



AIA[®] Document G714[™] – 2017

Construction Change Directive

PROJECT: *(name and address)*
Highland Township Fire Station 1 - PIA
18-122A

CONTRACT INFORMATION:
Contract For: General Construction

Date: February 18, 2020

CCD INFORMATION:
Directive Number: 002

Date: June 15, 2020

OWNER: *(name and address)*
Highland Township
250 W. Livingston Road
Highland, MI 48357

ARCHITECT: *(name and address)*
PARTNERS in Architecture, PLC
65 Market Street
Mount Clemens, MI 48043

CONTRACTOR: *(name and address)*
Axiom Construction Services Group, LLC
10638 Rushton Road
South Lyon, MI 48178

The Contractor is hereby directed to make the following change(s) in this Contract:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits.)

1. Revision to the civil plans based on MDOT requirements.
2. Extend a cold water line to the water closet in the Apparatus Bay.
3. Add power for the SCBA compressor.
4. Revise the layout for the Apparatus Laundry and New Extractor.

(See attached Exhibits A, B, C and D for clarification)

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:
 - ☐ Lump Sum decrease of \$0.00
 - ☐ Unit Price of \$ per
 - ☐ Cost, as defined below, plus the following fee:
(Insert a definition of, or method for determining, cost)
 - ☒ As follows: These changes will result in an increase to the contract. The final amount is to be determined. An adjustment will be made to the contract amount, afterwards, via Change Order.
2. The Contract Time is proposed to remain unchanged. The proposed adjustment, if any, is (0 days).

NOTE: *The Owner, Architect and Contractor should execute a Change Order to supersede this Construction Change Directive to the extent they agree upon adjustments to the Contract Sum, Contract Time, or Guaranteed Maximum price for the change(s) described herein.*

When signed by the Owner and Architect and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Contractor signature indicates agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this CCD.

PARTNERS in Architecture, PLC

Highland Township

Axiom Construction Services Group, LLC

ARCHITECT *(Firm name)*

OWNER *(Firm name)*

CONTRACTOR *(Firm name)*



Joseph P. Valeri

SIGNATURE

Joseph Valeri, Sr. Project
Architect

PRINTED NAME AND TITLE

DATE

SIGNATURE

Ken Chapman, Fire Chief

PRINTED NAME AND TITLE

DATE

SIGNATURE

Deib Mougrabi, Director of Field
Operations

PRINTED NAME AND TITLE

DATE

EXHIBIT A

LEGEND

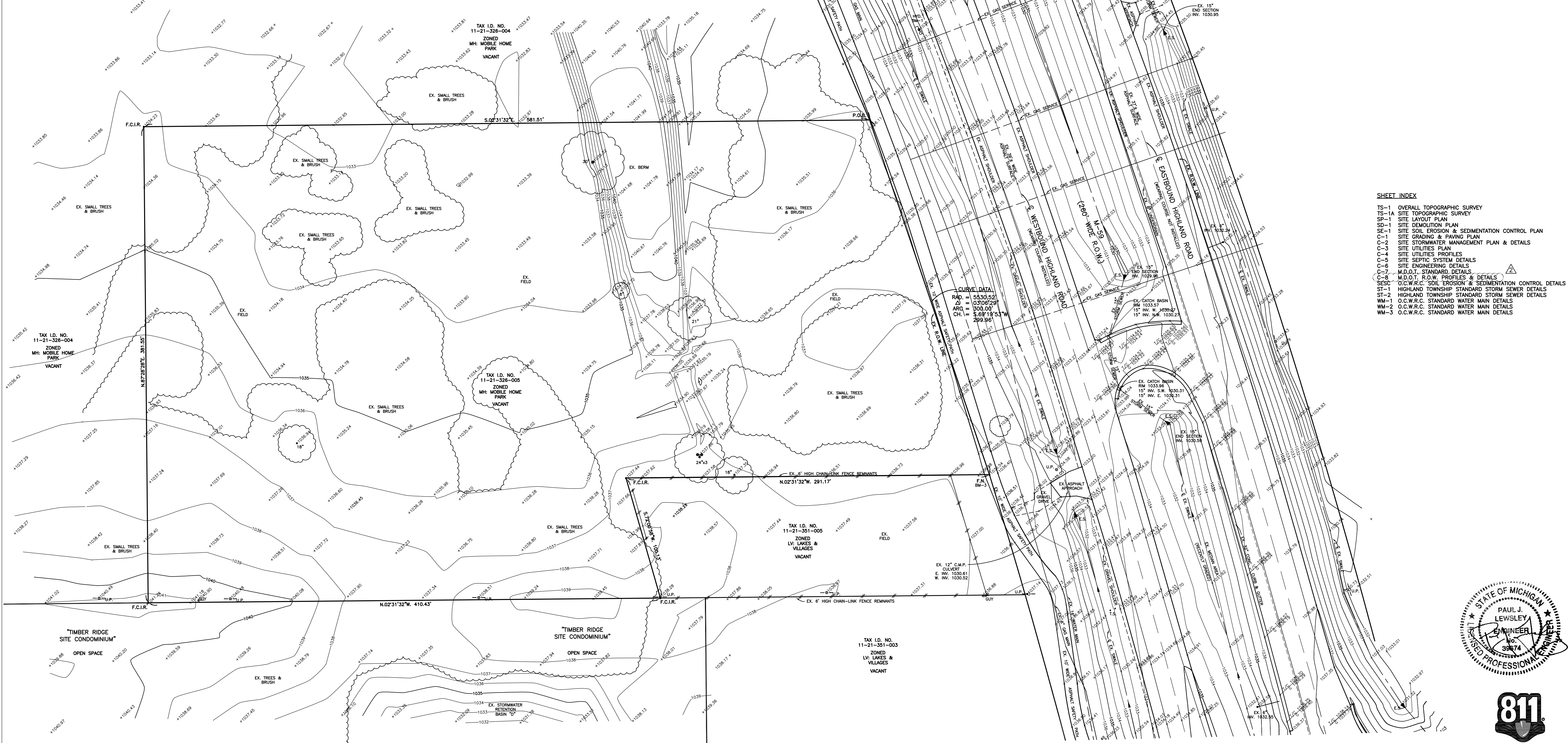
- EXISTING ELEVATION
- + 25.00 — PROPOSED ELEVATION (ADD 1000 FEET)
- 1025— EXISTING CONTOUR
- 25— PROPOSED CONTOUR (ADD 1000 FEET)
- U.P. — UTILITY POLE
- ⊙ L.P. — LIGHT POLE
- GUY — GUY WIRE
- ◇ T.S. — TRAFFIC SIGN
- ⊗ W.S.O. — WATER SHUT-OFF
- ⊗ G.S.O. — GAS SHUT-OFF
- A.M. — AMERITECH MARKER
- A.P. — AMERITECH PEDESTAL
- F.I. — FOUND IRON
- F.C.I.R. — FOUND CAPPED IRON ROD
- F.N. — FOUND NAIL

BENCH MARKS

- B.M.-1 ARROW ON HYDRANT LOCATED ON THE NORTH SIDE OF HIGHLAND ROAD 61'± SOUTH AND 53'± EAST OF THE SOUTHEAST PROPERTY CORNER
ELEVATION 1035.51 U.S.G.S. DATUM
- B.M.-2 ARROW ON HYDRANT LOCATED ON THE NORTH SIDE OF HIGHLAND ROAD AT THE SOUTHEAST CORNER OF "TIMBER RIDGE SITE CONDOMINIUM"
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ELEVATION 1036.54 U.S.G.S. DATUM

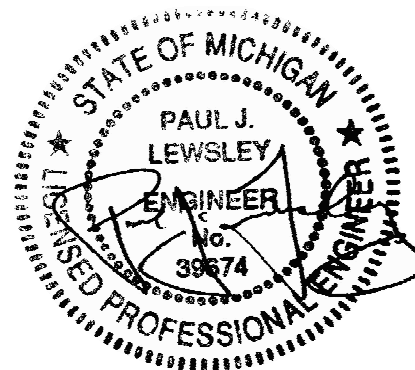
PROPERTY DESCRIPTION - (TAX I.D. 11-21-326-005)

PART OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 21, T.3N., R.7E., CHARTER TOWNSHIP OF HIGHLAND, OAKLAND COUNTY, MICHIGAN, BEING DESCRIBED AS:
BEGINNING AT A POINT DISTANT N.02°35'00"W. 947.06' FEET, ALONG THE NORTH AND SOUTH 1/4 LINE FROM THE SOUTH 1/4 CORNER OF SAID SECTION 21 TO A POINT ON THE NORTHERLY RIGHT OF WAY LINE OF M-59; THENCE ALONG SAID RIGHT OF WAY LINE S.61°47'08"W. 455.36 FEET; THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE 595.38 FEET ON A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 5,530.52 FEET, A CENTRAL ANGLE OF 06°10'05" AND A CHORD BEARING S.64°41'45"W. 595.10 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE 300.00 FEET ON A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 5,530.52 FEET, A CENTRAL ANGLE OF 03°06'29" AND CHORD BEARING S.69°19'53"W. 299.96 FEET; THENCE N.02°31'32"W. 291.17 FEET; THENCE S.72°00'58"W. 100.13 FEET; THENCE N.02°31'32"W. 410.43 FEET; THENCE N.87°28'28"E. 381.55 FEET; THENCE S.02°31'32"E. 581.51 FEET TO THE POINT OF BEGINNING; SAID DESCRIPTION CONTAINS 217,800 SQUARE FEET, OR 5.00 ACRES, MORE OR LESS.



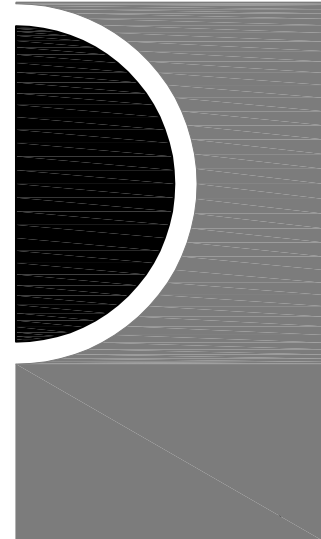
SHEET INDEX

- TS-1 OVERALL TOPOGRAPHIC SURVEY
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- C-2 SITE STORMWATER MANAGEMENT PLAN & DETAILS
- C-3 SITE UTILITIES PLAN
- C-4 SITE UTILITIES PROFILES
- C-5 SITE SEPTIC SYSTEM DETAILS
- C-6 SITE ENGINEERING DETAILS
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- WM-2 O.C.W.R.C. STANDARD WATER MAIN DETAILS
- WM-3 O.C.W.R.C. STANDARD WATER MAIN DETAILS



NOTE: PROPERTY BOUNDARY INFORMATION FROM SURVEY PREPARED BY HUBBELL, ROTH & CLARK, INC. DATED JUNE 4, 2019 AND PROVIDED BY CLIENT.

PARTNERS



PARTNERS in Architecture, PLC

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F 586.469.3607

Statement of Intellectual Property

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SOUTHFIELD, MICHIGAN 48075
PHONE: 248/424-9510
FAX: 248/424-2954
E-MAIL: pjewels@envengrs.com

KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

REVISED 03/20/20 - BID SET
BIDDING - CONSTRUCTION 03/27/2020
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REVISED 06/16/20 - CDD #1

DRAWN BY

CHECKED BY

APPROVED BY

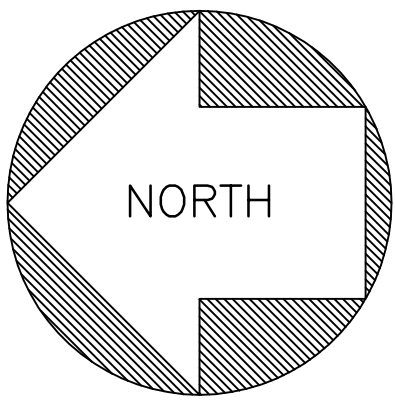
SHEET NAME

OVERALL TOPOGRAPHIC
SURVEY

SHEET NO.

TS-1

EE # 1946



SCALE
1"=30'



LEGEND

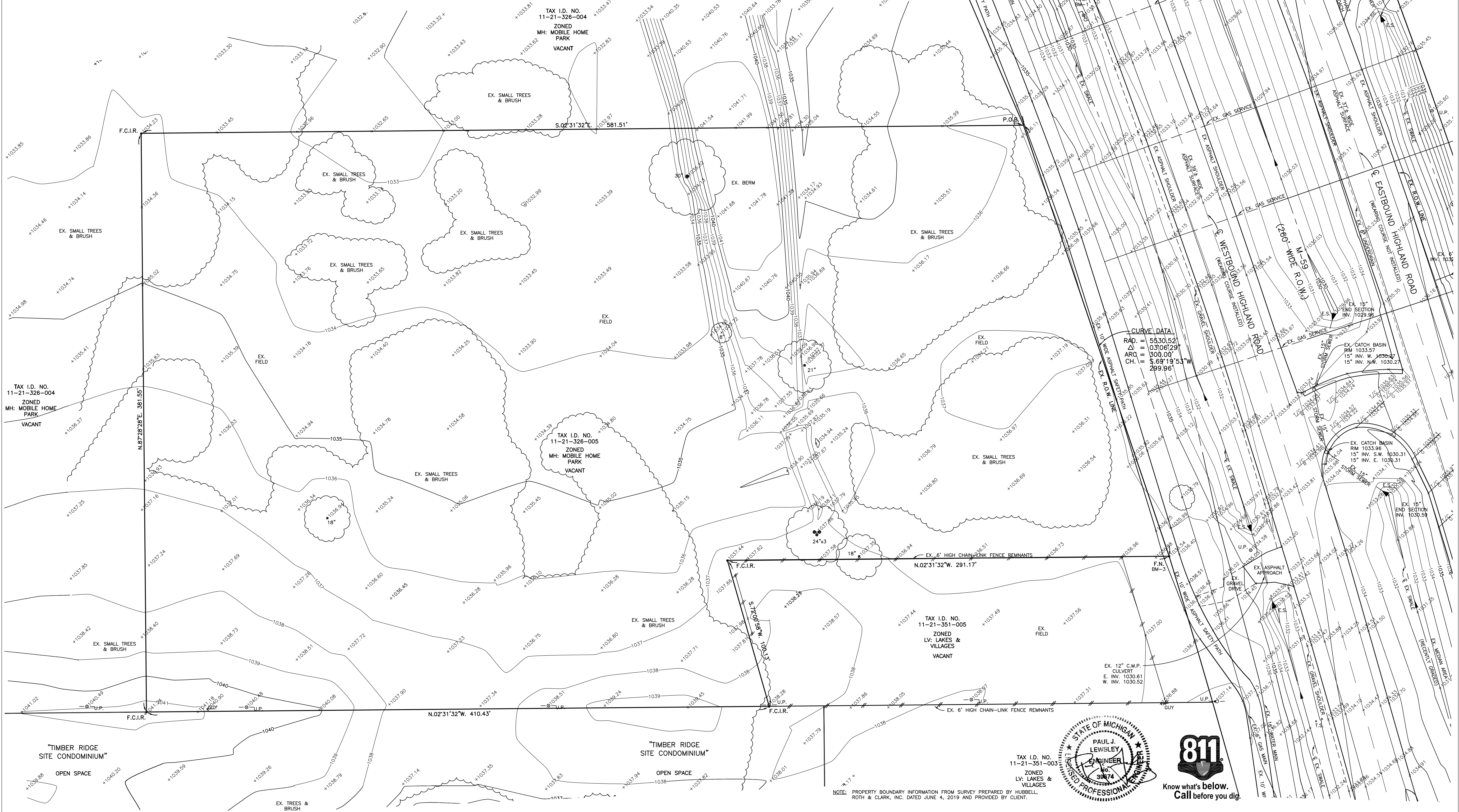
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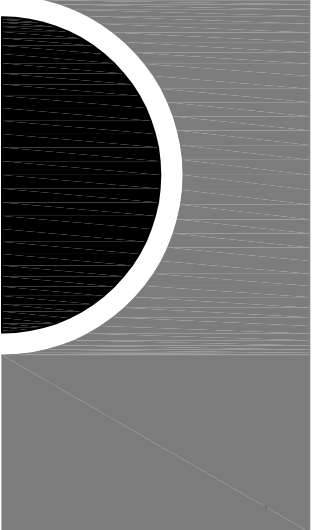
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REVISED 08/16/20 - CDD #1

DRAWN BY

CHECKED BY

APPROVED BY

SHEET NAME

SITE TOPOGRAPHIC
SURVEY

SHEET NO.

TS-1A

EE # 1946

SITE DATA

SITE AREA:
TOTAL PARCEL AREA: 217,800 SQ. FT. OR 5.00 ACRES

SITE ZONING CURRENT: MH (MOBILE HOME PARK)

PROPOSED BUILDING AREA: FIRST FLR. = 14,370 SQ. FT. TOTAL = 15,663 SQ. FT.

PROPOSED BUILDING HEIGHT: 42'-4"

PROPOSED BUILDING SETBACKS:
REQUIRED PROPOSED
FRONT (SOUTH) 100' MIN. 100.0' MIN.
NO OTHER SETBACKS ARE REQUIRED PER MH ZONING

PROPOSED SITE PARKING: 30 SPACES INCL. 2 B.F.

SITE FLOODPLAIN INFORMATION:
BASED ON THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NUMBER 26122C0300F, DATED SEPTEMBER 29, 2006 THE SUBJECT PROPERTY LIES WITHIN ZONE X,
AN AREA OUTSIDE THE ANNUAL 0.2% CHANCE FLOODPLAIN.

SITE LANDSCAPING:
A 20' GREENBELT IS REQUIRED ALONG HIGHLAND ROAD (M-59).

SITE WETLANDS INFORMATION:
NO M.D.E.Q. REGULATED WETLANDS EXIST ONSITE.

SITE SOILS INFORMATION:
THE SITE SOILS ARE PREDOMINATELY SANDY SOILS OVERLAIN BY 2" TO 11" OF SANDY TOPSOIL. PER PROJECT SOIL BORINGS.

SITE ENVIRONMENTAL INFORMATION:
THERE ARE NO KNOWN CONTAMINATED SITE AREAS. NO USE OR STORAGE OF HAZARDOUS MATERIALS, OTHER THAN NORMAL CLEANING PRODUCTS, IS ANTICIPATED.

TAX I.D. NO.
11-21-326-004
ZONED
MH: MOBILE HOME
PARK
VACANT

TAX I.D. NO.
11-21-326-005
ZONED
MH: MOBILE HOME
PARK
VACANT

TAX I.D. NO.
11-21-351-005
ZONED
LV: LAKES &
VILLAGES
VACANT

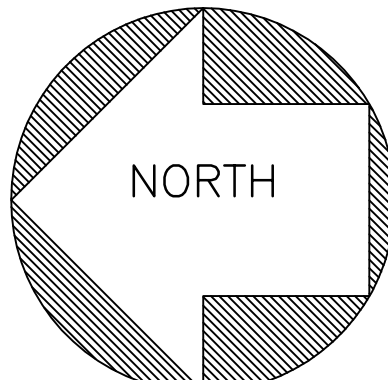
TAX I.D. NO.
11-21-351-003
ZONED
LV: LAKES &
VILLAGES
VACANT

NOTE: PROPERTY BOUNDARY INFORMATION FROM SURVEY PREPARED BY HUBBELL,
ROTH & CLARK, INC. DATED JUNE 4, 2019 AND PROVIDED BY CLIENT.

LOCATION MAP
SCALE: 1"=2000'

LEGEND

- 1025.00 - EXISTING ELEVATION
- +25.00 - PROPOSED ELEVATION (ADD 1000 FEET)
- 1025 - EXISTING CONTOUR
- 25 - PROPOSED CONTOUR (ADD 1000 FEET)
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- L.P. - LIGHT POLE
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- T.S. - TRAFFIC SIGN
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- F.I. - FOUND IRON
- F.M. - FOUND MONUMENT
- F.P.K. - FOUND P.K. NAIL
- F.I. - FOUND IRON
- F.C.I.R. - FOUND, CAPPED IRON ROD
- F.N. - FOUND NAIL



SCALE:
1"=40'



BENCH MARKS

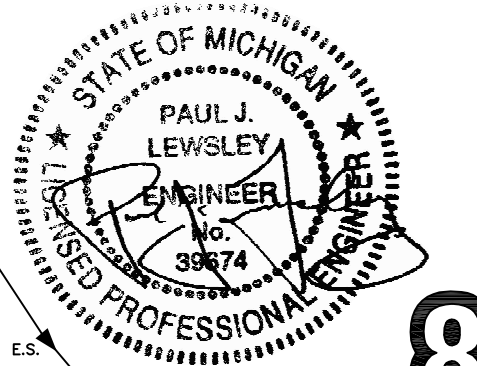
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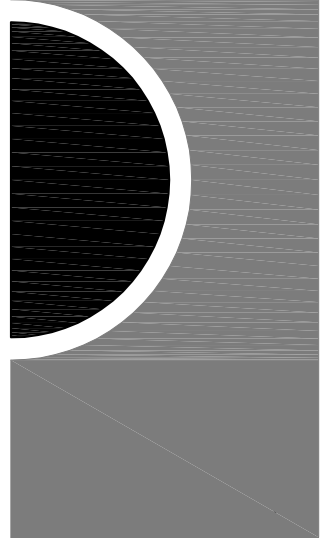
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KEY PLAN

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REVISED 02/18/20 - 70% CONSTRUCTION SET

REVISED 03/04/20 - PROGRESS SET

REVISED 03/20/20 - BID SET

BIDDING - CONSTRUCTION 03/27/2020

REVISED 04/20/20 - ADDENDUM NO. 1

CONSTRUCTION SET 05/04/2020

REVISED 06/16/20 - CDD #2

DRAWN BY

CHECKED BY

APPROVED BY

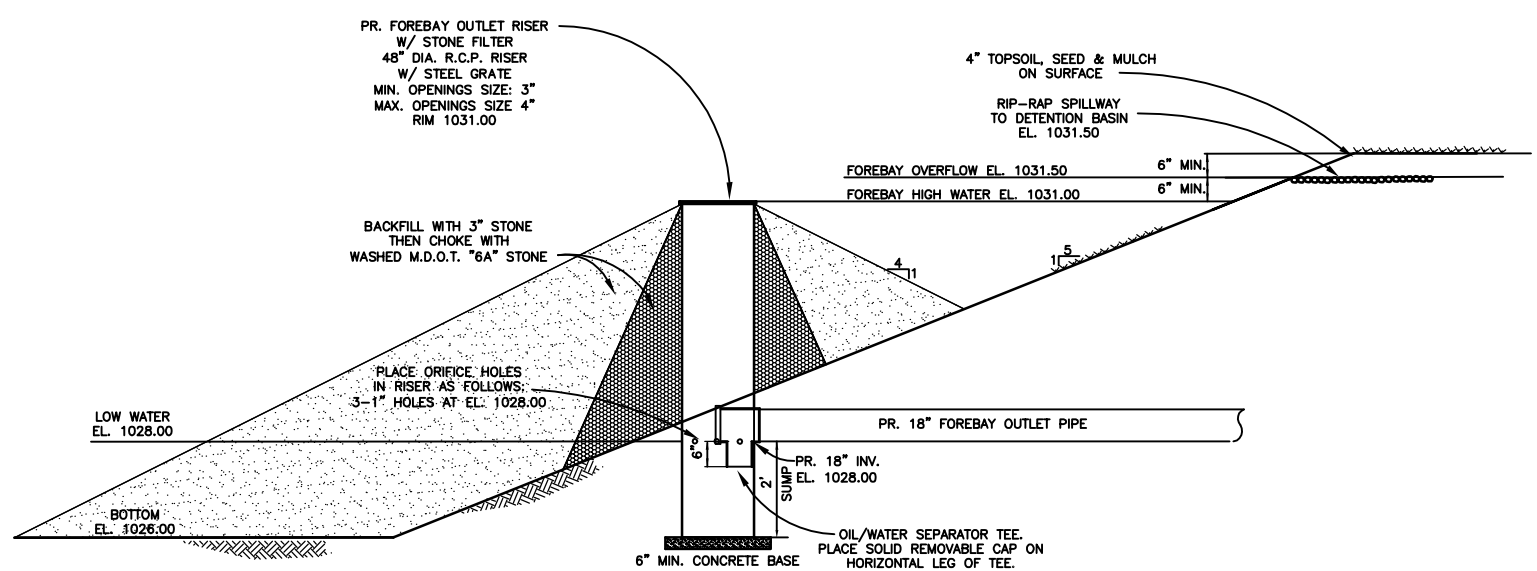
SHEET NAME

SITE LAYOUT PLAN

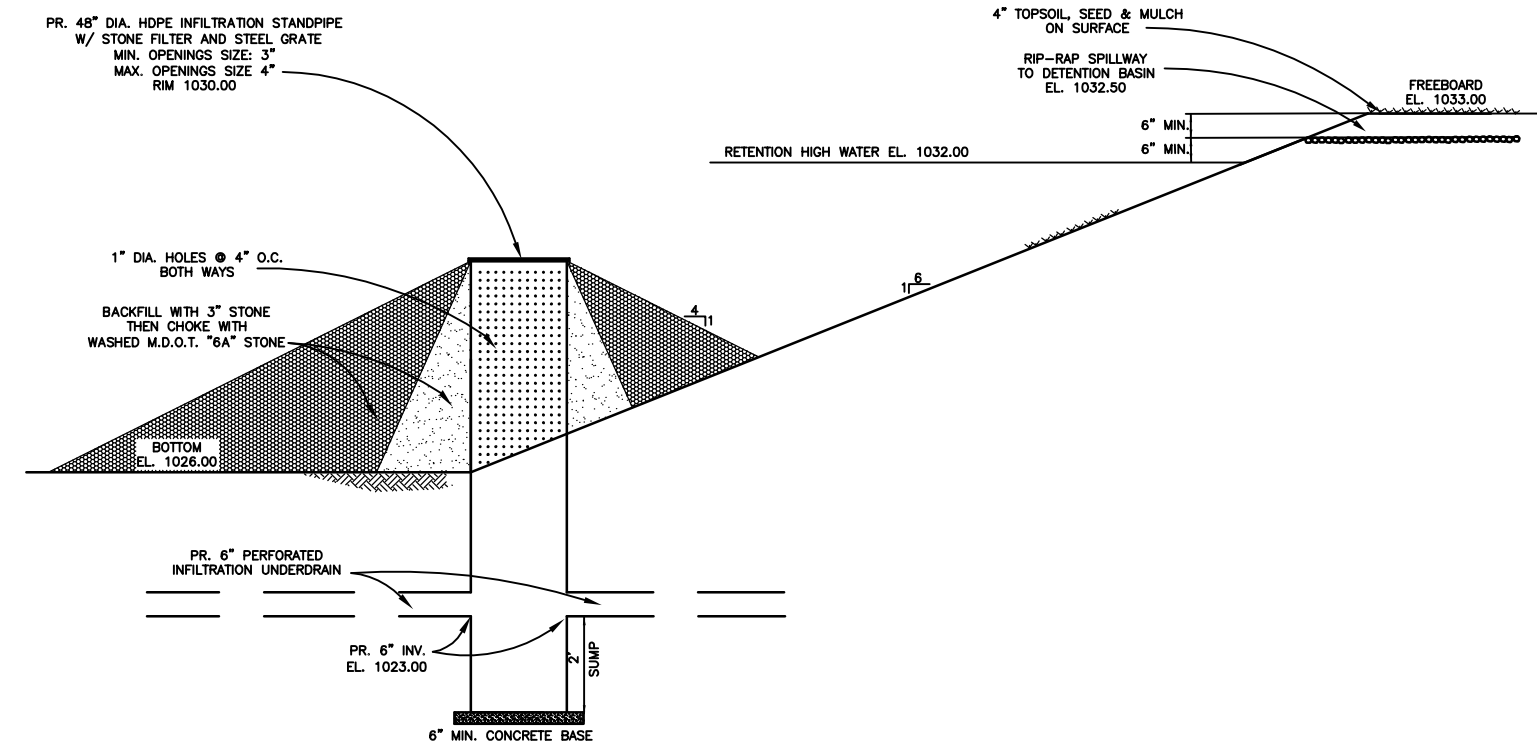
SHEET NO.

SP-1

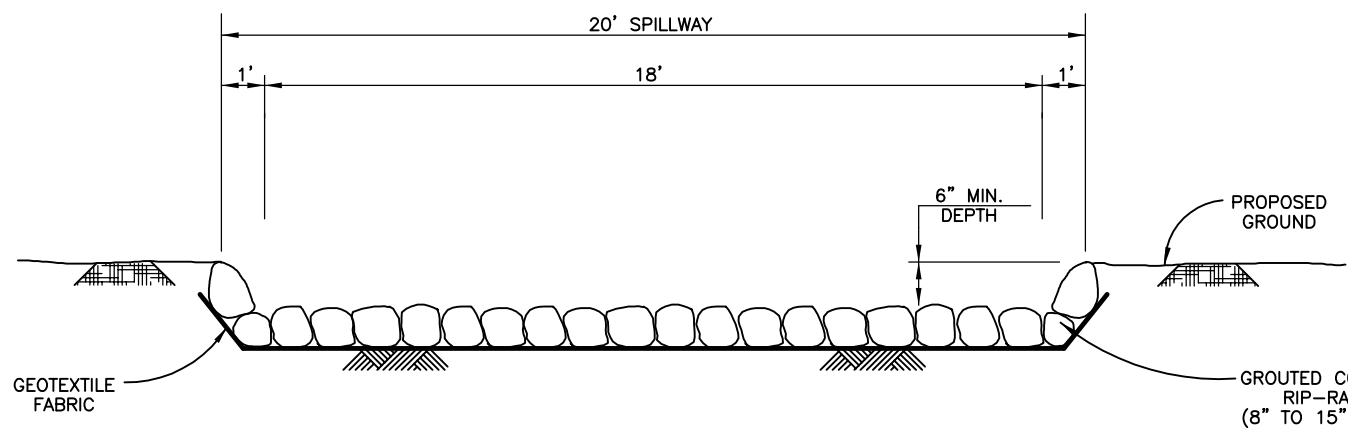
EE # 1946



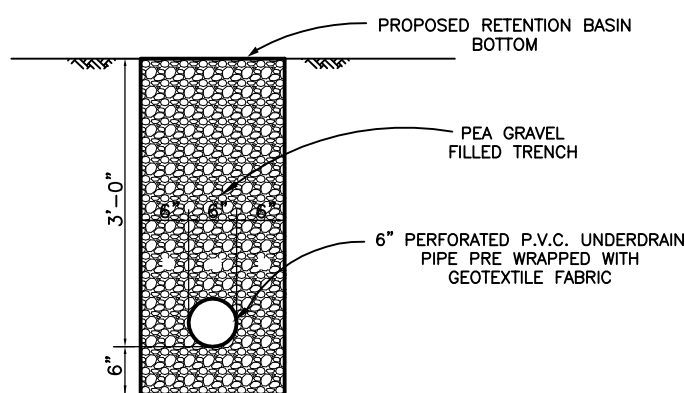
PROPOSED FOREBAY
OUTLET STRUCTURE DETAIL



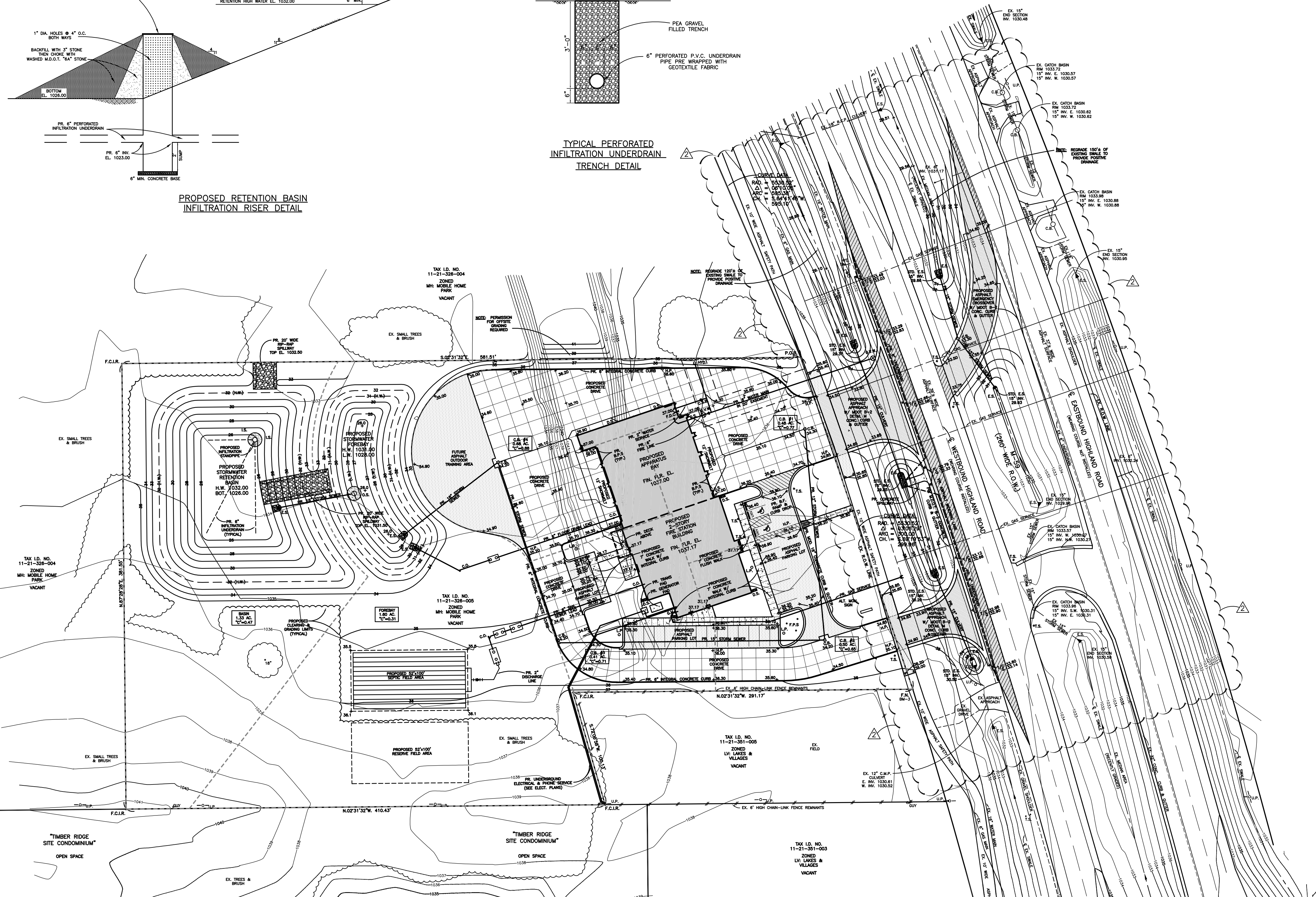
PROPOSED RETENTION BASIN
INFILTRATION RISER DETAIL



RIP-RAP OVERFLOW SPILLWAY
SECTION




TYPICAL PERFORATED
INFILTRATION UNDERDRAIN
TRENCH DETAIL



NOTE: PROPERTY BOUNDARY INFORMATION FROM SURVEY PREPARED BY HUBBELL,
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DRAINAGE STRUCTURE	TOTAL AREA (AC)	IMP. AREA (C=0.90)	PER. AREA (C=0.20)	WATER AREA (C=1.00)	WEIGHTED AVG. C-VALUE
C.B.#1	0.48	0.39	0.09	0.00	0.77
C.B.#2	0.50	0.32	0.18	0.00	0.65
C.B.#3	0.41	0.30	0.11	0.00	0.71
C.B.#4	0.68	0.66	0.02	0.00	0.88
O.S.#1	1.60	0.00	1.38	0.22	0.31
O.S.#2	1.33	0.00	0.88	0.45	0.47
	5.00	1.67	2.66	0.67	

Project <u>HIGHLAND TOWNSHIP FIRE STATION NO.1</u>															SHEET <u>1</u> OF <u>1</u>					
Project No. <u>1246</u>															Environmental engineers, Inc.					
Date <u>03/29/20</u> By <u>PAUL LEWISLEY</u>															Design for Storm Sewer Systems					
															q = CIA n = 0.013					
															T = 175					
															T Initial = 15 Minutes Maximum					
															Show formula					
From M.I. or D.P.#	To M.I. or D.P.#	Increment Acres "A"	Equivalent Area 100% Acres CA	Total Area 100% Acres CA	T. Time Min.	L Inches per hour	Q. c.f.s.	Diameter of pipe ft.	Slope Pipe ft./ft.	Slope H.G.	Length of line ft.	Velocity ft./ sec.	Time of flow min.	Capacity of sewer c.f.s.	H.G. elevation upper end	Ground Elevation Upper end	Lower end	Invert Elevation Upper end	Lower end	
C.B.#1	C.B.#2	0.48	0.77	0.37	0.37	15.00	4.38	1.62	12"	0.0032	0.0021	182	2.5	1.21	1.95	1031.21	1034.30	1034.20	1030.80	1030.22
C.B.#2	C.B.#3	0.50	0.65	0.33	0.70	16.21	4.25	2.98	15"	0.0028	0.0021	229	2.8	1.35	3.15	1030.83	1034.20	1034.20	1030.02	1029.38
C.B.#3	C.B.#4	0.41	0.71	0.29	0.99	17.57	4.11	4.07	15"	0.0040	0.0040	163	3.3	0.82	0.49	1030.35	1034.20	1034.20	1029.38	1028.73
C.B.#4	FOREBAY	0.68	0.88	0.60	1.59	18.39	4.03	6.41	18"	0.0040	0.0037	102	3.8	0.45	6.64	1029.70	1034.20	—	1028.53	1028.12
FOREBAY	RET. BASIN	1.60	0.31	0.50	2.09	18.84	3.99	8.34	18"	0.0080	0.0063	92	5.3	0.29	9.40	1029.04	1031.00	—	1028.00	1027.26
															1028.46					

SITE STORMWATER RETENTION BASIN DESIGN CALCULATIONS

USE O.C.W.R.C. METHOD TO DETERMINE REQUIRED SITE RETENTION VOLUME BASED ON
100 YEAR FREQUENCY STORM AND PROVIDE FOREBAY AREA WITH CAPACITY FOR SITE
1 YR. STORM VOLUME WHICH IS TO DISCHARGE OVER A 24 HOUR PERIOD. THE
TRIBUTARY AREA FOR THE PROPOSED RETENTION BASIN IS 5.00 ACRES. THE
AVERAGE SITE RUNOFF COEFFICIENT "C" IS 0.54 AS CALCULATED BELOW.

