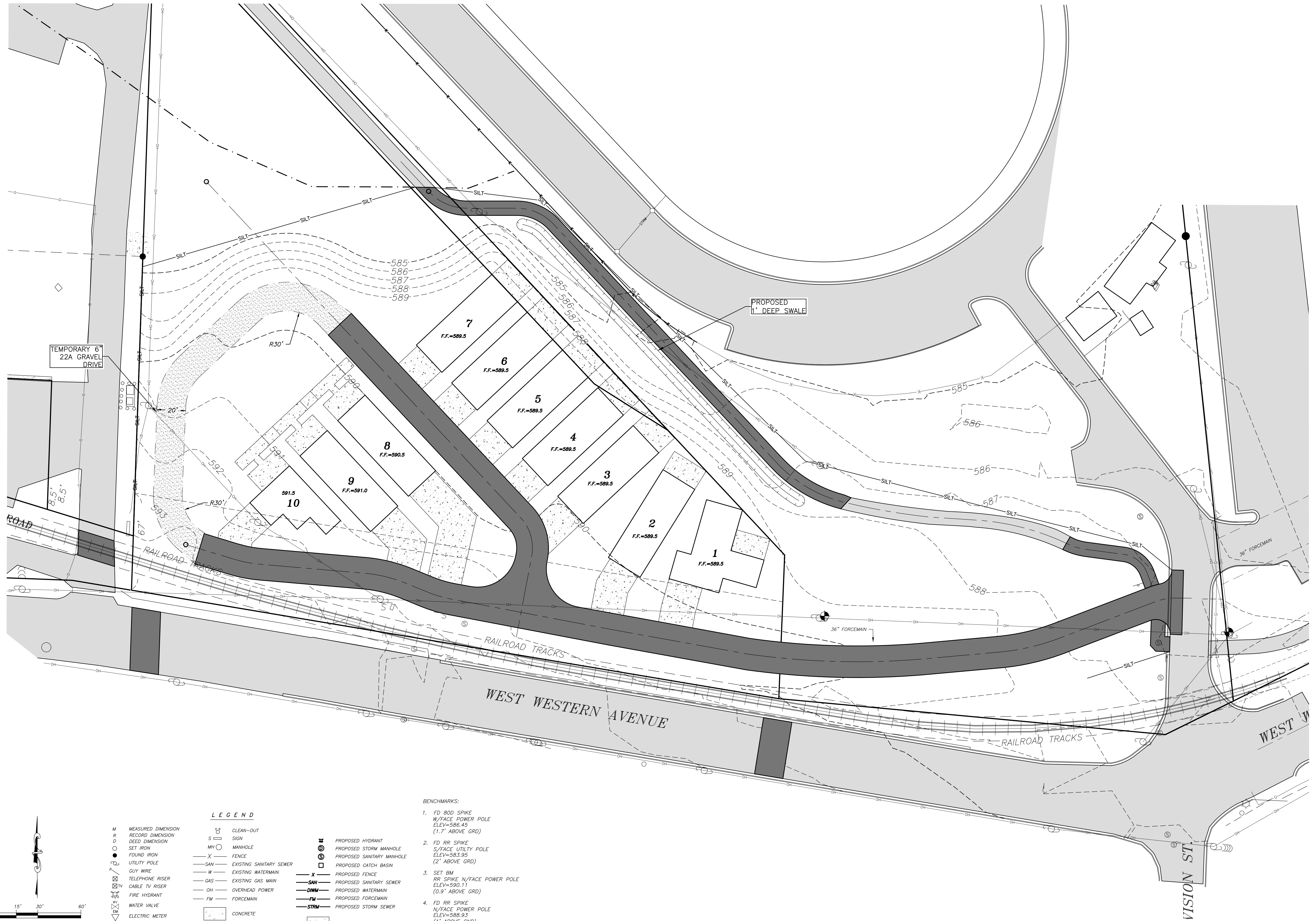
HARTSHORN VILLAGE
 PORTION OF BLOCKS 573, 574 AND 575
 OF THE REVISED PLAT
 (OF 1903) CITY OF MUSKOGEE
 MUSKOGEE COUNTY, MICHIGAN

PROJECT NAME:
PHASE 1 SITE PLAN

PROJECT:
 04311-0001
 (REF: 02015-0155,
 00023-00334)

SHEET:
 4 OF 9

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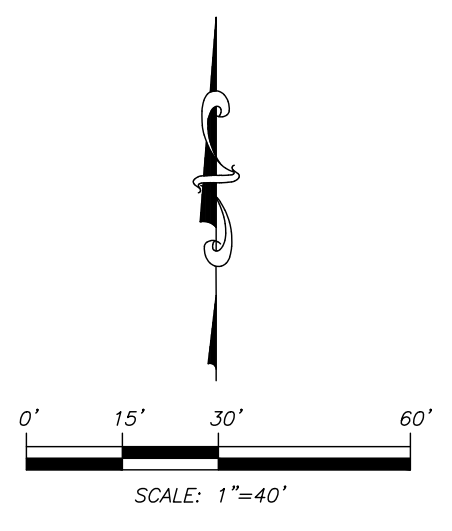


TEMPORARY 6" 22A GRAVEL DRIVE

PROPOSED 1' DEEP SWALE

WEST WESTERN AVENUE

VISION ST.



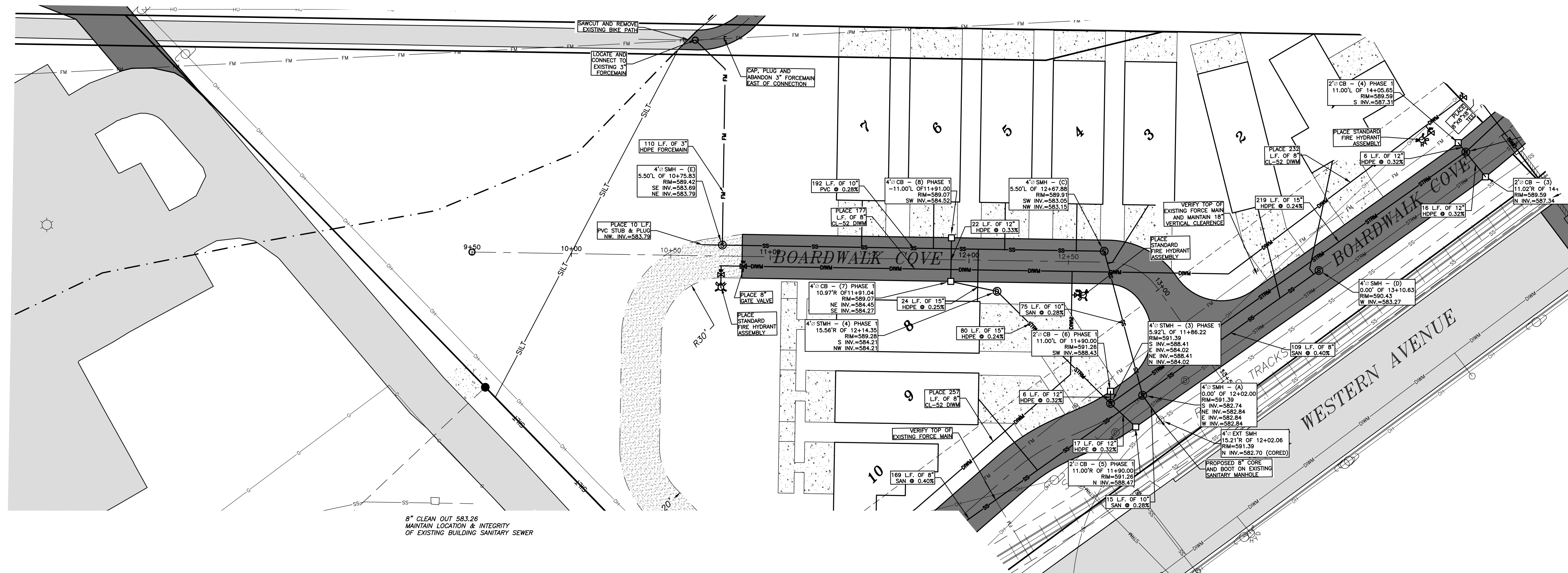
LEGEND					
M	MEASURED DIMENSION	⊗	CLEAN-OUT SIGN	⊗	PROPOSED HYDRANT
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D	DEED DIMENSION	⊗	FENCE	⊗	PROPOSED SANITARY MANHOLE
S	SET IRON	⊗	EXISTING SANITARY SEWER	⊗	PROPOSED CATCH BASIN
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⊗	UTILITY POLE	⊗	EXISTING GAS MAIN	⊗	PROPOSED SANITARY SEWER
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⊗	CABLE TV RISER	⊗	CONCRETE	⊗	PROPOSED STORM SEWER
⊗	FIRE HYDRANT	⊗	ASPHALT	⊗	PROPOSED CONCRETE
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DRAWN BY: NSS/TJB		DATE: 7-30-18
CHECKED BY: TWD		SURVEYED BY: TWD
DWG NAME: PUD PLAN		DESIGNED BY: TJB/WAV
PROJECT: HARTSHORN VILLAGE		NO. DATE DESCRIPTION
PORTION OF BLOCKS 573, 574 AND 575		1 11/12/19 ENGINEER UTILITY REVISIONS
OF THE REVISED PLAT		TJB BY
(OF 1903) CITY OF MUSKEGON		WAV
MUSKEGON COUNTY, MICHIGAN		CHW'D DATE
PROJECT NAME: HARTSHORN VILLAGE		
PHASE 1 SITE GRADING		
PROJECT: 04311-0001		
(REF: 02015-0155, 00023-00334)		
SHEET: 5 OF 9		

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WESTSHORE
ENGINEERING & SURVEYING
ENVIRONMENTAL



- LEGEND**
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 - PROPOSED CONCRETE
 - PROPOSED ASPHALT

WATERMAIN NOTES:

