Warren Fire Station #5

City of Warren, Michigan

PARTNERS

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586-469-3600

Owner:
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Warren, MI 48093
586-574-4500

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586-203-8423

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY
DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Cover Sheet

SHEET NO.
A0-00

PROPOSED LEGEND

- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
- SHUT OFF
- STORM
- SANITARY
- WATER MAIN
- 000.00 PR. ELEVATION
- FG FINISH GRADE
- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

EXISTING LEGEND

- BM # BENCHMARK
- TRAVERSE POINT
- MONUMENT
- IRON PIPE
- IRON ROD
- SANITARY M.H.
- CLEAN OUT
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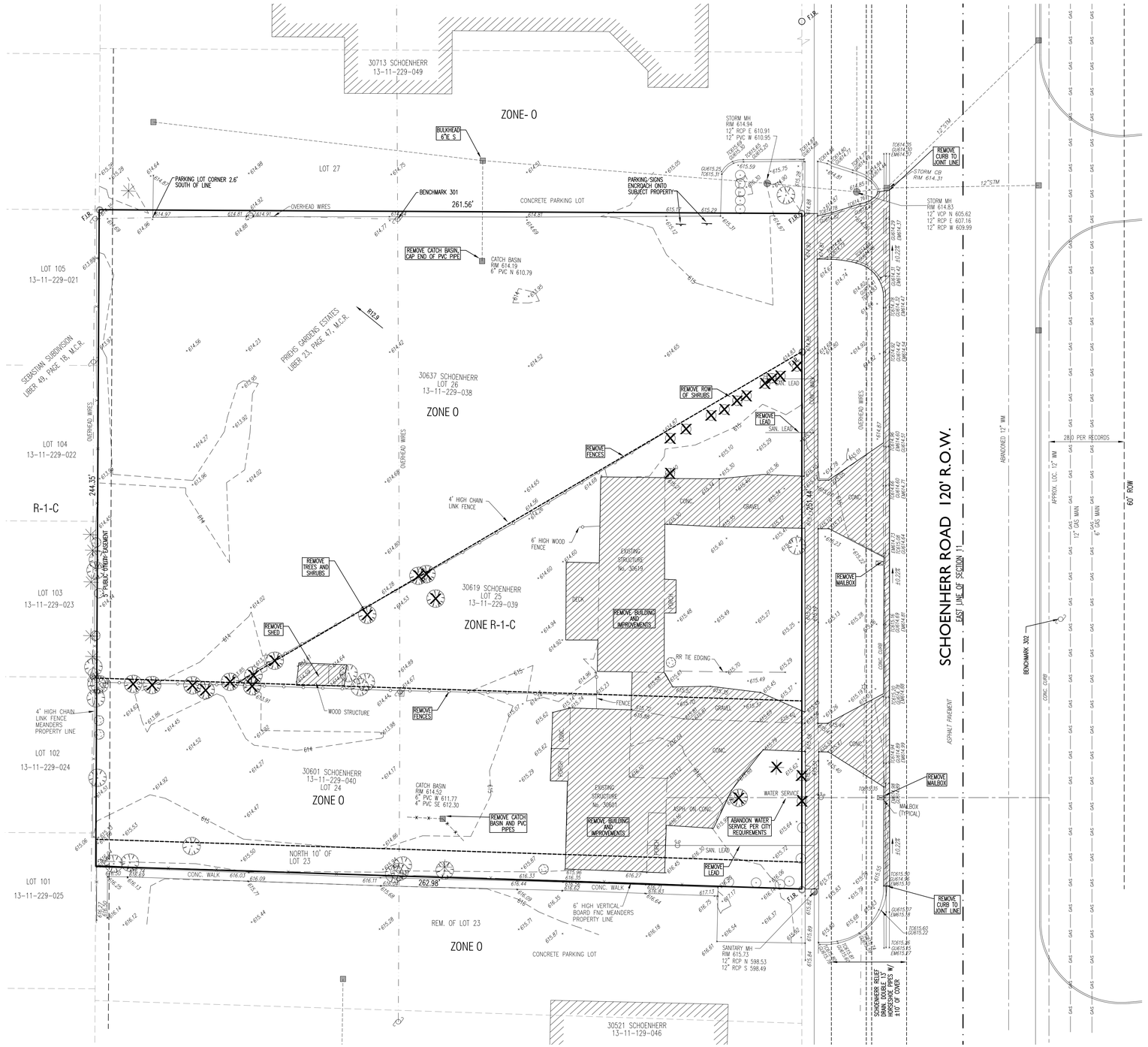
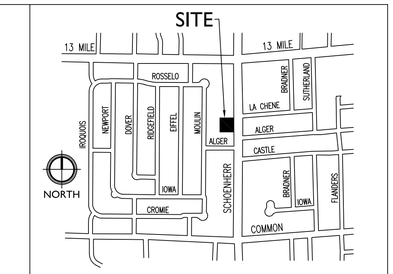
- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

NORTH

0 20 40

1" = 20'
SCALE IN FEET





PROPERTY DESCRIPTION

PARCELS:
13-11-229-040 LOT 24 AND THE NORTH 10 FEET OF LOT 23, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30601 SCHOENHERR
13-11-229-039 LOT 25, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30619 SCHOENHERR
13-11-229-038 LOT 26, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30637 SCHOENHERR

COMBINED DESCRIPTION
LOTS 24 THROUGH 26 AND THE NORTH 10 FEET OF LOT 23, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R.
CONTAINING 1.49 ACRES, MORE OR LESS

GENERAL REMOVAL NOTES:

- SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLAN AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS THE INTENT THAT THESE ITEMS WILL BE COMPLETELY REMOVED, ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE AND THAT DEMOLITION WILL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO THESE ITEMS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE AND DUST CONTROL AND TRAFFIC CONTROL IN ACCORDANCE WITH THE LOCAL CODES.
- ALL MATERIAL TO BE DEMOLISHED SHALL BE REMOVED FROM SITE AND DISPOSED OF OFF-SITE IN A LEGAL MANNER.
- ANY ITEM NOTED TO BE REMOVED AND SALVAGED SHALL BE STORED ON-SITE AND PROTECTED FROM DAMAGE. LOSS OR DAMAGE OF STORED ITEMS SHALL BE REPLACED AT NO COST TO THE OWNER.
- DETERMINING THE EXISTENCE AND LOCATIONS OF UNDERGROUND AND OVERHEAD LINES AND THEIR PROTECTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CALL MISS DIG PRIOR TO START OF CONSTRUCTION.
- ALL ITEMS OF WORK NOTED ON THE PLANS OR IN THE SPECIFICATIONS THAT ARE NOT SPECIFICALLY NOTED IN THE PROPOSAL SHALL BE CONSIDERED AS INCIDENTAL TO THE CONSTRUCTION AND SHALL BE CONSTRUCTED AT NO EXTRA COST TO THE OWNER.
- ALL BACKFILL SHALL BE GRANULAR MATERIAL CLASS II IN ACCORDANCE WITH ARTICLES 2.09.07 AND 2.09.08 OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 95 PERCENT (95%) OF ITS MAXIMUM UNIT WEIGHT. PAYMENT FOR SAND BACKFILL SHALL BE INCIDENTAL TO THE PROJECT. ALL EXCAVATED MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF AT A LOCATION SECURED BY THE CONTRACTOR.
- DURING THE PROCESS OF THE WORK, THE CONTRACTOR SHALL ACCOMMODATE BOTH VEHICULAR AND PEDESTRIAN TRAFFIC. ACCESS TO FIRE HYDRANTS, WATER AND GAS VALVES SHALL ALWAYS BE MAINTAINED. THE CONTRACTOR'S TRUCK AND EQUIPMENT OPERATIONS SHALL BE GOVERNED BY ALL LOCAL TRAFFIC ORDINANCES AND REGULATIONS OF THE FIRE AND POLICE DEPARTMENT. WORKING SITES SHALL BE WELL PROTECTED BY BARRICADES AND LIGHTS AND SHALL NOT BE OCCUPIED LONGER THAN NECESSARY.

BENCHMARK LISTING

BENCHMARK 301: BENCH TIE IN SOUTH FACE OF UTILITY POLE ALONG THE NORTHERLY PROPERTY LINE OF LOT 26
ELEVATION = 614.93 (NAVD 88 DATUM)

BENCHMARK 302: BENCH TIE IN WEST FACE OF UTILITY POLE ALONG THE EAST SIDE OF SCHOENHERR ROAD ACROSS FROM SITE.
ELEVATION = 616.19 (NAVD 88 DATUM)

Know what's **below**
Call before you dig.

PARTNERS

PARTNERS in Architecture, PLC
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MOUNT CLEMENS, MI 48043
P 586.469.3600

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Phone 810.794.1931
Fax 810.794.3331
www.pce-eng.com

PCE JOB #23-064

PROFESSIONAL SEAL

OWNER
City of Warren
One City Square
Warren, MI 48093
(586) 574-4520

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd.
Warren, MI 48089

PROJECT NO.
21-146B

ISSUES / REVISIONS
BIDDING / CONSTRUCTION 06/13/23

DRAWN BY
EHJ

CHECKED BY
JTM

APPROVED BY
MAM

SHEET NAME
DEMOLITION PLAN

C1-01

PROPOSED LEGEND

- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
- SHUT OFF
- STORM
- SANITARY
- WATER MAIN
- 000.00 PR. ELEVATION
- FG FINISH GRADE
- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