PROPOSED WEIGHTED "C" VALUE

LAND USE	AREA (A) (ACRES)	RUNOFF COEFFICIENT (C)	C = I(AwC)/A
IMPERVIOUS	1.67	0.90	C = RUNOFF COEFFICIENT
PERVIOUS	0.20	0.20	A = DRAINAGE AREA
WATER	0.67	1.00	C = (1.67x0.90+2.66x0.20+0.67x1.00)
	5.00		C = 0.54

100 YR. FREQUENCY STORM RETENTION VOLUME REQUIRED:

V₁₀₀ = 2(16,500)(A)(C) WHERE:
V₁₀₀ = 2(16,500)(5.00)(0.54) V = VOLUME REQUIRED
V₁₀₀ = 89,100 CU. FT. A = TRIBUTARY AREA ACRAGE
C = AVERAGE SITE RUNOFF COEFFICIENT
RETENTION VOLUME REQUIRED: 89,100 CU. FT.

PRETREATMENT VOLUME REQUIRED

1 YR. STORM = 4,320(A)(C)
1 YR. STORM = 4,320(A)(C) = 4,320(5.00)(0.54)
1 YR. STORM = 4,320(A)(C) = 11,664 CU. FT.
PRETREATMENT VOLUME REQUIRED: 11,664 CU. FT.

PROPOSED FOREBAY VOLUME PROVIDED

CONTOUR	AREA BELOW CONTOUR	AVERAGE AREA	DEPTH INTERVAL	VOLUME BETWEEN CONTOURS	CUMULATIVE VOLUME
1028.0 (L.W.)	2,371 S.F.	3,123 S.F. x 1.00 FT.	=	3,123 CU. FT.	3,123 CU. FT.
1029.0	5,975 S.F.	4,724 S.F. x 1.00 FT.	=	4,724 CU. FT.	7,847 CU. FT.
1030.0	5,573 S.F.	6,511 S.F. x 1.00 FT.	=	6,511 CU. FT.	14,358 CU. FT.
1031.0 (H.W.)	7,449 S.F.	8,501 S.F. x 1.00 FT.	=	8,501 CU. FT.	22,859 CU. FT.
1032.0	5,553 S.F.				

FOREBAY VOLUME PROVIDED = 22,859 CU. FT.

PROPOSED RETENTION BASIN VOLUME PROVIDED

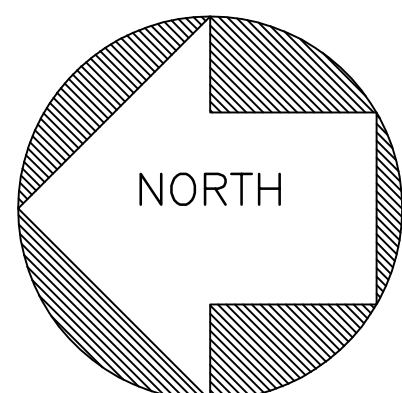
CONTOUR	AREA BELOW CONTOUR	AVERAGE AREA	DEPTH INTERVAL	VOLUME BETWEEN CONTOURS	CUMULATIVE VOLUME
1025.0 (BOT.)	4,677 S.F.	5,637 S.F. x 1.00 FT.	=	5,637 CU. FT.	5,637 CU. FT.
1026.0	6,998 S.F.	7,679 S.F. x 1.00 FT.	=	7,679 CU. FT.	13,316 CU. FT.
1027.0	11,272 S.F.	10,917 S.F. x 1.00 FT.	=	10,917 CU. FT.	24,233 CU. FT.
1028.0	14,064 S.F.	12,668 S.F. x 1.00 FT.	=	12,668 CU. FT.	36,901 CU. FT.
1029.0	17,169 S.F.	15,617 S.F. x 1.00 FT.	=	15,617 CU. FT.	51,518 CU. FT.
1030.0 (H.W.)	20,601 S.F.	18,885 S.F. x 1.00 FT.	=	18,885 CU. FT.	70,503 CU. FT.

TOTAL STORAGE VOLUME PROVIDED IN RETENTION BASIN & FOREBAY:
22,859 + 70,503 = 93,362 CU. FT.

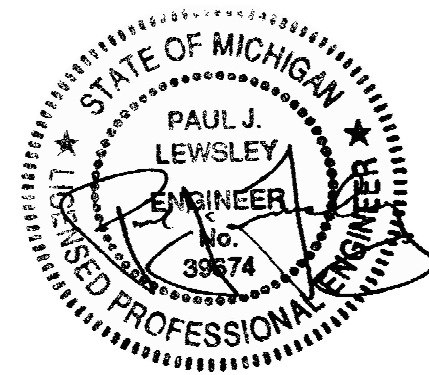
FOREBAY OUTLET RESTRICTOR SIZING CALCULATIONS

Q_{avg} = V₁ / T₁ = (24x400)(60/3600)
Q_{avg} = 11,664/86,400 = 0.135 CFS
T₁ = 0.667(T₂ - T₀)
T₁ = 0.667(1031.00 - 1028.00)
T₁ = 2.00 FT.
A₀ = Q_{avg} / (0.62 x 2xg_{avg})
A₀ = 0.135 / (0.62 x 2x32.2)(2.00)
A₀ = 0.0192
A₀ = AREA OF A 1" HOLE (0.00545 FT²)
REQUIRED NUMBER OF 1-INCH HOLES = 0.0144/0.00545 = 3.52
USE 3-1" HOLES AT EL. 1028.00
A₀ = AREA OF A 3-1" HOLES = 3x0.00545
A₀ = 0.0164 FT²
Q_{avg} = 0.62A₀x 2xg_{avg}
Q_{avg} = 0.62x0.0164x32.2x2.00
Q_{avg} = 0.115 CFS
T₁ = V₁ / Q_{avg} = 11,664/0.115x3,600
T₁ = 11,664/(0.115x3,600)
T₁ = 28.17 HR OR APPROXIMATELY 24 HOURS

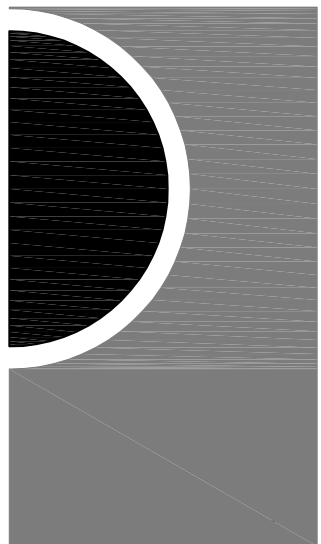
LEGEND



- EXISTING ELEVATION
- PROPOSED ELEVATION (ADD 1000 FEET)
- EXISTING CONTOUR
- PROPOSED CONTOUR (ADD 1000 FEET)
- U.P. - UTILITY POLE
- L.P. - LIGHT POLE
- GUY - GUY WIRE
- T.S. - TRAFFIC SIGN
- W.S.O. - WATER SHUT-OFF
- G.S.O. - GAS SHUT-OFF
- A.M. - AMERITECH MARKER
- A.P. - AMERITECH PEDESTAL
- F.I. - FOUND IRON
- F.M. - FOUND MONUMENT
- F.P.K. - FOUND P.K. NAIL



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KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

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CONSTRUCTION SET 05/04/2020
REVISED 06/16/20 - CDD #2

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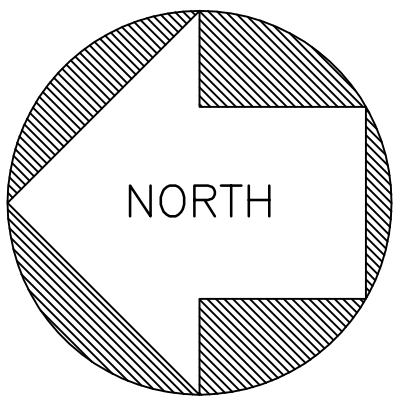
SHEET NAME

SITE STORMWATER
MANAGEMENT PLAN
& DETAILS

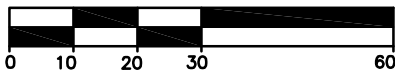
SHEET NO.

C-2

EE # 1946



SCALE
1"=30'



LEGEND

- + 1025.00— EXISTING ELEVATION
- + 25.00— PROPOSED ELEVATION (ADD 1000 FEET)
- 1025— EXISTING CONTOUR
- 25— PROPOSED CONTOUR (ADD 1000 FEET)
- U.P.— UTILITY POLE
- L.P.— LIGHT POLE
- GUY— GUY WIRE
- T.S.— TRAFFIC SIGN
- W.S.O.— WATER SHUT-OFF
- G.S.O.— GAS SHUT-OFF
- A.M.— AMERITECH MARKER
- A.P.— AMERITECH PEDESTAL
- F.I.— FOUND IRON
- F.C.I.R.— FOUND CAPPED IRON ROD
- F.N.— FOUND NAIL

PROPERTY DESCRIPTION — (TAX I.D. No. 11-21-326-005)

PART OF THE EAST 1/2 OF THE SOUTHWEST 1/4 OF SECTION 21, T.3N., R.7E., CHARTER TOWNSHIP OF HIGHLAND, OAKLAND COUNTY, MICHIGAN, BEING DESCRIBED AS: BEGINNING AT A POINT DISTANT N.02°35'00"W. 947.06 FEET, ALONG THE NORTH AND SOUTH 1/4 LINE FROM THE SOUTH 1/4 CORNER OF SAID SECTION 21 TO A POINT ON THE NORTHERLY RIGHT OF WAY LINE OF M-59; THENCE ALONG SAID RIGHT OF WAY LINE S.61°47'08"W. 455.36 FEET; THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE 595.38 FEET ON A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 5,530.52 FEET, A CENTRAL ANGLE OF 08°10'05" AND A CHORD BEARING S.64°41'45"W. 595.10 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE 300.00 FEET ON A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 5,530.52 FEET, A CENTRAL ANGLE OF 03°06'29" AND CHORD BEARING S.69°19'53"W. 299.96 FEET; THENCE N.02°31'32"W. 291.17 FEET; THENCE S.72°00'58"W. 100.13 FEET; THENCE N.02°31'32"W. 410.43 FEET; THENCE N.87°28'28"E. 381.55 FEET; THENCE S.02°31'32"E. 581.51 FEET TO THE POINT OF BEGINNING. SAID DESCRIPTION CONTAINS 217.80 SQUARE FEET, OR 5.00 ACRES, MORE OR LESS.

BENCH MARKS

- B.M.-1 ARROW ON HYDRANT LOCATED ON THE NORTH SIDE OF HIGHLAND ROAD 61'± SOUTH AND 53'± EAST OF THE SOUTHEAST PROPERTY CORNER ELEVATION 1035.51 U.S.G.S. DATUM
- B.M.-2 ARROW ON HYDRANT LOCATED ON THE NORTH SIDE OF HIGHLAND ROAD AT THE SOUTHEAST CORNER OF "TIMBER RIDGE SITE CONDOMINIUM" ELEVATION 1038.98 U.S.G.S. DATUM
- B.M.-3 FOUND NAIL IN SAFETY PATH AT THE SOUTHWEST PROPERTY CORNER ELEVATION 1036.54 U.S.G.S. DATUM

CONSTRUCTION NOTES

- ALL SITE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF HIGHLAND TOWNSHIP.
- ALL CONSTRUCTION WITHIN HIGHLAND ROAD (M-59) RIGHT-OF-WAY SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF MICHIGAN DEPARTMENT OF TRANSPORTATION. A M.D.O.T. PERMIT IS REQUIRED.
- ALL SOIL EROSION AND SILT MUST BE CONTROLLED AND CONTAINED ON-SITE. A SOIL EROSION CONTROL PERMIT IS REQUIRED FROM THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER'S OFFICE AND A N.P.D.E.S. PERMIT IS REQUIRED FROM THE M.D.E.C. THE DISTURBED AREA OF THE SITE WILL BE 4.74 ACRES. THE SITE SOILS ARE PREDOMINANTLY SANDY SOILS OVERLAIN BY 2" TO 11" OF SANDY TOPSOIL. PER PROJECT SOIL BORINGS, THE PROPOSED CONSTRUCTION AREA SHALL BE CLEARED AND STRIPPED OF ALL TOPSOIL PRIOR TO THE START OF MASS GRADING OR UTILITIES WORK. ALL SITE FILLING UNDER OR WITHIN A 1 ON 1 INFLUENCE OF EXISTING OR PROPOSED BUILDING OR PAVEMENT AREAS SHALL UTILIZE CLEAN SOIL, FREE OF ANY VEGETATION OR ORGANIC MATERIALS. ALL FILL SHALL BE PLACED IN 8" MAXIMUM LIFTS AND COMPACTED TO 95% OF MAXIMUM DENSITY PER MODIFIED PROCTOR TEST. ALL DISTURBED UNPAVED AREAS TO BE STABILIZED WITH 4" MINIMUM TOPSOIL, SEED AND MULCH (OR SOO) AS SOON AS FINAL GRADING IS COMPLETE.
- ALL UTILITIES EXCAVATION UNDER OR WITHIN 1 ON 1 INFLUENCE OF EXISTING OR PROPOSED PAVEMENT AREAS SHALL HAVE COMPACTED M.D.O.T. CL#1 SAND BACKFILL. ALL PROPOSED WATER MAIN AND FIRE LINE CONSTRUCTION SHALL BE DUCTILE IRON CLASS 54 PIPE, SHALL HAVE 5.5 FEET MINIMUM COVER AND SHALL BE IN ACCORDANCE WITH OAKLAND COUNTY STANDARD DETAILS. AN E.G.L.E. PERMIT IS REQUIRED FOR THE PROPOSED PUBLIC WATER MAIN CONSTRUCTION.
- ALL PROPOSED SANITARY SEWER LEAD CONSTRUCTION SHALL BE 6" P.V.C. SDR 23.5 PIPE, AN E.G.L.E. PERMIT IS NOT REQUIRED FOR THE PROPOSED SANITARY SEWER LEAD CONSTRUCTION.
- ALL PROPOSED STORM SEWER CONSTRUCTION SHALL BE PERFORATED ADS HP STORM SEWER PIPE WRAPPED WITH GEOTEXTILE FABRIC (UNLESS OTHERWISE NOTED). SHALL HAVE M.D.O.T. CL#1 BEDDING AND SHALL BE IN ACCORDANCE WITH HIGHLAND TOWNSHIP STANDARD DETAILS. ALL LOW POINT DRAINAGE STRUCTURES WITHIN PAVEMENT AREAS SHALL HAVE 8"X8" CONCRETE APRONS AND 10"-4" P.V.C. BLEEDER DRAIN IN A TIE-GRAD TRENCH IN FOUR DIRECTIONS FROM THE STRUCTURE. ALL PROPOSED GRADES SHOWN WITHIN PAVEMENT AREAS ARE FINISHED PAVEMENT GRADES. PAVEMENT PERIMETERS TO HAVE INTEGRAL CONCRETE CURB, MODIFIED M.D.O.T. 1-2 CONCRETE CURB AND GUTTER OR CONCRETE WALK WITH INTEGRAL CURB AS SHOWN ON PLAN.
- PROPOSED ON-SITE ASPHALT PAVEMENT TO BE:
1-1/2" M.D.O.T. NO. 13A BITUMINOUS WEARING COURSE ON
1-1/2" M.D.O.T. NO. 32 BITUMINOUS LOCKING COURSE ON
8" M.D.O.T. NO. 21AA AGGREGATE BASE
PROPOSED ON-SITE CONCRETE PAVEMENT TO BE:
7" M.D.O.T. P-1 PLAN CONCRETE PAVEMENT ON
8" M.D.O.T. NO. 21AA AGGREGATE BASE

TAX I.D. NO.
11-21-326-004

ZONED
MH: MOBILE HOME
PARK

VACANT

TAX I.D. NO.
11-21-326-005

ZONED
MH: MOBILE HOME
PARK

VACANT

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ZONED
MH: MOBILE HOME
PARK

VACANT

PROPOSED STORM SEWER STRUCTURE COORDINATE LIST	
17	N. 5101.71 E. 5312.78
18	N. 5078.38 E. 5132.74
19	N. 5306.20 E. 5122.40
20	N. 5363.44 E. 5275.15
21	N. 4973.43 E. 5394.56
22	N. 5485.70 E. 5244.14
23	N. 5572.26 E. 5267.18
24	N. 5441.99 E. 5199.75
25	N. 5432.11 E. 5199.75
26	N. 5551.13 E. 5229.33
27	N. 5061.90 E. 5396.27
28	N. 5018.02 E. 5275.22
29	N. 4985.95 E. 5192.48
30	N. 4951.69 E. 5120.19
31	N. 4990.66 E. 5447.77
32	N. 4939.95 E. 5353.57
33	N. 5258.14 E. 5232.57
34	N. 5360.12 E. 5194.10
35	N. 5368.54 E. 5190.92
36	N. 5393.73 E. 5181.42

PROPOSED WATER MAIN FITTING COORDINATE LIST	
1	N. 5045.62 E. 5375.43
2	N. 5182.35 E. 5324.22
3	N. 5186.91 E. 5336.32
4	N. 5198.10 E. 5365.98
5	N. 5184.22 E. 5323.52
6	N. 5188.90 E. 5321.77
7	N. 5202.57 E. 5316.65
8	N. 5191.60 E. 5334.57
9	N. 5213.07 E. 5326.53
10	N. 5361.61 E. 5127.23
11	N. 5362.57 E. 5113.60
12	N. 5357.99 E. 5103.44
13	N. 5352.67 E. 5108.15

PROPOSED SANITARY SEWER STRUCTURE COORDINATE LIST	
1	N. 5236.21 E. 5174.54
2	N. 5338.22 E. 5113.60
3	N. 5347.58 E. 5132.52
4	N. 5352.67 E. 5130.76
5	N. 5361.61 E. 5127.23
6	N. 5362.57 E. 5113.60
7	N. 5357.99 E. 5103.44
8	N. 5352.67 E. 5108.15

PROPOSED R.O.W. STORM SEWER QUANTITIES

- 113 L.F. - 15" R.C.P. C76 CL IV STORM SEWER
- 200 L.F. - 15" R.C.P. C76 CL IV CULVERT
- 1 EA. - STD. 4" DIA. LOWHEAD CATCH BASIN
- 1 EA. - STD. 15" CONC. END SECTION
- 1 EA. - STD. 18" H.D.P.E. END SECTION
- 1 EA. - STD. 1000 GAL. OIL/WATER SEPARATOR

PROPOSED SITE SANITARY SEWER QUANTITIES

- 129 L.F. - 6" P.V.C. SDR 23.5 SANITARY SEWER LEAD
- 1,344 L.F. - 3" P.V.C. DRAIN FIELD PIPE
- 30 L.F. - 2" P.V.C. SCH 40 SANITARY SEWER FORCEMAIN
- 2 EA. - STD. 15" CONC. SEPTIC TANK
- 1 EA. - STD. 1475 GAL. SEPTIC TANK
- 1 EA. - STD. 1500 GAL. TWO COMPARTMENT DOSING TANK
- 1 EA. - STD. 1500 GAL. TWO COMPARTMENT DOSING TANK

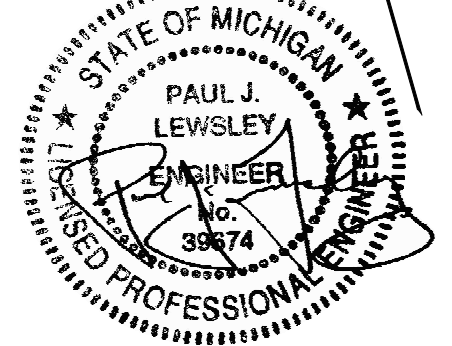
PROPOSED SITE PUBLIC WATER MAIN QUANTITIES

- 193 L.F. - 8" D.I. CL. 54" WATER MAIN
- 1 EA. - STD. 16"X8" TAPPING SLEEVE, GATE VALVE & WELL
- 1 EA. - STD. HYDRANT ASSEMBLY

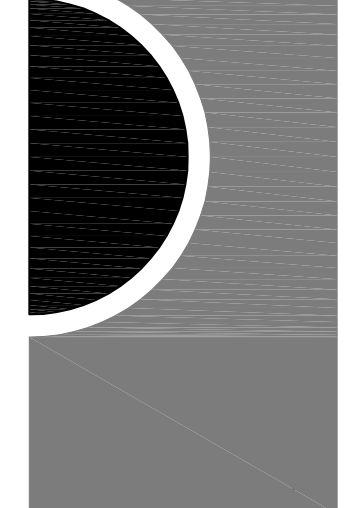
PROPOSED SITE WATER SERVICE QUANTITIES

- 28 L.F. - 2" TYPE "K" COPPER WATER SERVICE
- 20 L.F. - 6" D.I. CL. 54" FIRE LINE
- 1 EA. - STD. 6" GATE VALVE & WELL
- 1 EA. - STD. 2" CURB STOP & BOX

NOTE: PROPERTY BOUNDARY INFORMATION FROM SURVEY PREPARED BY HUBBELL, ROTH & CLARK, INC. DATED JUNE 4, 2019 AND PROVIDED BY CLIENT.



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E-MAIL: jplewley@envengrs.com

KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

- REVISED 02/18/20 - 70% CONSTRUCTION SET
- REVISED 03/04/20 - PROGRESS SET
- REVISED 03/20/20 - BID SET
- BIDDING - CONSTRUCTION 03/27/2020
- REVISED 04/20/20 - ADDENDUM No. 1
- CONSTRUCTION SET 05/04/2020
- REVISED 06/16/20 - CDD #2

DRAWN BY

CHECKED BY

APPROVED BY

SHEET NAME

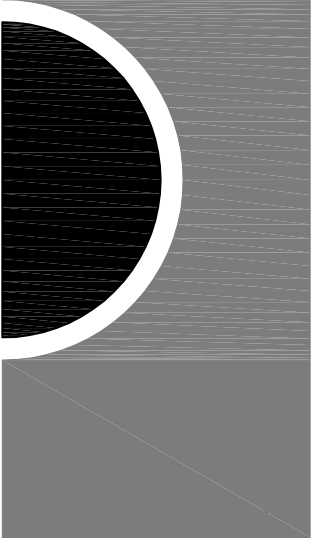
SITE UTILITIES PLAN

SHEET NO.

C-3

EE # 1946

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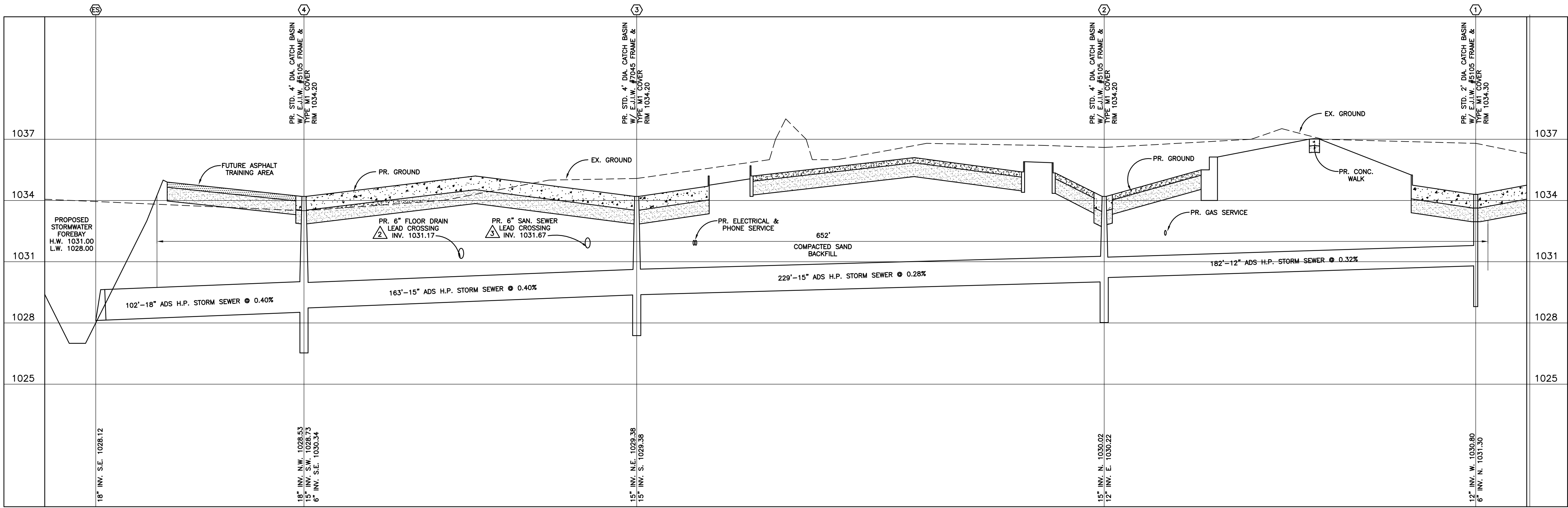
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SITE UTILITIES PROFILES

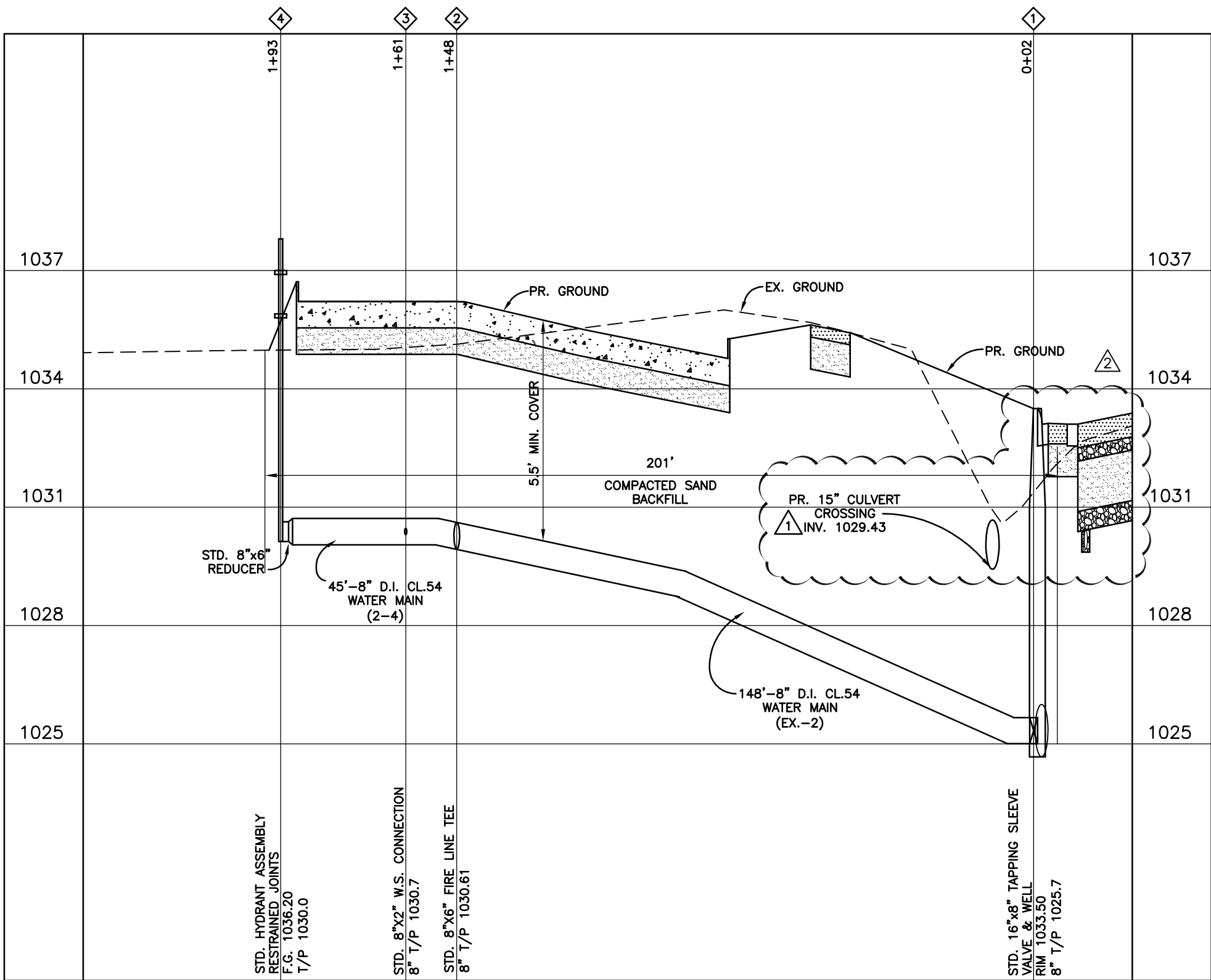
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C-4

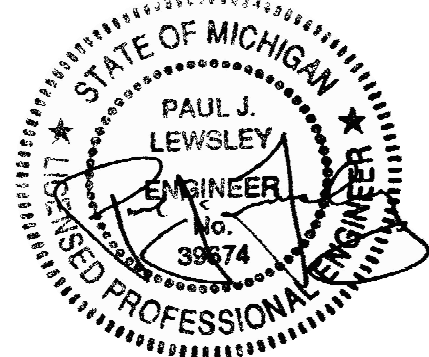
EE # 1946



STORM SEWER PROFILE
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



WATER MAIN PROFILE
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



Know what's below.
Call before you dig.