- ALL WORK AND MATERIALS SHALL MEET THE REQUIREMENTS OF THE CITY OF MUSKEGON REGIONAL WATER SYSTEM SPECIFICATIONS.
- CONNECT TO EX. WATERMAIN AFTER PRESSURE AND BACTERIOLOGICAL TESTS HAVE BEEN PERFORMED AND ACCEPTED.
- DEFLECTIONS BETWEEN SECTIONS OF WATERMAIN PIPE SHALL AS LISTED IN THE CITY OF MUSKEGON SPECIFICATIONS.
- MECHANICAL JOINTS WITH METAL GASKETS REQUIRED AT ALL BENDS, TEES, AND GATE VALVES.
- CITY OF MUSKEGON REQUIRES RESILIENT SEATED GATE VALVES.
- MECHANICAL JOINT AND METAL GASKETS SHALL BE USED FOR PIPE RESTRAINT.
- MAINTAIN 18" VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER MAIN CROSSINGS.
- CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING WATER & SEWER MAINS AND ANY OTHER UTILITIES DURING CONSTRUCTION AND SHALL REPAIR SUCH DAMAGES WITH NO COST TO THE OWNER.
- UNLESS OTHERWISE CALLED FOR ON DRAWINGS, PROPOSED WATERMAIN SHALL BE DUCTILE IRON PIPE, CLASS 52 WITH PUSH-ON JOINTS (MECHANICAL JOINT AND FITTINGS) AND PRESSURE RATING OF 350 PSI.
- WATERMANS SHALL BE PRESSURE TESTED, CHLORINATED, AND FLUSHED PRIOR TO BEING CONNECTED TO AND INTEGRATED INTO THE EXISTING SYSTEM. HYDROSTATIC OR LEAKAGE TESTING SHALL NOT BE ALLOWED AGAINST A CLOSED VALVE CONNECTED TO A POTABLE SYSTEM. A PHYSICAL GAP MUST BE LEFT AT EACH END OF THE NEW WATERMAIN TO BE TESTED.
- HYDRANTS SHALL BE PLACED WITH A 6" GATE VALVE & BOX.
- EACH HOME SITE SHALL BE PROVIDED WITH A NEW ONE (1) INCH WATER SERVICE, CONSISTING OF A CORPORATION STOP, TYPE "X" COPPER TUBING, AND A CURB STOP AND BOX. REFER TO CITY OF MUSKEGON SPECIFICATIONS FOR APPROVED MATERIALS.

SANITARY SEWER NOTES:

- ALL GRAVITY SEWER MAINS SHALL BE PVC (SDR-35), ALL LEADS SHALL BE PVC (SDR-26).
- PLACE 6" WYE ON SANITARY SEWERS FOR LEADS WHERE SPECIFIED.
- INFILTRATION FOR ANY SECTION OF SEWER IS NOT ACCEPTABLE.
- NO FOOTING DRAINS SHALL BE CONNECTED TO THE SEWER.
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- ALL WORK AND MATERIALS SHALL MEET WESTSHORE CONSULTING AND CITY OF MUSKEGON STANDARDS.

PROFILE NOTES:

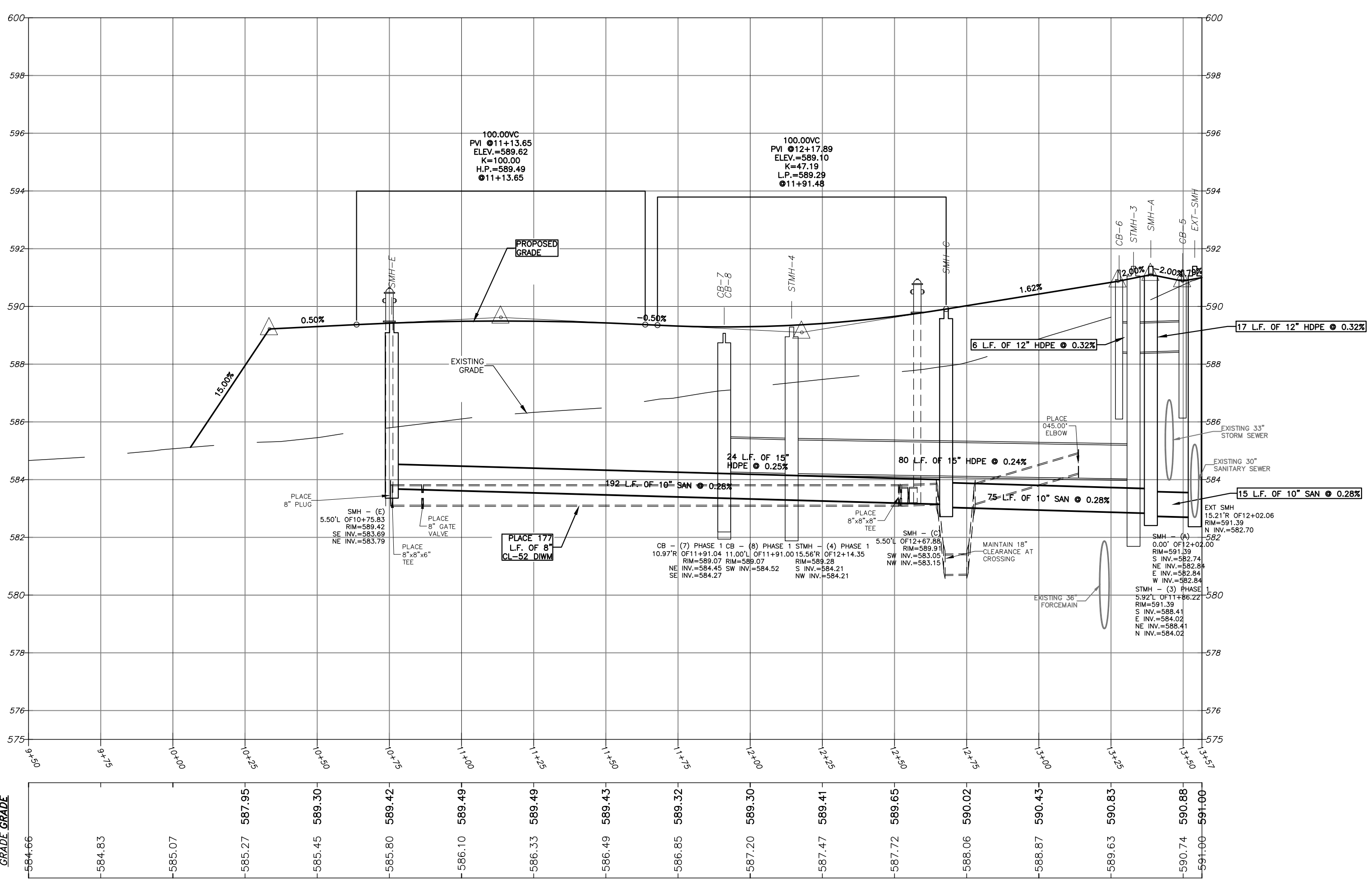
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- DURING THE ENTIRE CONSTRUCTION PHASE OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE CLEANUP OPERATIONS ALONG AND ON THE ROADWAY WHERE DIRT AND/OR DEBRIS HAS BEEN DEPOSITED DUE TO CONSTRUCTION ACTIVITIES AND/OR RELATED WORK. AS A MINIMUM, CLEANUP WILL BE DONE ON A DAILY BASIS; ADDITIONAL CLEANUP WILL BE PERFORMED AS DEEMED NECESSARY BY THE CITY.

BENCHMARKS:

- FD 800 SPIKE
W/FACE POWER POLE
ELEV=586.45
(1.7' ABOVE GRD)
- FD RR SPIKE
S/FACE UTILITY POLE
ELEV=583.95
(2' ABOVE GRD)
- SET BM
RR SPIKE N/FACE POWER POLE
ELEV=580.11
(0.9' ABOVE GRD)
- FD RR SPIKE
N/FACE POWER POLE
ELEV=588.93
(1' ABOVE GND)
- SET BM
SPINDLE N/FACE POWER POLE
ELEV=594.25



DATE:	7-19-19	SURVEYED BY:	TJB	ENGINEER UTILITY REVISIONS:	TJB	NO.	1	DATE:	11/12/19	BY:	CHW/D
CHECKED BY:	TJB	DESIGNED BY:	TJB	DATE:	11/12/19	DESCRIPTION:	PHASE 1	DATE:	11/12/19	BY:	CHW/D
DRAWN BY:	TJB	DWG NAME:	PHASE 1	DATE:	11/12/19	DESCRIPTION:	PHASE 1	DATE:	11/12/19	BY:	CHW/D

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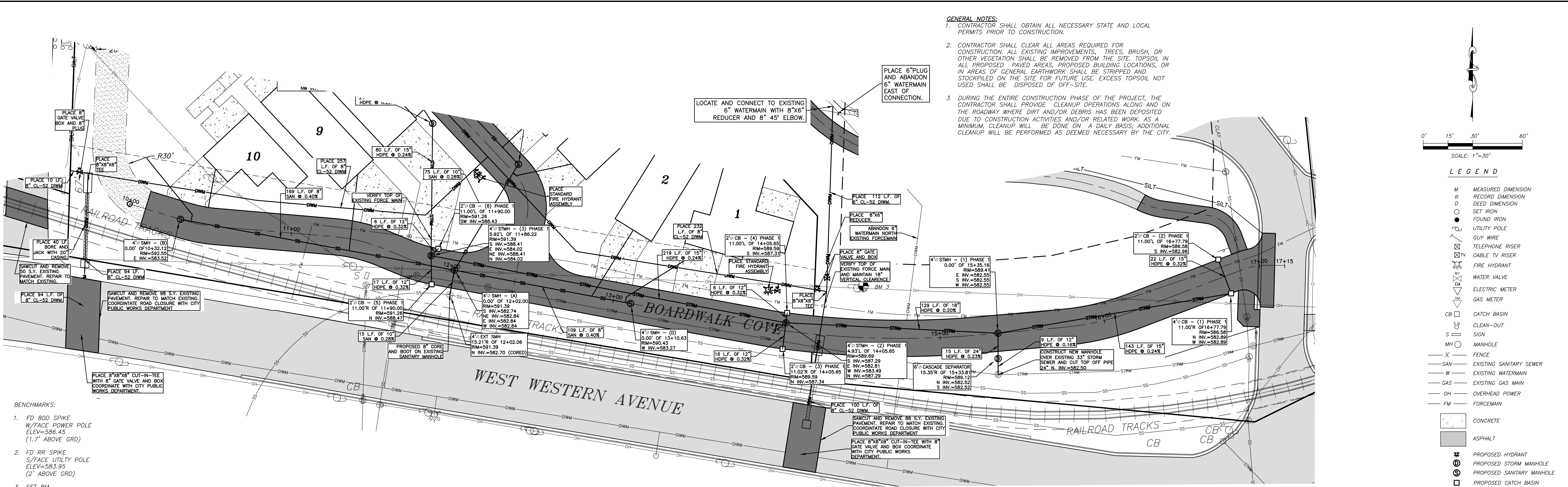
HARTSHORN VILLAGE
PORTION OF BLOCKS 573, 574 AND 575
OF THE REVISED PLAT
(OF 1903) CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

PROJECT NAME:
PHASE 1
HARTSHORN EAST 1
PLAN & PROFILE

PROJECT:
04311-0001
(REF: 02015-0155,
00023-0033H)