EXISTING LEGEND

- BENCHMARK
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- MONUMENT
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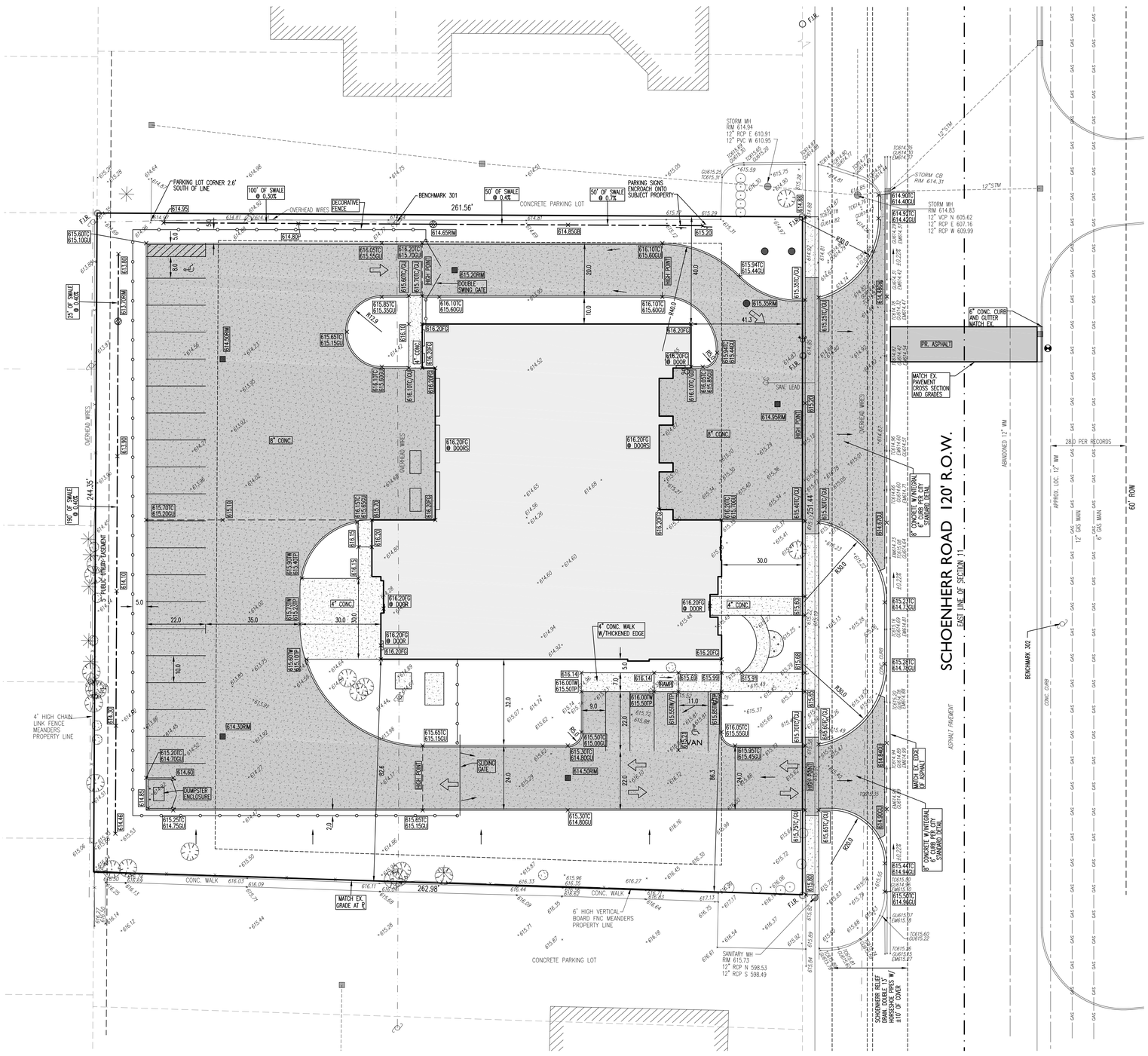
- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

NORTH

0 20 40

1" = 20'
SCALE IN FEET



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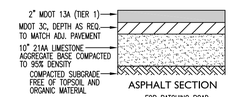
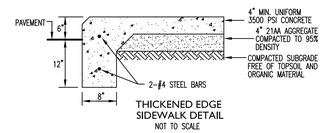
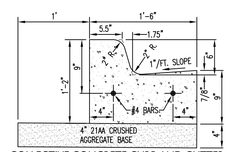


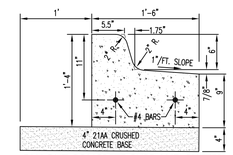
ASPHALT SECTION
FOR PATCHING ROAD
NO SCALE



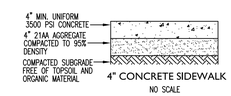
THICKENED EDGE
SIDEWALK DETAIL
NOT TO SCALE



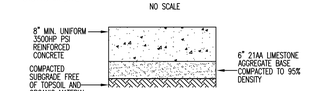
COLLECTIVE CONCRETE CURB AND GUTTER,
MDOT DETAIL R-30, TYPE F2



FALLOUT CONCRETE CURB AND GUTTER,
MODIFIED MDOT DETAIL R-30, TYPE F2



4" CONCRETE SIDEWALK
NO SCALE



8" CONCRETE SECTION
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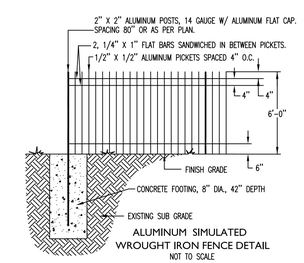

ALUMINUM SIMULATED
WROUGHT IRON FENCE DETAIL
NOT TO SCALE

PARTNERS

PARTNERS in Architecture, PLC
65 MARKET STREET
MOUNT CLEMENS, MI 48043
P 586.469.3600

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PROFESSIONAL SEAL

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PROJECT NAME

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30619 Schoenherr Rd.
Warren, MI 48089

PROJECT NO.

21-146B

ISSUES / REVISIONS

BIDDING / CONSTRUCTION 06/13/23

DRAWN BY
EHJ

CHECKED BY
JTM

APPROVED BY
MAM

SHEET NAME

GRADING PLAN

C2-01

PROPOSED LEGEND

- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
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- TC TOP OF CURB
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EXISTING LEGEND

- BM # BENCHMARK
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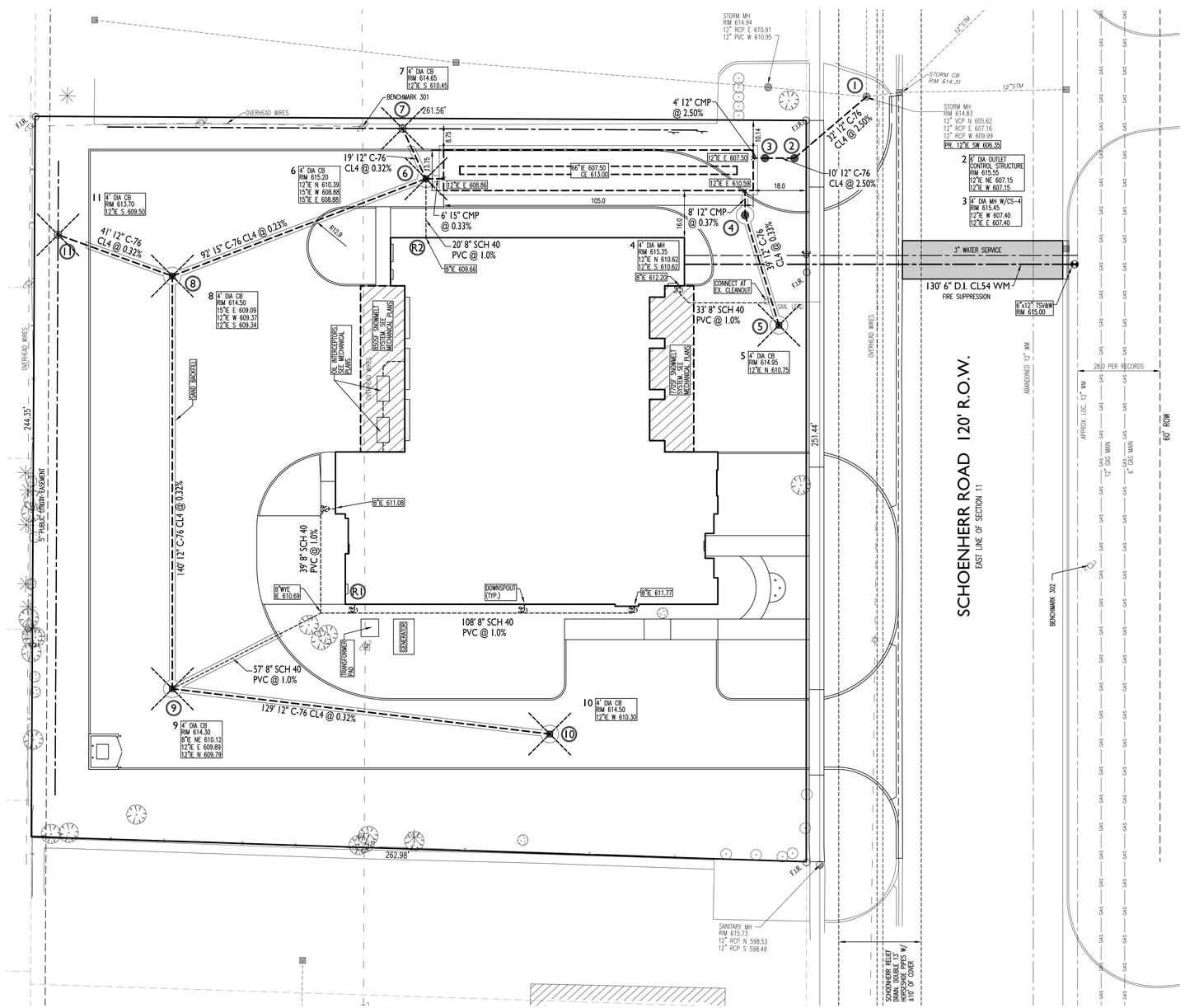
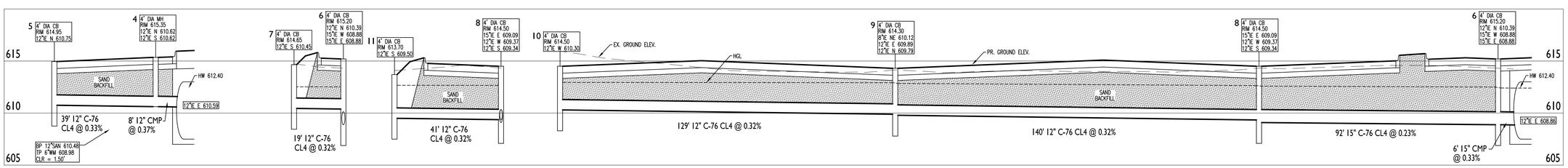
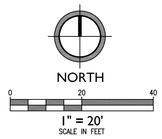
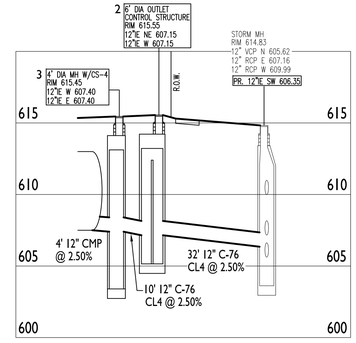




STORM SEWER PROFILE
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL





STORM OUTLET PROFILE
SCALE: 1"=20' HORIZONTAL
1"=5' VERTICAL

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ISSUES / REVISIONS

BIDDING / CONSTRUCTION	06/13/23

DRAWN BY
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CHECKED BY
JTM

APPROVED BY
MAM

SHEET NAME

UTILITY PLAN

C3-01

PROPOSED LEGEND

- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
- SHUT OFF
- STORM
- SANITARY
- WATER MAIN
- 000.00 PR. ELEVATION
- FG FINISH GRADE
- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

EXISTING LEGEND

- BM # BENCHMARK
- TRAVERSE POINT
- MONUMENT
- IRON PIPE
- IRON ROD
- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
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- TELEPHONE MANHOLE
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- LIGHT POLE
- SIGN
- MAILBOX
- DECIDUOUS TREE
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- WALL STONE OR BLOCK
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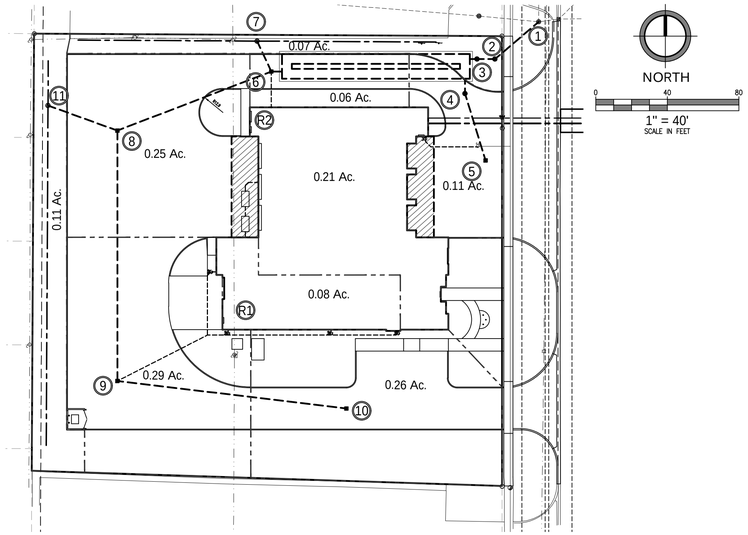