MINIMUM MERGING TAPER LENGTH "L" (FEET)										
OFFSET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
FEET	25	30	35	40	45	50	55	60	65	70
1	10	15	20	27	45	50	55	60	65	70
2	21	30	41	53	90	100	110	120	130	140
3	31	45	61	80	135	150	165	180	195	210
4	42	60	82	107	180	200	220	240	260	280
5	52	75	102	133	225	250	275	300	325	350
6	63	90	123	160	270	300	330	360	390	420
7	73	105	143	187	315	350	385	420	455	490
8	83	120	163	213	360	400	440	480	520	560
9	94	135	184	240	405	450	495	540	585	630
10	104	150	204	267	450	500	550	600	650	700
11	115	165	225	293	495	550	605	660	715	770
12	125	180	245	320	540	600	660	720	780	840
13	135	195	266	347	585	650	715	780	845	910
14	146	210	286	374	630	700	770	840	910	980
15	157	225	307	400	675	750	825	900	975	1050

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

$L = \frac{W \cdot S^2}{1.47 \cdot V}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR LESS

$L = \frac{S \cdot V}{1.47}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER
S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
W = WIDTH OF OFFSET

TABLES FOR "L", "D" AND "B" VALUES

DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D" AND LENGTH OF LONGITUDINAL BUFFER SPACE ON WHERE WORKERS PRESENT SEQUENCES										
"D" DISTANCES (D FEET)	25	30	35	40	45	50	55	60	65	70
POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE "B"										
SPEED MPH	20	30	35	40	45	50	55	60	65	70
LENGTH FEET	20	33	37	42	47	52	57	62	67	72

1. BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE, PORTION OF STOPPING DISTANCE FOR 45 MPH AND LOWER PASSENGER VEHICLE POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS, AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

2. POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

3. BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE, PORTION OF STOPPING DISTANCE FOR 45 MPH AND LOWER PASSENGER VEHICLE POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS, AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

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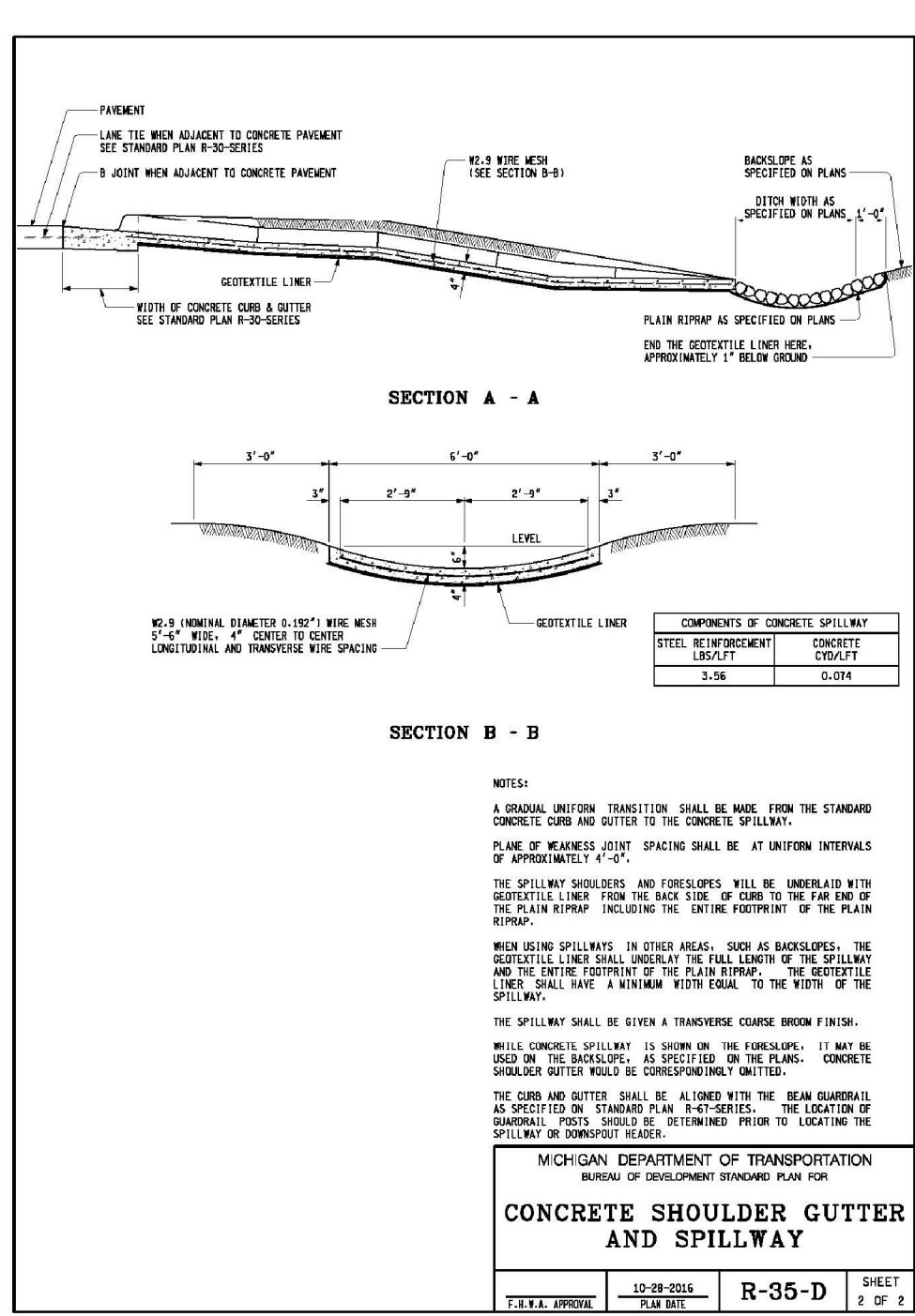
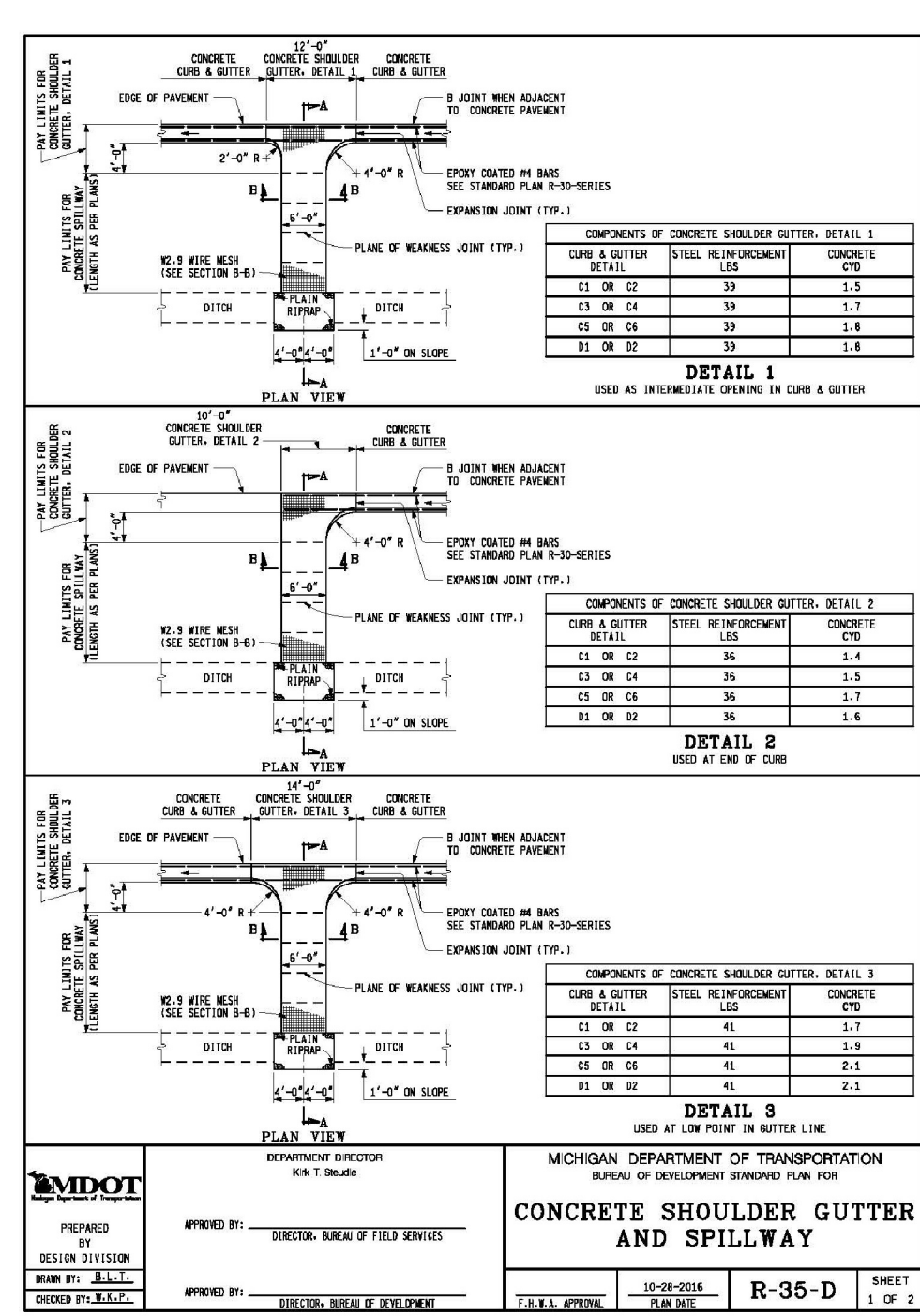
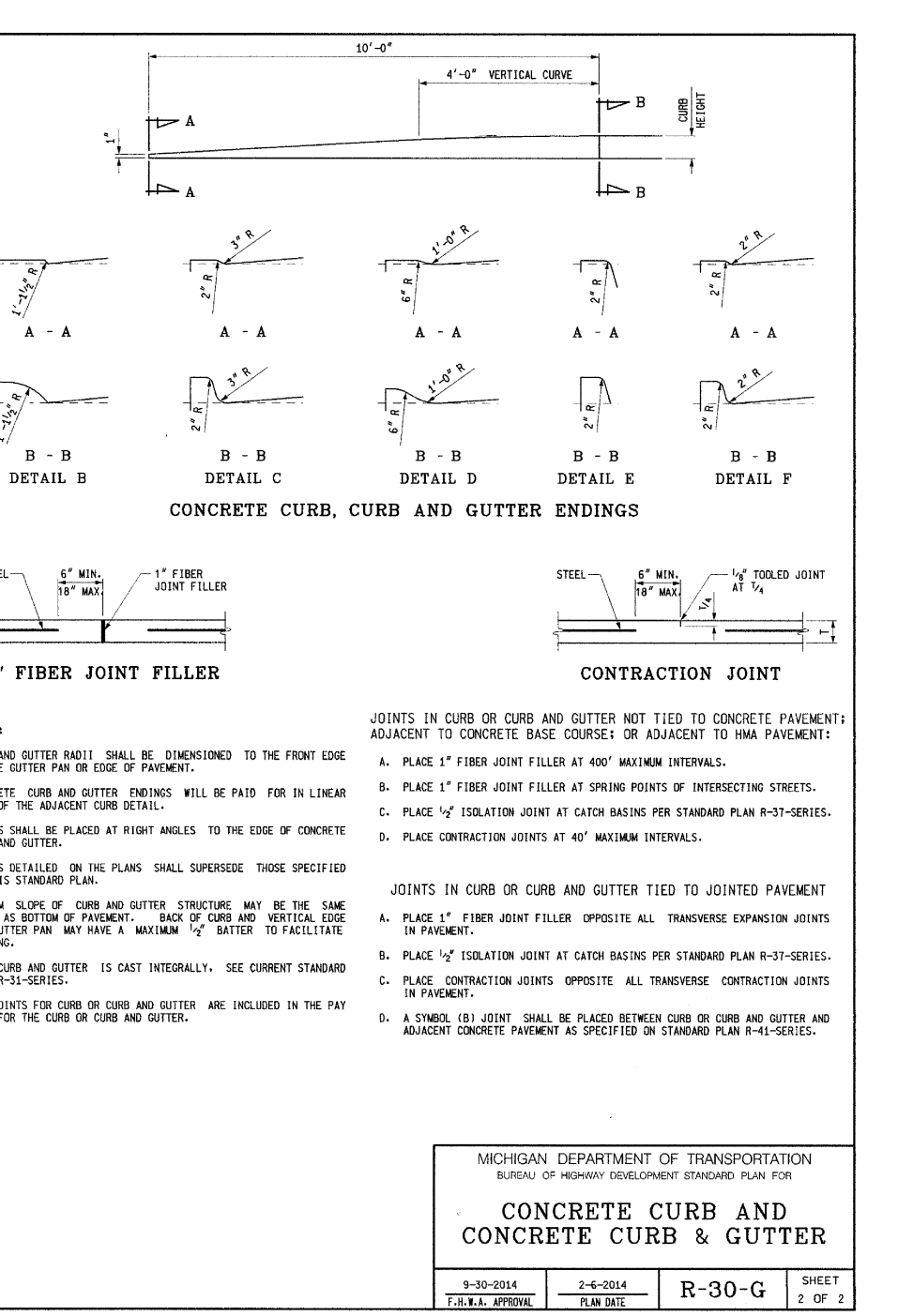
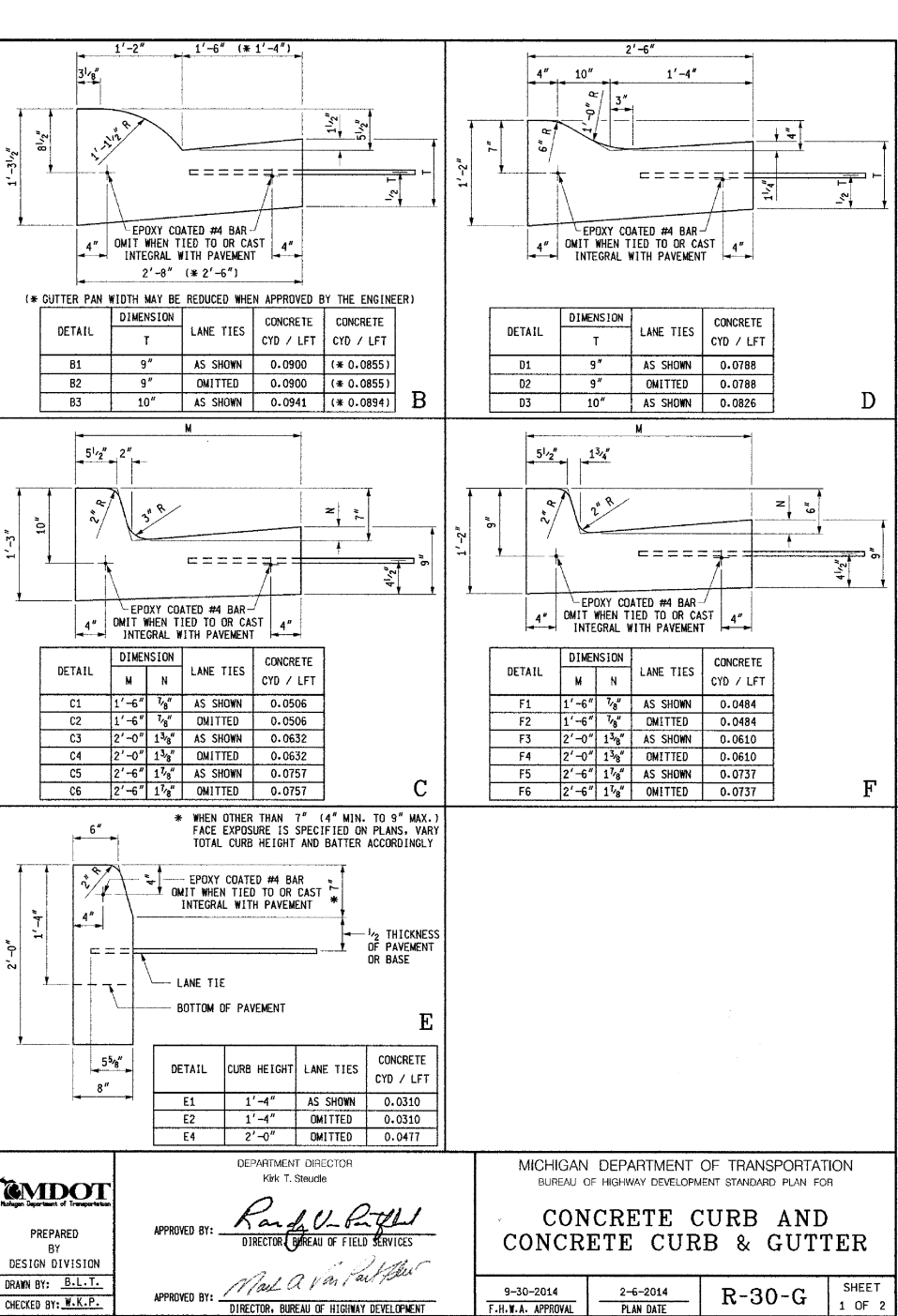
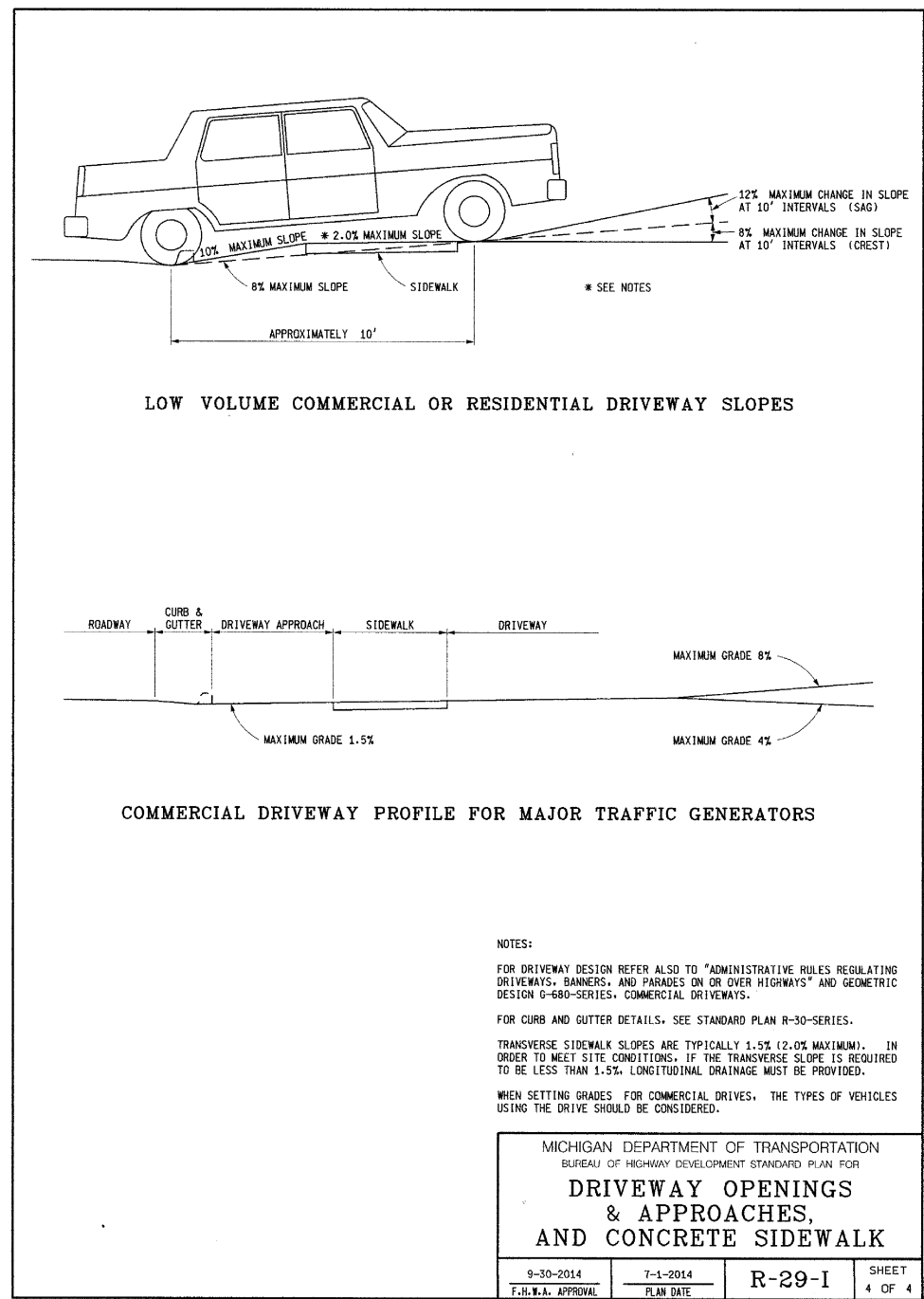
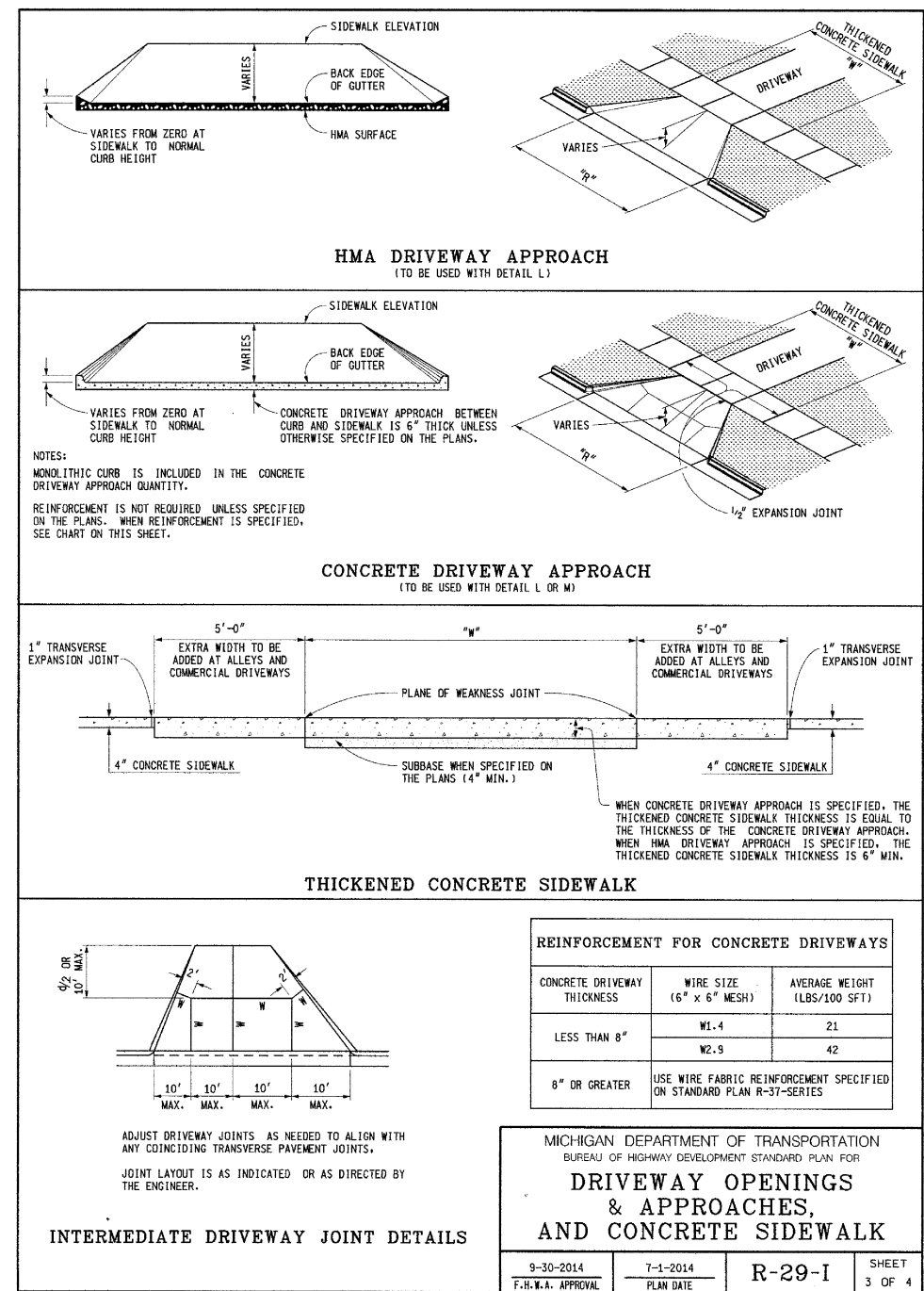
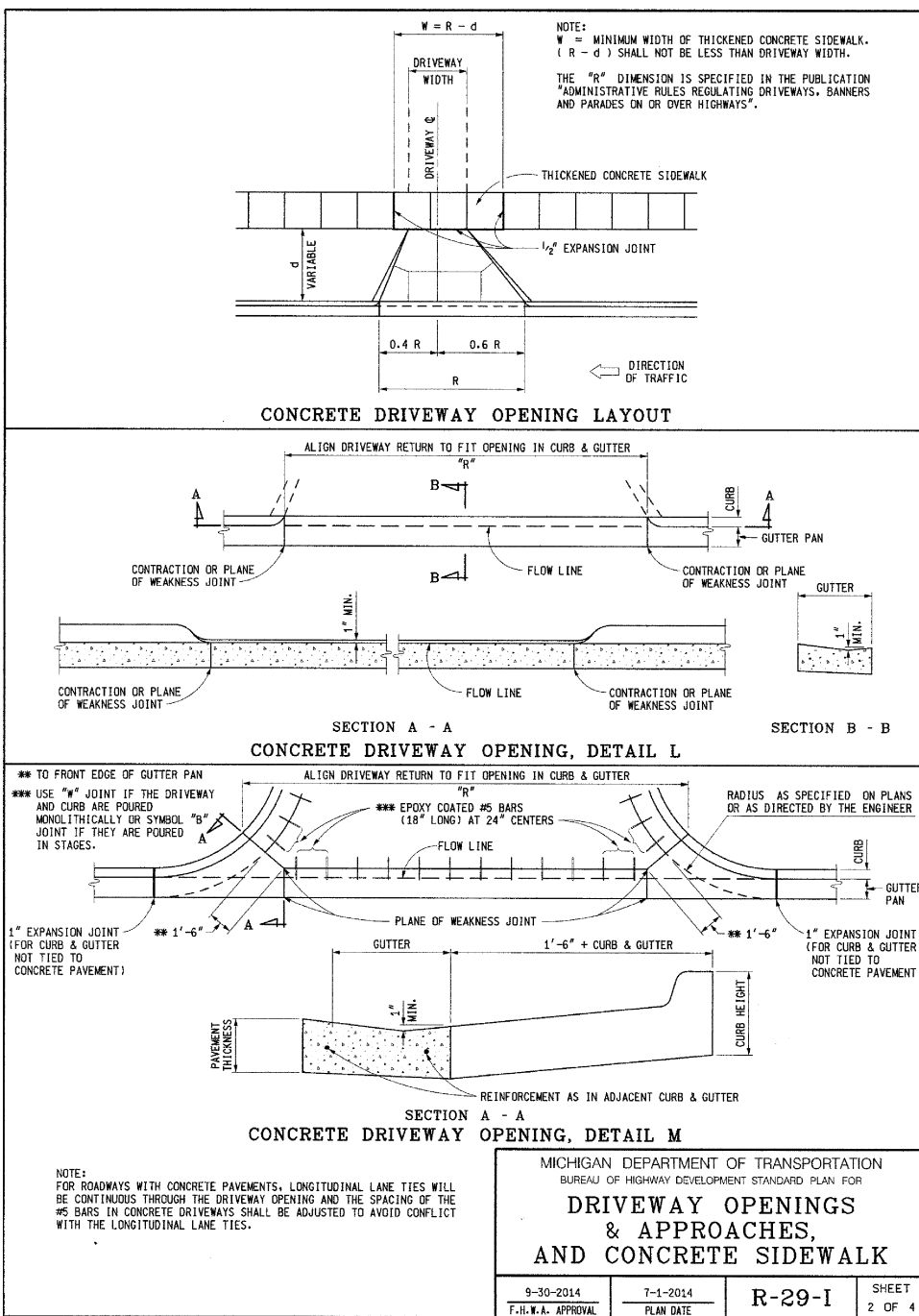
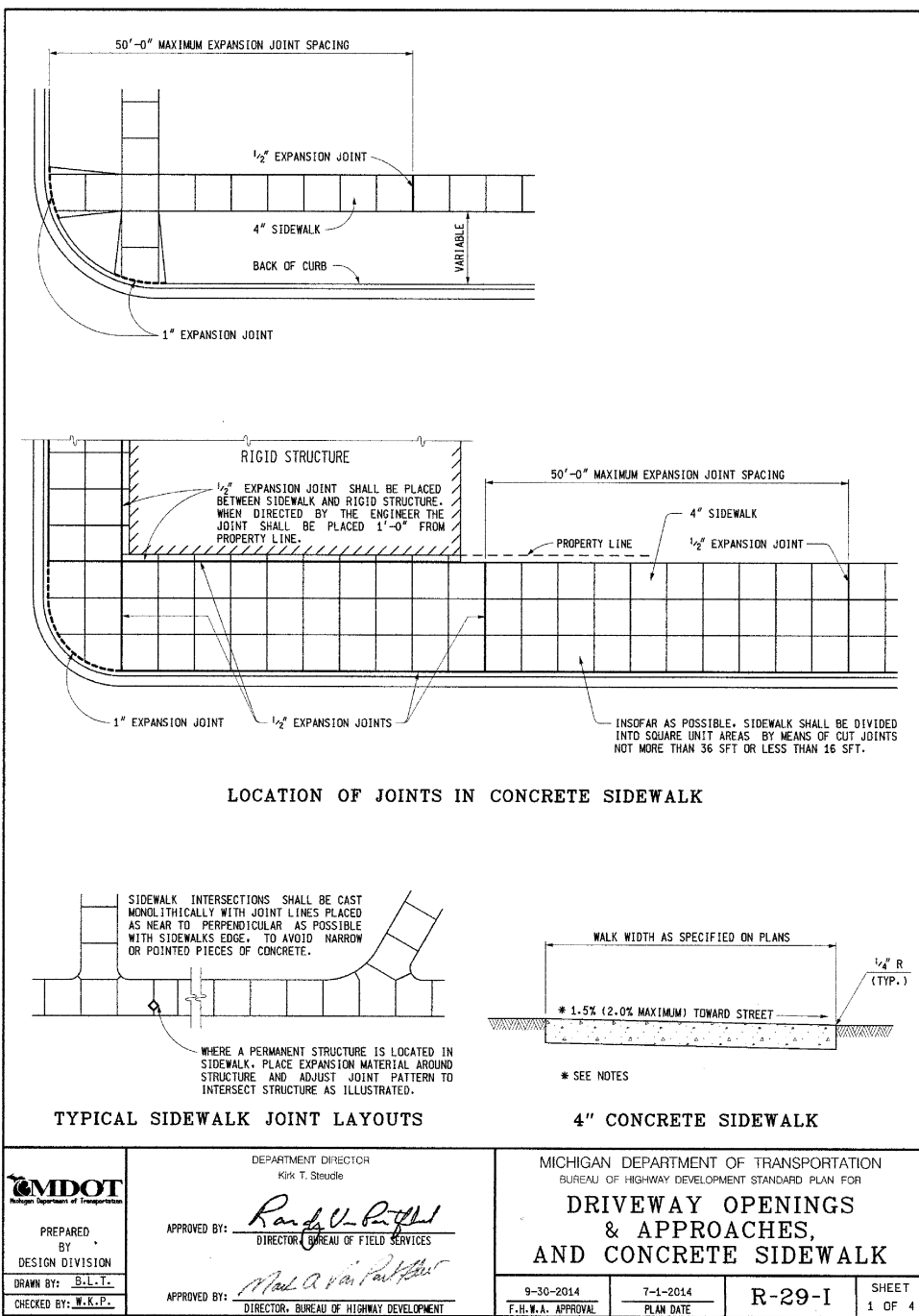
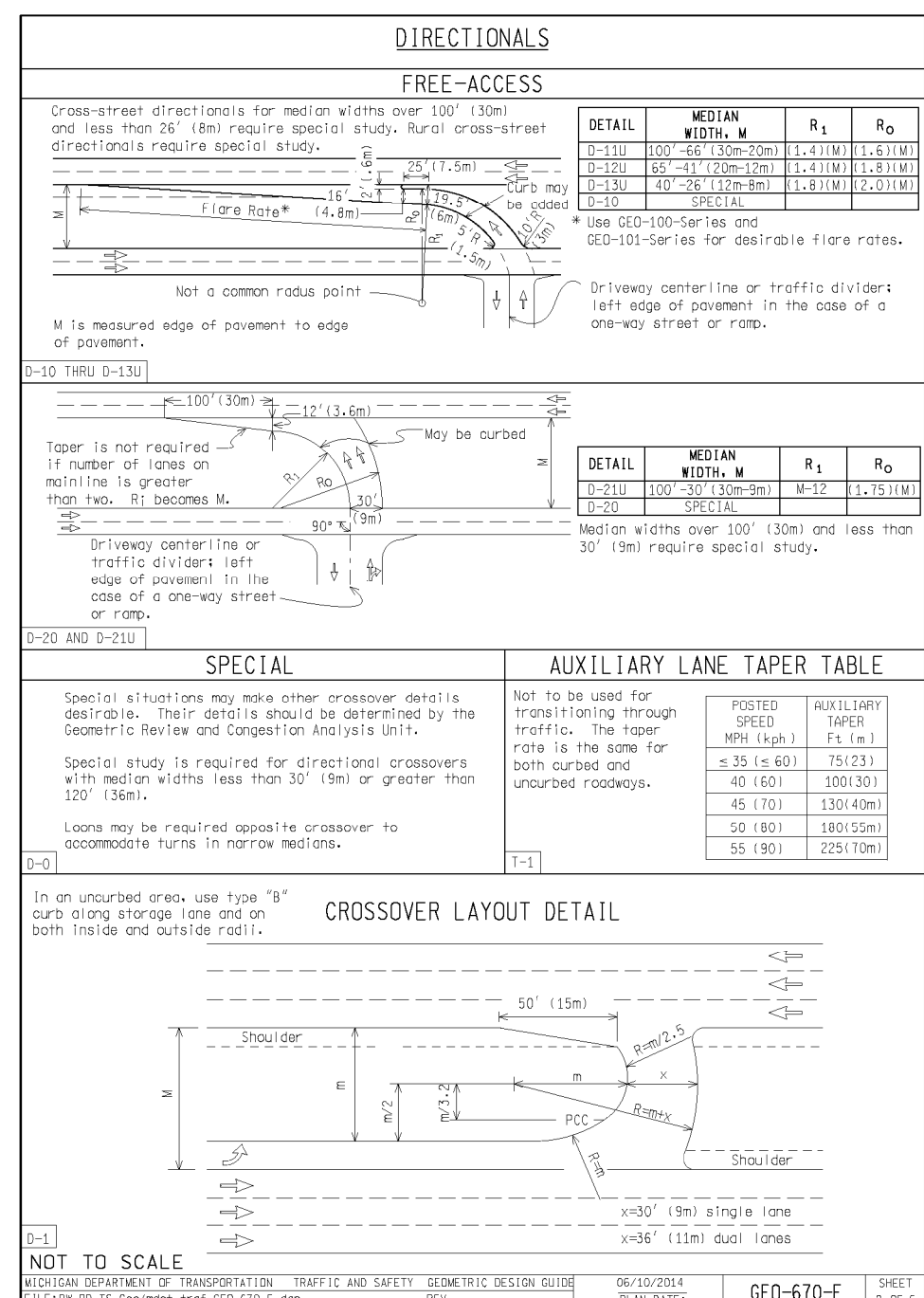
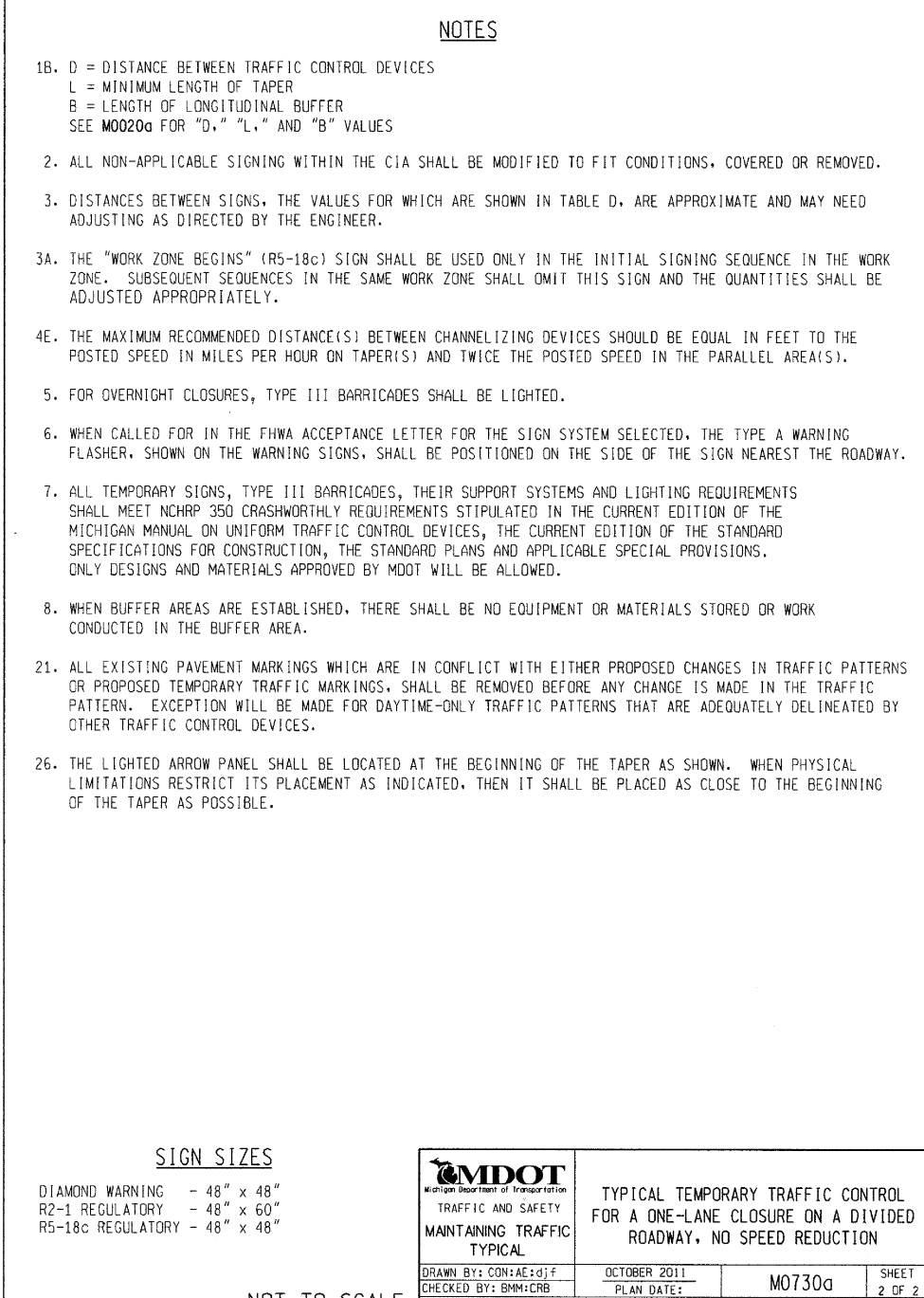
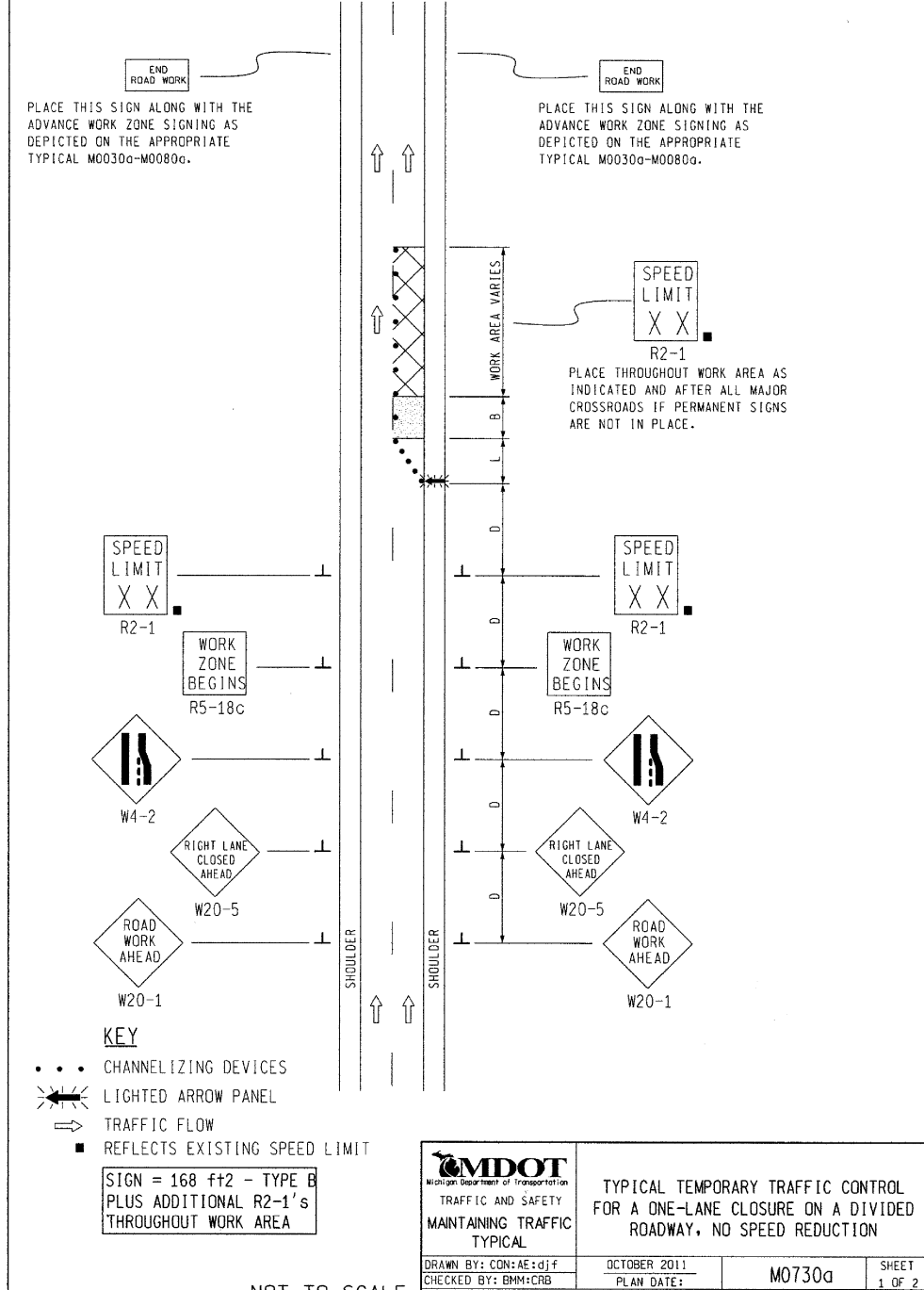
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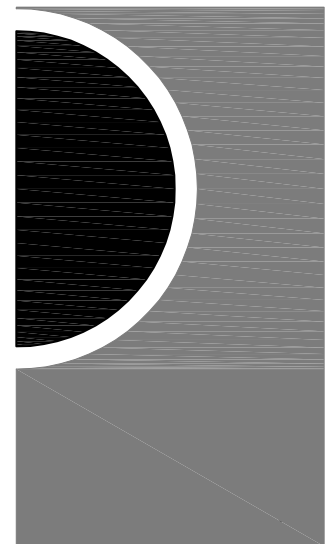
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FAX: 248/424-2954
E-MAIL: p.jewley@envengrs.com

KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

REVISED 02/18/20 - 70% CONSTRUCTION SET
REVISED 03/04/20 - PROGRESS SET
REVISED 03/20/20 - BID SET
REVISED 04/20/20 - ADDENDUM NO. 1
CONSTRUCTION SET 05/04/2020
REVISED 06/16/20 - CDD #2

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APPROVED BY

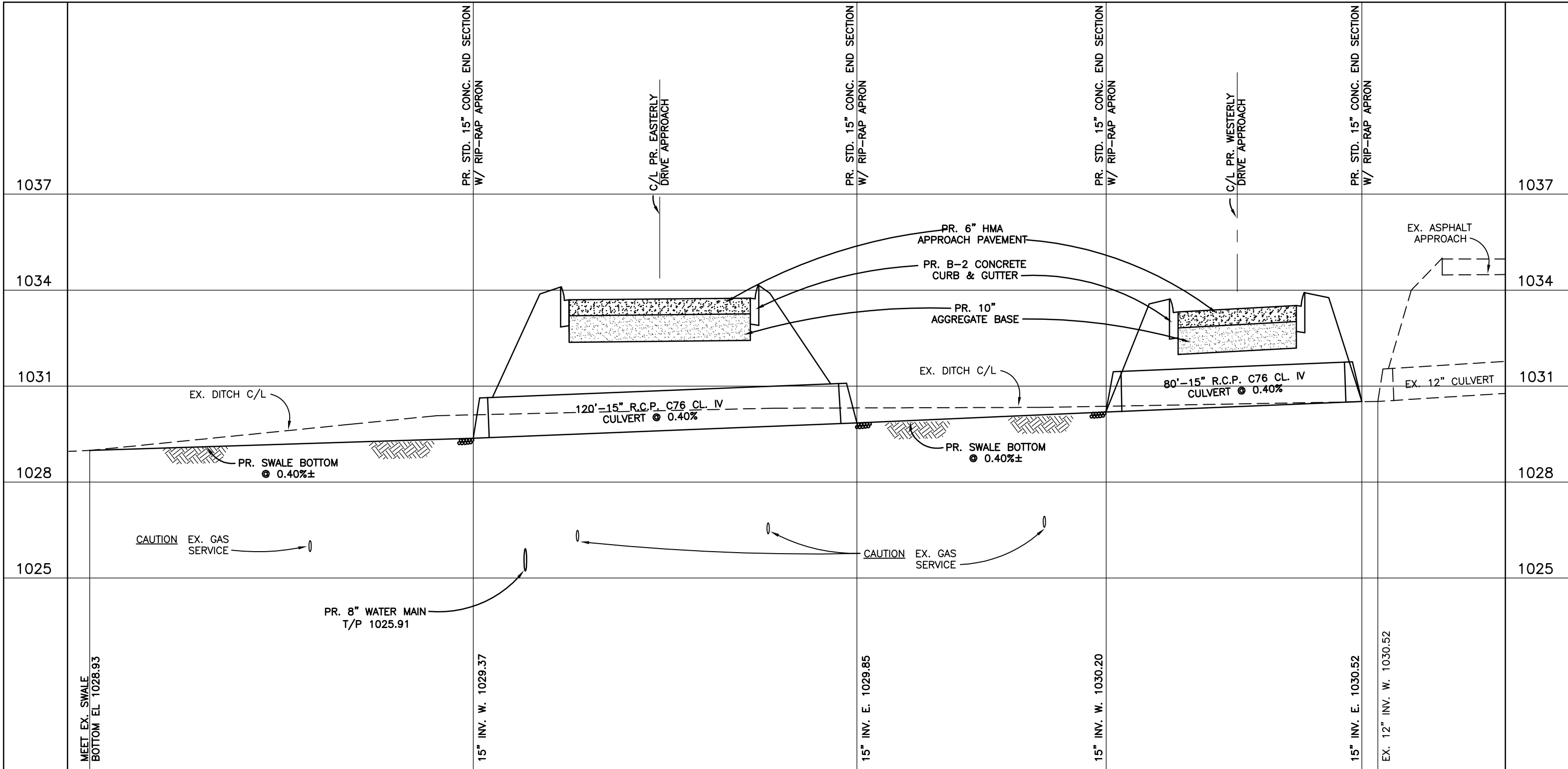
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M.D.O.T. STANDARD DETAILS

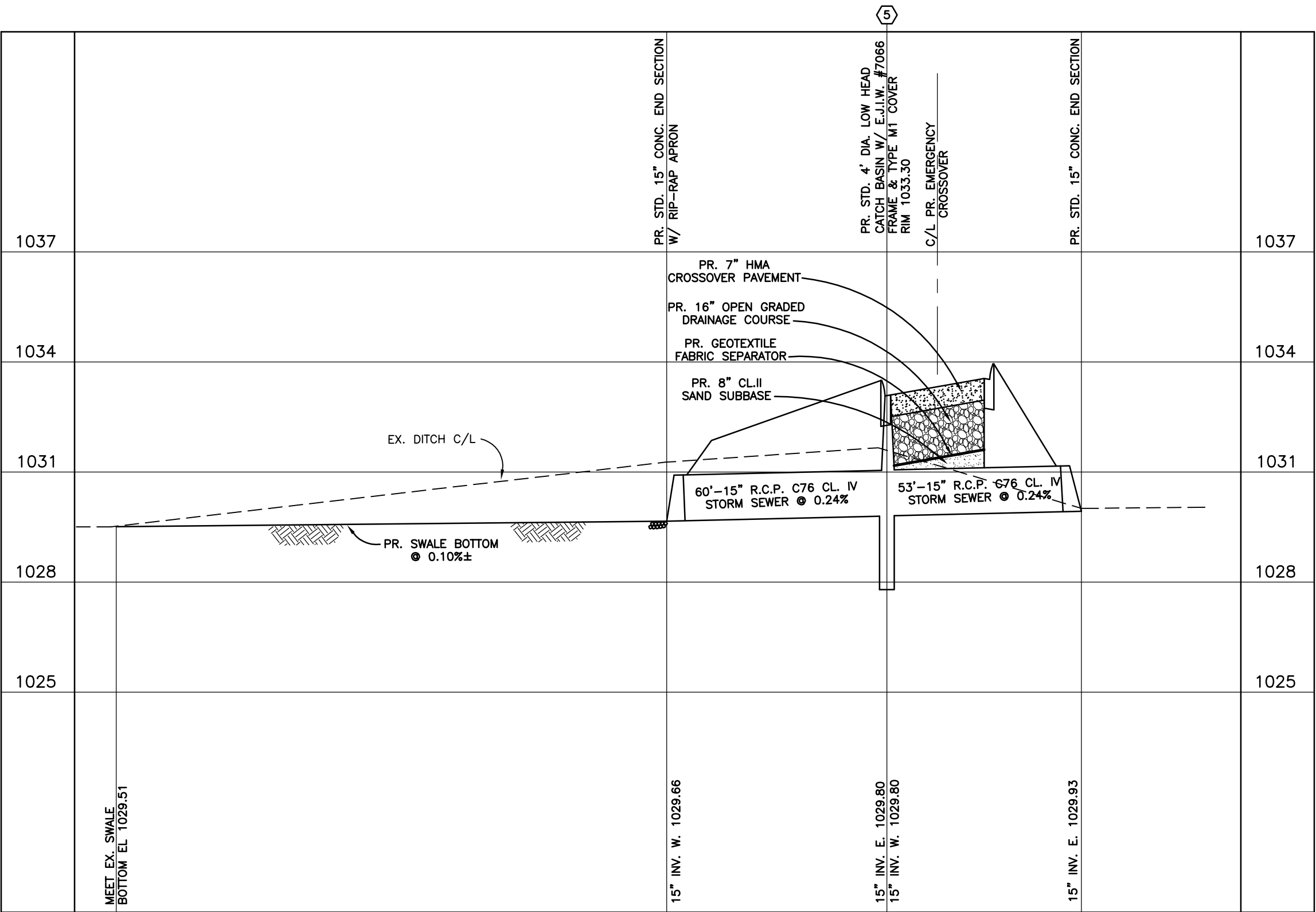
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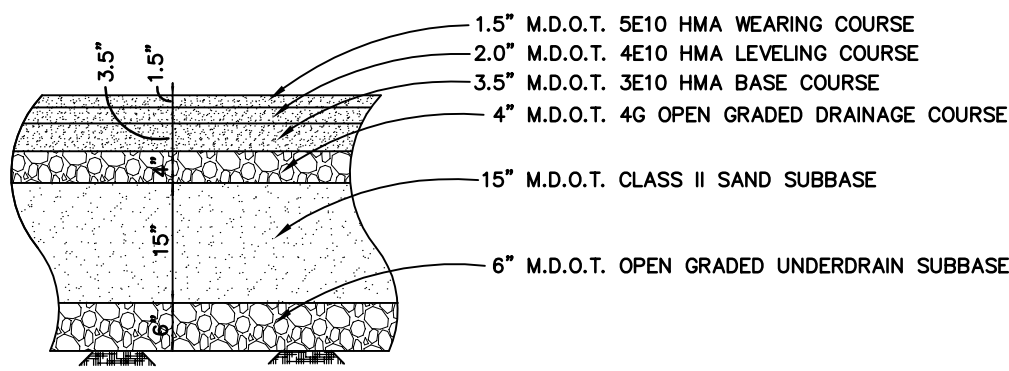
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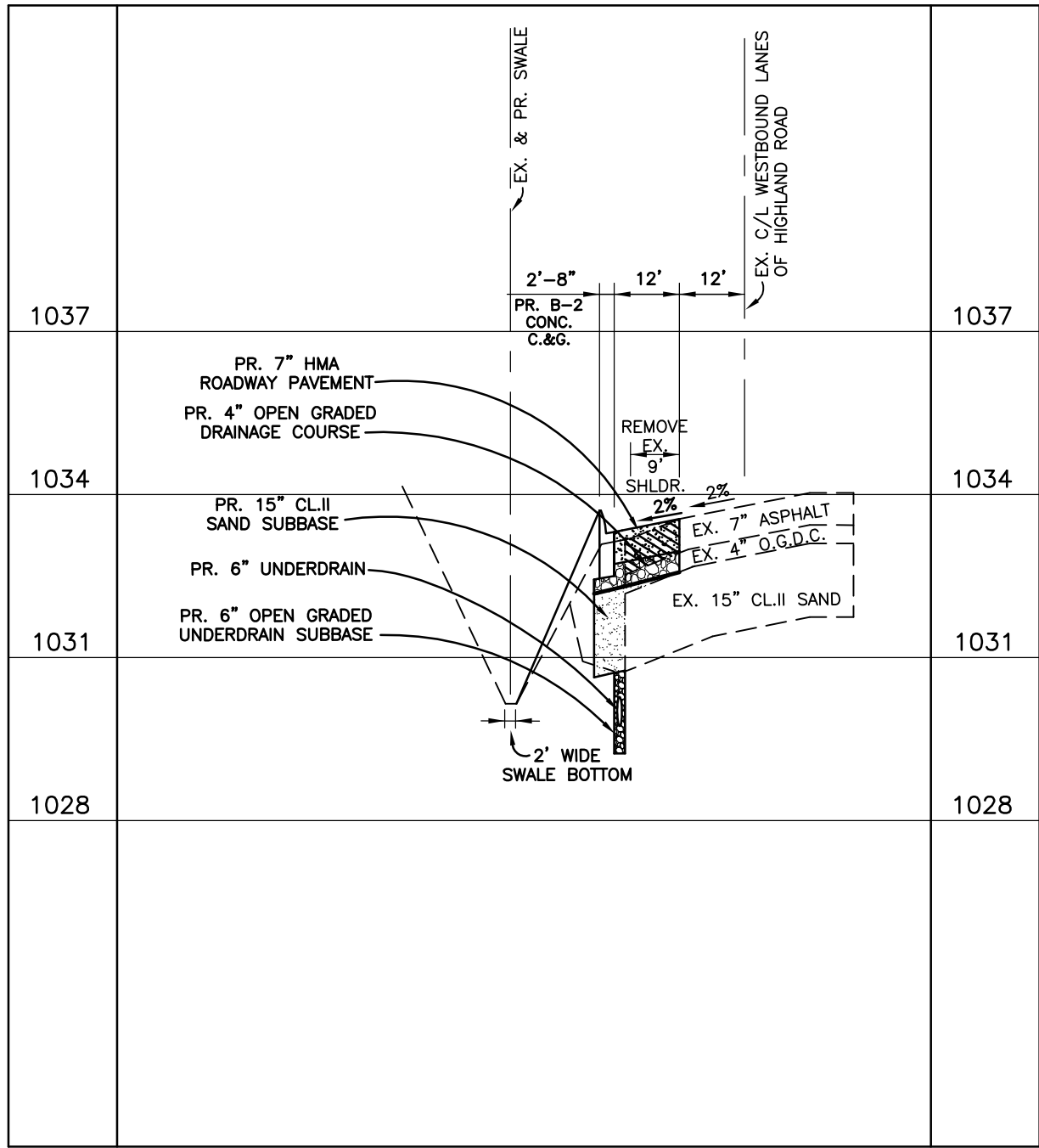
HIGHLAND ROAD R.O.W. FRONTAGE
DITCH PROFILE
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



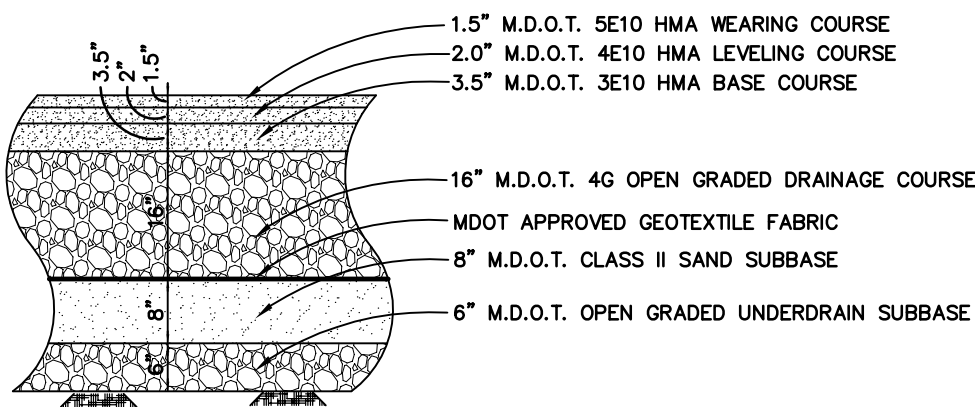
HIGHLAND ROAD MEDIAN
STORM SEWER PROFILE
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



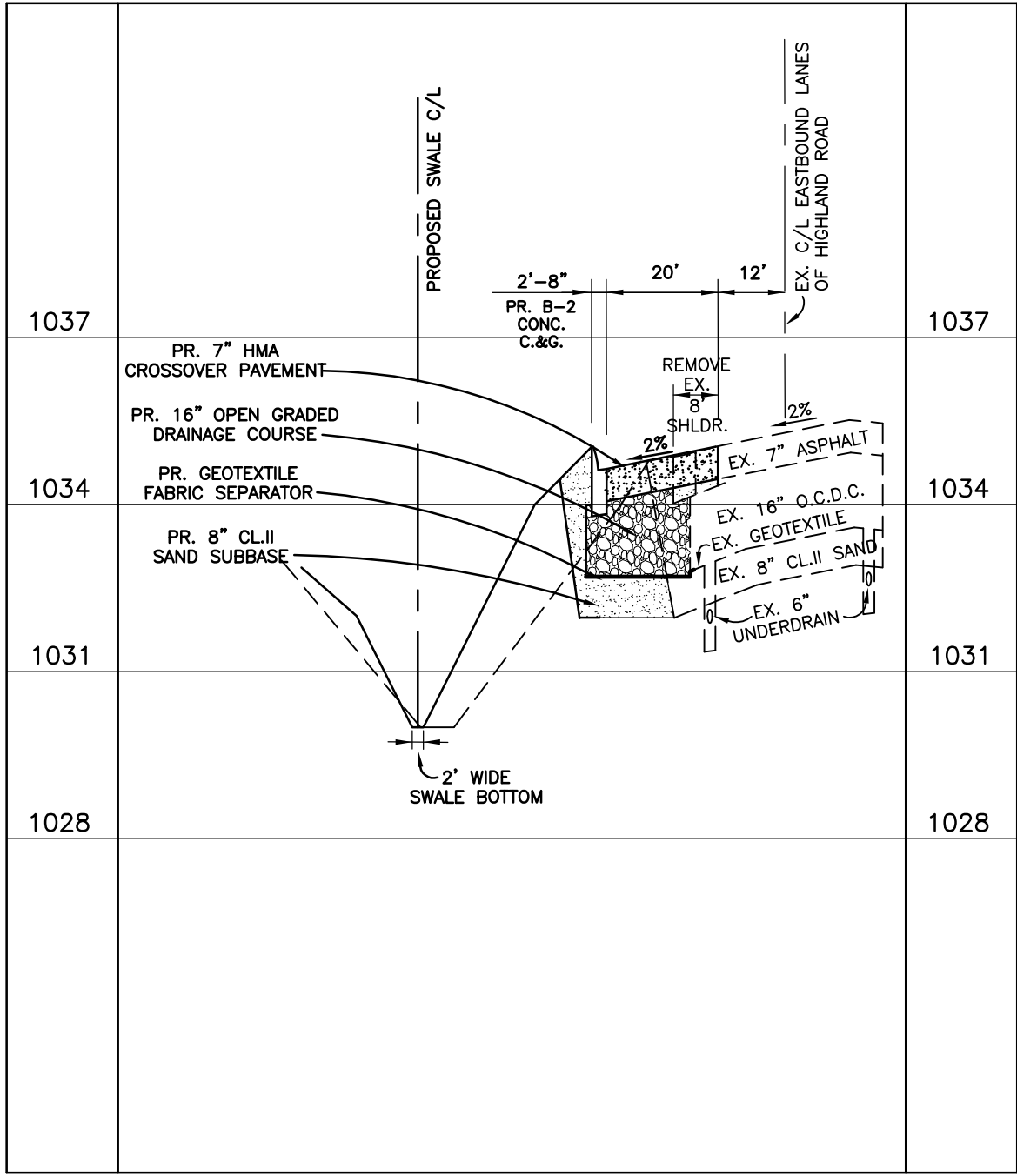
TYPICAL ROADWAY
WIDENING LANE & TAPER
ASPHALT PAVEMENT SECTION



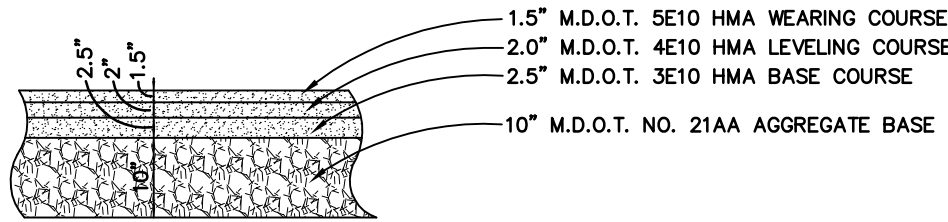
WIDENING LANE
SECTION A-A
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



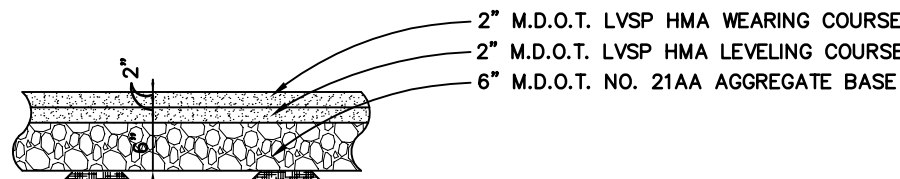
TYPICAL EMERGENCY CROSSOVER
ASPHALT PAVEMENT SECTION



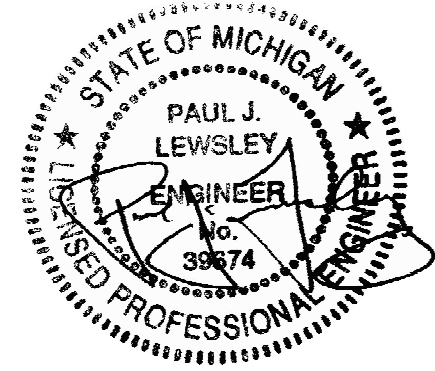
EMERGENCY CROSSOVER
SECTION B-B
SCALE: 1"=30' HORIZONTAL
1"=3' VERTICAL



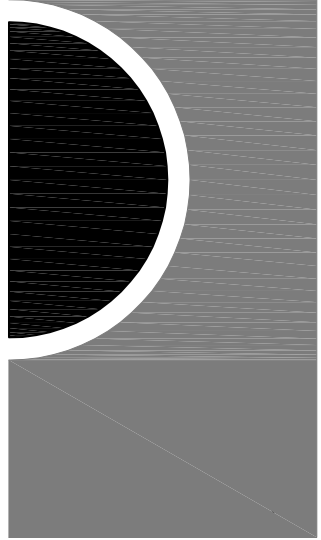
TYPICAL DRIVEWAY APPROACH
ASPHALT PAVEMENT SECTION



TYPICAL SAFETY PATH
ASPHALT PAVEMENT SECTION



PARTNERS



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BIDDING - CONSTRUCTION 03/27/2020

REVISED 04/20/20 - ADDENDUM No. 1

CONSTRUCTION SET 05/04/2020

REVISED 06/16/20 - CDD #2 >

DRAWN BY

CHECKED BY

APPROVED BY

SHEET NAME

M.D.O.T. R.O.W. PROFILES
& DETAILS

SHEET NO.

C-8

EE # 1946



INSIDE DIA.	SLAB THICKNESS	MAX. HEIGHT OF COVER	REINFORCEMENT		
			A-BARS EA. SIDE		B-BARS TOP & BOTTOM
			NO. SIZE	SPACING	
4'-0"	8"	8'-0"	(4)-#5	3 @ 3"	(3)-#5
5'-0"	8"	8'-0"	(6)-#5	3 @ 3" 2 @ 6"	(3)-#5
6'-0"	8"	8'-0"	(5)-#6	4 @ 8"	(3)-#5
7'-0"	8"	8'-0"	(7)-#6	6 @ 8"	(3)-#5
8'-0"	8"	8'-0"	(9)-#6	8 @ 8"	(3)-#5
9'-0"	10"	8'-0"	(11)-#6	10 @ 8"	(3)-#5
10'-0"	10"	8'-0"	(13)-#7	12 @ 8"	(3)-#5

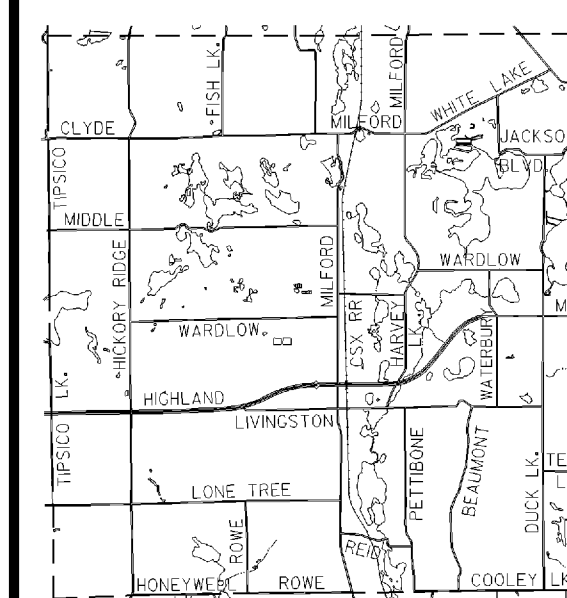


- NOTES:**
1. ALL WORKSMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT ENGINEERING DESIGN STANDARDS AND SPECIFICATIONS OF HIGHLAND TOWNSHIP.
 2. IT SHALL BE THE OWNER'S ENGINEER AND CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
 3. ALL SEWER TRENCHES UNDER THE 45 DEGREE ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAYEMENTS, BIKE PATHS, SIDEWALKS OR DRIVE APPROPRIATE SHALL BE BACKFILLED WITH MDOT CLASS 11 SAND COMPACTED TO AT LEAST 95% OF MAXIMUM UNIT WEIGHT.
 4. ALL STORM SEWER SHALL BE INSTALLED ON CLASS "B" BEDDING OR BETTER.
 5. JOINTS FOR STORM SEWER SHALL BE PREMIUM JOINTS (TONGUE AND GROOVE WITH RUBBER GASKETS).
 6. LEAD MATERIAL SHALL BE 4" DIA. (MIN.) PVC SCHEDULE 40 OR SDR 23.5. LEAD CONNECTIONS MAY ONLY BE AT STRUCTURES.
 7. CONTACT THE TOWNSHIP ENGINEER 48 HOURS PRIOR TO STORM SEWER INSTALLATION TO SCHEDULE OBSERVATION. FULL TIME OBSERVATION IS REQUIRED FOR ALL UNDERGROUND STORM SEWER AND LEACHING SYSTEM CONSTRUCTION. CONTACT MICHAEL DARGA WITH HUBBELL, ROTH & CLARK, INC. 248-454-6532.
 8. BEFORE YOU DIG CALL MISS DIG AT 1-800-482-7171.
 9. ALL MORTAR AND CONCRETE WORK SHALL BE PROTECTED FROM FREEZING (40° F. AND FALLING) FOR A MINIMUM OF 48 HOURS.
 10. PIPE FOR STORM SEWERS WITHIN THE PUBLIC ROAD RIGHT-OF-WAY OR PRIVATE ROAD EASEMENT SHALL BE RCP, C-76, CLASS IV OR V RCP.
 11. DOUBLE WALLED HDPE MEETING THE REQUIREMENTS OF ASTM F2306.



HRC

DATE	ADDITIONS AND/OR REVISION
DESIGNED	M.P.D.
DRAWN	T.E.W.
CHECKED	J.B.
APPROVED	G.E.H.
V:\200503\20050368\C\sdformsewer.dwt,V8.dgn	



HIGHLAND TOWNSHIP

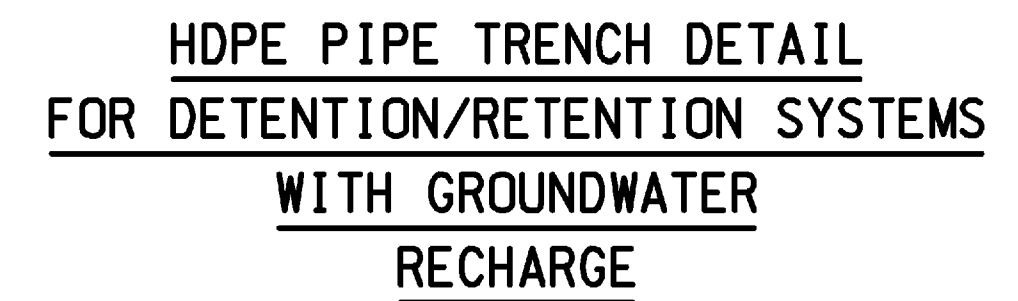
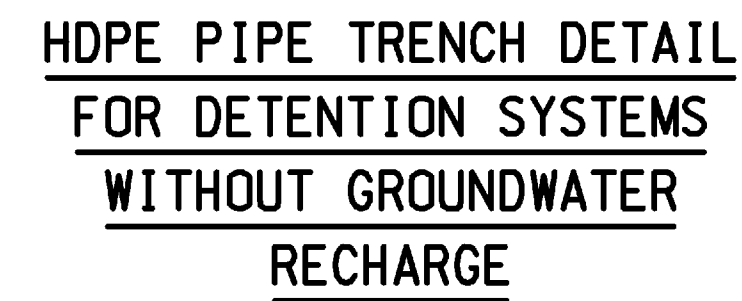
HIGHLAND TOWNSHIP DESIGN STANDARDS

STORM SEWER DETAILS

HRC JOB NO. 20050368	SCALE NONE
DATE SEPTEMBER 2005	SHEET NO. 1



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11. DOUBLE WALLED HOPE MEETING THE REQUIREMENTS OF ASTM F2306.