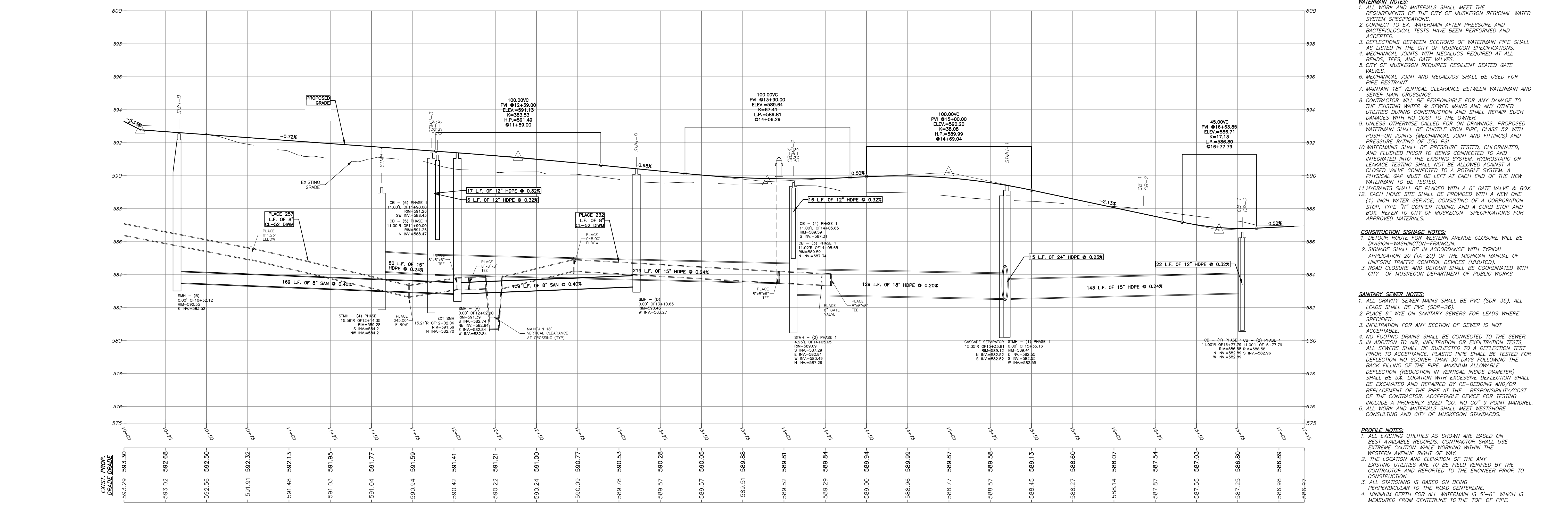
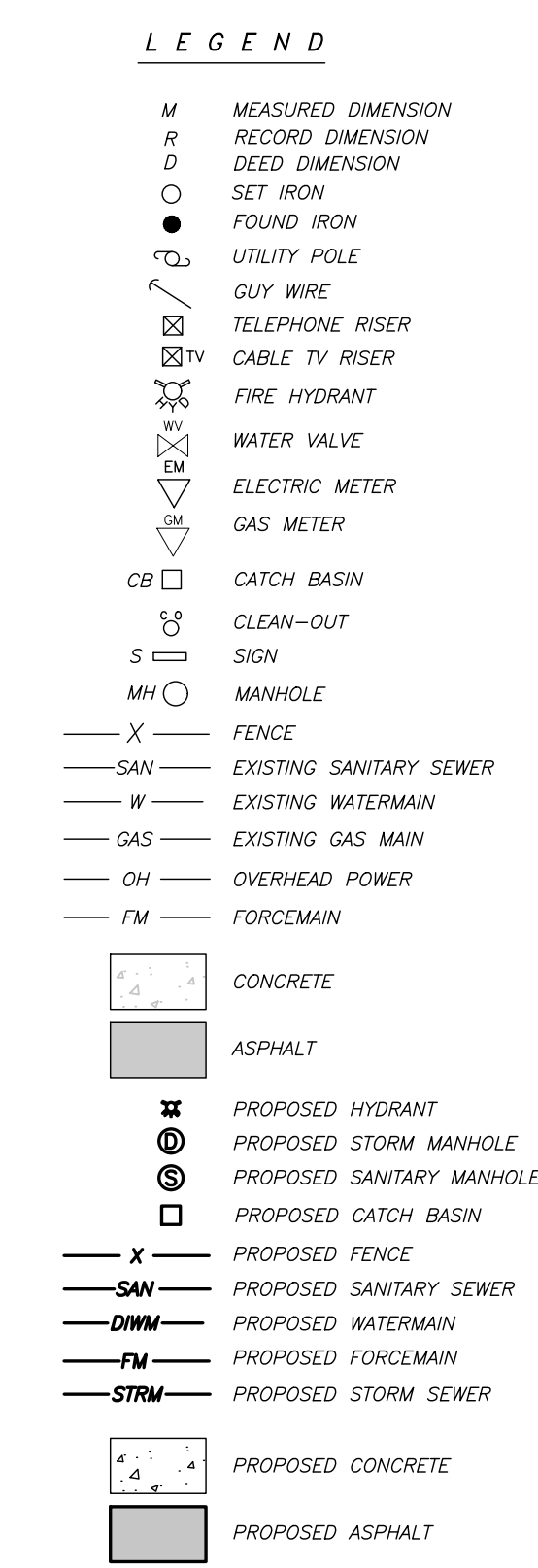
SHEET:
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- BENCHMARKS:**
- FD BOD SPIKE
W/FACE POWER POLE
ELEV=586.45
(1.7' ABOVE GRD)
 - FD RR SPIKE
S/FACE UTILITY POLE
ELEV=583.95
(2' ABOVE GRD)
 - SET BM
RR SPIKE N/FACE POWER POLE
ELEV=590.11
(0.9' ABOVE GRD)
 - FD RR SPIKE
N/FACE POWER POLE
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(1' ABOVE GRD)
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- WATERMAIN NOTES:**
- ALL WORK AND MATERIALS SHALL MEET THE REQUIREMENTS OF THE CITY OF MUSKEGON REGIONAL WATER SYSTEM SPECIFICATIONS.
 - CONNECT TO EX. WATERMAIN AFTER PRESSURE AND BACTERIOLOGICAL TESTS HAVE BEEN PERFORMED AND ACCEPTED.
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 - UNLESS OTHERWISE CALLED FOR ON DRAWINGS, PROPOSED WATERMAIN SHALL BE DUCTILE IRON PIPE, CLASS 52 WITH PUSH-ON JOINTS (MECHANICAL JOINT AND FITTINGS) AND PRESSURE RATING OF 350 PSI.