DRAINAGE AREA MAP

STORM SEWER DESIGN CALCULATIONS

Line Upstream Node to Downstream Node	Inlet Area (acres)	Inlet C Coefficient	Inlet CA (acres)	Total CA (acres)	System Flow Time TC (min)	System Intensity (in/hr) I=175/(Tc+25)	Discharge (cfs)	Length (ft)	Section Size (in)	Pipe Slope (ft/ft)	Pipe Capacity (cfs)	Velocity Flowing Full (ft/s)	-HGL- Upstream (ft)	-HGL- Downstream (ft)	Upstream Rim Elevation (ft)	Downstream Rim Elevation (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)
r1 to 9	0.08	0.55	0.04	0.04	20	3.89	0.17	57	8	0.01	1.74	4.99	612.89	612.89	616.20	614.30	610.69	610.12
r2 to 6	0.21	0.55	0.12	0.12	20	3.89	0.45	20	8	0.01	1.74	4.99	612.52	612.51	616.20	615.20	609.66	609.46
7 to 6	0.07	0.55	0.04	0.04	20	3.89	0.15	19	12	0.0032	2	2.55	612.52	612.52	614.65	615.20	610.45	610.39
11 to 8	0.11	0.55	0.06	0.06	20	3.89	0.24	41	12	0.0032	2.01	2.56	612.65	612.65	613.70	614.50	609.50	609.37
10 to 9	0.26	0.55	0.14	0.14	20	3.89	0.56	129	12	0.0032	2.01	2.56	612.91	612.88	614.50	614.30	610.30	609.89
9 to 8	0.29	0.55	0.16	0.35	21	3.81	1.32	140	12	0.0032	2.02	2.57	612.82	612.63	614.30	614.50	609.79	609.34
8 to 6	0.25	0.55	0.14	0.54	21.8	3.74	2.03	92	15	0.0023	3.09	2.52	612.59	612.50	614.50	615.20	609.09	608.88
6 to out1	0.06	0.55	0.03	0.73	22.4	3.69	2.7	6	15	0.0033	3.73	3.04	612.41	612.40	615.20	615.20	608.88	608.86
5 to 4	0.1	0.55	0.06	0.06	20	3.89	0.21	39	12	0.0033	2.06	2.62	612.40	614.95	615.35	610.75	610.62	
4 to out1	0	0	0	0.06	20.4	3.86	0.21	8	12	0.0037	2.18	2.78	612.40	612.40	615.35	615.95	610.62	610.59

STARTING HG = HIGH WATER IN DETENTION SYSTEM

DETENTION CALCULATIONS

REFERENCE: PROCEDURES AND DESIGN STANDARDS FOR STORMWATER MANAGEMENT, MACOMB COUNTY PUBLIC WORKS COMMISSIONER, DATED MAY 28,2021

TOTAL AREA CONTRIBUTING TO DETENTION SYSTEM 63,040 SF = 1.45 AC

C VALUE FOR COMMERCIAL SITE = 0.55

WATER QUALITY CONTROL (WQC) (FIRST FLUSH VOLUME)

REQUIREMENTS PER SECTION H.3

V(wq) IS MANAGED BY THE FOLLOWING BMPs

MECHANICAL SEPARATOR MEETING THE COUNTY REQUIREMENTS.

CHANNEL PROTECTION RATE CONTROL-EXTENDED DETENTION (CPRC)

REQUIREMENTS PER SECTION H.3

SITE RUNOFF FROM A 1.9 " RAINFALL EVENT

V(ed) = 3,630 x 1.9 x C x A

3630 x 1.9 x 0.55 x 1.45 AC= 5,500 CF

CHANNEL PROTECTION MAXIMUM OUTFLOW RATE: RELEASE VOLUME OVER 48 HOURS

Q= 5,500 /48HRS x 1/3600 = 0.032 CFS

ORIFICE AREA FOR REQ'D RESTRICTED OUTFLOW RATE

Q= 0.032 CFS

A=Q/0.62 x [2G*0.40(H_{WD}-H_{LW})^0.5= 0.0047 SF

THE AREA OF A 7/8" (0.875 ") DIAMETER HOLE = 0.00418 SF

NUMBER OF HOLES REQ'D= 0.0047 / 0.00418 = 1.1

USE 1 HOLE IN WEIR WALL AT 607.15

DRAIN TIME OF CPRC

VOLUME PROVIDED: 5,514 CF

FLOW THROUGH CPRC OUTLET

D= 0.88 inch= 0.07292 FTx 1 HOLES

A= 0.0042

Q=0.62A*[2G*0.40([H_{WD}-H_{LW}])^0.5= 0.028 cfs

5,514 CF/ 0.028 CFS = 196929 SECONDS = 54.70 HOURS > 48 HOURS

DETENTION AND FLOOD CONTROL (DFC) 100-yr storage

REQUIREMENTS PER SECTION H.4

Q(yrr) = 1.0 CFS/ACRE

Q(100ai)=Q(yrr) x AREA= 1.45 CFS

Q(100in)=CAx275/(TC+25) TC=15 minutes

0.55 x 1.45 x 275 /(15 + 25)= 5.48 CFS

V(100run) = 3,630 x 5.2 x C x A

3630 x 5.2 x 0.55 x 1.45 /AC= 15,054 CF

R = 0.206-0.15Ln (Q(100ai)/Q(100in)

0.206 -(0.15 x -1.3301)= 0.41

V(100det) = V(100run)xR

15,054 x 0.41 = 6,172 CF

100 YEAR OUTFLOW PROVIDED THROUGH CHANNEL PROTECTION ORIFICES

D= 0.88 inch= 0.07292 FTx 1 HOLES

A= 0.0042

Q=0.62A*[2G*(H_{HW}-H_{LW})]^0.5= 0.05 cfs

ADDITIONAL OUTFLOW ALLOWED:

1.45 CFS- 0.05 CFS= 1.40 CFS

ORIFICE AREA FOR REQ'D RESTRICTED OUTFLOW RATE

Q= 1.40 CFS

A=Q/0.62 x [2G*(H_{HW}-H_{WD})]^0.5= 0.363 SF

THE AREA OF A 2 " x 26 "SLOT= 52 SQ.IN= 0.3611 SF

BOTTOM OF SLOT AT 611.80

ACTUAL MAXIMUM OUTFLOW

D= 0.88 inch= 0.07292 FTx 1 HOLES

A= 0.0042

Q=0.62A*[2G*(H_{HW}-H_{LW})]^0.5= 0.05 cfs

A= 0.3611

Q=0.62A*[2G*(H_{HW}-H_{WD})]^0.5= 1.39 cfs

TOTAL OUTFLOW: 1.440 cfs < Q(100ai) 1.45 cfs

UNDERGROUND DETENTION SYSTEM STORAGE VOLUME ESTIMATION

CALCULATIONS PROVIDED BY CONTECH ENGINEERED SOLUTIONS

Summary of Inputs

System Information		Backfill Information		Pipe & Analysis Information	
Out-to-out length (ft):	105.0	Backfill Porosity (%):	35%	System Diameter (in):	66
Out-to-out width (ft):	13.8	Depth Above Pipe (in):	0.0	Pipe Spacing (in):	33
Number of Manifolds (ea):	2.0	Depth Below Pipe (in):	0.0	Incremental Analysis (in):	1.2
Number of Barrels (ea):	2.0	Width At Ends (ft):	1.5	System Invert (Elevation):	607.5
		Width At Sides (ft):	1.5		

System		Pipe		Stone		Total System	
Depth (ft)	Elevation (ft)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)	Incremental Storage (cf)	Cumulative Storage (cf)
0.00	607.50	0.0	0.0	0.0	0.0	0.0	0.0
0.10	607.60	21.2	21.2	55.9	55.9	77.1	77.1
0.20	607.70	38.4	59.6	49.9	105.8	88.3	165.4
0.30	607.80	49.3	108.9	46.1	151.8	95.4	260.7
0.40	607.90	57.8	166.7	43.1	194.9	100.9	361.6
0.50	608.00	64.9	231.6	40.6	235.5	105.5	467.1
0.60	608.10	71.1	302.7	38.4	273.9	109.5	576.7
0.70	608.20	76.5	379.2	36.5	310.5	113.0	689.7
0.80	608.30	81.3	460.6	34.8	345.3	116.2	805.9
0.90	608.40	85.7	546.2	33.3	378.7	119.0	924.9
1.00	608.50	89.6	635.8	32.0	410.6	121.6	1,046.4
1.10	608.60	93.2	729.0	30.7	441.3	123.9	1,170.3
1.20	608.70	96.4	825.4	29.6	470.9	126.0	1,296.3
1.30	608.80	99.3	924.7	28.5	499.5	127.9	1,424.1
1.40	608.90	102.0	1,026.7	27.6	527.1	129.6	1,553.8
1.50	609.00	104.4	1,131.1	26.8	553.8	131.2	1,685.0
1.60	609.10	106.6	1,237.8	26.0	579.8	132.6	1,817.6
1.70	609.20	108.6	1,346.4	25.3	605.1	133.9	1,951.5
1.80	609.30	110.4	1,456.8	24.7	629.8	135.1	2,086.6
1.90	609.40	112.0	1,568.8	24.1	653.9	136.1	2,222.7
2.00	609.50	113.4	1,682.2	23.6	677.5	137.0	2,359.7
2.10	609.60	114.6	1,796.8	23.2	700.7	137.8	2,497.5
2.20	609.70	115.7	1,912.4	22.8	723.6	138.5	2,636.0
2.30	609.80	116.5	2,029.0	22.5	746.1	139.1	2,775.1
2.40	609.90	117.3	2,146.2	22.3	768.4	139.5	2,914.6
2.50	610.00	117.8	2,264.1	22.1	790.5	139.9	3,054.5
2.60	610.10	118.2	2,382.3	21.9	812.4	140.1	3,194.7
2.70	610.20	118.4	2,500.7	21.9	834.3	140.3	3,335.0
2.80	610.30	118.5	2,619.2	21.8	856.1	140.4	3,475.3
2.90	610.40	118.4	2,737.7	21.9	878.0	140.3	3,615.6
3.00	610.50	118.2	2,855.9	21.9	899.9	140.1	3,755.8
3.10	610.60	117.8	2,973.7	22.1	922.0	139.9	3,895.7
3.20	610.70	117.3	3,090.9	22.3	944.3	139.5	4,035.2
3.30	610.80	116.5	3,207.5	22.5	966.8	139.1	4,174.3
3.40	610.90	115.7	3,323.1	22.8	989.6	138.5	4,312.7
3.50	611.00	114.6	3,437.7	23.2	1,012.8	137.8	4,450.6
3.60	611.10	113.4	3,551.1	23.6	1,036.4	137.0	4,587.6
3.70	611.20	112.0	3,663.1	24.1	1,060.6	136.1	4,723.7
3.80	611.30	110.4	3,773.5	24.7	1,085.2	135.1	4,858.8
3.90	611.40	108.6	3,882.2	25.3	1,110.5	133.9	4,992.7
4.00	611.50	106.6	3,988.8	26.0	1,136.5	132.6	5,125.3
4.10	611.60	104.4	4,093.2	26.8	1,163.3	131.2	5,256.5
4.20	611.70	102.0	4,195.2	27.6	1,190.9	129.6	5,386.1
H_{WD} 4.30	611.80	99.3	4,294.6	28.5	1,219.4	127.9	5,514.0	>5500 CF
4.40	611.90	96.4	4,390.9	29.6	1,249.0	126.0	5,640.0
4.50	612.00	93.2	4,484.1	30.7	1,279.7	123.9	5,763.8
4.60	612.10	89.6	4,573.7	32.0	1,311.7	121.6	5,885.4
4.70	612.20	85.7	4,659.4	33.3	1,345.0	119.0	6,004.4
4.80	612.30	81.3	4,740.7	34.8	1,379.9	116.2	6,120.6
H_{HW} 4.90	612.40	76.5	4,817.2	36.5	1,416.4	113.0	6,233.6	>6172 CF
5.00	612.50	71.1	4,888.3	38.4	1,454.9	109.5	6,343.1
5.10	612.60	64.9	4,953.2	40.6	1,495.4	105.5	6,448.7
5.20	612.70	57.8	5,011.0	43.1	1,538.5	100.9	6,549.5
5.30	612.80	49.3	5,060.3	46.1	1,584.6	95.4	6,644.9
5.40	612.90	38.4	5,098.7	49.9	1,634.5	88.3	6,733.2
5.50	613.00	21.2	5,119.9	55.9	1,690.4	77.1	6,810.3