STANDARD LEACHING BASIN




05 2



D	A	B	C	E MIN
20"	6.5'	4.5'	3.5'	3'
16"	4.7'	4.7'	2.5'	2.75'
12"	4'	3'	2.5'	2.5'
10"	3'	2'	2'	2.25'
8"	2.7'	2'	2'	2.25'
6"	2'	2'	2'	2.25'

REVISION BLOCK			
Drawn/Reviewed/Checked/Date: N/A			
Rev. No:	Rev. By:	Rev. Date:	Description:
1	JS	02/04/18	MARKUPS PER Q. APPFL
2			
3			
4			

ORIG. DATE:	01/01/01	
SCALE:	NONE	
DESIGNED BY:	OCDC	
DRAWN BY:	OCDC Mapping	



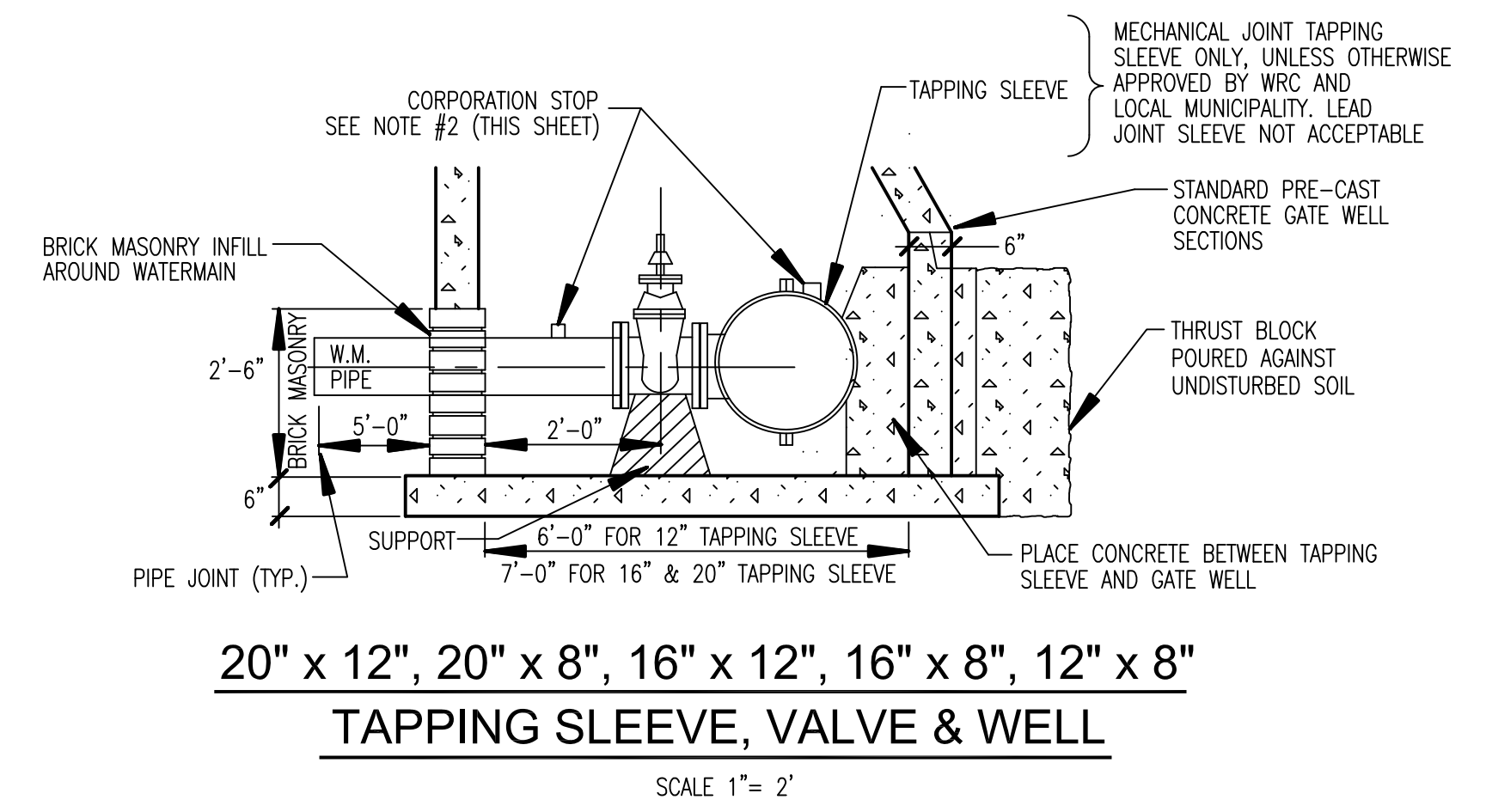
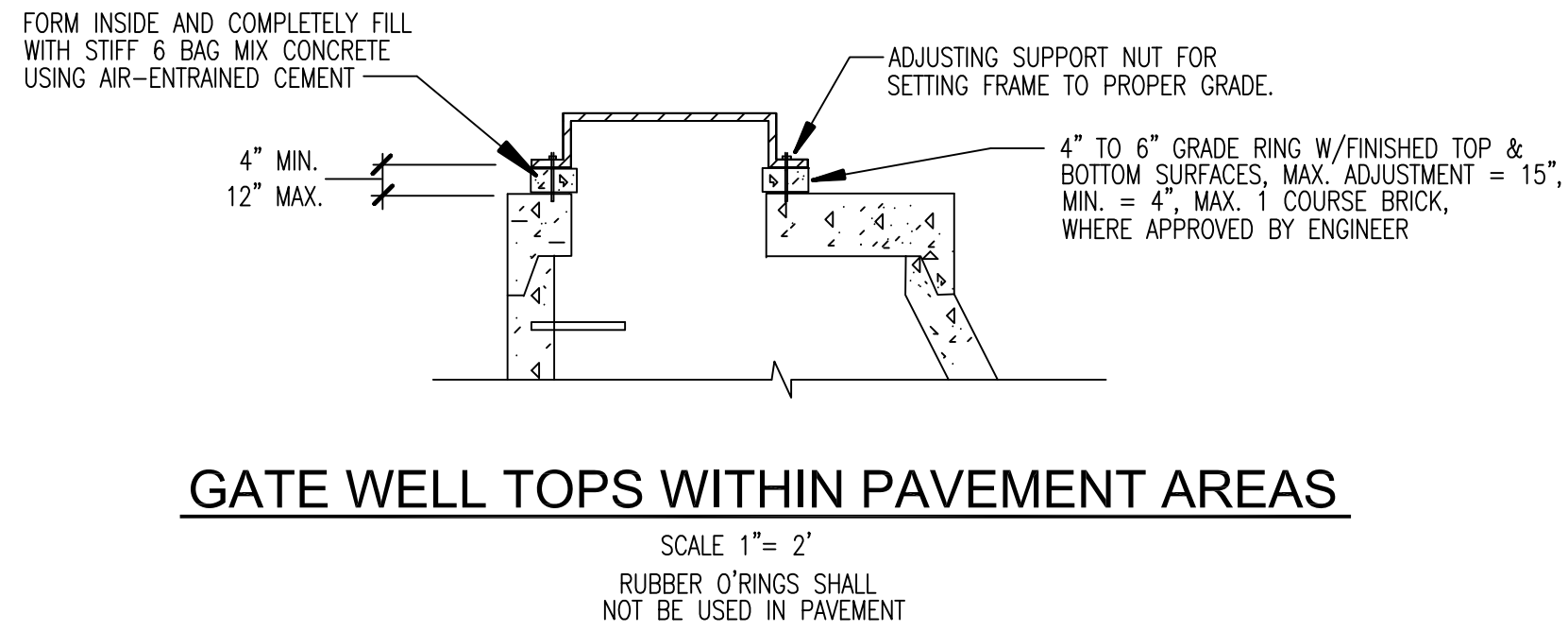
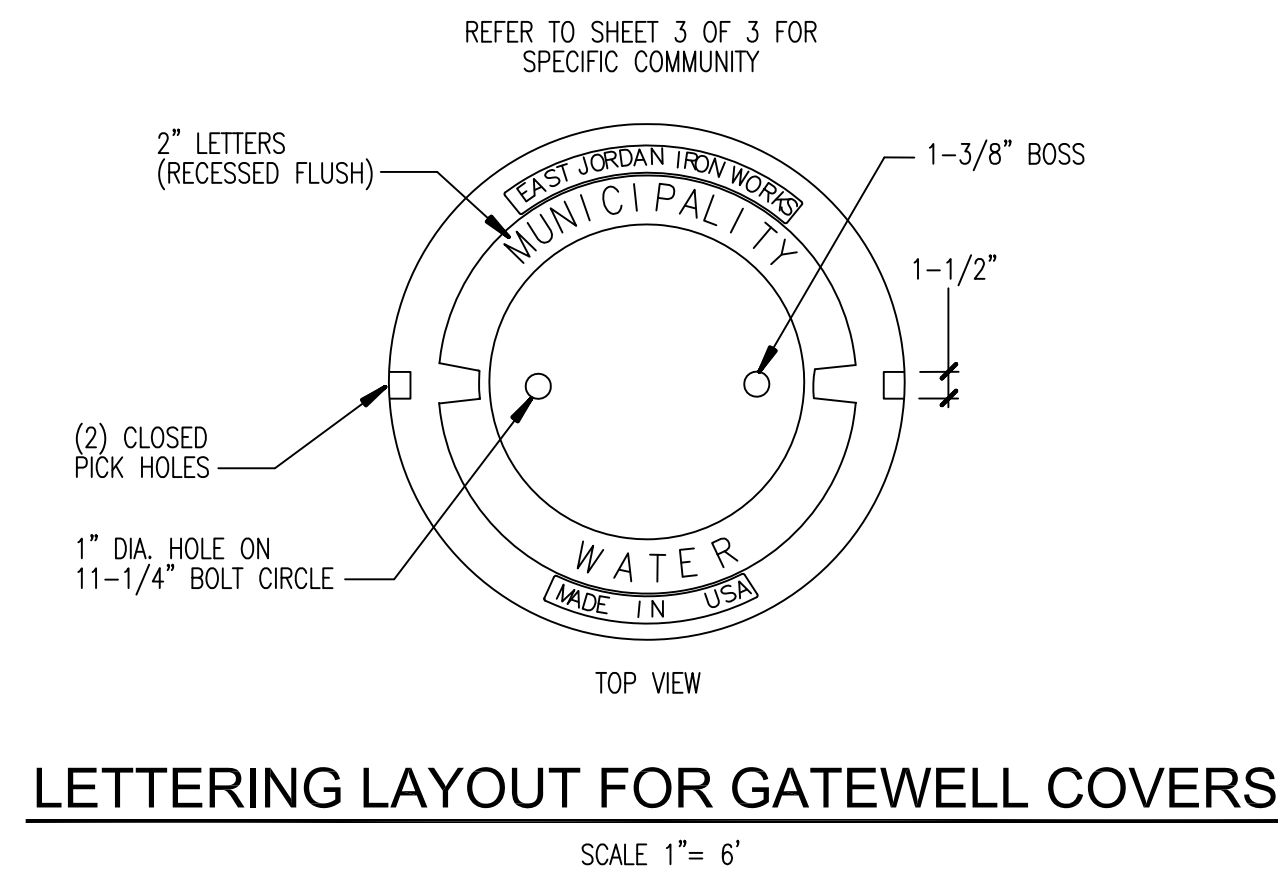
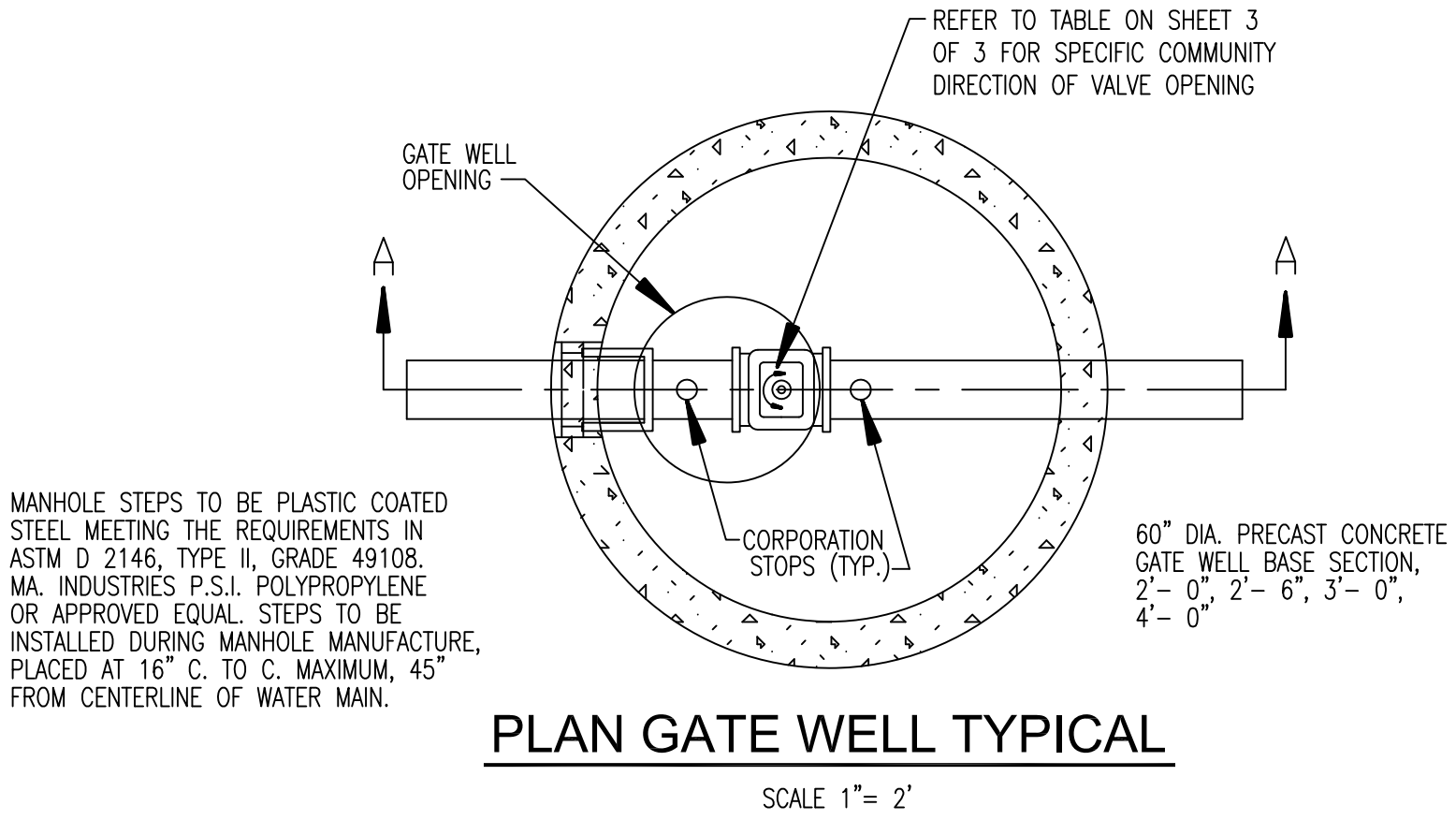
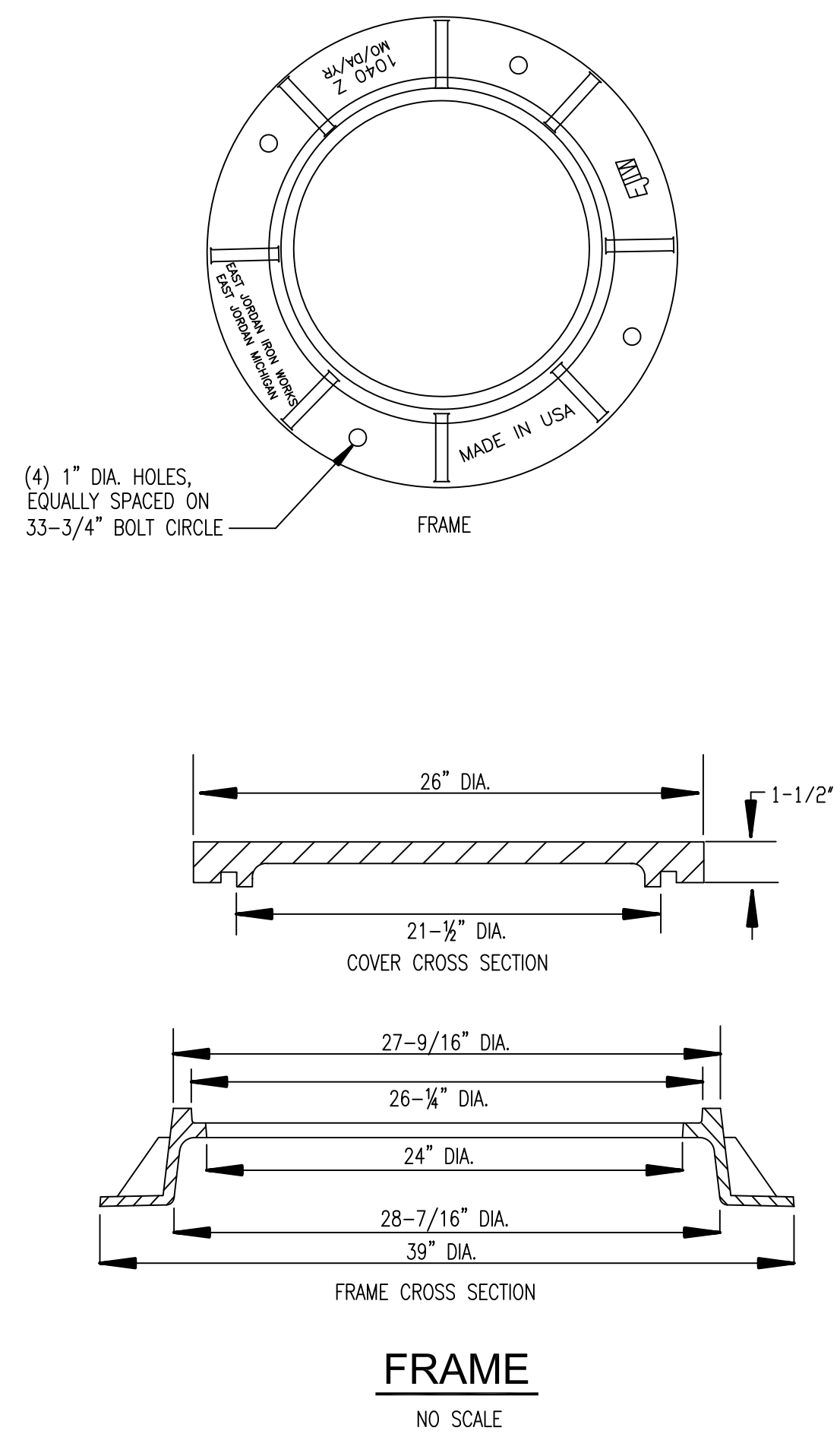
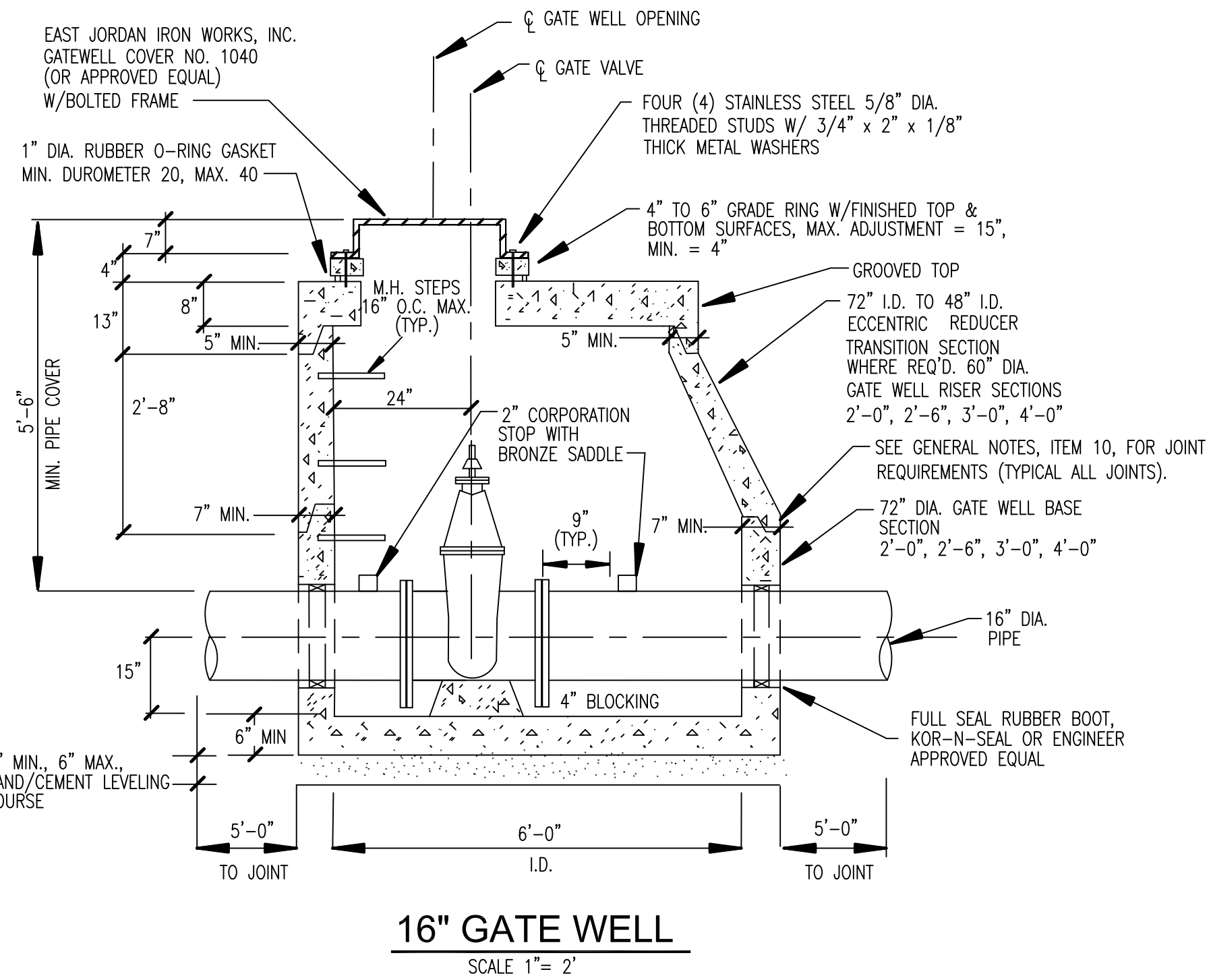
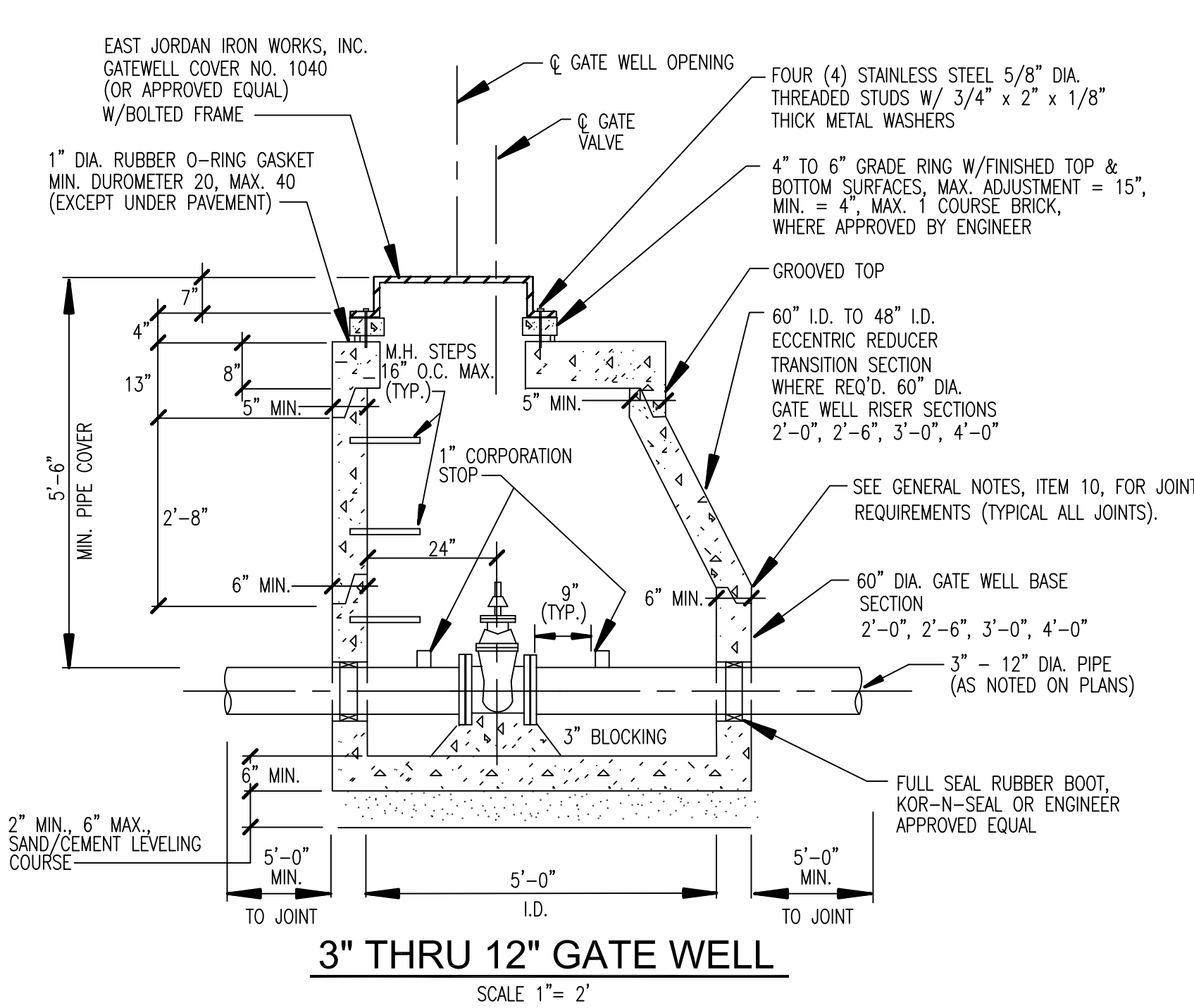
WRC
WATER RESOURCES COMMISSION
Jim Nash

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFOUR, MICHIGAN
48328-1907

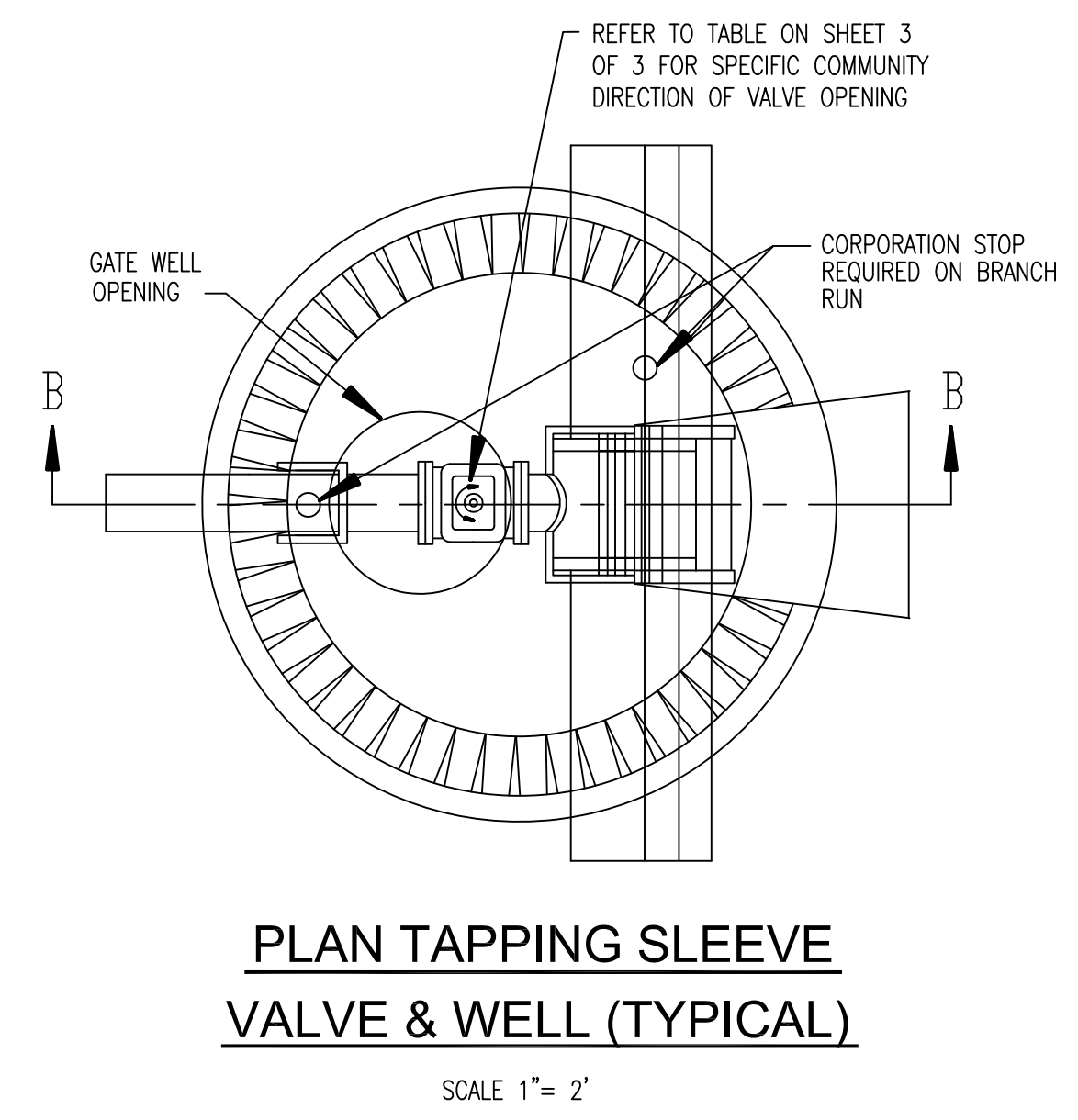
SHEET NO.:

4 OF 5

GATE VALVE & WELL DETAILS



- NOTES:
1. REFER TO NOTE 7 OF "VALVE AND SLEEVE NOTES" ON SHEET 3 OF 3.
 2. FOR PIPE SMALLER THAN 16" USE 1" CORPORATION STOP, FOR 16" PIPE OR LARGER USE 2" CORPORATION STOP WITH BRONZE SADDLE.
 3. REFER TO NOTE 11 OF "GENERAL NOTES" ON SHEET 3 OF 3.
 4. WRC DOES NOT RECOMMEND SIZE ON SIZE TAPPING.