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 - HYDRANTS SHALL BE PLACED WITH A 6" GATE VALVE & BOX. EACH HOME SITE SHALL BE PROVIDED WITH A NEW ONE (1) INCH WATER SERVICE, CONSISTING OF A CORPORATION STOP, TYPE "K" COPPER TUBING, AND A CURB STOP AND BOX. REFER TO CITY OF MUSKEGON SPECIFICATIONS FOR APPROVED MATERIALS.
- CONSTRUCTION SIGNAGE NOTES:**
- DETOUR ROUTE FOR WESTERN AVENUE CLOSURE WILL BE DIVISION WASHINGTON-FRANKLIN.
 - SIGNAGE SHALL BE IN ACCORDANCE WITH TYPICAL APPLICATION 20 (TA-20) OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
 - ROAD CLOSURE AND DETOUR SHALL BE COORDINATED WITH CITY OF MUSKEGON DEPARTMENT OF PUBLIC WORKS.
- SANITARY SEWER NOTES:**
- ALL GRAVITY SEWER MAINS SHALL BE PVC (SDR-35). ALL LEADS SHALL BE PVC (SDR-26).
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HARTSHORN VILLAGE
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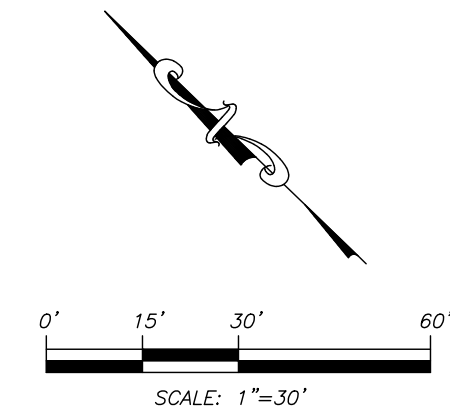
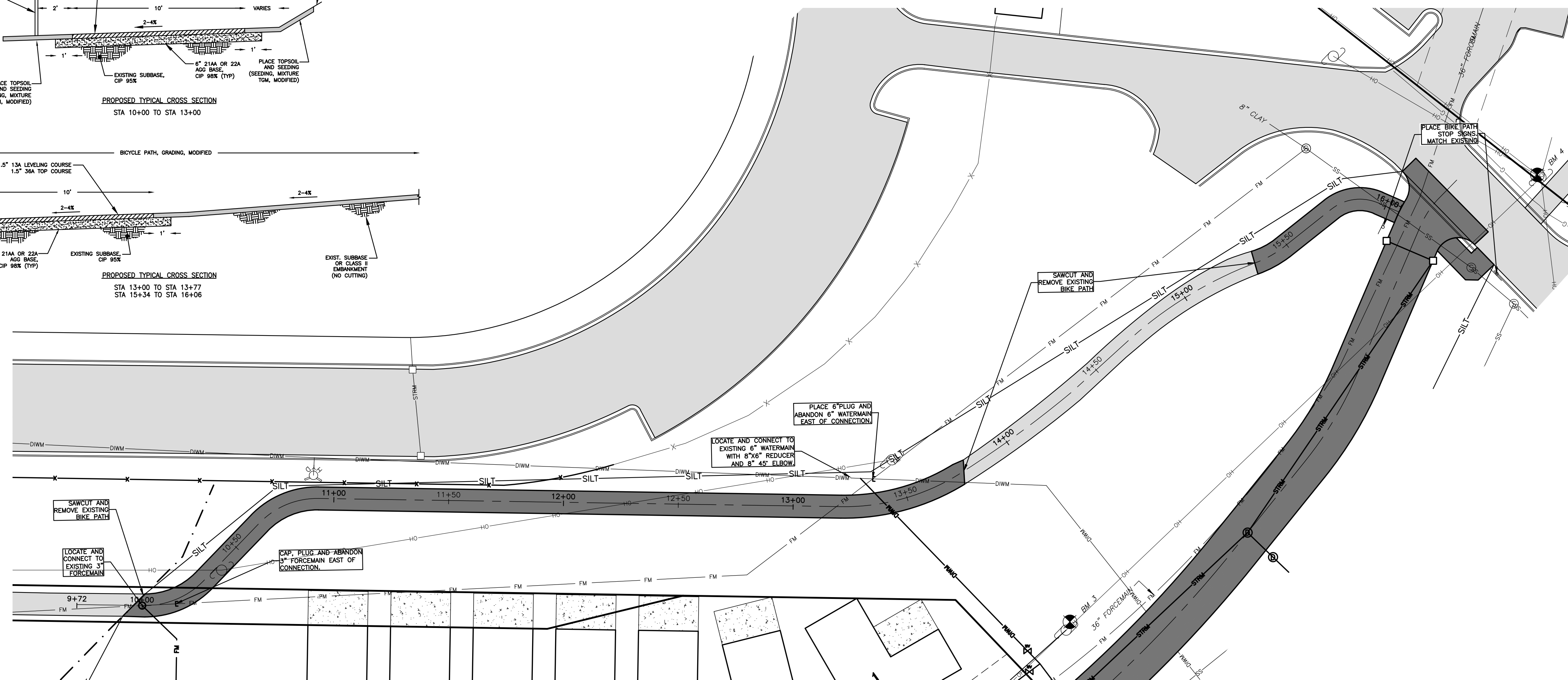
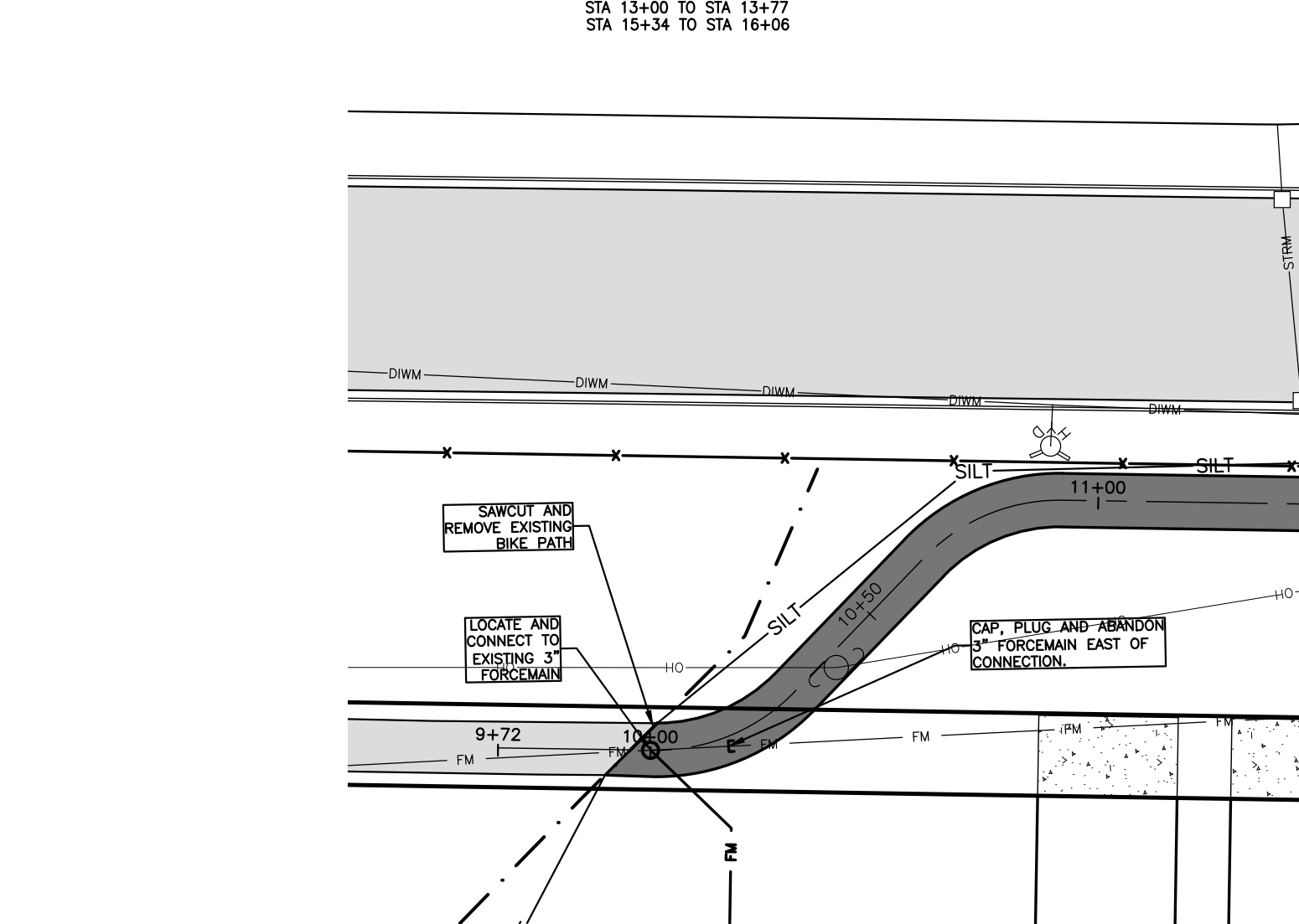
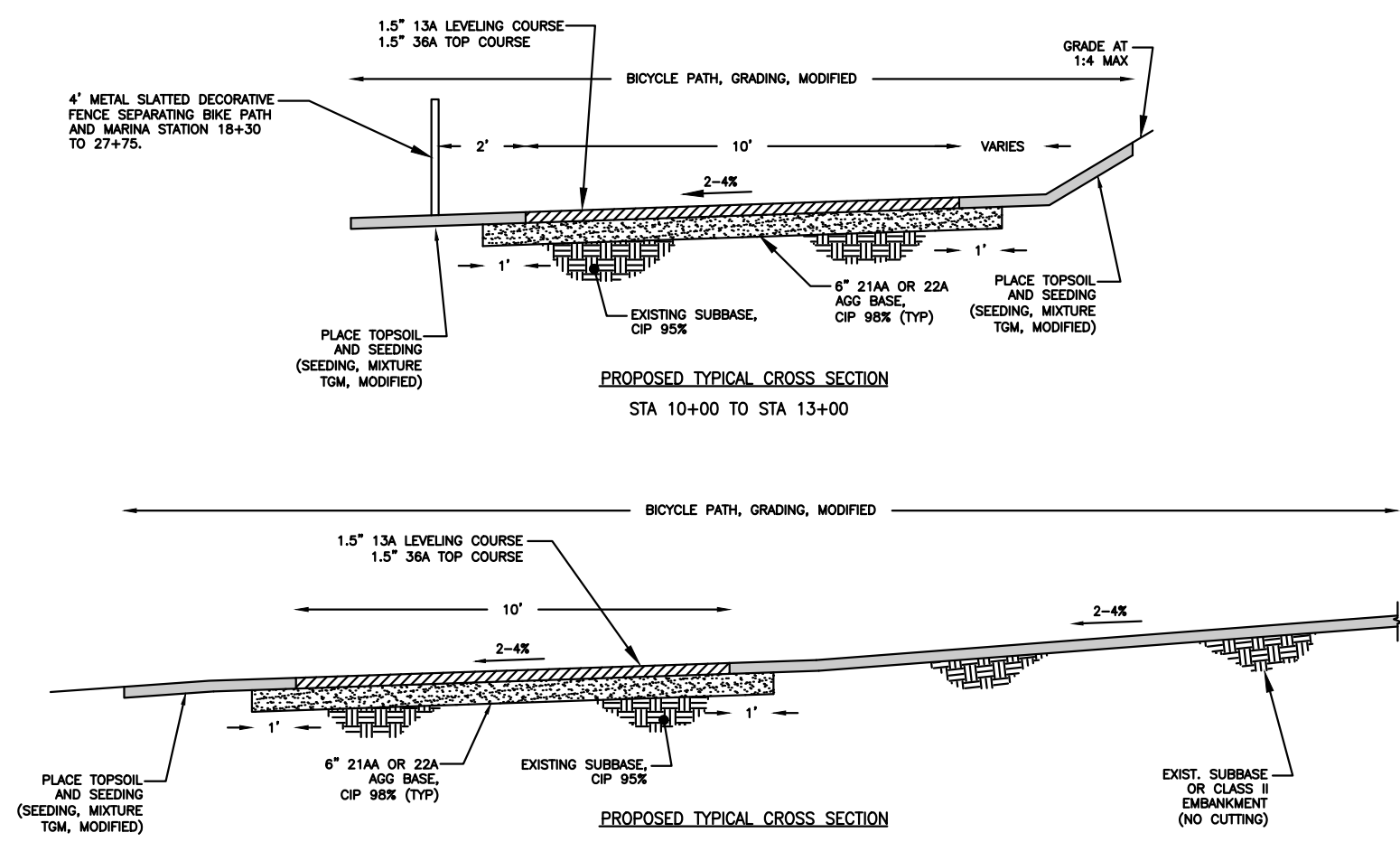
DATE: 7-19-19
DRAWN BY: TJB
CHECKED BY: TJB
DESIGNED BY: TJB
DATE: 11/12/19
BY: CHW
DESCRIPTION: ENGINEER UTILITY REVISIONS
TUB/WAY