OVERFLOW, 100-YR STORM

100-YR DISCHARGE TO DETENTION SYSTEM Q(100IN)= 5.48 CFS

WEIR EQUATION

B= 6 FT

H= 0.82 FT

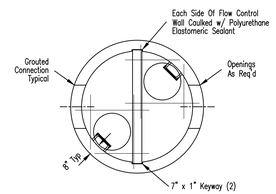
P= 7.25 FT

C=0.602+0.075(H/P)= 0.61048

Q=C*2/3*(2G)^.5*B*H^1.5= 14.545 > 5.48 CFS, OK

CAPACITY OF 12 INCH PIPE AT S= 0.025

Q=K/N *A*R^(2/3)*S^(1/2) = 5.65 CFS > 5.48 cfs



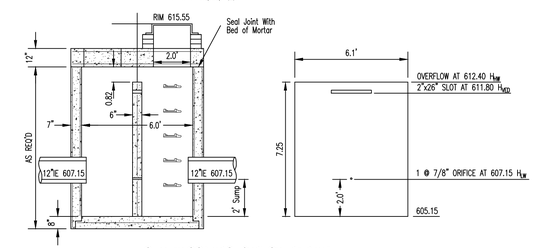
Manhole Sections To Be Manufactured To ASTM C-478 Specifications

Reinforcing Shown For Schematic Only. All Steel Areas Are Minimums.

Contractor To Seal Between Precast Wall & Base w/Butyl Rope.

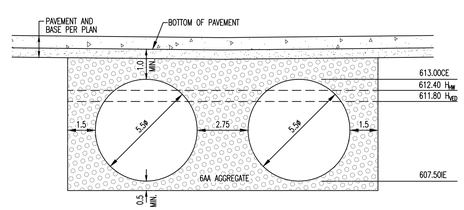
Inlet & Outlet Pipes Size Varies.

Number, Size and Elevation of Holes In The Flow Restrictor Wall Shall Be In Accordance With The Governing Agency.



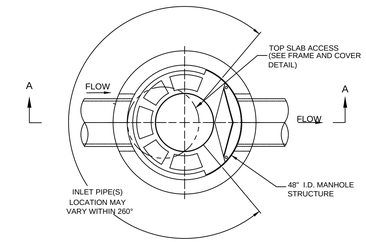
OUTLET CONTROL STRUCTURE DETAIL

NOT TO SCALE

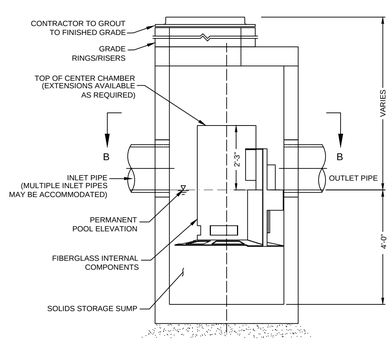


DETENTION SYSTEM CROSS SECTION DETAIL

NOT TO SCALE



PLAN VIEW B-B



ELEVATION A-A

CS-4 CASCADE SEPARATOR

IN MANHOLE #2

NOT TO SCALE

PARTNERS

PARTNERS in Architecture, PLC

65 MARKET STREET
MOUNT CLEMENS, MI 48043
P 586.469.3600

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PCE JOB #23-064

PROFESSIONAL SEAL

OWNER

City of Warren

One City Square
Warren, MI 48093
(586) 574-4520

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren, MI 48089

PROJECT NO.

21-146B

ISSUES / REVISIONS

BIDDING / CONSTRUCTION 06/13/23

DRAWN BY

EHJ

CHECKED BY

JTM

APPROVED BY

MAM

SHEET NAME

STORM AND DETENTION CALCULATIONS

C4-01

PROPOSED LEGEND

- SANITARY M.H.
- CLEAN OUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
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- FF FINISH FLOOR
- IE INVERT ELEVATION
- TC TOP OF CURB
- GU GUTTER

NORTH

0 20 40

1" = 20'
SCALE IN FEET

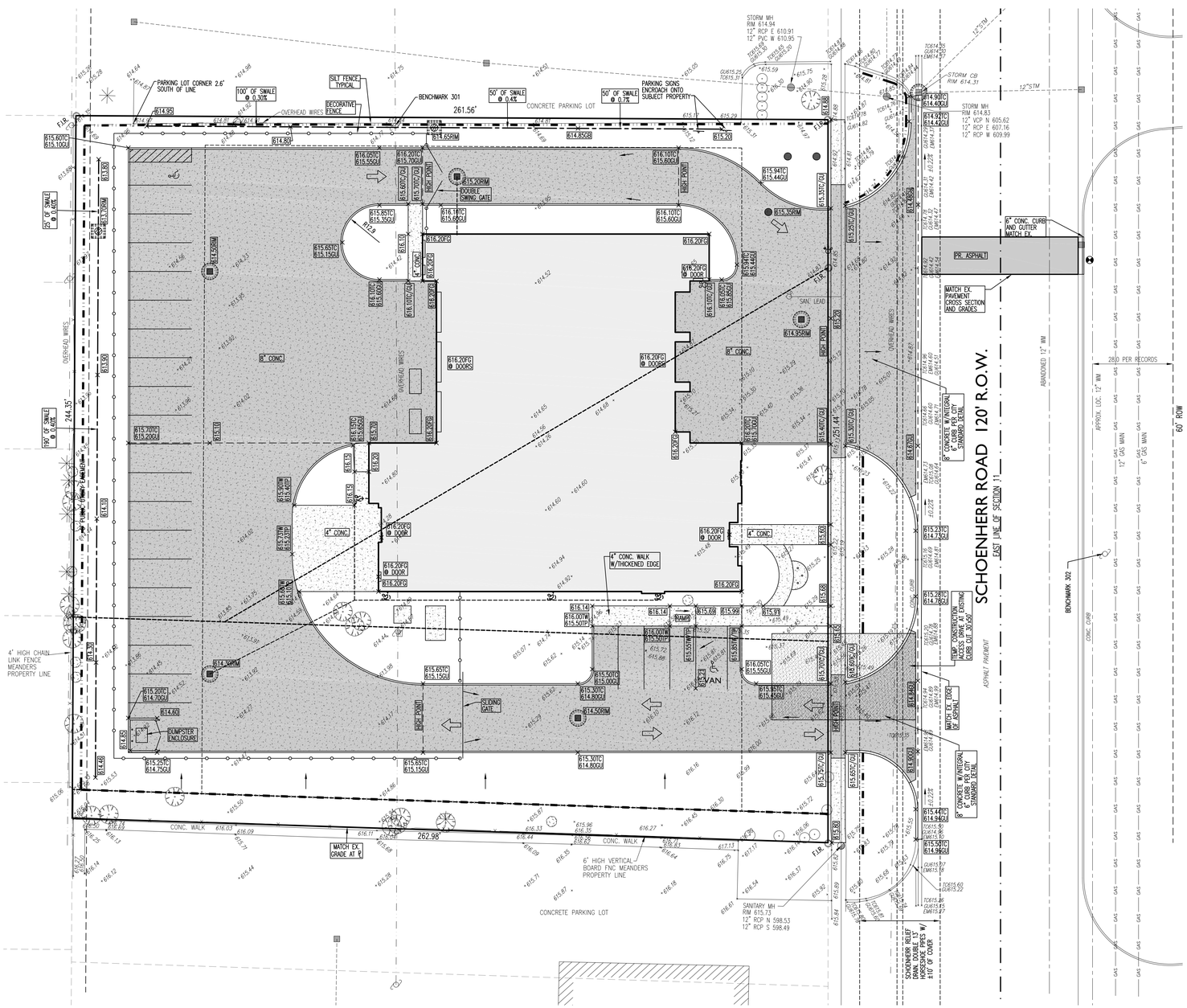
PROPERTY DESCRIPTION

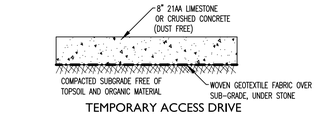
PARCELS:
13-11-229-040 LOT 24 AND THE NORTH 10 FEET OF LOT 23, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30601 SCHOENHERR
13-11-229-039 LOT 25, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30619 SCHOENHERR
13-11-229-038 LOT 26, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R. 30637 SCHOENHERR

COMBINED DESCRIPTION
LOTS 24 THROUGH 26 AND THE NORTH 10 FEET OF LOT 23, PRIEHS GARDENS ESTATES AS RECORDED IN LIBER 23, PAGE 47, M.C.R.
CONTAINING 1.49 ACRES, MORE OR LESS

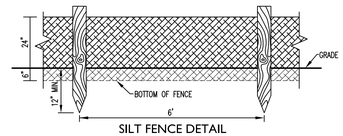
SOIL EROSION CONTROL LEGEND

- SILT FENCE
- INLET FILTER
- REAR YARD INLET PROTECTION





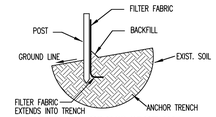
TEMPORARY ACCESS DRIVE
NOT TO SCALE



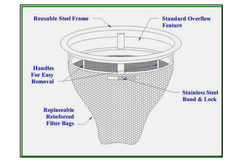
SILT FENCE DETAIL
NOT TO SCALE

PROPERTY OF FILTER FABRIC	TEST METHOD	2125
GRAB TENSILE	ASTM-D-4632	WARP 110 FILL 90
MULLEN BURST	ASTM 3786	275
U.V. RESISTANCE (STRENGTH RETAINED)	ASTM 4355	70
PERMITTIVITY	ASTM 4491	15

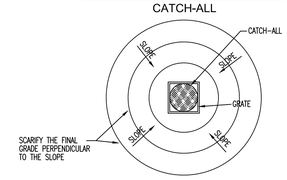
A STURDY, LIGHTWEIGHT, SUNLIGHT RESISTANT, WOVEN POLYPROPYLENE.