WATER MAIN STANDARD DETAILS

Rev.	Rev.	Rev.	Description:
1	01/01/01	03/15/13	UPDATE TITLEBLOCK AND ARROWS
2	07/06/14		PROPOSED REVISIONS
3	11/01/14		PROPOSED CHANGE TO DELETE HOLES FROM GATEWELL COVERS
4	03/19/15		MARKUPS PER G. APPEL

ORIG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

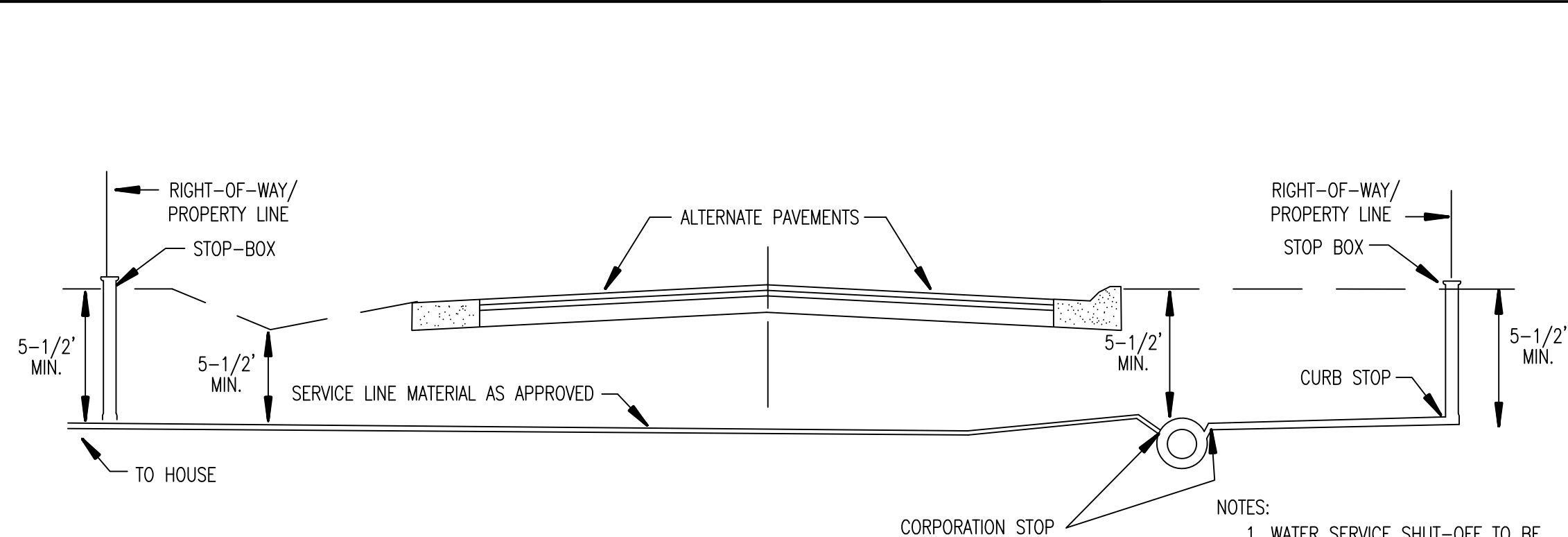
DRAWN BY: WRC Mapping

WRC

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST
WATERFORD, MICHIGAN
48326-1907

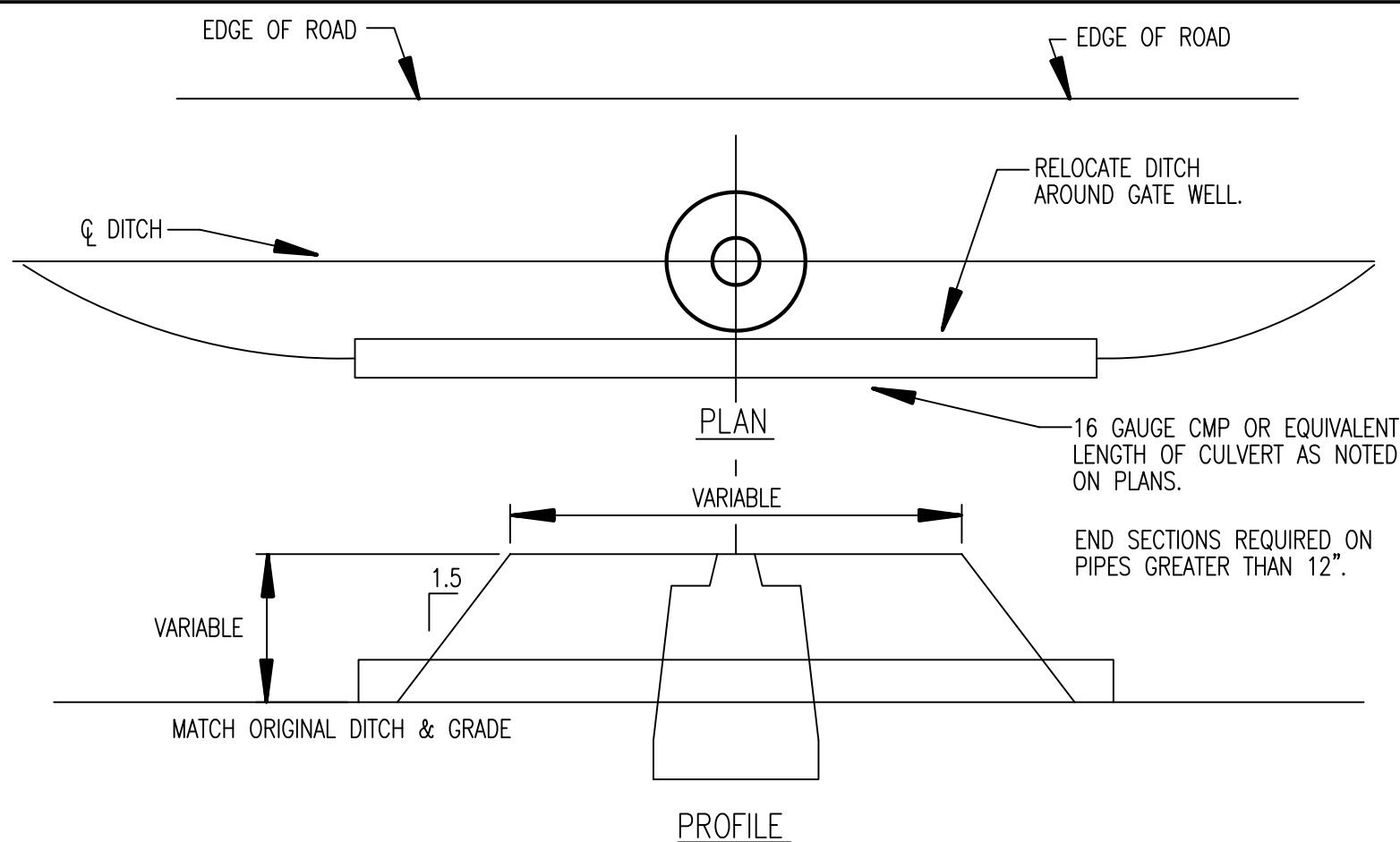
SHEET NO.:

1 of 5



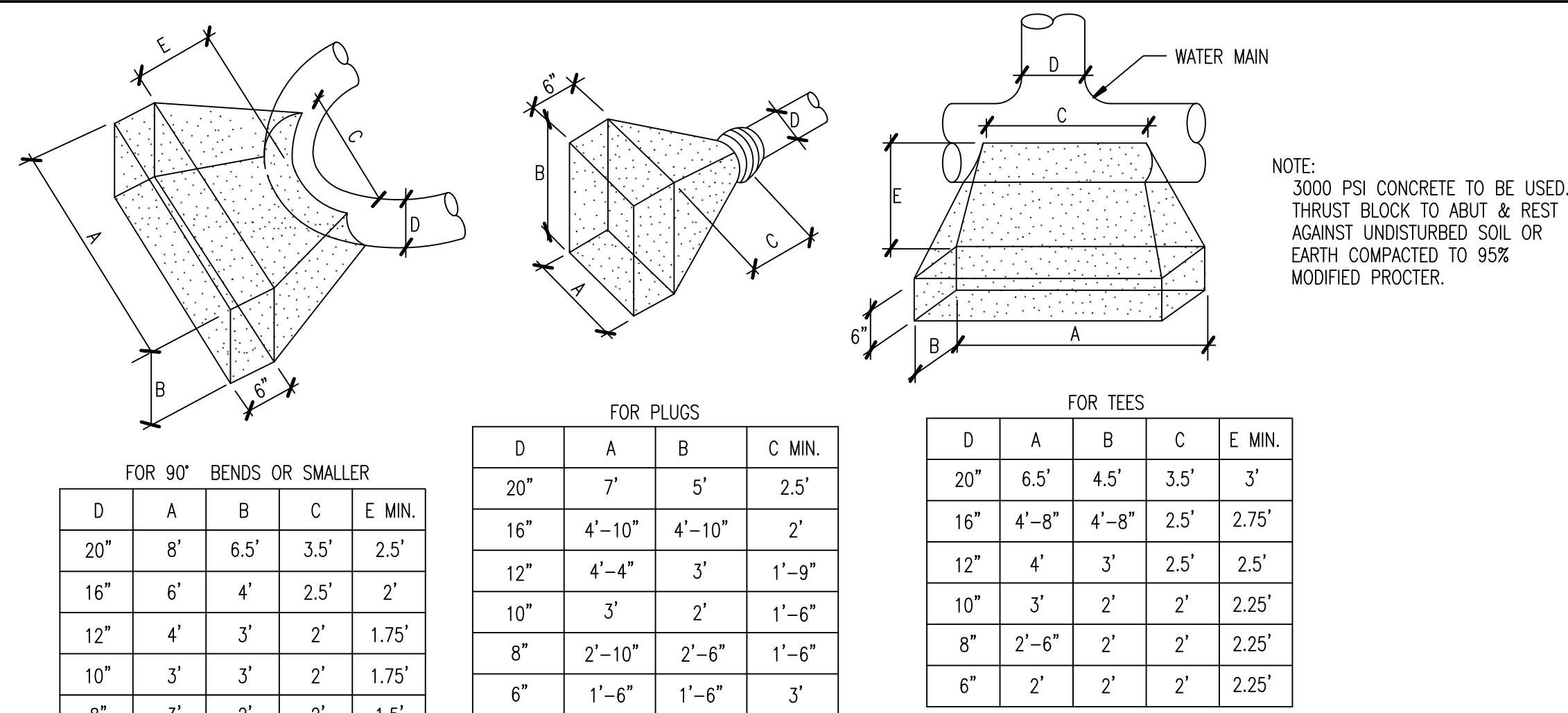
**TYPICAL PUBLIC ROAD
WATER SERVICE CONNECTION**

NO SCALE

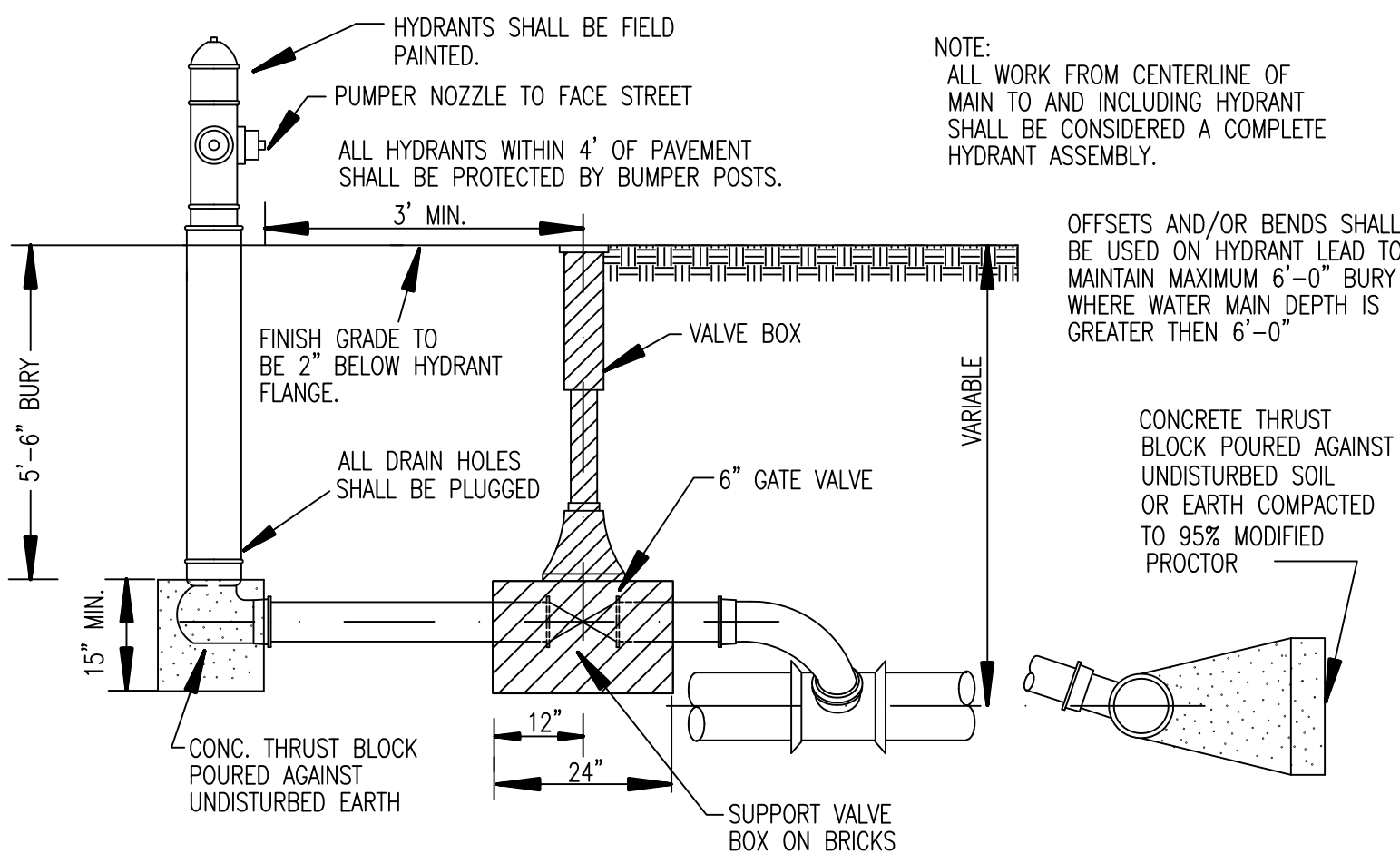


DITCH ENCLOSURE AT GATE WELL

NO SCALE

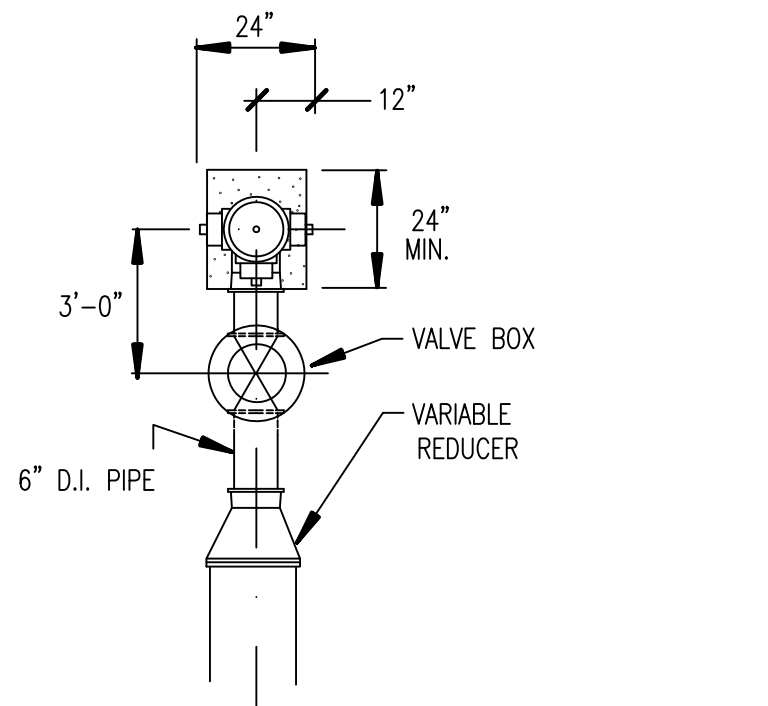


THRUST BLOCK DETAILS



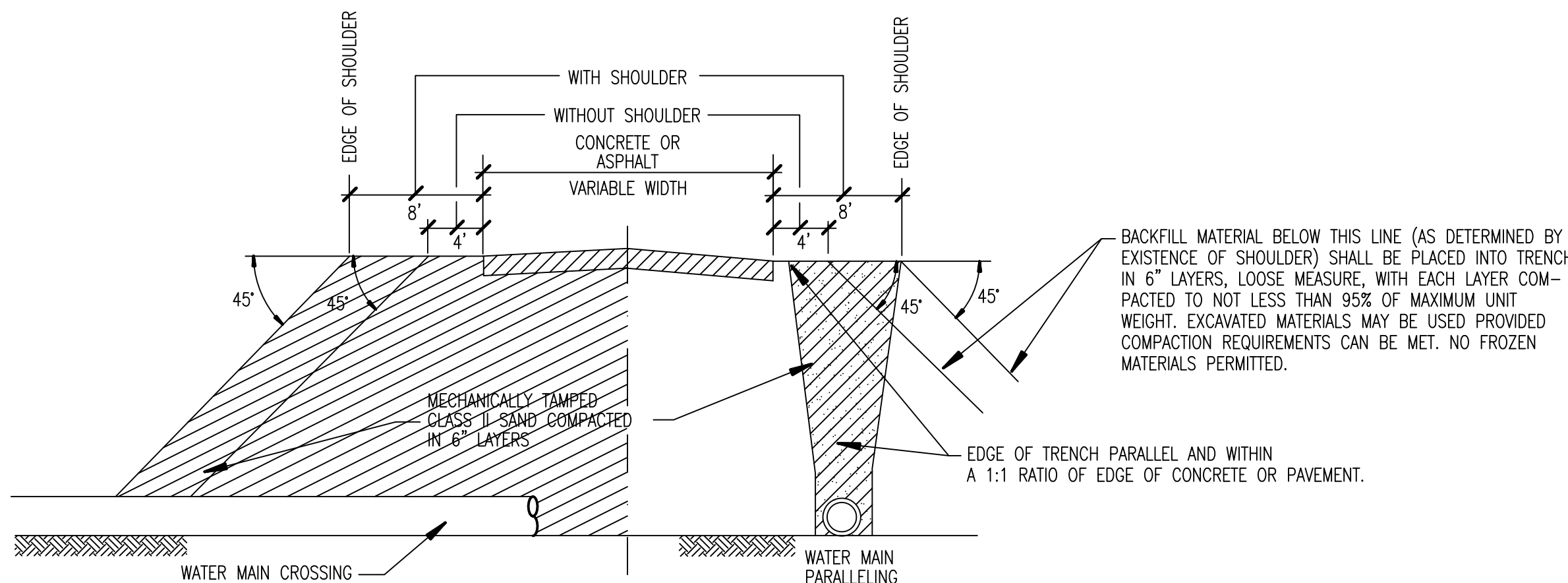
SECTION 6" HYDRANT SIDE OUTLET

SCALE 1" = 2'



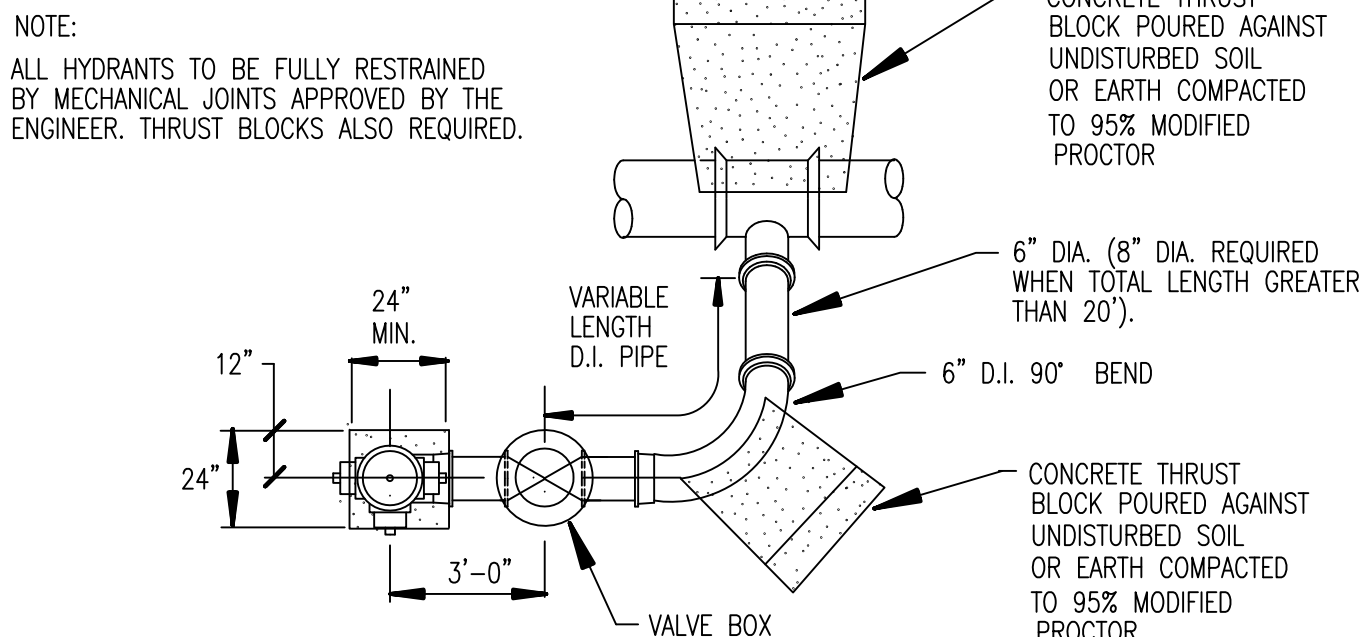
PLAN 6" HYDRANT WATER MAIN END

SCALE 1" = 1'



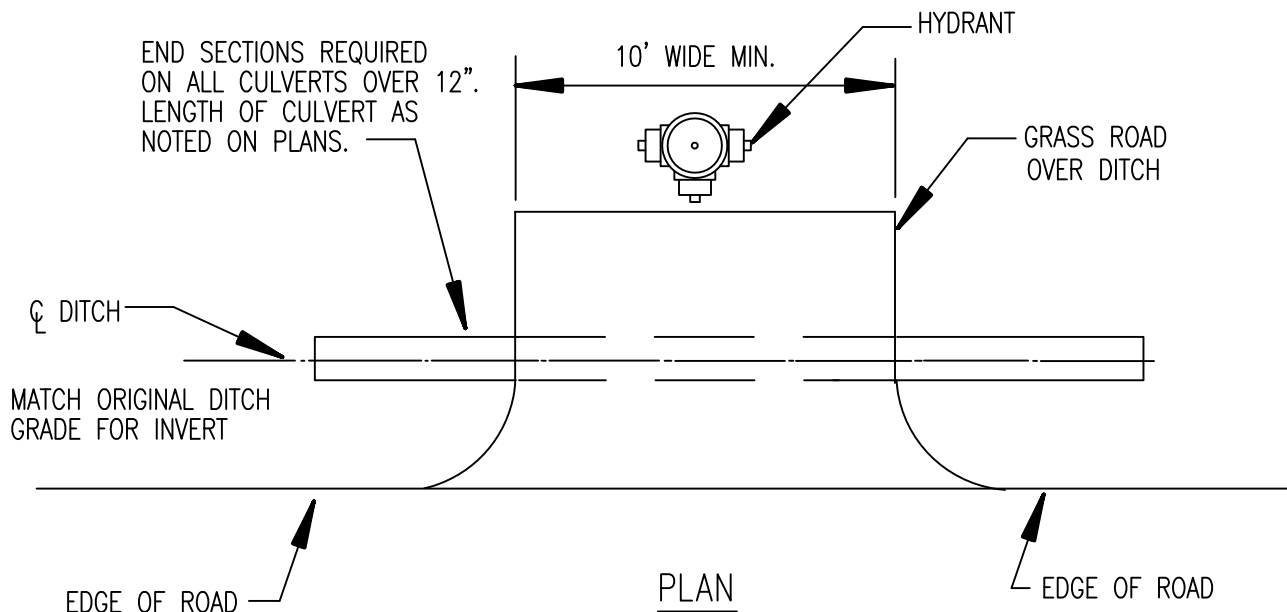
MINIMUM BACKFILL UNDER OR NEAR PAVEMENT

SCALE 1" = 6'



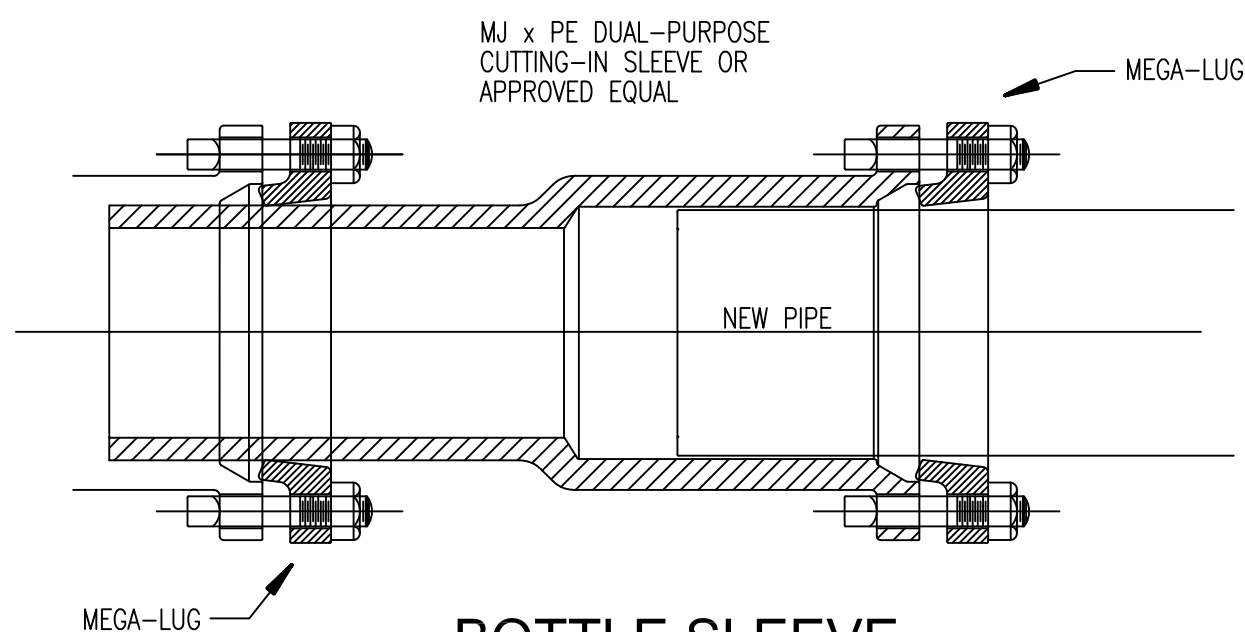
PLAN 6" HYDRANT SIDE OUTLET

SCALE 1" = 1'

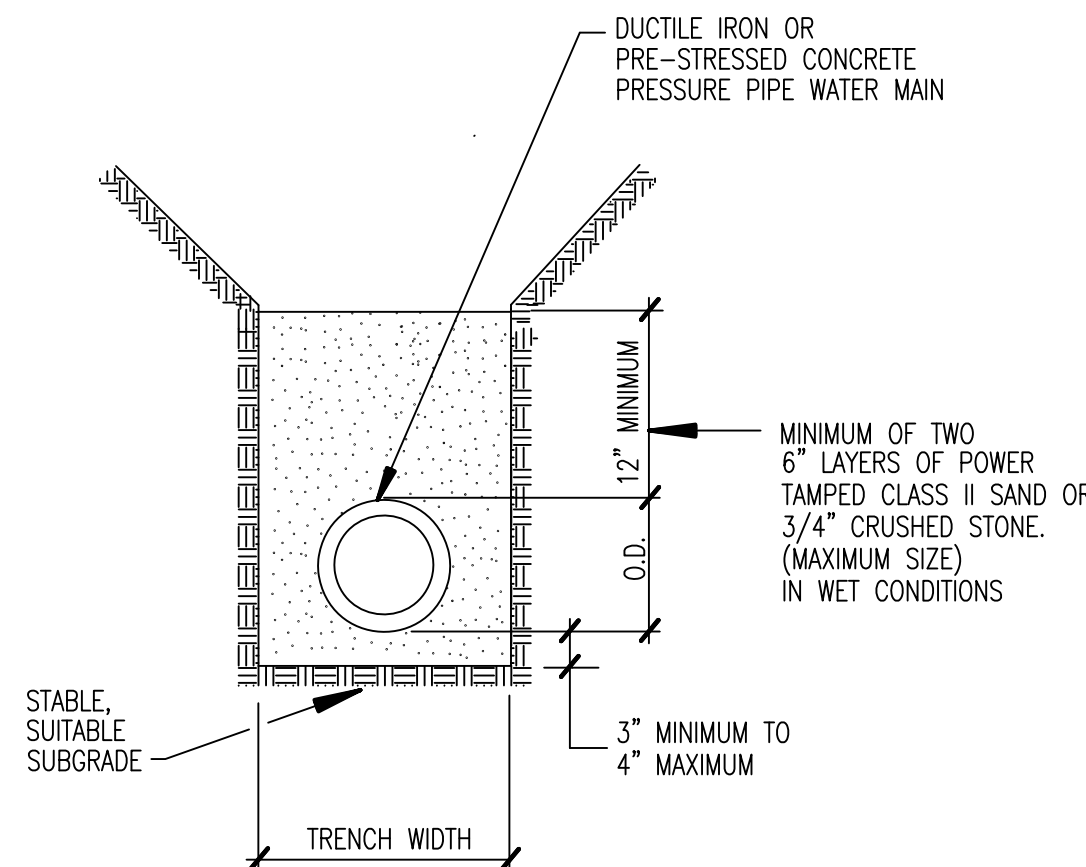


DITCH ENCLOSURE AT HYDRANT

NO SCALE

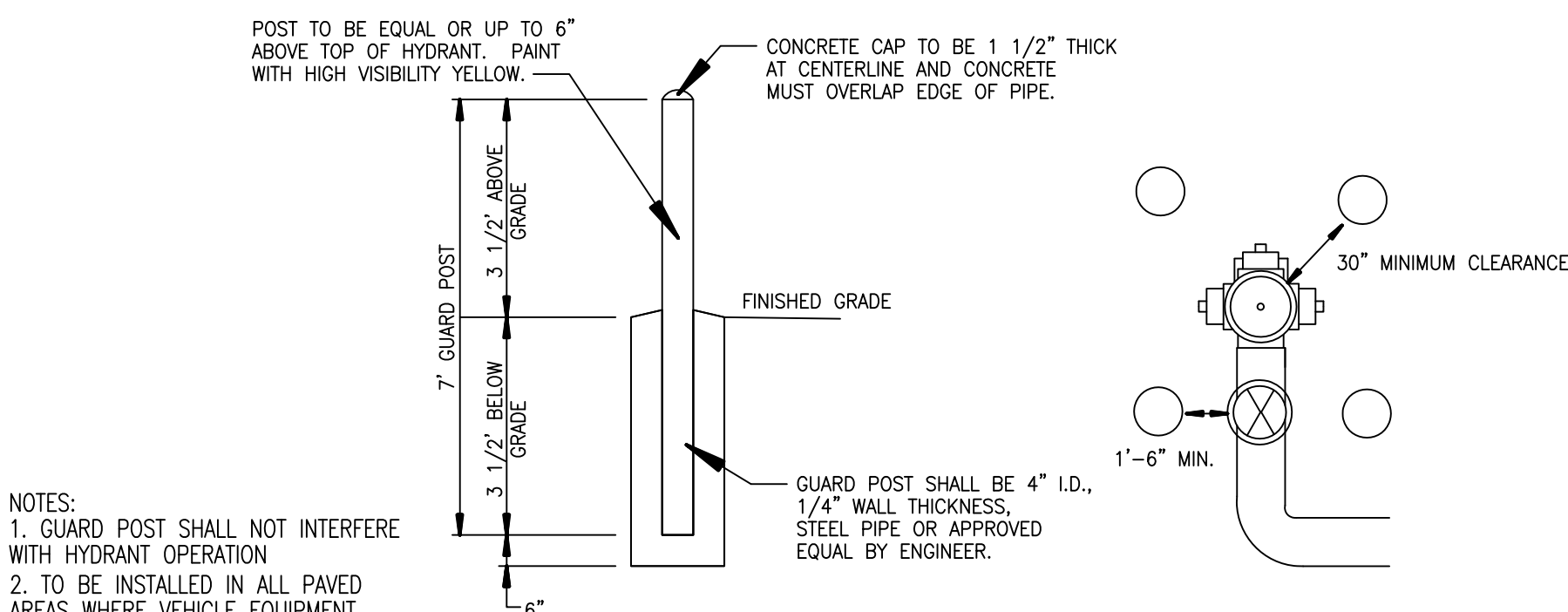


BOTTLE SLEEVE



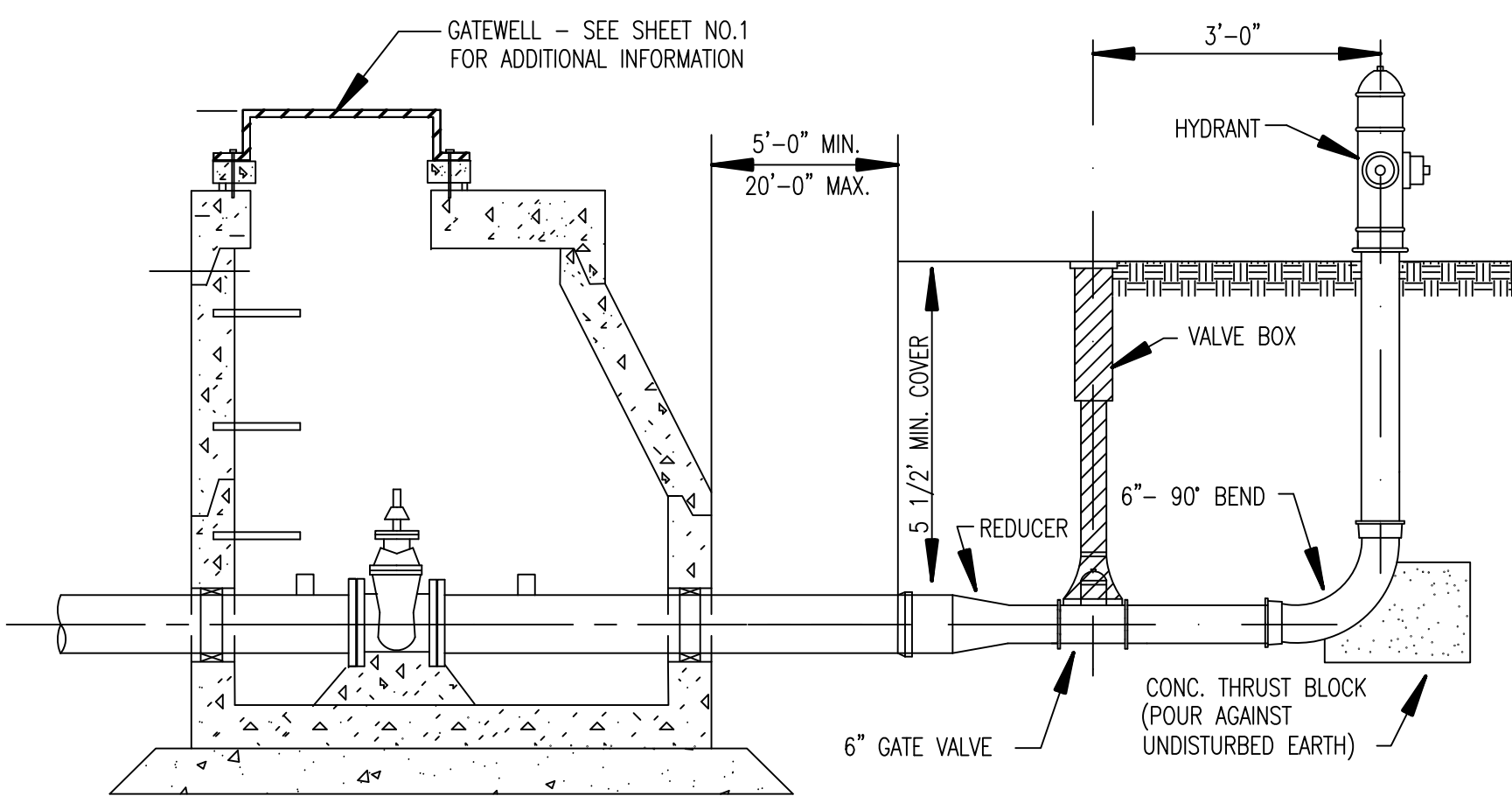
STANDARD BEDDING FOR WATER MAIN

SCALE 1" = 4'



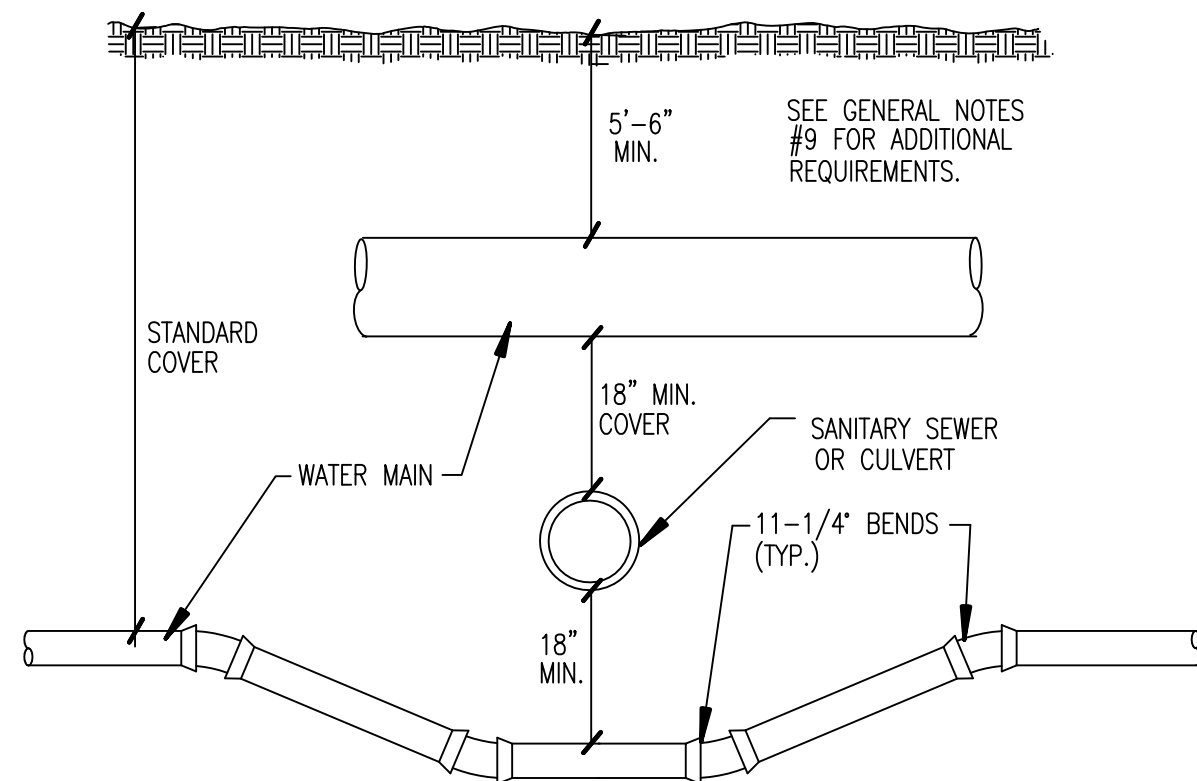
GUARD POST

SCALE 1" = 3'



DEAD END BLOWOFF CONNECTION

SCALE 1" = 1'



SEWER OR CULVERT CROSSING

SCALE 1" = 2'

**WATER MAIN
STANDARD DETAILS**


REVISION BLOCK			
Data Source / Source Date: N/A			
Rev. No.	Rev. Date	Description:	
1	07/08/14	PROPOSED REVISIONS	
2	11/01/14	PROPOSED CHANGE TO DELETE REFERENCE TO BOTTLE SLEEVE MANUFACTURER	
3	02/03/14	FINAL CHANGE TO DELETE REFERENCE TO BOTTLE SLEEVE MANUFACTURER	
4	02/14/15	MARKUPS PER G. APPEL	
ORIG. DATE:		01/01/01	
SCALE:		NONE	
DESIGNED BY:		WRC	
DRAWN BY:		WRC Mapping	
			
		ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MICHIGAN 48326-1907	
		SHEET NO.: 2 of 5	

EXHIBIT B

GENERAL NOTES - TOILET ACCESSORIES

- A. REFER TO SPECIFICATION SECTION 102800 FOR DESCRIPTION OF TOILET ACCESSORIES.
- B. REFER TO MECHANICAL PLANS FOR ALL PLUMBING FIXTURES.
- C. CENTER FLOOR DRAIN IN ROOM UON. ENSURE 1/8" PER FOOT SLOPE TOWARD FLOOR DRAINS. (TYP.)
- D. PROVIDE WD BLOCKING SUPPORT AT ALL GRAB BAR LOCATIONS PER GRAB BAR MANUFACTURER'S RECOMMENDATION.