PROJECT: PHASE 1
HARTSHORN EAST 2
PLAN & PROFILE

PROJECT: 04311-0001
(REF: 02015-0155, 00023-0033H)

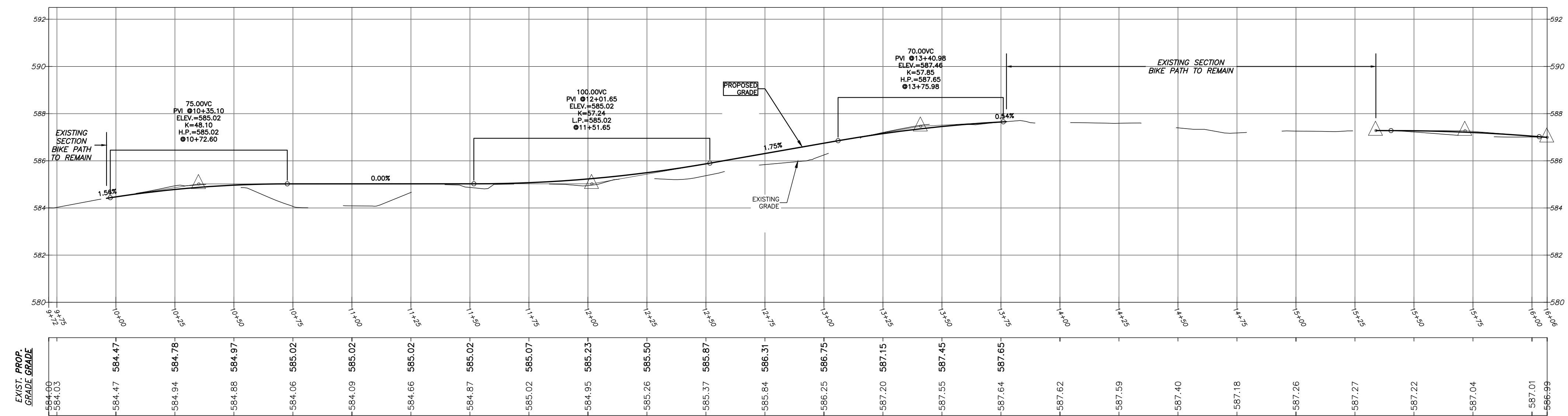
SHEET: 7 OF 9

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LEGEND

M	MEASURED DIMENSION
R	RECORD DIMENSION
D	DEED DIMENSION
○	SET IRON
○	FOUND IRON
○	UTILITY POLE
○	GUY WIRE
○	TELEPHONE RISER
○	CABLE TV RISER
○	FIRE HYDRANT
○	WATER VALVE
○	ELECTRIC METER
○	GAS METER
○	CATCH BASIN
○	CLEAN-OUT
○	SIGN
○	MANHOLE
X	FENCE
SAN	EXISTING SANITARY SEWER
W	EXISTING WATERMAIN
GM	EXISTING GAS MAIN
OH	OVERHEAD POWER
FM	FORCEMAIN
CONCRETE	CONCRETE
ASPHALT	ASPHALT
⊕	PROPOSED HYDRANT
⊕	PROPOSED STORM MANHOLE
⊕	PROPOSED SANITARY MANHOLE
⊕	PROPOSED CATCH BASIN
X	PROPOSED FENCE
SAN	PROPOSED SANITARY SEWER
DWM	PROPOSED WATERMAIN
FM	PROPOSED FORCEMAIN
STRM	PROPOSED STORM SEWER
CONCRETE	PROPOSED CONCRETE
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DATE:	7-19-19	DATE:	11/12/19
CHECKED BY:	TJB	DESIGNED BY:	TJB
DRAWN BY:	TJB	DWG NAME:	PHASE 1
SURVEYED BY:	TJB	NO. DATE:	NO. DATE
BY:	TJB	DESCRIPTION:	BY CHW/D

2534 Black Creek Road
Muskegon, MI 49444
Ph: (231) 777-3447
Fax: (231) 773-3453
Service@WestshoreConsulting.com

WESTSHORE
ENGINEERING & SURVEYING
ENVIRONMENTAL

HARTSHORN VILLAGE
PORTION OF BLOCKS 573, 574 AND 575
OF THE REVISED PLAT
(OF 1903) CITY OF MUSKOGON
MUSKOGON COUNTY, MICHIGAN

PROJECT NAME:
PHASE 1
BIKE PATH
PLAN & PROFILE

PROJECT:
04311-0001
(REF: 02015-0155,
00223-0033H)

SHEET:
8 OF 9

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PIPE RESTRAINT LENGTH REQUIRED (ft.)

PIPE DIAMETER	TEES, 90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	DEAD ENDS	REDUCERS (ONE SIZE)	**
4"	23	9	5	2	57		
6"	32	13	6	3	82	43	63
8"	41	17	8	4	104	43	55
12"	58	24	12	6	149	80	120
16"	74	31	15	7	192	82	110
20"	89	37	18	9	233	82	104
24"	104	43	21	10	272	82	99
30"	123	51	25	12	328	115	148
36"	141	58	28	14	379	115	140

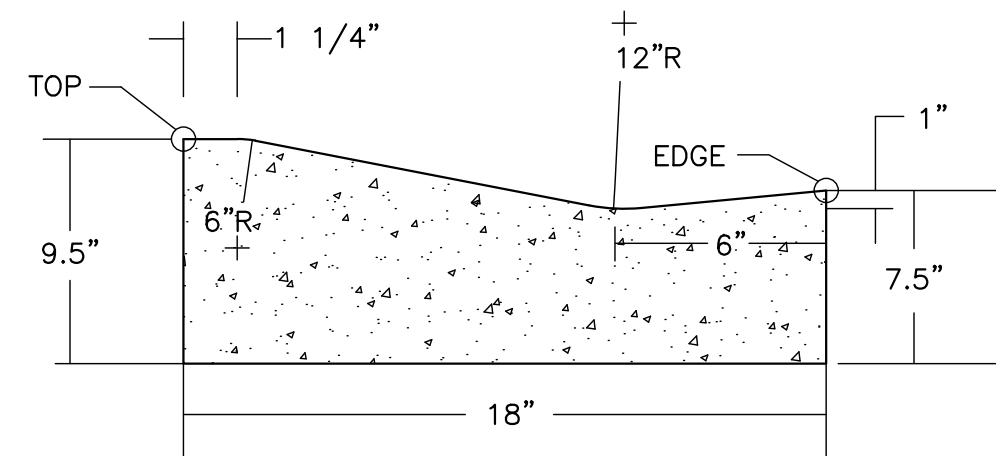
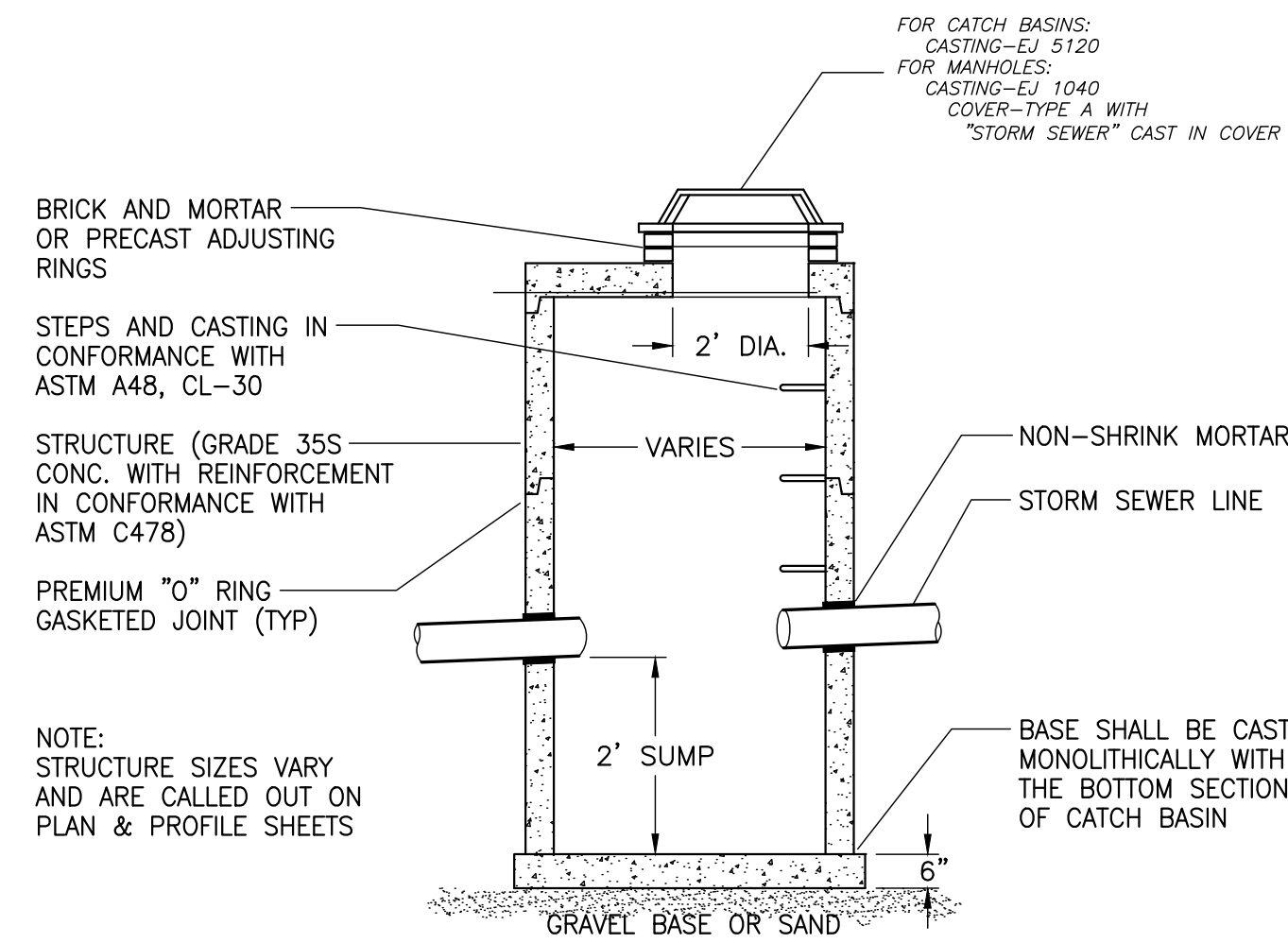
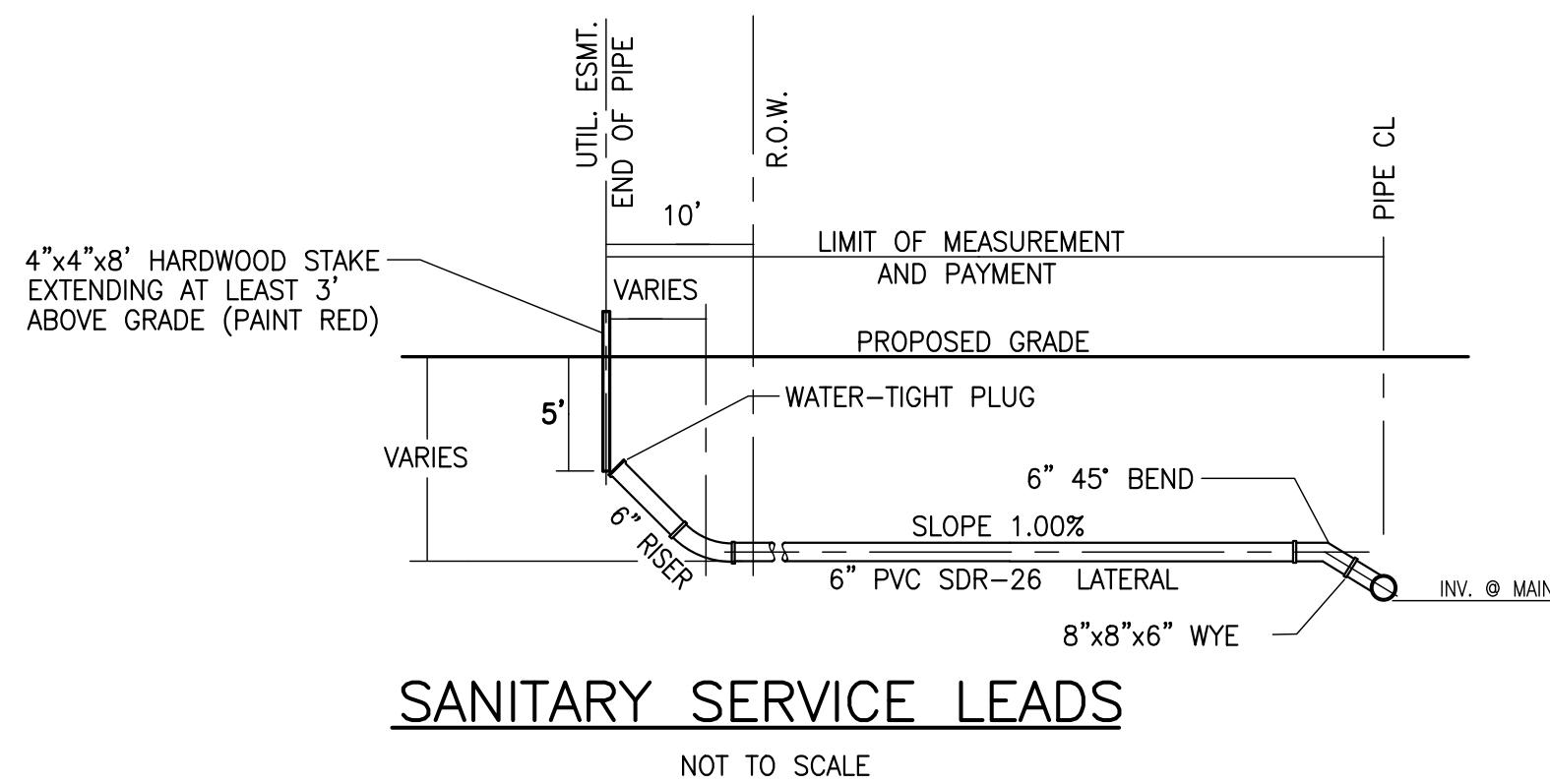
** IF STRAIGHT RUN OF PIPE ON SMALL SIDE OF REDUCER EXCEEDS THIS VALUE, THEN NO RESTRAINED JOINTS ARE NECESSARY.