SILT FENCE CROSS-SECTION
NOT TO SCALE

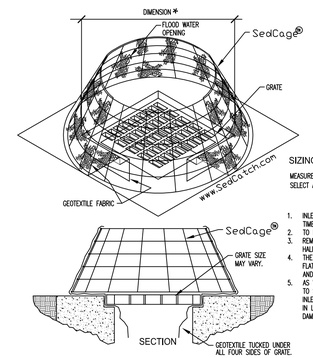


CATCH-ALL



LOW POINT INLET FILTER
NO SCALE

PLACE CATCH-ALLS OVER ALL EX. AND PR. CATCH BASINS WITHIN CONSTRUCTION AREA



SizingInstructions:

MEASURE THE DIAGONAL DIMENSION OF THE GRATE. SELECT A CAGE THAT IS AT LEAST 1" LARGER.

1. INLET PROTECTION SHALL BE INSTALLED AT THE TIME THE STRUCTURE IS SET.
2. TO INSTALL: TUCK FABRIC UNDER GRATE.
3. REMOVE SEDIMENT IF IT ACCUMULATES TO ONE HALF THE HEIGHT OF THE SedCage®
4. THE AREA AROUND THE SedCage® SHOULD BE AS FLAT AS POSSIBLE TO INCREASE EFFECTIVENESS AND REDUCE MAINTENANCE REQUIREMENTS.
5. AS WITH ALL INLET PROTECTION DEVICES, CHECK TO SEE HOW DEEP THE WATER COULD RISE IF THE INLET WERE BLOCKED ENTIRELY. DO NOT INSTALL IN LOCATIONS THAT COULD CAUSE PROPERTY DAMAGE OR POSE A SAFETY HAZARD TO TRAFFIC.

SedCatch® SedCage®- Yard Inlet Protection

TOTAL EARTH DISTURBANCE
0.98 ACRES±

NEAREST WATER BODY
SCHOENHERR RELIEF DRAIN IN ADJACENT ROW

ON SITE SOIL TYPE
Lg – LENAWEE SILTY CLAY LOAM

GENERAL NOTES
NO STOCKPILING IS PROPOSED FOR THIS PROJECT
NO DEWATERING IS ANTICIPATED
REPUBLIC AVE. WILL BE USED AS CONSTRUCTION ENTRANCE

ONSITE RESPONSIBLE PARTY
FOR TEMPORARY AND PERMANENT SOIL EROSION CONTROL:
TO BE PROVIDED WHEN THE CONTRACTOR IS SELECTED.

TIMING SEQUENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

ACTIVITY	2023 AUG	SEPT	OCT	NOV	2024 APR	MAY	JUN	JUL	AUG	SEP	NOV
INSTALL TEMPORARY EROSION CONTROL MEASURES											
ROUGH GRADING & CONSTRUCTION											
COMPLETION OF CONSTRUCTION											
FINAL GRADING											
INSTALLATION OF PERMANENT EROSION CONTROL MEASURES AND SEEDING											
REMOVAL OF TEMPORARY EROSION CONTROL MEASURES											

NO WORK DURING PERIOD

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND MAINTENANCE NOTES

- THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED, THE SOIL EROSION AND SEDIMENTATION CONTROL ACT AND THE MACOMB COUNTY SOIL EROSION AND SEDIMENTATION CONTROL ORDINANCE.
- ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF HE MACOMB COUNTY PUBLIC WORKS OFFICE.
- EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- STAGING THE WORK WILL BE DONE BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH CHANGE.
- THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF SOIL EROSION AND SEDIMENTATION CONTROL DEVICES.
- THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS BEFORE AND AT ALL TIMES DURING CONSTRUCTION ON THIS PROJECT. ANY MODIFICATIONS OR ADDITIONS TO SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE COMPLIED WITH AS REQUIRED OR DIRECTED BY THE MACOMB COUNTY PUBLIC WORKS OFFICE.
- IF ANY OF THE SESC MEASURES ON THE SITE ARE DEEMED INADEQUATE OR INEFFECTIVE, THE MACOMB COUNTY PUBLIC WORKS OFFICE SESC DIVISION HAS THE RIGHT TO REQUIRE ADDITIONAL SESC MEASURES AT THE EXPENSE OF THE LANDOWNER.
- INSTALL SILT FENCE AS INDICATED ON THE PLAN AND AT ADDITIONAL AREAS AS NECESSARY.
  - A. SILT FENCE SHALL BE INSTALLED PER DETAIL.
  - B. BUILD UP OF SEDIMENT SHALL BE REMOVED WHEN SEDIMENT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE SILT FENCE.
  - C. IF SILT FENCE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE SILT FENCE SHALL BE REPLACED PROMPTLY.
  - D. SILT FENCE SHALL IN INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT. REQUIRED MAINTENANCE SHALL BE PROVIDED PROMPTLY.
- INSTALL INLET FILTER ON ALL PAVEMENT CATCH BASINS PER DETAIL.
  - A. INLET FILTERS SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF A RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT.
  - B. BUILDUP OF SEDIMENT AND DEBRIS SHALL BE REMOVED PROMPTLY.
  - C. IF FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.
- IMMEDIATELY AFTER SEEDING, MULCH ALL SEEDED AREAS WITH UNWEATHERED SMALL GRAIN STRAW, SPREAD UNIFORMLY AT THE RATE OF 1 TO 2 TONS PER ACRE OR 100 POUNDS (2–3 BALES) PER 1000 SQUARE FEET. THIS MULCH SHOULD BE ANCHORED WITH DISC TYPE MULCH ANCHORING TOOL OR OTHER MEANS AS APPROVED BY THE MACOMB COUNTY PUBLIC WORKS OFFICE. MULCH MATTING MAY BE USED IN LIEU OF LOOSE MULCH.
- IF ANY DEWATERING IS NEEDED, IT SHALL BE DISCHARGED THROUGH A FILTER BAG OVER A WELL–VEGETATED AREA. THE PUMP MUST DISCHARGE AT A NON–EROSIVE VELOCITY. IF NECESSARY, AN APPROVED ENERGY DISSIPATER MAY BE USED.
- ALL DIRT TRACKED ONTO ANY ROADWAY SHALL BE REMOVED IMMEDIATELY.
- STREETS AND OR PARKING AREAS WILL BE SCRAPED ON A DAILY BASIS AND SWEPT AT A MINIMUM OF ONCE PER WEEK BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE.
- DURING DRY PERIODS, ALL DISTURBED AREAS SHALL BE WATERED FOR DUST CONTROL.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER EARTH CHANGE ACTIVITY CEASES, TEMPORARILY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY. ALL TEMPORARY SOIL EROSION CONTROL SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED. ALL PERMANENT SOIL EROSION CONTROL MEASURES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED.
- FINAL GRADE, ESTABLISH VEGETATION AND OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.
- REMOVE ALL TEMPORARY SOIL EROSION DEVICES AFTER PERMANENT STABILIZATION IS ESTABLISHED.

EROSION CONTROL MEASURES AND SEQUENCE OF CONSTRUCTION

1. OWNER WILL OBTAIN A SOIL EROSION PERMIT PRIOR TO START OF CONSTRUCTION.
2. INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES AS INDICATED ON PLAN AND AT ADDITIONAL AREAS AS NECESSARY.
3. MAINTAIN A 15 FT. BUFFER OF VEGETATION WHERE POSSIBLE AROUND PERIMETER OF SITE.
4. INSTALL UTILITIES. INSTALL CATCH–ALL INLET BAGS ON ALL CATCH BASINS AND INLET STRUCTURES.
5. INSTALL PAVING.
6. FINAL GRADE, SPREAD TOPSOIL, STABILIZE SIDE SLOPES OF DRAIN, ESTABLISH VEGETATION AND/OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.
7. CLEAN PAVEMENT AND REMOVE ALL TEMPORARY EROSION CONTROL MEASURES. REESTABLISH VEGETATION AS NECESSARY.
8. ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
9. STREET CATCH BASINS TO BE PERIODICALLY CLEANED AND FILTER CLOTH CHANGED AND MAINTAINED.
10. AFTER COMPLETION OF PAVING, REMOVAL OF FORMS, AND GRADING OF R.O.W., TEMPORARY SEED AND MULCH OF R.O.W. MUST BE COMPLETED.

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PARTNERS in Architecture, PLC
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MOUNT CLEMENS, MI 48043
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2420 Pte. Tremble Road
Algonac, Mi. 48001
Phone 810.794.1931
Fax 810.794.3331
www.pce-eng.com

PCE JOB #23-064

PROFESSIONAL SEAL

OWNER

City of Warren

One City Square
Warren, MI 48093
(586) 574-4520

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren, MI 48089

PROJECT NO.

21-146B

ISSUES / REVISIONS

BIDDING / CONSTRUCTION 06/13/23

DRAWN BY
EHJ

CHECKED BY
JTM

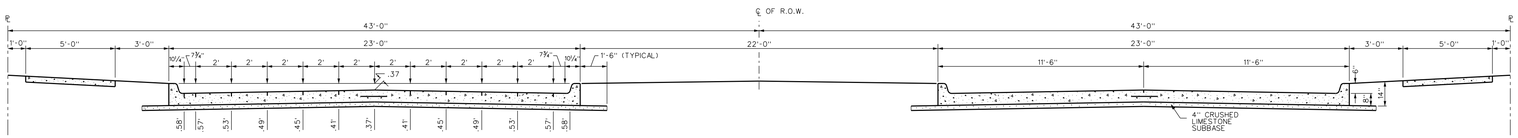
APPROVED BY
MAM

SHEET NAME

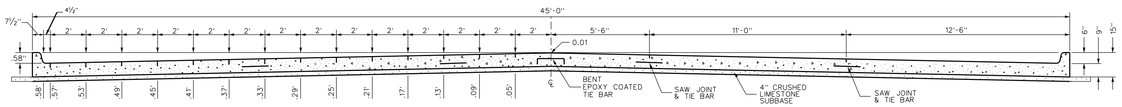
SOIL EROSION & SEDIMENTATION CONTROL

C5-01

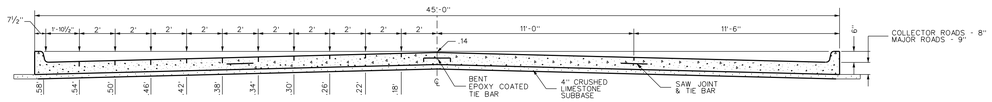
TYPICAL PAVEMENT CROSS-SECTIONS



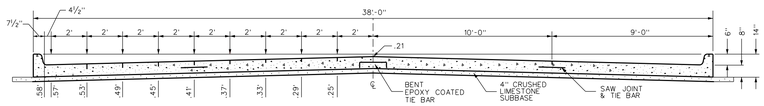
SECTION THRU BOULEVARD PAVEMENT



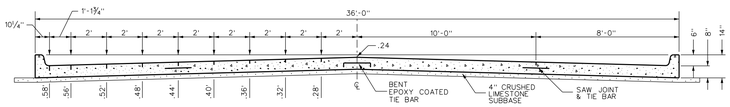
SECTION THRU 58' PAVEMENT



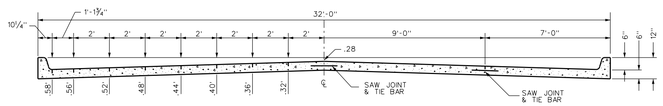
SECTION THRU 45' PAVEMENT



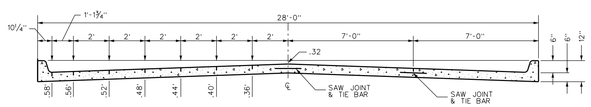
SECTION THRU 38' PAVEMENT



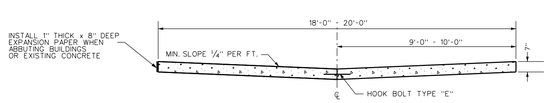
SECTION THRU 36' PAVEMENT



SECTION THRU 32' PAVEMENT

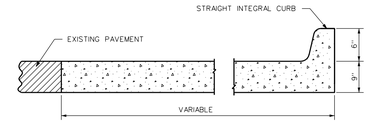


SECTION THRU 28' PAVEMENT

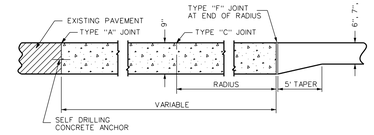


SECTION THRU ALLEY PAVEMENT

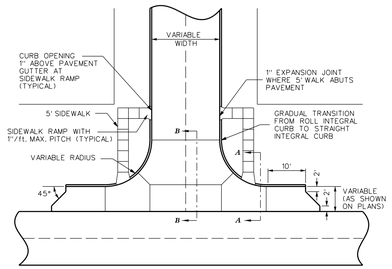
NOTE:
ALL DIMENSIONS & NOTES ON TYPICAL PAVEMENT CROSS SECTIONS ARE SYMMETRICAL ABOUT ℄