LEGEND - TOILET ACCESSORIES

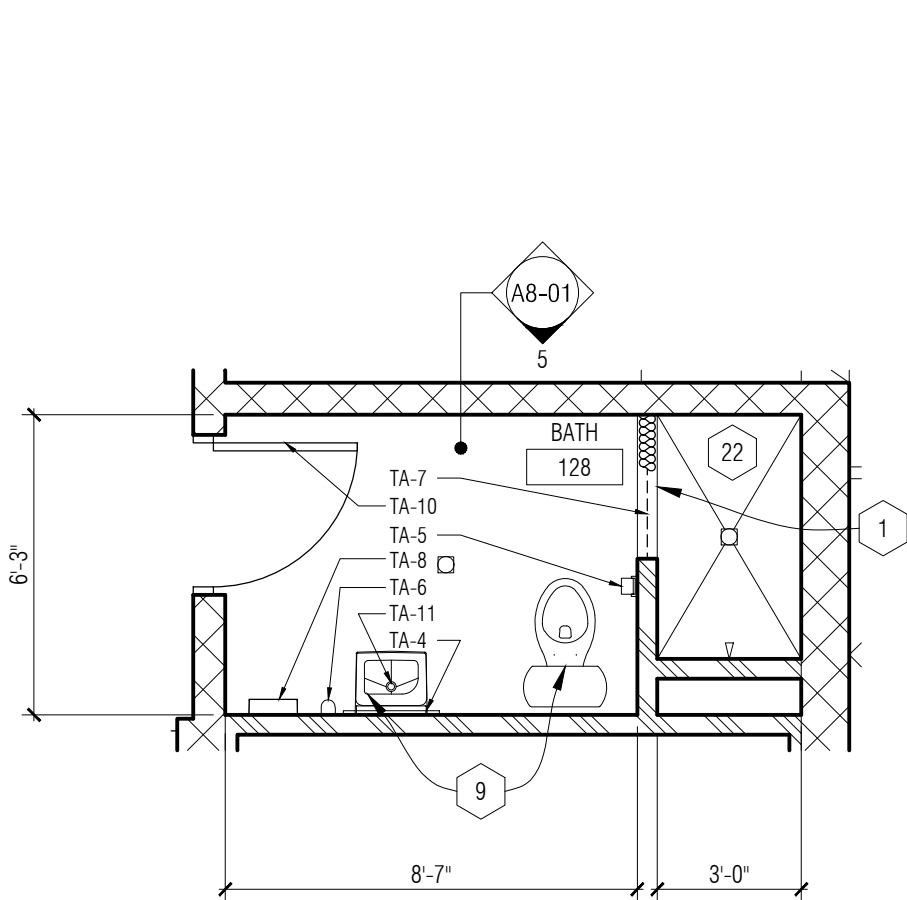
- TA-1 42" GRAB BAR
- TA-2 36" GRAB BAR
- TA-3 18" GRAB BAR - VERTICAL
- TA-4 WALL MOUNTED MIRROR
- TA-5 TOILET TISSUE DISPENSER
- TA-6 SURFACE MOUNTED SOAP DISPENSER
- TA-7 SHOWER CURTAIN ROD & HOOKS
- TA-8 PAPER TOWEL DISPENSER
- TA-9 ELECTRIC HAND DRIER
- TA-10 TOWEL HOOK
- TA-11 LAVATORY GUARD
- TA-12 FREE STANDING WASTE RECEPTACLE (NOT SHOWN- PROVIDE 1 AT EACH RESTROOM)

FLOOR PLAN GENERAL NOTES:

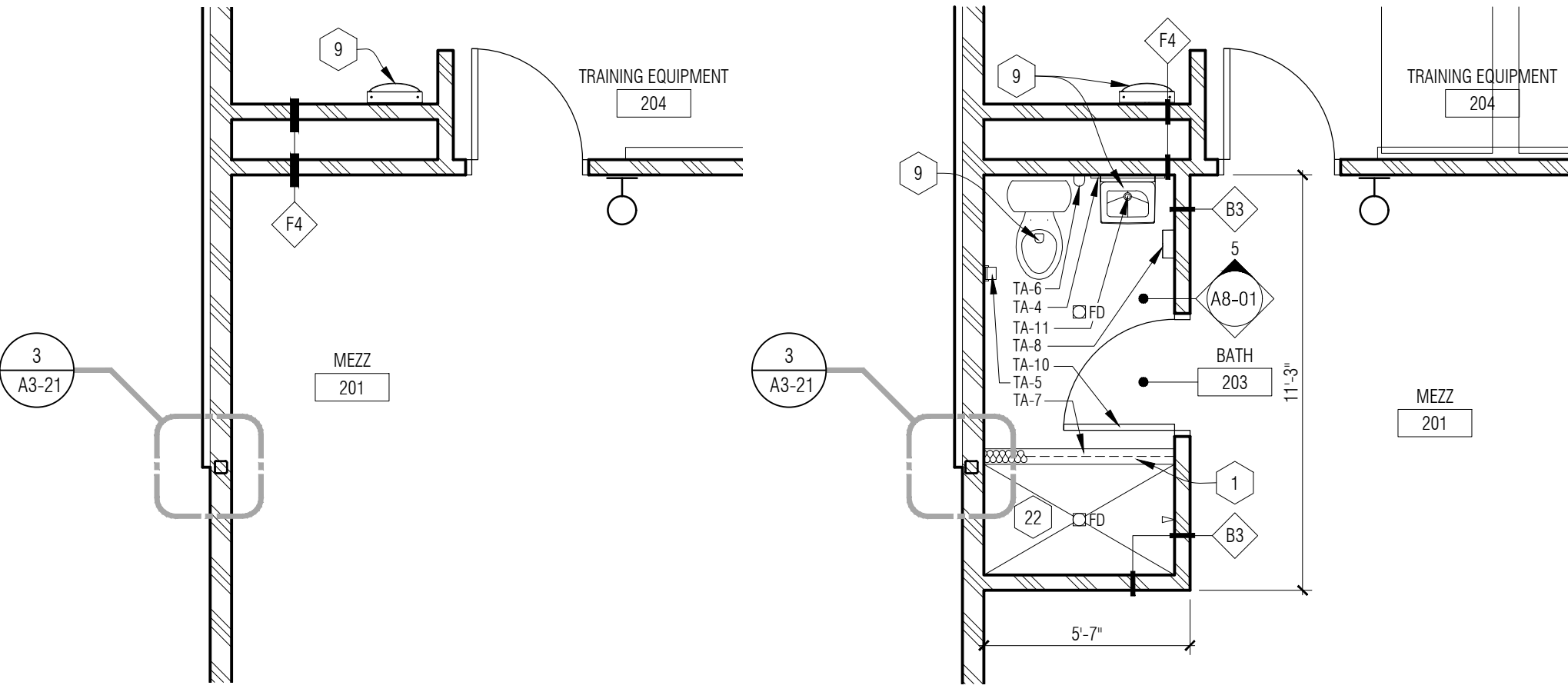
- A. ALL DIMENSIONS ARE TO FINISH FACE OF WALL - WALL THICKNESS IS SHOWN AS NOMINAL. SEE WALL TYPES FOR ACTUAL THICKNESS.
- B. COORDINATE SIZE AND LOCATION OF ALL DUCT, SHAFT AND LOUVER OPENINGS IN WALLS AND FLOORS WITH MECHANICAL AND ELECTRICAL. PROVIDE ALL REQUIRED LINTELS FOR OPENINGS.
- C. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.
- D. AT ALL LOCATIONS WHERE GYPSUM BOARD WALL INTERSECTS PERPENDICULAR TO MASONRY BLOCK WALL CORNER, THE GYPSUM BOARD IS TO BE SET BACK 1" FORM BULLNOSE OF BLOCK.
- E. AT FLOOR DRAIN LOCATIONS, SLOPE SLAB (-1") TO DRAIN LOCATION.

FLOOR PLAN KEY NOTES:

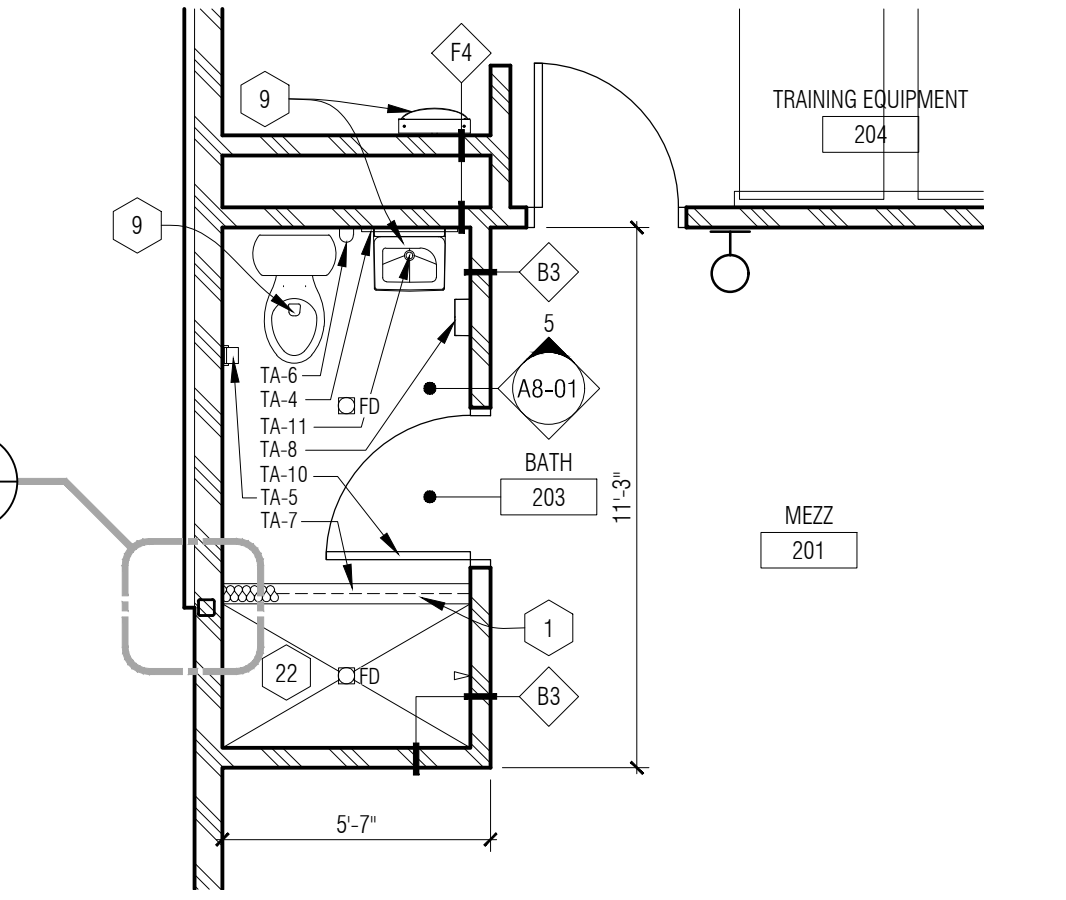
- 1 SOLID SURFACE TRANSITION AT SHOWER - REFER TO DETAIL T7 ON A0-14
- 2 THICKENED CONCRETE EQUIPMENT PAD, COORDINATE SIZE & LOCATOIN WITH MECH & ELEC EQUIPMENT
- 3 UNDER COUNTER DISHWASHER PROVIDED BY OWNER
- 4 DASHED LINE OF STONE SKIRTING AND SILL BELOW
- 5 TV BY OWNER - REFER TO ELEC
- 6 WASHER/DRYER PROVIDED BY OWNER - REFER TO MECH.
- 7 LINE OF FLOOR MATERIAL CHANGE - NO TRANSITION STRIP BETWEEN MATERIALS - REFER TO DETAIL T4 ON A0-14
- 8 HATCHED AREA OF MEZZANINE ABOVE
- 9 PLUMBING FIXTURE - REFER TO PLUMBING
- 10 WALL MOUNTED PPE STORAGE. REFER TO SPECIFICATIONS
- 11 REGENCY 18 GAUGE STAINLESS STEEL WORK TABLE - ITEM NUMBER: 600T2460G WITH NO UNDERSHELF
- 12 MILLWORK/CASEWORK - REFER TO INTERIOR ELEVATIONS
- 13 42" HIGH COUNTERTOP WITH BRACKETS
- 14 BASE BID: NO DECK
ALTERNATE #3: PRESSURE TREATED WOOD FLOOR DECK ON WOOD FLOOR CONSTRUCTION - REFER TO WALL SECTIONS AND STRUCTURAL.
- 15 MEZZANINE GUARD RAIL, TERMINATION, MOUNTING, AND STAIR GUARD / HAND RAIL MUST MAINTAIN LESS THAN 4" GAP AT STEEL VERTICAL POSTS
- 16 PPE-FABRICATED TRENCH DRAIN - PROVIDE 2" CHASE WITH JOINT SEALANT AROUND PERIMETER - REFER TO STRUCTURAL AND PLUMBING.
- 17 STAND PIPE - REFER TO PLUMBING
- 18 MASONRY OPENING - REFER TO DIMENSION PLAN AND ELEVATIONS FOR OPENING SIZE
- 19 APPLIANCE - PROVIDED & INSTALLED BY OWNER
- 20 6" Ø x 4'-0" HIGH CONCRETE FILLED GALVANIZED STEEL PIPE BOLLARD
- 21 SLOPED EPOXY FLOORING
- 22 PORCELAIN TILE SHOWER WITH SHOWER PAN FLASHING AND FLOOR DRAIN. COORDINATE DEPRESSION IN CONCRETE FLOOR SLAB AS REQUIRED FOR FLUSH FLOOR FINISH.
- 23 GROMMET IN COUNTERTOP
- 24 ALTERNATE: LINE OF DECK ABOVE
- 25 ADJUSTABLE SHELVING
- 26 EYE WASH STATION
- 27 LINE OF CLERESTORY ABOVE - REFER TO DETAIL 3/A3-01
- 28 MOP RACK
- 29 ELECTRICAL WATER COOLER - REFER TO MECH. & ELEC
- 30 COMPRESSORS TO BE RE LOCATED FROM STATION 1 - REFER TO MECH. & ELEC - OWNER TO RELOCATE
- 31 EXTRACTOR PROVIDED BY OWNER - REFER TO MECH. & ELEC FOR PROVIDED CONNECTIONS.
- 32 CLOSET WITH COAT RACK & SHELF
- 33 DELEGATED DESIGN STAIR SYSTEM WITH 5' CLEAR REMOVABLE RAILING AT LANDING
- 34 PPE CHARGING STATION - REFER TO SECTION DETAIL 7/A6-11
- 35 TRANSITION RAMPED FLOOR - 1/2" PER 1'-0" SLOPE
- 36 LINE OF ROOF EDGE BELOW
- 37 SIGNAGE BY OWNER, CENTER WITH DOOR BELOW
- 38 TRANSITION FROM FULL BET DEPTH STONE TO A 2" VENEER AT EXTERIOR LINE OF BUILDING BELOW
- 39 LINE OF ENTRANCE SLAB - REFER TO STRUCTURAL
- 40 WALL MOUNTED HOSE BIB - REFER TO PLUMBING
- 41 LINE OF OVERHEAD DOOR IN OPEN POSITION - REFER TO DOOR SCHEDULE



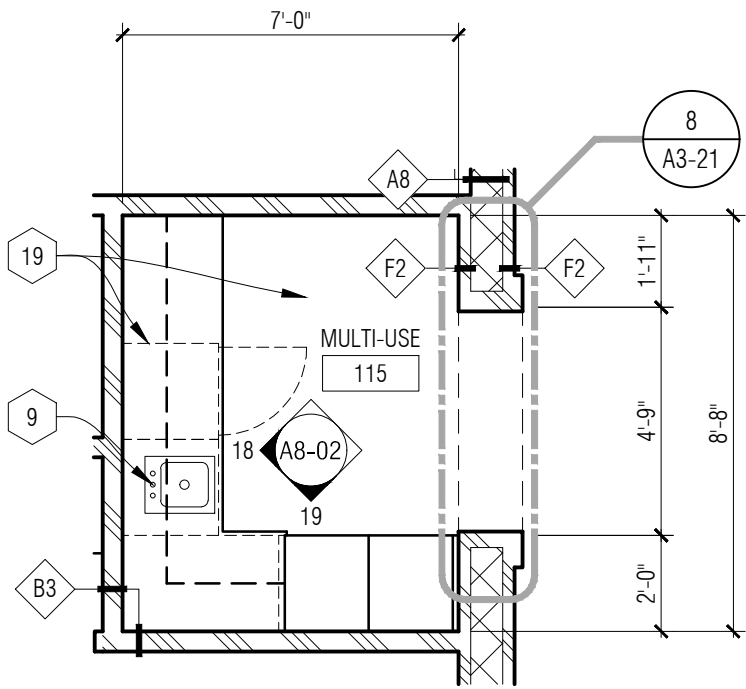
7 Enlarged Plan - Bathroom 116
A3-01 1/4" = 1'-0"



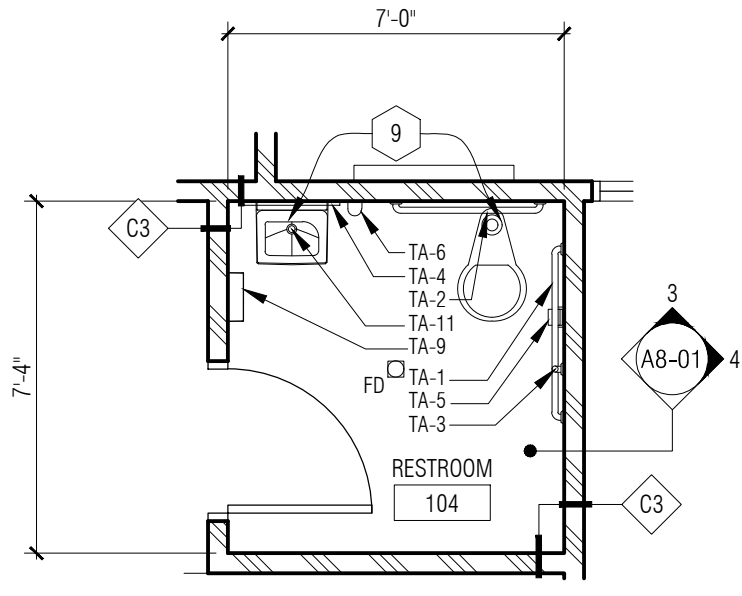
6 Mezzanine Level Enlarged Floor Plan - Base Bid
A3-01 1/4" = 1'-0"



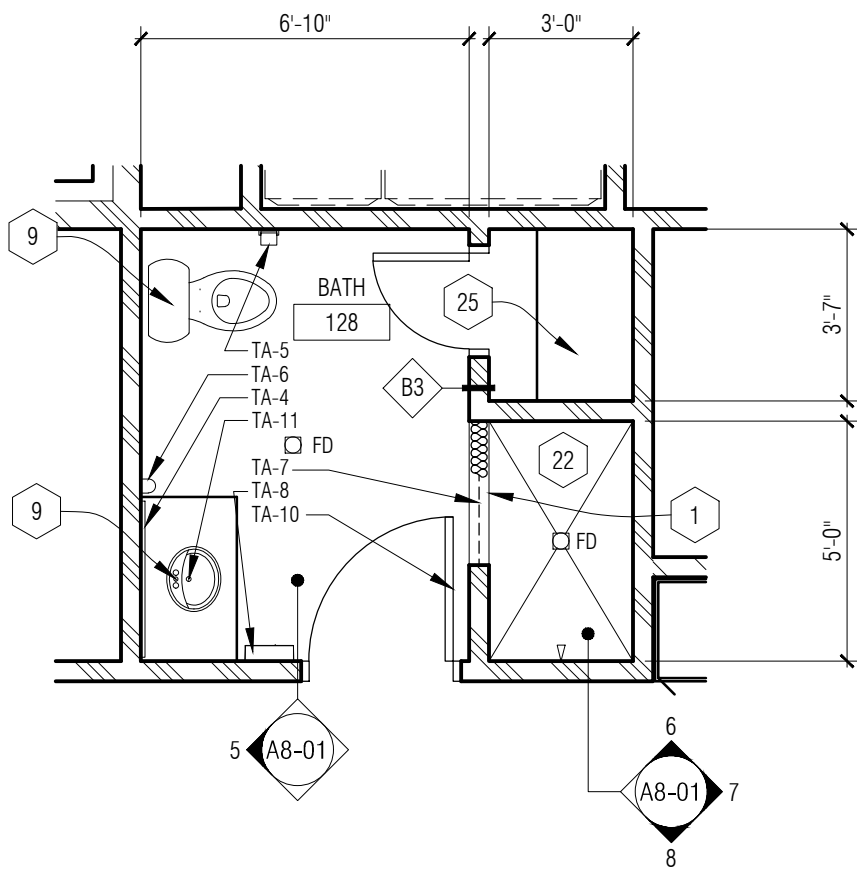
5 Mezzanine Level Enlarged Floor Plan - Alternate #2
A3-01 1/4" = 1'-0"



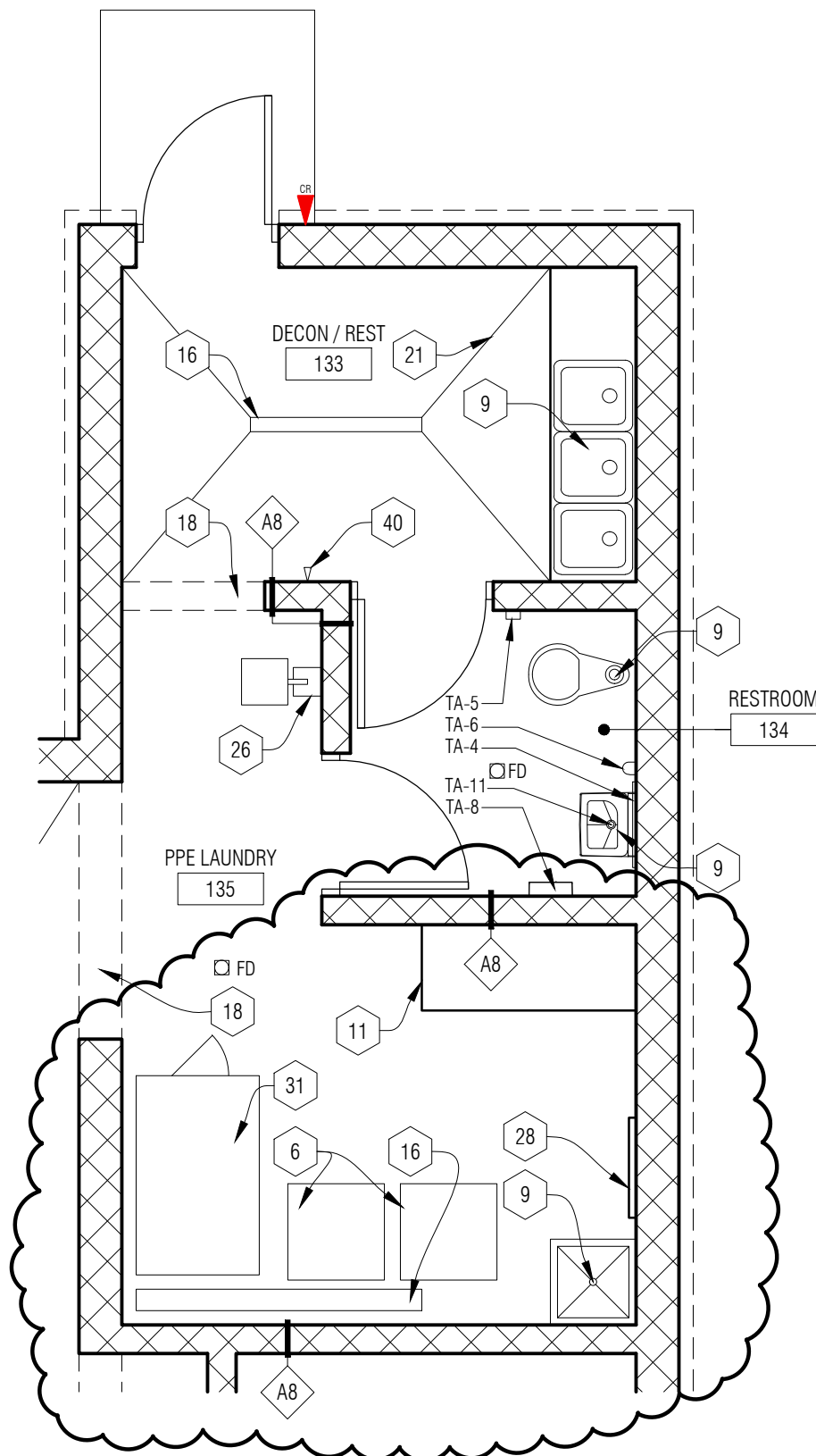
4 Enlarged Plan - Multi-Use
A3-01 1/4" = 1'-0"



3 Enlarged Plan - Restroom 103 & 104
A3-01 1/4" = 1'-0"



2 Enlarged Plan - Bathroom 124 & 128
A3-01 1/4" = 1'-0"



1 Enlarged Plan - Decon Area
A3-01 1/4" = 1'-0"

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65 MARKET STREET
MOUNT CLEMENS, MI 48043
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F 586.469.3607

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KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

Bidding - Construction	03/27/20
Addendum #1	04/20/20
Construction Set	05/04/20
CCD #2	06/16/20

DRAWN BY

CHECKED BY
LL / AM

APPROVED BY
DG

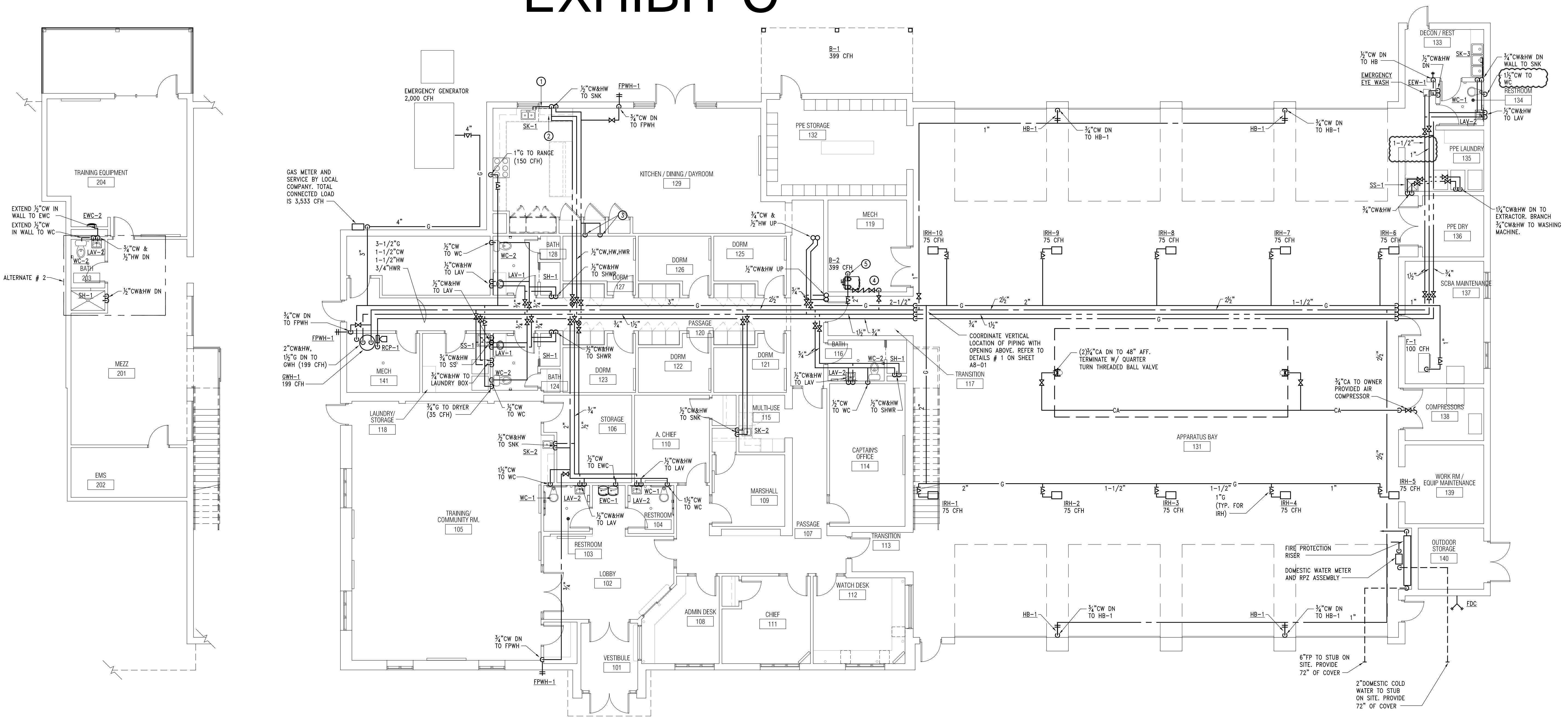
SHEET NAME

ENLARGED
FLOOR PLANS

SHEET NO.

A3-10

EXHIBIT C



2 Mezzanine Level Floor Plan - Domestic Water & gas
1/8" = 1'-0"

1 Main Level Floor Plan - Domestic Water & Gas
1/8" = 1'-0"

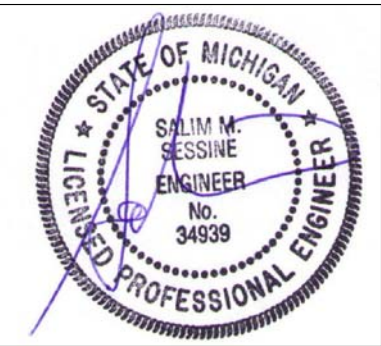
NATURAL GAS LOAD SUMMARY	
EQUIPMENT	INPUT (CFH)
GWH-1	199
IRH-1 THRU 10	(10x75) 750
B-1	399
GAS RANGE (ALLOCATED)	150
GAS DRYER (ALLOCATED)	35
GENERATOR (ALLOCATED)	2000
F-1	100
TOTAL	= 3,533 CFH
PIPE DESIGN BASED ON 7"W.C. @ 250 LINEAR FT. WITH 0.3"W.C. ALLOWABLE PRESSURE DROP.	