NOTE:
THE LENGTH OF RESTRAINED PIPE REQUIRED AS SHOWN ABOVE IS BASED ON TRENCH BACKFILL BEING COMPACTED TO 95% OF THE MAXIMUM UNIT WEIGHT AS MEASURED BY THE MODIFIED PROCTOR, ASHTO T-180. IF THE PIPE IS TO BE WRAPPED IN POLYETHYLENE, THE LENGTH OF RESTRAINED PIPE REQUIRED WILL BE AS SHOWN IN THE DRAWINGS OR IN THE SPECIAL SPECIFICATIONS. PIPE RESTRAINT SCHEDULE DOES NOT CONSIDER POLYETHYLENE WRAPPED PIPE.

- A. HYDRANTS**
1. THE BOWL OF EACH HYDRANT SHALL BE TIED TO THE PIPE WITH RODS OR CLAMPS, OR RESTRAINED WITH MEGA-LUGS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- B. PLUGS, TEES AND BENDS**
1. ON ALL WATERMAINS, ALL TEES, PLUGS AND BENDS SHALL BE SECURELY RESTRAINED IN ACCORDANCE WITH PIPE RESTRAINT SCHEDULE.

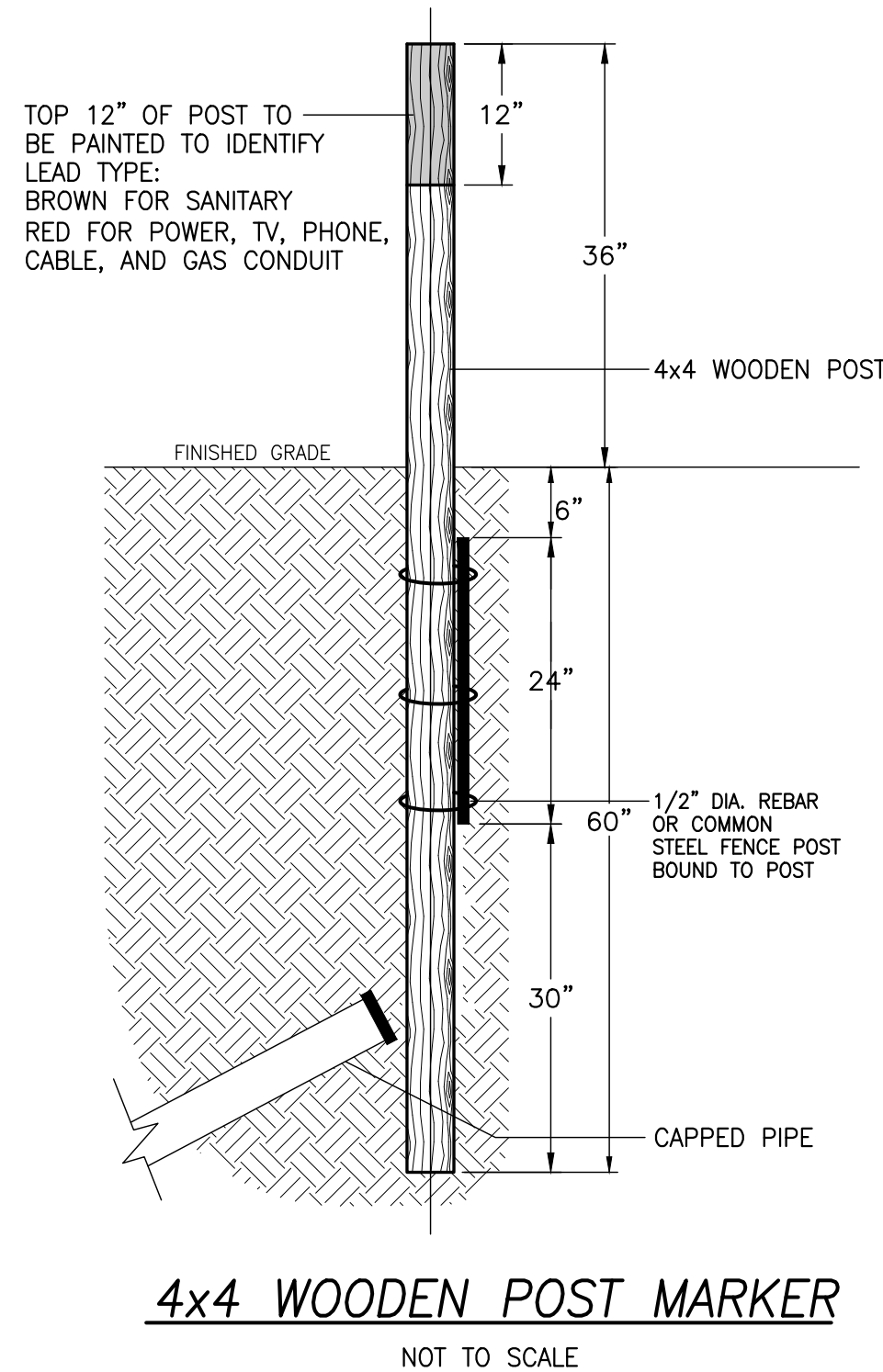
TABLE OF DIMENSIONS

PIPE DIA. (INCHES)	APPROX. SLOPE	T (INCHES)	A (INCHES)	B (INCHES)	C (INCHES)	D (INCHES)	E (INCHES)	G (INCHES)	R (INCHES)	X (INCHES)	Y (INCHES)
12	2.4 TO 1	2	4	24	48	72	24	2	9	8	18
15	2.4 TO 1	2.25	6	27	45	72	29.5	2.25	11	8	18
18	2.3 TO 1	2.5	9	27	45	72	35.5	2.5	12	8	18
21	2.4 TO 1	2.75	9	36	37	73	41.5	2.75	13	8	18
24	2.5 TO 1	3	9.5	43	30	73	47.25	3	14	8	18
27	2.5 TO 1	3.25	10.5	48	24	73	53	3.25	14	8	18
30	2.5 TO 1	3.5	12	53	20	73	59	3.5	15	8	18
36	2.5 TO 1	4	14.75	62	34	96	71	4	20	8	18
42	2.5 TO 1	4.5	21	62	35	96	76.75	4.5	22	10	24
48	2.5 TO 1	5	24	71	26	96	82.75	5	22	10	24
54	2.0 TO 1	5.5	27	64	33	96	89	5.5	24	10	24
60	1.9 TO 1	6	35	59	38	98	94.5	6	*	12	24
66	1.7 TO 1	6.5	30	71	27	98	100.5	6.5	*	12	24
72	1.8 TO 1	7	36	77	21	98	106.25	7	*	12	24
78	1.8 TO 1	7.5	36	89	21	109	112.25	7.5	*	12	24
84	1.6 TO 1	8	36	90	21	110	118	8	*	12	24