SECTION A-A



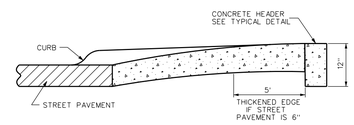
SECTION B-B



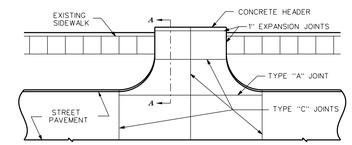
PLAN

INTERSECTION DETAIL WITH FUTURE WIDENING STRIP

NOTE:
1. ALLEY RETURN SHALL BE THE SAME THICKNESS AS THE STREET PAVEMENT AND POURED AT THE SAME TIME AS THE STREET PAVEMENT
2. COMPLETE SQUARES OF EXISTING SIDEWALK SHALL BE REPLACED AS REQUIRED TO ADJUST THE GRADE

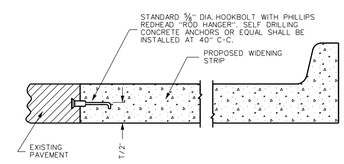


SECTION A-A

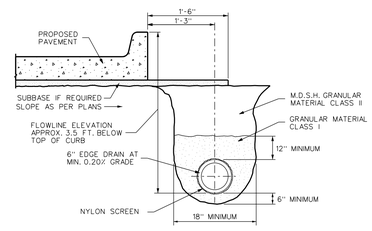


PLAN

ALLEY RETURN DETAIL

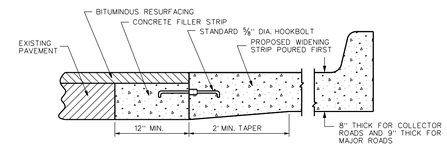


LONGITUDINAL LANE CONSTRUCTION JOINT
(FOR WIDENING LANE)



EDGE DRAIN DETAIL

NOTE: HOOKBOLTS SHALL BE INSTALLED AT 40" C-C.



LONGITUDINAL LANE CONSTRUCTION JOINT WITH FILLER STRIP
(FOR WIDENING LANE)

REVISIONS DATE	BY	CHANGE
5/2013	R.M.A.	7" TO 6" CURB HEIGHT
5/2004	D.D.Z.	REV. HOOK BOLT/TIE BAR/SUBBASE REQUIREMENTS
7/1998	D.D.Z.	REDRAWN
5/1983	C.R.	

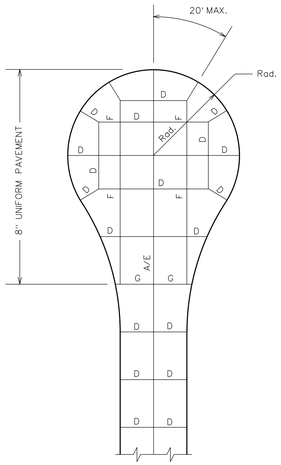
DIVISION OF ENGINEERING
CITY OF WARREN, MICHIGAN

CONCRETE PAVEMENT DETAILS

SCALE: NONE
DRAWN BY: D.D.Z.
APPROVED BY: R.T.D.
DATE: 7/78
SHEET 1 OF 1 SHEETS

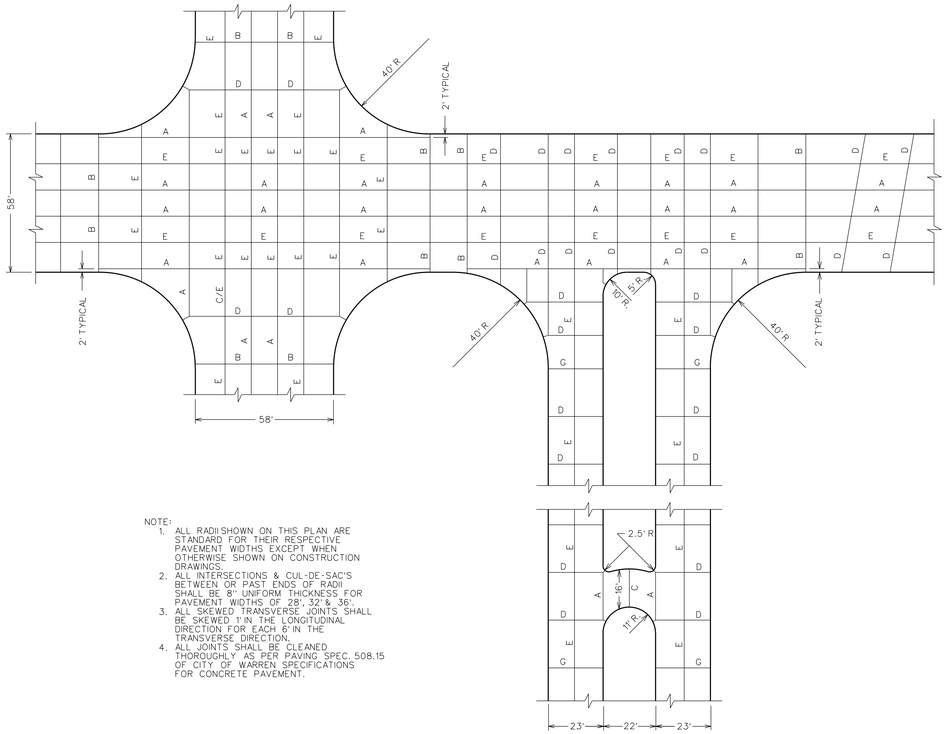
DP-1

8/9/2013 7:41:56 AM
H:\Drawings\Standards\DP-1.DGN
Current User: rmagents

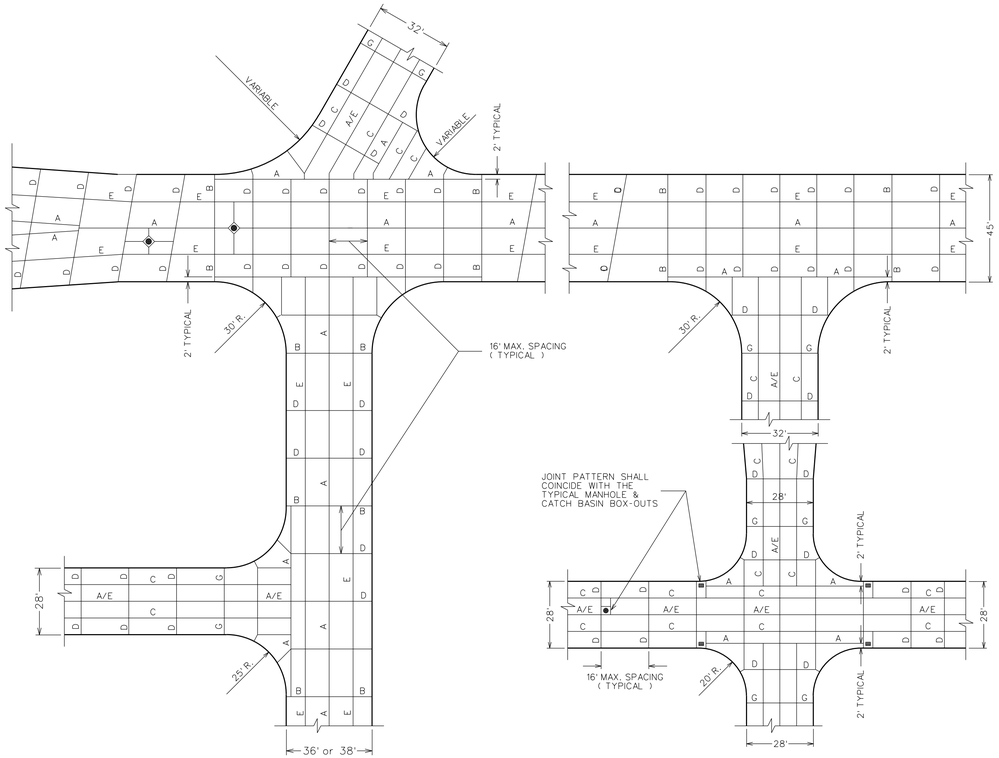


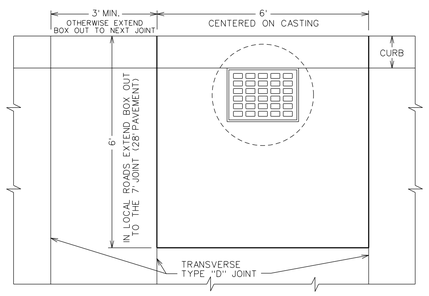
CUL-DE-SAC

NOTE:
1. MINIMUM RADIUS FOR A RESIDENTIAL CUL-DE-SAC SHALL BE 36'.
2. OTHER RADII SHALL BE AS DETERMINED BY THE CITY ENGINEER.



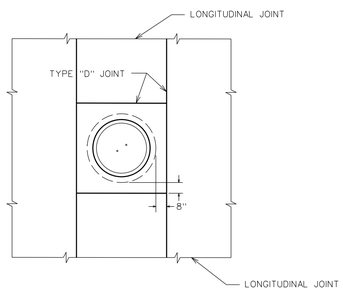
NOTE:
1. ALL RADII SHOWN ON THIS PLAN ARE STANDARD FOR THEIR RESPECTIVE PAVEMENT WIDTHS EXCEPT WHEN OTHERWISE SHOWN ON CONSTRUCTION DRAWINGS.
2. ALL INTERSECTIONS & CUL-DE-SAC'S BETWEEN OR PAST ENDS OF RADII SHALL BE 8" UNIFORM THICKNESS FOR PAVEMENT WIDTHS OF 28', 32' & 36'.
3. ALL SKEWED TRANSVERSE JOINTS SHALL BE SKEWED 1' IN THE LONGITUDINAL DIRECTION FOR EACH 6' IN THE TRANSVERSE DIRECTION.
4. ALL JOINTS SHALL BE CLEANED THOROUGHLY AS PER PAVING SPEC. 508.15 OF CITY OF WARREN SPECIFICATIONS FOR CONCRETE PAVEMENT.