NEW WORK KEY NOTES:

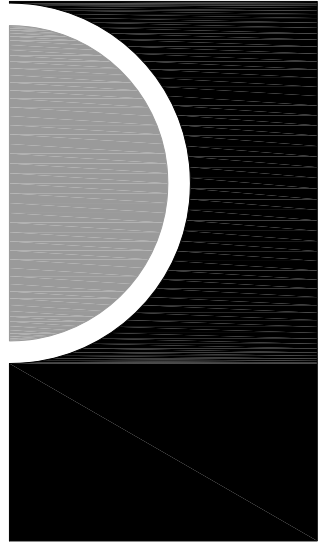
- EXTEND DOMESTIC WATER IN WALL TO SINK. KEEP TIGHT TO INTERIOR OF WALL. PROVIDE MINIMUM 2" RIGID INSULATION BEHIND PIPE AN SEAL TO STUD AND ALL SEAMS.
- EXTEND HOT WATER TO DISHWASHER. PROVIDE FINAL CONNECTION PER MANUFACTURERS RECOMMENDATION.
- 1/2" COLD WATER DOWN TO REFRIGERATOR. PROVIDE ONE BACKFLOW PREVENTER APOLLO MODEL #4C-100 SERIES PER COLD WATER DROP ABOVE CEILING. ROUTE DEVICE DRAIN TO SERVICE SINK.
- 1" COLD WATER TO MECHANICAL EQUIPMENT. PROVIDE RPZ AND PIPE "SPIT" TO FLOOR DRAIN.
- 2" GAS DOWN TO BOILER. PROVIDE SHUT-OFF IN VERTICAL. (399 CFH EA)
- BOILER # 1 (IN FLOOR HEAT) IS AN ALTERNATE # 5.

GENERAL NOTES:

- A. COORDINATE ALL WORK WITH OTHER TRADES.



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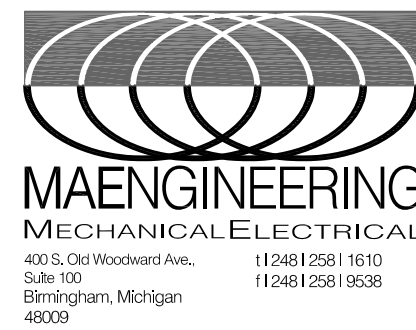
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MOUNT CLEMENS, MI 48043
P 586.469.3600
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KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

SCHEMATIC DESIGN	01-28-2020
BIDDING-CONSTRUCTION	03-27-2020
ADDENDUM # 1	04-20-2020
CONSTRUCTION	05-04-2020
CDD # 1	06-03-2020
CDD # 2	06-16-2020

DRAWN BY

MS

CHECKED BY

MS

APPROVED BY

MS

SHEET NAME

FLOOR PLANS -
DOMESTIC WATER
AND GAS

SHEET NO.

M1-02

EXHIBIT D

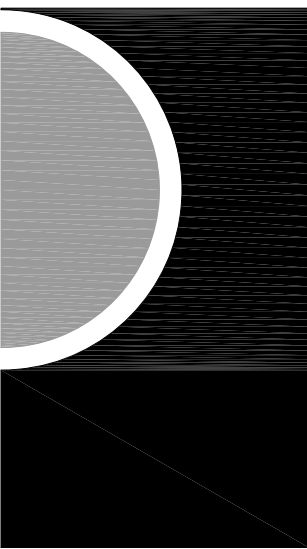
RISER KEY NOTES:

- 1 PROVIDE ALL UNUSED SPACE IN MAIN SWITCHBOARDS MDP AND ALL DISTRIBUTION PANELS UP'S FULLY BUSSED FOR FUTURE USE.
- 2 PROVIDE CONCRETE PAD FOR ALL GROUND AND FLOOR MOUNTED EQUIPMENT: DISTRIBUTION PANELS, TRANSFORMERS, ETC. CONCRETE PADS NOT SPECIFICALLY INDICATED ON PLANS AND RISER DIA. REFER TO SPECIFICATIONS FOR EXACT REQUIREMENTS.
- 3 PROVIDE LIGHTING CONTROL RELAY PANEL AS REQUIRED TO CONTROL INTERIOR AND EXTERIOR LIGHTING AS SPECIFIED.
- 4 PROVIDE GROUNDING AND BONDING PER NEC 250. BOND ALL GROUNDING ELECTRODES PRESENT IN THE BUILDING, INCLUDING CONCRETE ENCASED ELECTRODES (REBAR) AND BUILDING STEEL TO THE SYSTEM GROUND.
- 5 VFD IS PROVIDED WITH EQUIPMENT. PROVIDE COMPLETE INSTALLATION, COORDINATE WITH MECHANICAL FOR EXACT REQUIREMENTS.
- 6 DISCONNECT SWITCH PROVIDED WITH EQUIPMENT, REFER TO GENERAL NOTE-G THIS SHEET.
- 7 COORDINATE WITH APPROVED GENERATOR SUBMITTALS FOR EXACT REQUIREMENTS AND PROVIDE SERVICES AS REQUIRED. PROVIDE BRANCH CIRCUITS FROM RP-1B.
- 8 EXISTING OWNER EQUIPMENT. EXACT REQUIREMENTS TO BE VERIFIED AND PROVIDE COMPLETE ELECTRICAL INSTALLATION INCLUDING FEEDER, OVERCURRENT PROTECTION, DISCONNECT SWITCH, ETC. PER EQUIPMENT NAMEPLATE DATA, INFORMATION INDICATED ON DOCUMENTS IS FOR REFERENCE ONLY.

GENERAL RISER NOTES:

- A. REFER TO SHEETS EO.003 FOR WIRE SCHEDULES AND SHEETS EO.004 AND EO.005 FOR PANEL SCHEDULES.
- B. REFER TO VOLTAGE DROP SCHEDULE ON SHEET EO.001 AND ADJUST FEEDERS ACCORDINGLY.
- C. RUN ALL UNDERGROUND CONDUITS MIN. 4" UNDER SLAB.
- D. NEW ELECTRICAL SERVICE REQUIREMENTS TO BE COORDINATED WITH DTE ENERGY.
- E. ALL MOTORS AND EQUIPMENT INDICATED ON THIS RISER DIAGRAM ARE RATED 208V/3Ø, UNLESS OTHERWISE NOTED.
- F. ALL FLOOR AND GROUND MOUNTED EQUIPMENT (SWITCHBOARDS, DISTRIBUTION PANELS, GENERATOR, CONTROL PANELS ETC.) TO BE PAD MOUNTED. PROVIDE CONCRETE PAD AS REQUIRED PER APPROVED EQUIPMENT SUBMITTAL, COORDINATE WITH ARCHITECT.
- G. COORDINATE WITH MECHANICAL FOR DISCONNECT SWITCHES SUPPLIED WITH THE EQUIPMENT, PROVIDE FOR ALL AS INDICATED IF NOT INCLUDED WITH THE EQUIPMENT.

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PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

SCHEMATIC DESIGN	01-28-2020
BIDDING-CONSTRUCTION	03-27-2020
CONSTRUCTION	05-04-2020
CCD #1	06-03-2020
CCD #2	06-16-2020

DRAWN BY

NH

CHECKED BY

EK

APPROVED BY

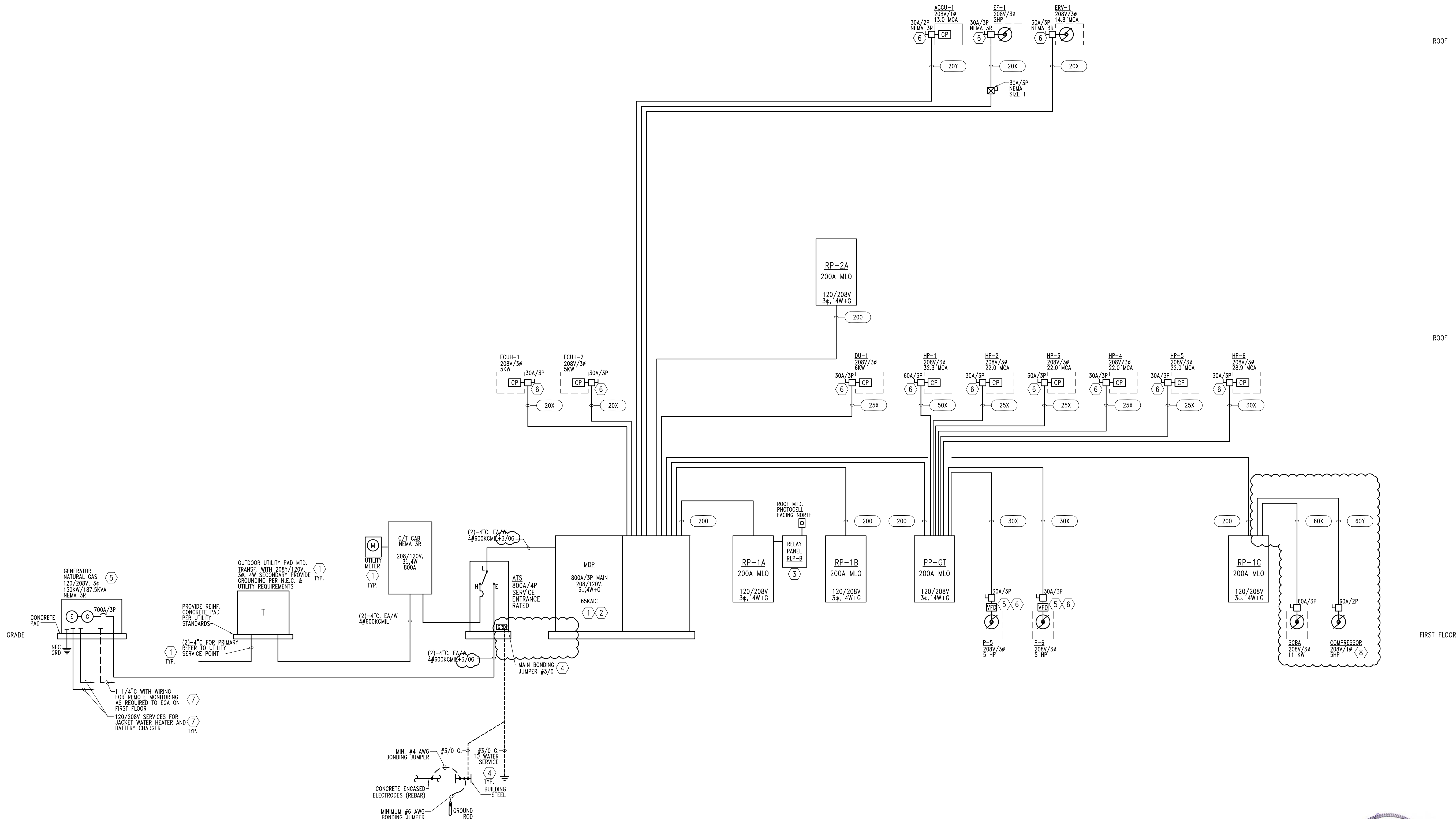
EK

SHEET NAME

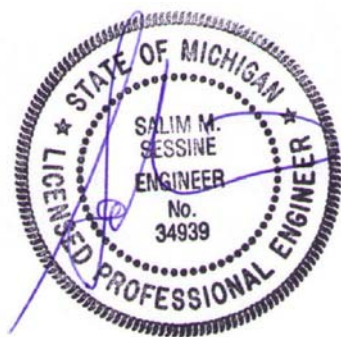
ELECTRICAL RISER
DIAGRAM

SHEET NO.

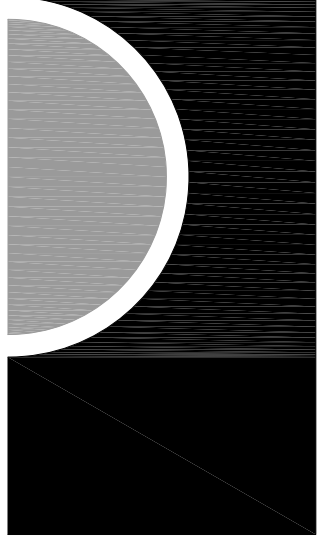
EO-02



1
EO-02
ELECTRICAL RISER DIAGRAM
Scale: No Scale



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MOUNT CLEMENS, MI 48043
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KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 11600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

SCHEMATIC DESIGN 01-28-2020
BIDDING-CONSTRUCTION 03-27-2020CONSTRUCTION 05-04-2020
CCD #1 06-03-2020
CCD #2 06-16-2020

DRAWN BY

NH

CHECKED BY

EK

APPROVED BY

EK

SHEET NAME

ELECTRICAL PANEL
SCHEDULES

SHEET NO.

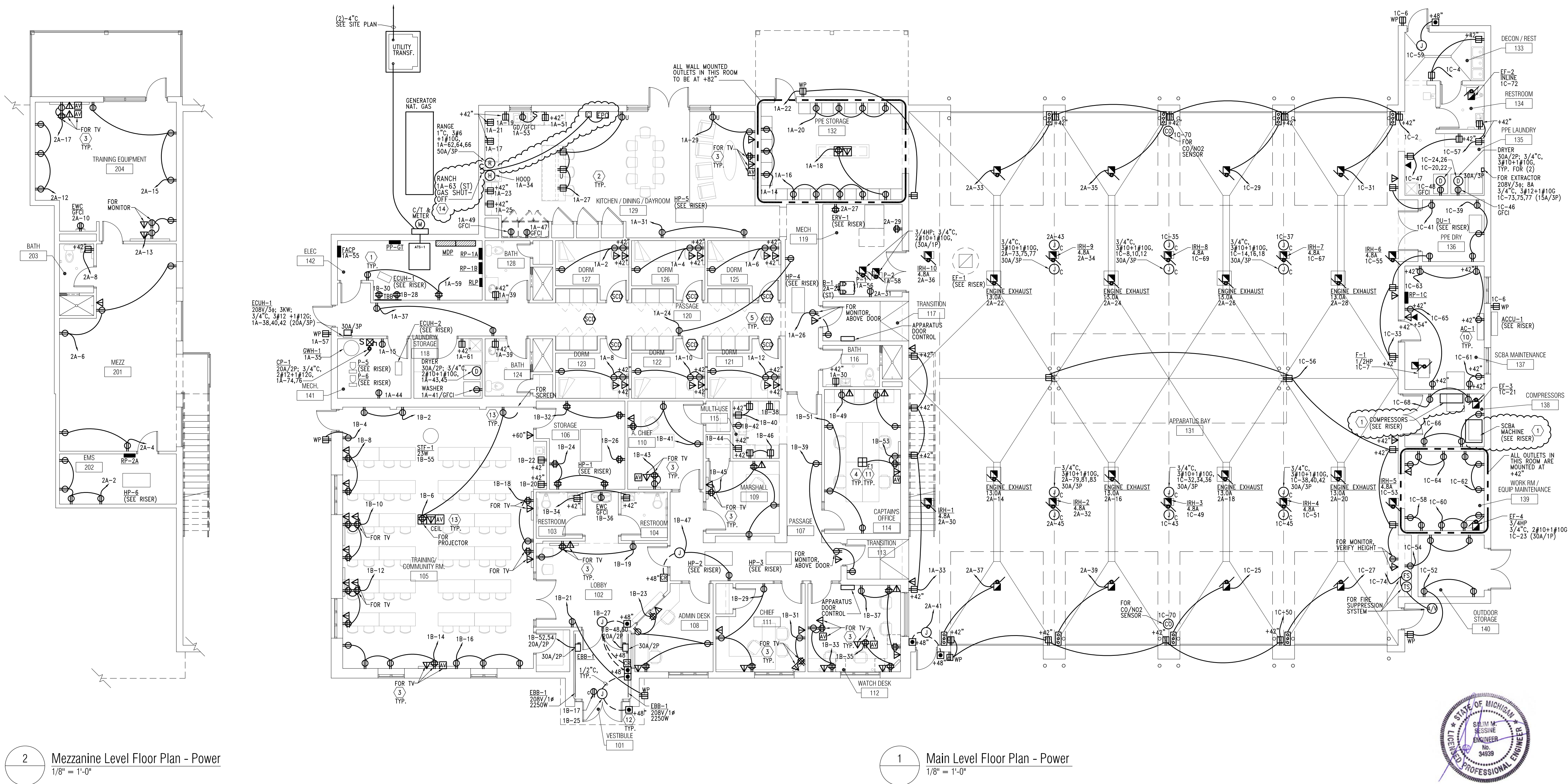
E0-04

PROJECT:	HIGHLAND TWP FS-1	200A	MLO	CLASS:	208/120V,3PH,4W+G	PANEL:
PROJ NO:	75810	DATE:	06/15/20	VA	MOUNTING:	PP-GT
BRANCH CIRCUIT:	NO. POLES	BKR	BUS A	BUS B	BUS C	REMARKS
1	3	3325	3325	3325		HP-1 32.6 MCA
3	1					
5	50					
7	3	2244	2244	2244		HP-2 22.0 MCA
9	1					
11	25					
13	3	2244	2244	2244		HP-3 22.0 MCA
15	1					
17	25					
19	3	2244	2244	2244		HP-4 22.0 MCA
21	1					
23	25					
25	3	2244	2244	2244		HP-5 22.0 MCA
27	1					
29	25					
31	3	2948	2948	2948		HP-6 28.9 MCA
33	1					
35	30					
37	1					SPACE
39	1					SPACE
41	1					SPACE
2	3	2100	2100	2100		P-5 5 HP
4	1					
6	30					
8	3	2100	2100	2100		P-6 5 HP
10	1					
12	30					
14	1					SPACE
16	1					SPACE
18	1					SPACE
20	1					SPACE
22	1					SPACE
24	1					SPACE
26	1					SPACE
28	1					SPACE
30	1					SPACE
32	1	20				SPACE
34	1	20				SPACE
36	1	20				SPACE
38	1	20				SPACE
40	1	20				SPACE
42	1	20				SPACE
LIGHTING LOAD						NEC 220.42
REC. LOAD						NEC 220.44
EQUIPMENT						80%
TOTAL LOAD						58347 VA
CONNECTED LOAD						162 A
DEMAND LOAD						130 A

PROJECT:	HIGHLAND TWP FS-1	200A	MLO	CLASS:	208/120V,3PH,4W+G	PANEL:
PROJ NO:	75810	DATE:	06/15/20	VA	MOUNTING:	RP-1B
BRANCH CIRCUIT:	NO. POLES	BKR	BUS A	BUS B	BUS C	REMARKS
3	1	20	600	679		LIGHTING VIA RLP
5	1	20		485		LIGHTING VIA RLP
7	1	20	500			LIGHTING VIA RLP
9	1	20				SPACE
11	1	20				SPACE
13	1	20	400			L TRAFFIC LIGHTS
15	1	20				SPACE
17	1	20	1200			L REC. FOR SIGN VIA RLP
19	1	20	720			R 5 REC.
21	1	20	540			R 3 REC.
23	1	20	1080			R 6 REC.
25	1	20	1200			E DOOR OPERATOR
27	1	20	1200			E DOOR OPERATOR
29	1	20	720			R 4 REC.
31	1	20	540			R 3 REC.
33	1	20	900			R 5 REC.
35	1	20	720			R 4 REC.
37	1	20	900			R 5 REC.
39	1	20	540			R 5 REC.
41	1	20	720			R 4 REC.
43	1	20	540			R 3 REC.
45	1	20	1080			R 3 REC.
47	1	20	540			R 3 REC.
49	1	20	540			R 3 REC.
51	1	20	540			R 3 REC.
53	1	20	1080			R 4 REC.
55	1	20	100			E STP-1
57	1	20	400			E PA SYSTEM
59	1	20	400			E RADIO SYSTEM
61	1	20				SPACE
63	1	20				SPACE
65	1	20				SPACE
67	1	20				SPACE
69	1	20				SPACE
71	1	20				SPACE
73	1	20				SPACE
75	1	20				SPACE
77	1	20				SPACE
79	1	20				SPACE
81	1	20				SPACE
83	1	20				SPACE
2	1	20	900			R 5 REC.
4	1	20	400			R 2 REC.
6	1	20	1000			R 4 REC.
8	1	20	720			R 4 REC.
10	1	20	1080			R 6 REC.
12	1	20	1080			R 6 REC.
14	1	20	900			R 5 REC.
16	1	20	540			R 3 REC.
18	1	20	900			R 5 REC.
20	1	20	1000			E COFFEE
22	1	20	1000			E COFFEE
24	1	20	720			R 4 REC.
26	1	20	540			R 3 REC.
28	1	20	1000			E TBB
30	1	20	1000			E TBB
32	1	20	400			R 2 REC.
34	1	20	800			R 2 REC.
36	1	20	900			E EWC
38	1	20	600			E EQUIPMENT
40	1	20	900			E EQUIPMENT
42	1	20	800			E REF.
44	1	20	600			E EQUIPMENT
46	1	20	900			E EQUIPMENT
48	2	20	1125			E EBB-1
50	2	20	1125			E EBB-1
52	1	20	1125			E EBB-1
54	1	20				SPACE
56	1	20				SPACE
58	1	20				SPACE
60	1	20				SPACE
62	1	20				SPACE
64	1	20				SPACE
66	1	20				SPACE
68	1	20				SPACE
70	1	20				SPACE
72	1	20				SPACE
74	1	20				SPACE
76	1	20				SPACE
78	1	20				SPACE
80	1	20				SPACE
82	1	20				SPACE
84	1	20				SPACE
LIGHTING LOAD						3884 VA
REC. LOAD						3302 VA
EQUIPMENT						14000 VA
TOTAL LOAD						42044 VA
CONNECTED LOAD						117 A
DEMAND LOAD						91 A

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PROJECT:		HIGHLAND TWP FS-1			200A		MLO		CLASS:		120/208V 3PH, 4W+G.		PANEL:	
PROJ NO:		75810		DATE:		06/15/20				MOUNTING:		RP-2A		
BRANCH CIRCUIT:				WATTS				CODE				REMARKS		
NO.	POLES	BKR	BUS A	BUS B	BUS C	L	R	E						
1	1	20	350						L	LIGHTING				
3	1	20		300					L	LIGHTING				
5	1	20								SPARE				
7	1	20								SPARE				
9	1	20								SPARE				
11	1	20								SPARE				
13	1	20	540					R		3 REC.				
15	1	20						R		3 REC.				
17	1	20		540				R		3 REC.				
19	1	20			540					SPARE				
21	1	20								SPARE				
23	1	20						E	B-1					
25										SHUNT TRIP				
27	1	20		400				E		1 REC.				
29	1	20						E		1 REC.				
31	1	20	400					E		1 REC.				
33	1	20			1200			E		DOOR OPERATOR				
35	1	20						E		DOOR OPERATOR				
37	1	20	1200					E		DOOR OPERATOR				
39	1	20			1200			E		DOOR OPERATOR				
41	1	20						E		DOOR OPERATOR				
43	1	20		400				E		CEILING J-BOX				
45	1	20			400			E		CEILING J-BOX				
47	1	20								SPARE				
49	1	20								SPARE				
51	1	20								SPARE				
53	1	20								SPARE				
55	1	20								SPARE				
57	1	20								SPARE				
59	1	20								SPARE				
61	1	20								SPACE				
63	1	20								SPACE				
65	1	20								SPACE				
67	1	20								SPACE				
69	1	20								SPACE				
71	1	20								SPACE				
73	2	30	400					E		CEILING J-BOX				
75	2	30		400				E		CEILING J-BOX				
77	2	30	400					E		CEILING J-BOX				
79	2	30			400			E		CEILING J-BOX				
81	2	30		400				E		CEILING J-BOX				
83	2	30			400			E		CEILING J-BOX				
2	1	20	720					R		4 REC.				
4	1	20		360				R		2 REC.				
6	1	20			540			R		3 REC.				
8	1	20	600					R		DEDICATED CKT				
10	1	20		800						E EWC				
12	1	20			540			R		3 REC.				
14	1	20	1680					E		ENGINE EXHAUST				
16	1	20		1680				E		ENGINE EXHAUST				
18	1	20			1680			E		ENGINE EXHAUST				
20	1	20	1680					E		ENGINE EXHAUST				
22	1	20		1680				E		ENGINE EXHAUST				
24	1	20			1680			E		ENGINE EXHAUST				
26	1	20	1680					E		ENGINE EXHAUST				
28	1	20		1680				E		ENGINE EXHAUST				
30	1	20			576			RR-1						
32	1	20	576					RRH-2						
34	1	20		576				E		RRH-9				
36	1	20			576			E		RRH-10				
38	1	20								SPARE				
40	1	20								SPARE				
42	1	20								SPARE				
44	1	20								SPARE				
46	1	20								SPARE				
48	1	20								SPARE				
50	1	20								SPARE				
52	1	20								SPARE				
54	1	20								SPARE				
56	1	20								SPARE				
58	1	20								SPARE				
60	1	20								SPARE				
62	1	20								SPARE				
64	1	20								SPARE				
66	1	20								SPARE				
68	1	20								SPARE				
70	1	20								SPARE				
72	1	20								SPARE				
74	1	20								SPACE				
76	1	20								SPACE				
78	1	20								SPACE				
80	1	20								SPACE				
82	1	20								SPACE				
84	1	20								SPACE				
LIGHTING LOAD		350						650 VA		NEC 220.42	=	650 VA		
RECEPTACLE LOAD		1,880	900	1,620			4380 VA		NEC 220.44	=	4380 VA			
EQUIPMENT LOAD		8,416	10,416	8,912			2774 VA		80%	=	22195 VA			
											=			
TOTAL LOAD		10,626	11,616	10,532			32774 VA		81 A	=	27725 VA			
							CONNECTED LOAD		76 A	=	DEMAND LOAD			



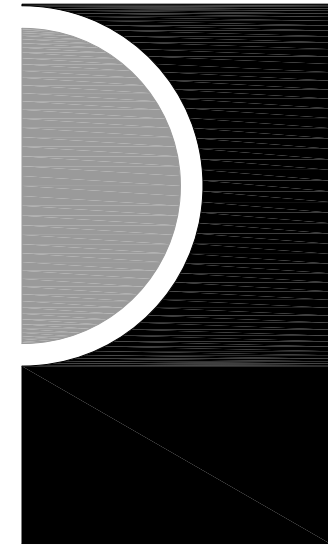
KEYED POWER NOTES:

- 1 EXACT LOCATION AND REQUIREMENTS FOR EQUIPMENT TO BE COORDINATED WITH EQUIPMENT VENDOR, APPROVED SUBMITTALS AND NAMEPLATE DATA. INFORMATION INDICATED ON THESE PLANS IS FOR REFERENCE ONLY.
- 2 ALL RECEPTACLES LOCATED WITHIN 6'-0" OF A WATER SOURCE AND ALL IN THE KITCHENS SHALL BE GFI TYPE. PROVIDE GFI RECEPTACLES REGARDLESS OF SYMBOL USED ON PLAN FOR THESE LOCATIONS. FOR LOCATIONS THAT ARE NOT ACCESSIBLE, LOCATE BLANK PLATE GFI ABOVE THE RECEPTACLE AT +4'-4" AFF OR NEAR ROOM WALL SWITCHES) OR PROVIDE GFCI BRANCH BREAKERS IN PANELBOARDS AS DIRECTED BY OWNER TO COMPLY WITH NEC 210.8.
- 3 DUPLEX RECEPTACLES AND DATA OUTLETS FOR FLAT SCREEN TV SHALL BE MOUNTED AT 5'-0" AFF UNLESS OTHERWISE NOTED. COORDINATE WITH ARCHITECT/OWNER FOR EXACT QUANTITIES, LOCATIONS AND MOUNTING HEIGHTS.
- 4 EXACT LOCATIONS FOR ALL FLOOR OUTLETS TO BE COORDINATED WITH ARCHITECT/OWNER.
- 5 PROVIDE (2)-20A/1P, 120V DEDICATED BRANCH CIRCUITS FOR ALL FIRE/SMOKE DAMPERS. WIRE TO RP-1A-1. REFER TO PANEL SCHEDULES, COORDINATE AND REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATIONS AND QUANTITIES. NOT ALL FIRE/SMOKE DAMPERS ARE INDICATED ON THESE PLANS.
- 6 COORDINATE WITH MECHANICAL FOR EXACT REQUIREMENTS FOR FIRE PROTECTION SYSTEM, INCLUDING NUMBER OF FLOW/TAMPER SWITCHES.
- 7 PROVIDE POWER FOR DRY PIPE SYSTEM COMPRESSOR. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FIRE SUPPRESSION CONTRACTOR. LOCATION INDICATED ON PLAN IS FOR REFERENCE ONLY.
- 8 EXACT LOCATIONS FOR FIRE ALARM CONTROL AND ANNUNCIATOR PANELS AND SECURITY SYSTEM PANELS TO BE COORDINATED WITH ARCHITECT/OWNER. PROVIDE FLUSH MOUNTING FOR ALL, UNLESS LOCATED IN UNFINISHED SPACES.
- 9 EXACT LOCATIONS FOR ALL ELECTRICAL EQUIPMENT TO BE COORDINATED, REFER TO GENERAL NOTE-F.
- 10 INDOOR AC UNIT IS FED FROM THE OUTDOOR ACU UNIT. COORDINATE WITH MECHANICAL FOR COMPLETE INSTALLATION REQUIREMENTS, INCLUDING INTERWIRING OF THE UNIT.
- 11 RUN 1 1/4" FROM LOW VOLTAGE COMPARTMENT BETWEEN FLOOR BOX AND MONITOR BOX, RUN CONCEALED IN CEILING AND WALL. COORDINATE WORK WITH SUITE BELOW.
- 12 PROVIDE DOUBLE GANG J-BOX WITH SINGLE MUD RING @48" AFF FOR CARD READER AND DOOR PUSH BUTTON, RUN 1/2" FROM CARD READER/PUSH BUTTON TO DOOR OPERATOR OR STRIKE ACTUATOR FOR LOW VOLTAGE WORK. PROVIDE 120V POWER IN THE CEILING FOR DOOR OPERATOR OR STRIKE AS INDICATED. FOR MORE DETAILS REFER TO SHEET E5-01. ALSO PROVIDE REQUIRED WIRING FOR INTERCOM REMOTE UNLOCK SYSTEM COORDINATE WITH DOOR INSTALLER.
- 13 PROVIDE POWER, DATA/AV AND CONTROLS FOR PROJECTOR AND PROJECTION SCREEN. EXACT LOCATIONS AND REQUIREMENTS TO BE COORDINATED WITH ARCHITECT/OWNER.
- 14 PROVIDE RED MUSHROOM EMERGENCY POWER ON/OFF BUTTON AND ALL REQUIRED BRANCH CIRCUIT TRANSFORMER, CONTACTORS, BOXES ETC. TO SHUT-OFF GAS RANGE SOLENOID VALVE, INTERLOCK GAS SOLENOID SHUT-OFF VALVE WITH FIRE ALARM SYSTEM. COORDINATE ALL REQUIREMENTS.

GENERAL POWER NOTES:

- A. REFER TO SHEET E.001 FOR ELECTRICAL LEGEND.
- B. PROVIDE COMPLETE ADDRESSABLE FIRE ALARM SYSTEM FOR THE BUILDING. FIRE ALARM SYSTEM SHALL INCLUDE ALL CONTROL, MONITORING, POWER SUPPLIES, INITIATING DEVICES, INDICATING APPLIANCES, CONTROL MODULES AND WIRING AS REQUIRED BY AUTHORITIES HAVING JURISDICTION FOR AN APPROVED INSTALLATION. REFER TO SPECIFICATIONS. SYSTEM SHALL BE LAYED OUT ON A PERFORMANCE BASIS, DEVICES INDICATED ON PLANS ARE FOR REFERENCE ONLY.
- C. PROVIDE FIRE STOPPING SYSTEM WHERE REQUIRED TO MAINTAIN THE FIRE RESISTANCE RATING OF THE ASSEMBLIES.
- D. EXACT LOCATIONS AND REQUIREMENTS FOR ALL EQUIPMENT SHALL BE VERIFIED WITH ARCHITECT/OWNER AND EQUIPMENT SUPPLIER PRIOR TO INSTALLATION.
- E. COORDINATE EXACT LOCATIONS, MOUNTING HEIGHTS & REQUIREMENTS FOR ALL DEVICES WITH LATEST ARCHITECTURAL FURNITURE & EQUIPMENT LAYOUTS & ELEVATIONS.
- F. COORDINATE EXACT LOCATIONS FOR ALL ELECTRICAL EQUIPMENT, PANELBOARDS, DISCONNECTS, STARTERS, CONTROL PANELS, ETC. WITH ARCHITECTURAL PLANS AND ALL OTHER TRADES INCLUDING MECHANICAL TO MAINTAIN REQUIRED WORKING CLEARANCES AND DEDICATED EQUIPMENT SPACE. DETERMINE EXACT LOCATIONS AND VERIFY WITH ALL OTHER TRADES PRIOR TO BEGINNING OF CONSTRUCTION TO AVOID INTERFERENCES WITH MECHANICAL, STRUCTURAL, ETC.
- G. MAINTAIN A MINIMUM OF 24" HORIZONTAL SEPARATION BETWEEN BOXES INSTALLED ON OPPOSITE SIDES OF FIRE RATED WALLS TO COMPLY WITH NEC 300.21.
- H. ALL WIRING DEVICES SHALL BE OF TAMPER RESISTANT CONSTRUCTION AND WITH AFCI PROTECTION.
- I. ALL DEVICES AT COUNTER LOCATIONS TO BE MOUNTED ABOVE THE COUNTER AT +42" AFF OR AS NOTED ON THESE PLANS. COORDINATE WITH ARCHITECT/OWNER AND MILLWORK CONTRACTOR FOR EXACT LOCATIONS.
- J. LOCATE DISCONNECT SWITCHES FOR MECHANICAL AND BUILDING EQUIPMENT TO MAINTAIN WORKING CLEARANCES. LOCATIONS ON THESE PLANS ARE FOR REFERENCE ONLY.
- K. GROUND FAULT PROTECTION FOR DEVICES INSTALLED AT LOCATIONS NOT READILY ACCESSIBLE. PROVIDE GROUND FAULT BLANK FACE DEVICE AT ACCESSIBLE LOCATION OR PROVIDE GFCI BRANCH BREAKER IN PANELBOARD.
- L. ALL ROOF MOUNTED EQUIPMENT TO BE NEMA 3R WEATHERPROOF RATED, INCLUDING STARTERS, DISCONNECTS, ETC.

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CONSULTANT



KEY PLAN

OWNER

Highland Township
Fire Department

PROJECT NAME

Highland Township
Fire Station No. 1

1600 W. Highland Rd.
Highland, MI 48357

PROJECT NO.

18-122A

ISSUES / REVISIONS

SCHEMATIC DESIGN	01-28-2020
BIDDING-CONSTRUCTION	03-27-2020
ADDENDUM # 1	04-20-2020
CONSTRUCTION	05-04-2020
CCD #1	06-03-2020
CCD #2	06-16-2020

DRAWN BY

NH

CHECKED BY

EK

APPROVED BY

EK

SHEET NAME

FLOOR PLANS -
POWER

SHEET NO.

E3-00