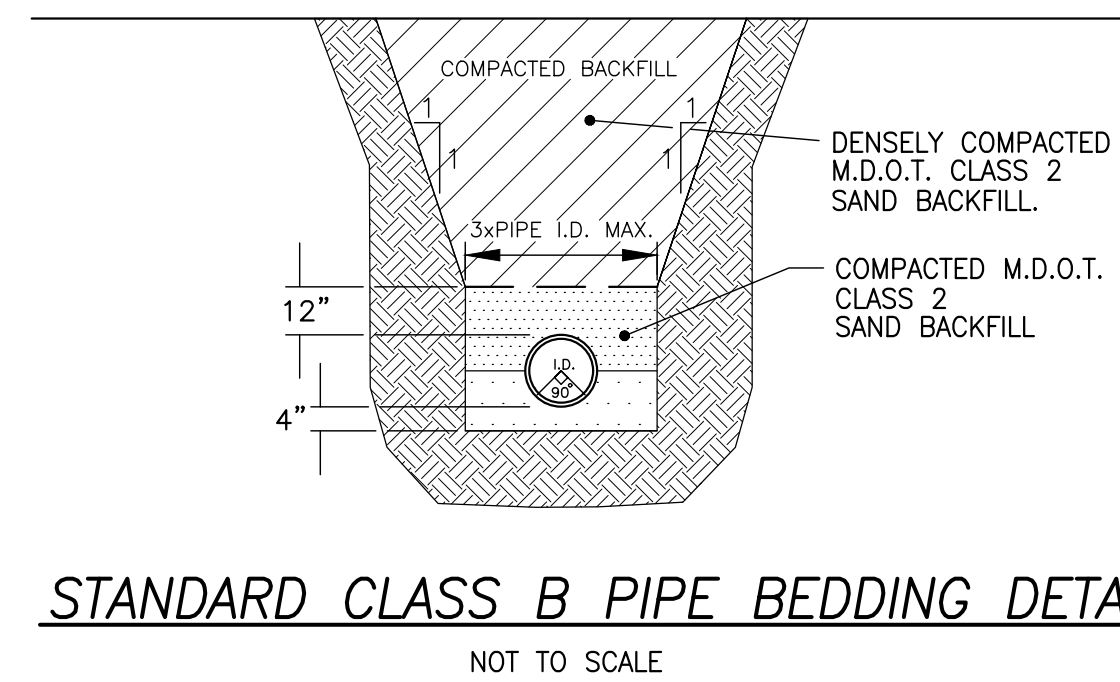


18" CONC ROLLED CURB DETAIL
NOT TO SCALE

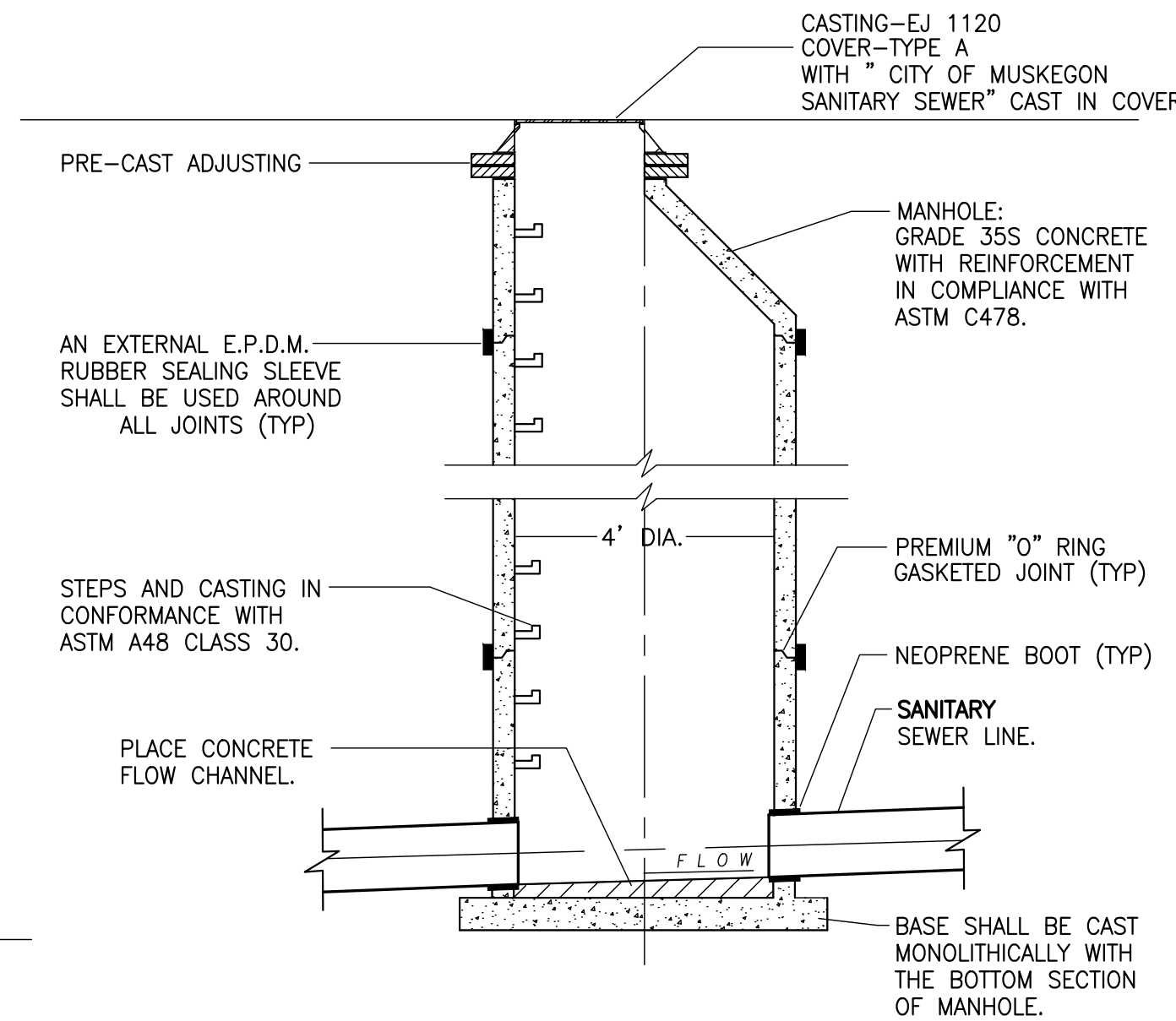
- NOTE:** 1. CONTRACTION JOINTS SHALL BE PLACED EVERY 10 FT.
2. EXPLANATION JOINTS SHALL BE PLACED AT 350 FT. MIN. AND AT ALL RADIUS POINTS.



NOTE: MARKER TO BE USED TO IDENTIFY END OF SANITARY LATERALS AND CONDUIT CROSSING UNDER THE ROAD.