NOTE: ALL CATCH BASINS SHALL BE SEPERATED FROM THE PAVEMENT AND CURB BY BOXING OUT AROUND THE BASIN AS SHOWN. EXPANSION JOINT MATERIAL SHALL EXTEND COMPLETELY THROUGH THE CURB.

CATCH BASIN BOXOUT

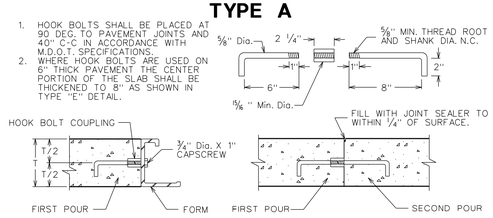


NOTE: ALL MANHOLE CASTINGS AND OTHER STRUCTURES WITHIN THE PAVEMENT SHALL BE BOXED OUT AS SHOWN.

MANHOLE BOXOUT

TYPE A

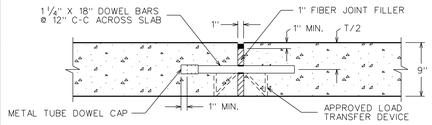
1. HOOK BOLTS SHALL BE PLACED AT 90 DEG. TO PAVEMENT JOINTS AND 40" C-C IN ACCORDANCE WITH M.D.O.T. SPECIFICATIONS.
2. WHERE HOOK BOLTS ARE USED ON 6" THICK PAVEMENT THE CENTER PORTION OF THE SLAB SHALL BE THICKENED TO 8" AS SHOWN IN TYPE "E" DETAIL.



LONGITUDINAL CONSTRUCTION JOINT

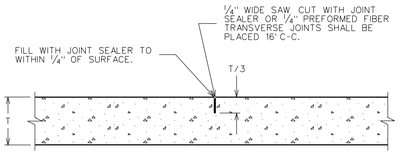
TYPE B

NOTE:
1. THIS JOINT IS TO BE PLACED AT MAX. 400' C-C AND AT ENDS OF RADII AT INTERSECTIONS.
2. THE JOINT FORMING STRIP ON THE LOAD TRANSFER DEVICE SHALL BE REMOVED AND THE JOINT FORMED WHILE THE CONCRETE IS STILL FRESH AND SHALL BE FILLED WITH JOINT SEALER TO WITHIN 1/4" OF SURFACE.



TRANSVERSE EXPANSION JOINT WITH LOAD TRANSFER

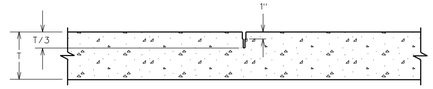
TYPE C



LONGITUDINAL CONTRACTION JOINT

TYPE D

NOTE:
1. JOINT SHALL FIRST BE SAWED 1/4" WIDE AND 1/3 OF THICKNESS DEEP.
2. JOINT SHALL THEN BE RESAWED 1/2" WIDE AND 1" DEEP. FILL WITH JOINT SEALER TO WITHIN 1/4" OF SURFACE

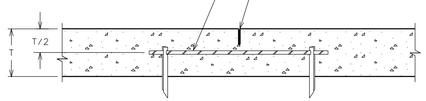


TRANSVERSE CONTRACTION JOINT

TYPE E

5/8" DIA. X 30" LONG EPOXY-COATED TIE BARS SUPPORTED BY FABRICATED STEEL CHAIRS AT EACH END AS SHOWN AND PLACED 40" C-C FOR 28' AND 32' WIDE PAVEMENT. ALL OTHER PAVEMENTS SHALL HAVE 1/2" DIA. X 30" TIE BARS AT 40" C-C SUPPORTED AS ABOVE.

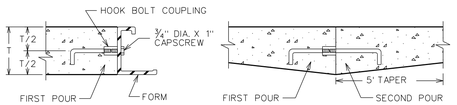
ALL SAW CUTS SHALL BE 1/4" WIDE, T/3 DEEP AND FILLED WITH JOINT SEALER.



LONGITUDINAL LANE TIE JOINT

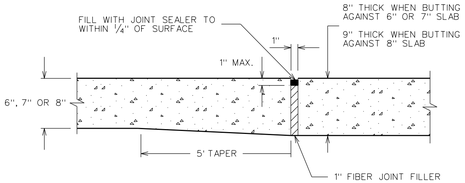
TYPE F

NOTE:
1. HOOK BOLTS SHALL BE PLACED AT 90 DEG. TO PAVEMENT JOINT AND 40" C-C.
2. WHERE HOOK BOLTS ARE USED ON 6" THICK PAVEMENT THE CENTER PORTION OF THE SLAB SHALL BE THICKENED TO 8" AS SHOWN.



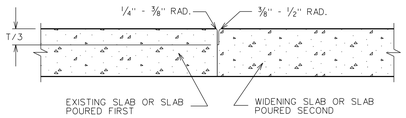
TRANSVERSE CONSTRUCTION JOINT

TYPE G



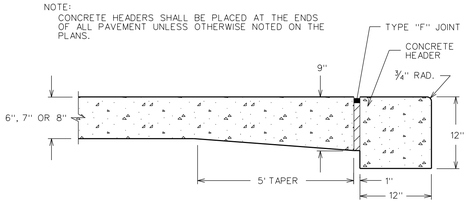
TRANSVERSE EXPANSION JOINT

NOTE:
THE FIRST SLAB SHALL BE EDGED WITH A SHORT LIP EDGER AND THE SECOND SLAB SHALL BE EDGED WITH A LONG LIP EDGER.

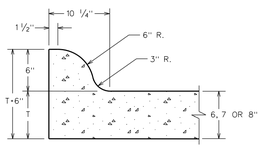


METHOD OF EDGING

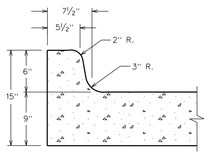
NOTE:
CONCRETE HEADERS SHALL BE PLACED AT THE ENDS OF ALL PAVEMENT UNLESS OTHERWISE NOTED ON THE PLANS.



PAVEMENT END DETAIL



ROLL INTEGRAL CURB 23' THRU 38' PAV'T.



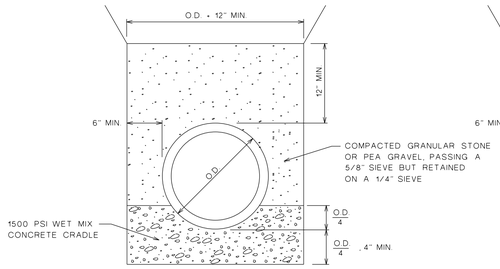
STRAIGHT INTEGRAL CURB 45' & 58' PAV'T.

DIVISION OF ENGINEERING
CITY OF WARREN, MICHIGAN

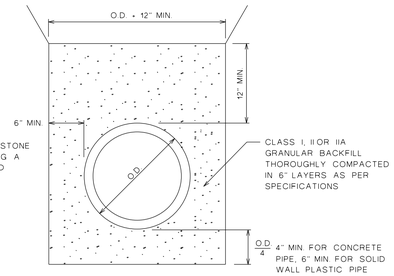
CONCRETE PAVEMENT DETAILS

REVISED: R.M.A. 7/12

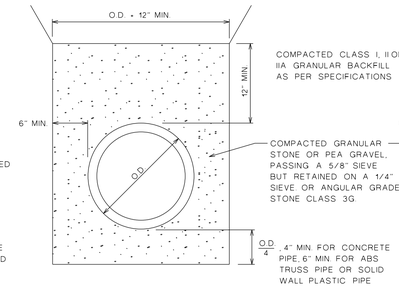
DP-2



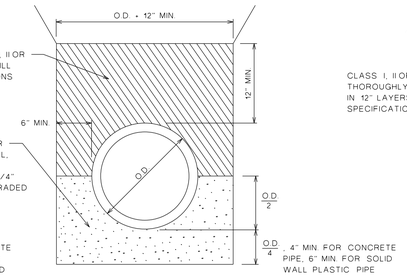
CLASS A BEDDING DETAIL



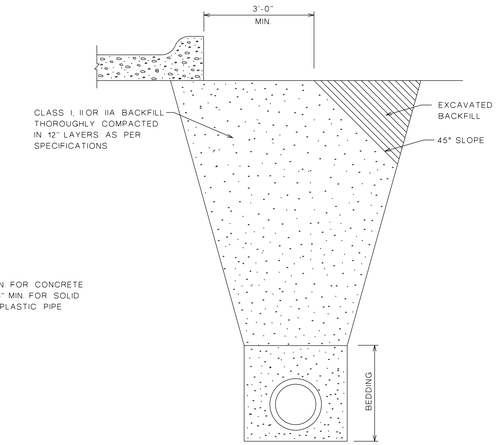
CLASS B BEDDING DETAIL



CLASS B MODIFIED BEDDING DETAIL



CLASS C BEDDING DETAIL

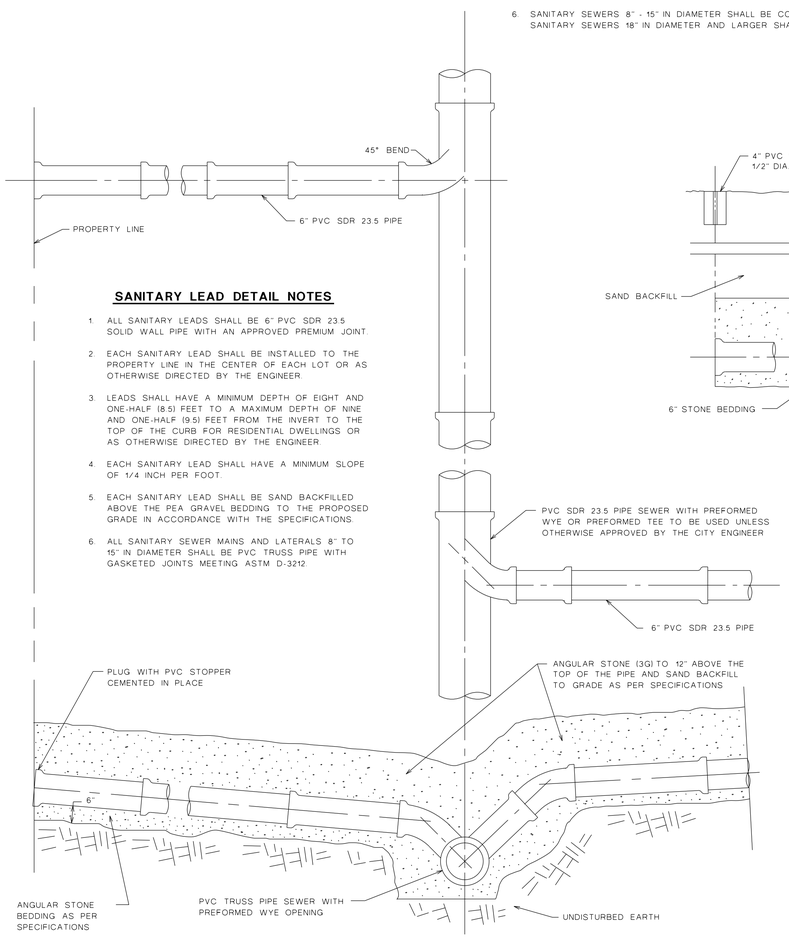


DETAIL FOR BACKFILLING WITHIN 3 FEET OF EXISTING OR PROPOSED PAVEMENT

1. WHERE TRENCHES ARE UNDER ROAD SURFACES, PAVEMENTS INCLUDING RETURNS, CURBS, DRIVEWAYS, SIDEWALKS, PARKING AREAS OR WHERE THE EDGE OF THE TRENCH IS WITHIN THREE (3) FEET OF AN EXISTING OR PROPOSED CONCRETE OR ASPHALT PAVEMENT OR SIDEWALK SUCH TRENCHES SHALL BE BACKFILLED WITH COMPACTED SAND AS PER SPECIFICATIONS.
2. DURING BACKFILL OPERATIONS THE AREA OF THE TRENCH THAT IS TO BE SAND FILLED AND COMPACTED SHALL BE MAINTAINED AT LEAST SIX (6) INCHES ABOVE THAT PORTION BACKFILLED WITH EXCAVATED MATERIALS AT ALL TIMES.