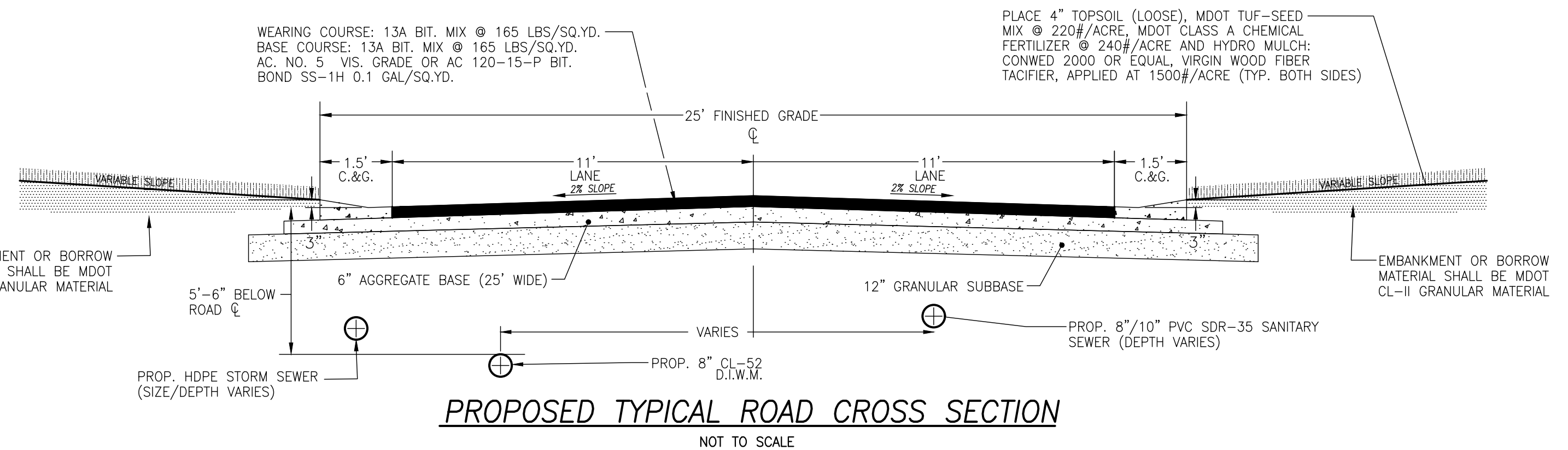
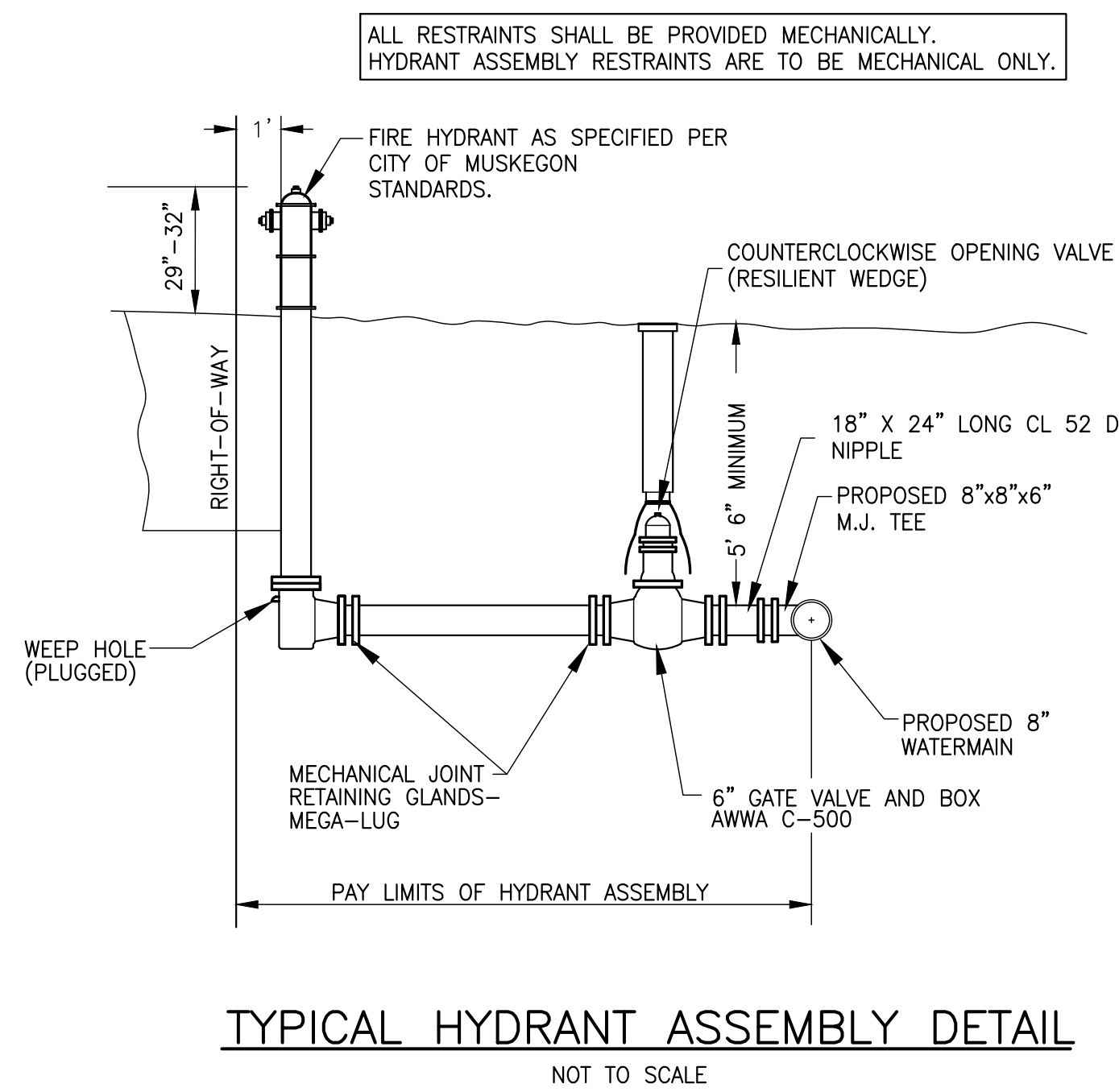
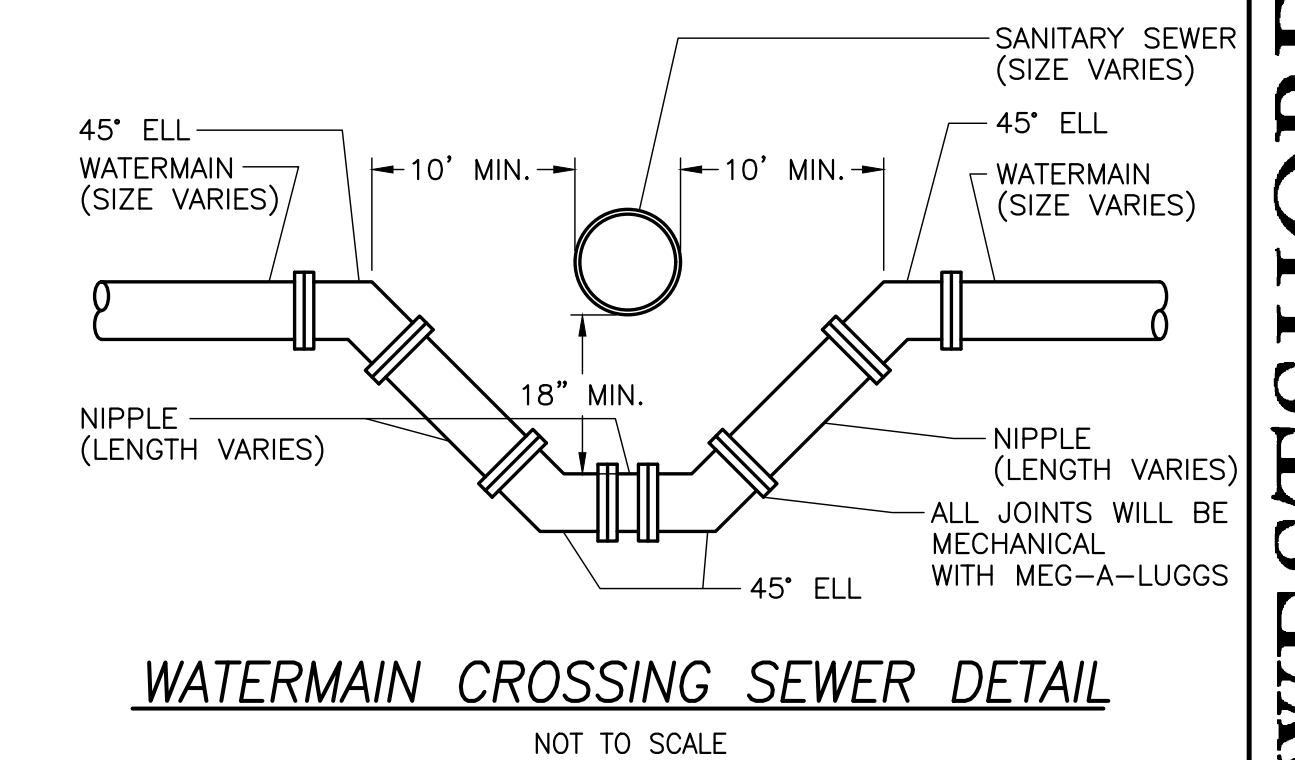
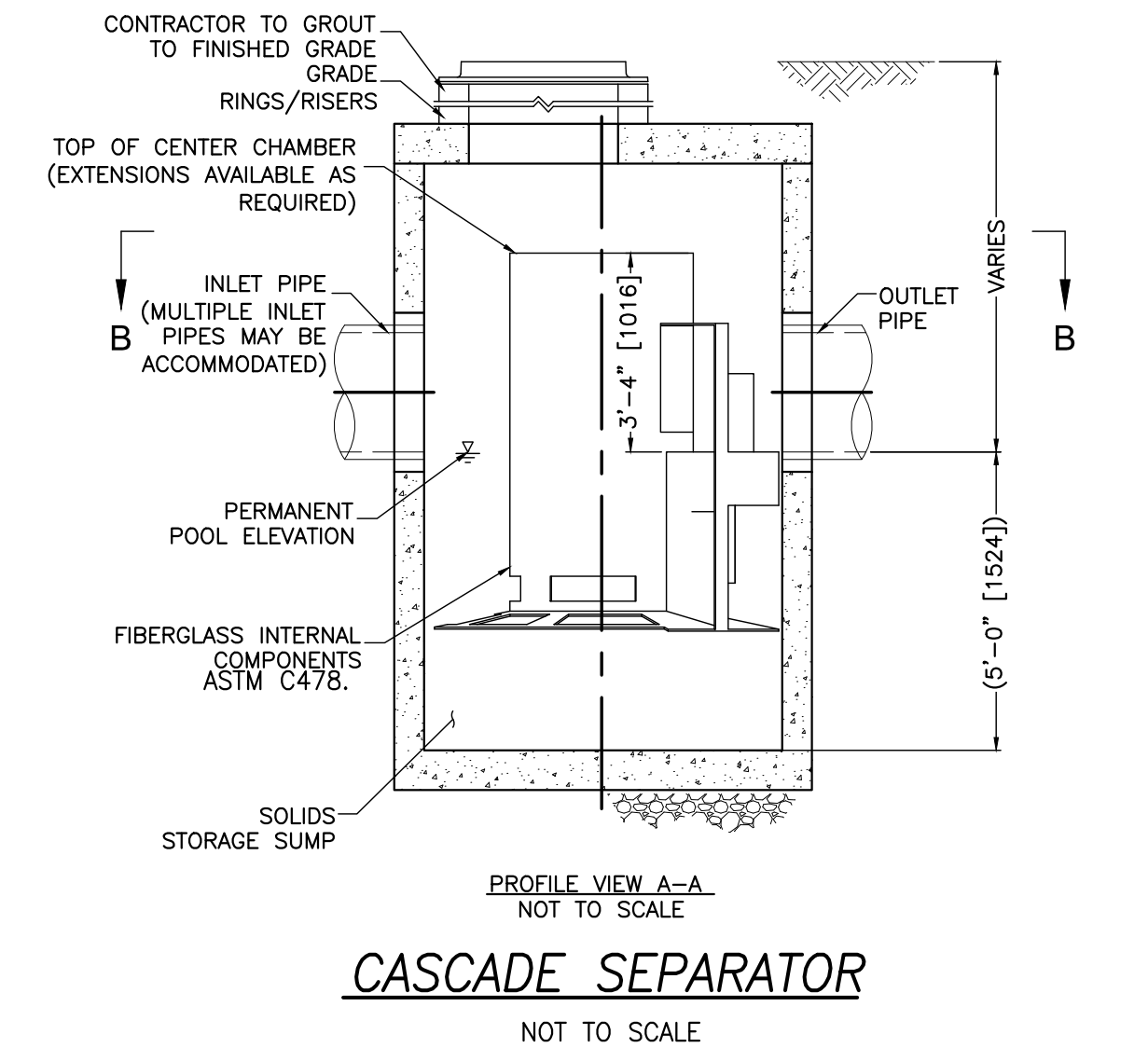


- NOTE:** 1. FOR PIPES UNDERNEATH PAVEMENT OR WITHIN 10' OF PAVEMENT USE M.D.O.T. CLASS II SAND BACKFILL, ALL OTHER AREAS USE CLEAN SITE SUBSOIL.
2. FOR USE WHERE EXISTING SOILS CONFORM TO M.D.O.T. CLASS II REQUIREMENTS (BEDDING FACTOR 1.9).



STANDARD 4" SANITARY MANHOLE
NOT TO SCALE

NOTE: ALL MANHOLES SHALL HAVE FULL-HEIGHT BITUMINOUS WATER PROOFING ON OUTSIDE OF STRUCTURE.



- NOTES:** 1. ASPHALT PAVEMENT TO BE COMPACTED BETWEEN 92-97% OF MAX. THEORETICAL DENSITY (MTD).
2. BASE SHALL BE MDOT 22A AND COMPACTED TO A MIN. OF 98% OF THE MAX. DRY DENSITY BASED ON THE ONE-POINT MICHIGAN CONE TEST.
3. ROAD SUBBASE SHALL BE MDOT CL-II GRANULAR MATERIAL COMPACTED TO A MIN. OF 95% OF MAX. DRY DENSITY BASED ON THE ONE-POINT MICHIGAN CONE TEST.
4. ALL AREAS WITHIN 10' OF EDGE OF PAVEMENT MUST BE COMPACTED TO AT LEAST 95% OF MAX. DRY DENSITY BASED ON THE ONE-POINT MICHIGAN CONE TEST.

DATE	BY	DESCRIPTION
11/12/19	CHW	DATE
11/12/19	TJB	REVISIONS
11/12/19	WAV	NO.
11/12/19	BY	DATE
11/12/19	BY	DATE

DATE	BY	DESCRIPTION
7-19-19	TJB	DATE
7-19-19	TJB	REVISIONS
7-19-19	TJB	NO.
7-19-19	TJB	BY
7-19-19	TJB	DATE

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WESTSHORE
ENGINEERING & SURVEYING
ENVIRONMENTAL



HARTSHORN VILLAGE
PORTION OF BLOCKS 573, 574 AND 575
OF THE REVISED PLAT
(OF 1903) CITY OF MUSKEGON
MUSKEGON COUNTY, MICHIGAN

PROJECT NAME: HARTSHORN VILLAGE
PROJECT: 04311-0001
REF: 02015-0155, 00023-00334
SHEET: 9 OF 9