BEDDING DETAIL NOTES

1. THE BEDDING DETAILS ARE FOR ALL SEWERS PLACED IN OPEN CUT EXCAVATIONS.
2. ON PIPES OF 30" DIAMETER OR LESS THE TRENCH WIDTH AT THE TOP OF THE PIPE SHALL NOT EXCEED THE EXTERNAL DIAMETER OF THE PIPE PLUS 16". FOR PIPES LARGER THAN 30" DIAMETER THE TRENCH WIDTH AT THE TOP OF THE PIPE SHALL NOT EXCEED THE EXTERNAL DIAMETER OF THE PIPE PLUS 24".
3. FROM ONE FOOT ABOVE THE TOP OF THE PIPE TO THE PROPOSED GRADE THE TRENCH SHALL BE BACKFILLED IN ACCORDANCE WITH SECTION 706 OF THE SPECIFICATIONS FOR SANITARY AND STORM SEWERS.
4. CLASS B MODIFIED BEDDING SHALL BE REQUIRED FOR ALL SANITARY SEWER CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. (ANGULAR STONE CLASS 3G SHALL BE THE BEDDING MATERIAL FOR TRUSS PIPE)
5. CLASS C BEDDING SHALL BE THE MINIMUM BEDDING REQUIRED FOR ALL STORM SEWER CONSTRUCTION.
6. SANITARY SEWERS 8" - 15" IN DIAMETER SHALL BE CONSTRUCTED OF PVC TRUSS PIPE W/GASKETED JOINT. SANITARY SEWERS 18" IN DIAMETER AND LARGER SHALL BE CONSTRUCTED OF CLASS IV OR BETTER R.C.S.P.(W/PREMIUM JOINT)

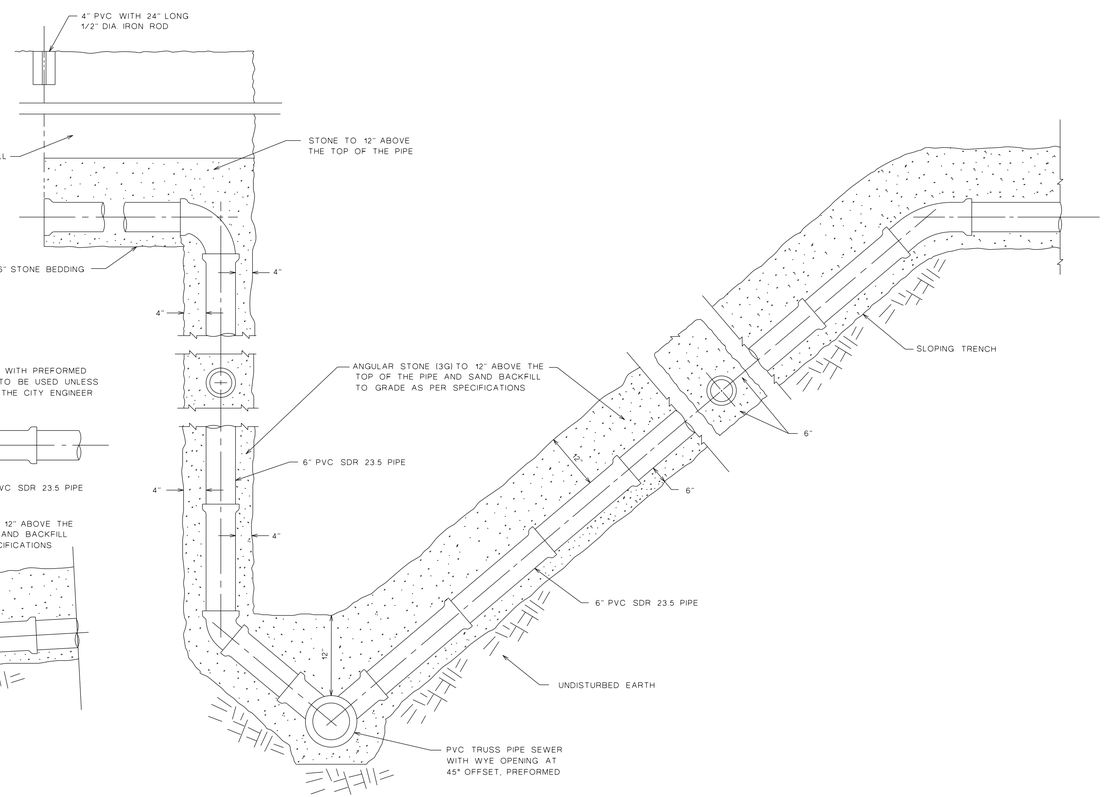


SANITARY LEAD DETAIL NOTES

1. ALL SANITARY LEADS SHALL BE 6" PVC SDR 23.5 SOLID WALL PIPE WITH AN APPROVED PREMIUM JOINT.
2. EACH SANITARY LEAD SHALL BE INSTALLED TO THE PROPERTY LINE IN THE CENTER OF EACH LOT OR AS OTHERWISE DIRECTED BY THE ENGINEER.
3. LEADS SHALL HAVE A MINIMUM DEPTH OF EIGHT AND ONE-HALF (8.5) FEET TO A MAXIMUM DEPTH OF NINE AND ONE-HALF (9.5) FEET FROM THE INVERT TO THE TOP OF THE CURB FOR RESIDENTIAL DWELLINGS OR AS OTHERWISE DIRECTED BY THE ENGINEER.
4. EACH SANITARY LEAD SHALL HAVE A MINIMUM SLOPE OF 1/4 INCH PER FOOT.
5. EACH SANITARY LEAD SHALL BE SAND BACKFILLED ABOVE THE PEA GRAVEL BEDDING TO THE PROPOSED GRADE IN ACCORDANCE WITH THE SPECIFICATIONS.
6. ALL SANITARY SEWER MAINS AND LATERALS 8" TO 15" IN DIAMETER SHALL BE PVC TRUSS PIPE WITH GASKETED JOINTS MEETING ASTM D-3212.

STANDARD SANITARY LEAD DETAIL - SHALLOW SEWER

UNDER 16 FEET



STANDARD SANITARY LEAD DETAIL - DEEP SEWER

16 FEET AND OVER

LEGEND

PLAN VIEW

CENTER LINE
EXIST. SEWER
EXIST. GAS MAIN
EXIST. UNDERGROUND ELECTRIC
EXIST. WATER MAIN
PROPOSED INSTALLATION
EXIST. MANHOLE
PROPOSED MANHOLE
UTILITY POLES
FIRE HYDRANT
GATE VALVE IN WELL
EXIST. CATCH BASIN
PROP. CATCH BASIN
EXIST. INLET
PROP. INLET
EXIST. FENCE
EXIST. SWALE OR DITCH
EXIST. CULVERT
EXIST. CULVERT (WITH HDDRS.)
TREES (DECIDUOUS)
TREES (EVERGREEN)
PROP. PAVM'T. (PAVING PLAN) EXIST. PAVM'T. (SEWER & WATERMAIN PLANS)
EXIST. GRAVEL ROAD
EXIST. SIDEWALK & PROP. LINE
EXIST. HOUSE OR BLDG. & LEAD WALK
PAVEMENT REMOVAL ONLY
PAVEMENT REMOVAL & REPLACE
TUNNEL, JACK OR BORE SEWER OR WATER MAINS

PROFILE

CENTER LINE
NORTH OR WEST ℙ OR SIDEWALK
SOUTH OR EAST ℙ OR SIDEWALK
NORTH OR WEST HOUSE GRADE — N(W)
SOUTH OR EAST HOUSE GRADE — S(E)
PROPOSED GRADE
PROPOSED SEWER
EXISTING SEWER

REVISIONS	DATE	BY	CHANGE
	1/08/08	C.M.K.	UPDATED PIPE TYPES
	8/24/06	R.M.A.	UPDATED BEDDING MATERIAL NOTES
	2/24/93	W.L.K.	UPDATED & REDRAWN

DIVISION OF ENGINEERING

CITY OF WARREN, MICHIGAN

PIPE BEDDING AND SEWER DETAILS

SCALE: NONE — DESIGNED BY: T.S.S.
APPROVED BY: J.V.H. — DRAWN BY: W.L.K.
SHEET 1 OF 1 SHEETS — DATE: 2/24/93

DS-1

1/17/2015 8:03:14 AM
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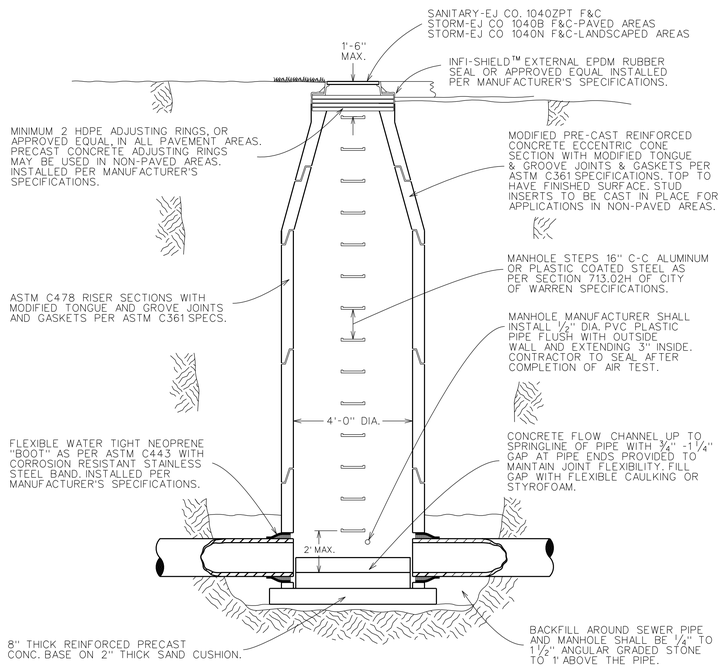
Current User: ragents

NOTES:

PRECAST BASE SECTIONS OF APPROVED DESIGN MAY BE USED FOR BOTTOM SECTION OF MANHOLE. ALL PRECAST MANHOLES & SLAB BASES SHALL BE MANUFACTURED WITH TYPE II,IP OR IIA CEMENT. ALL CONCRETE FOR CHANNELIZATION SHALL BE MADE WITH THE SAME AS ABOVE.

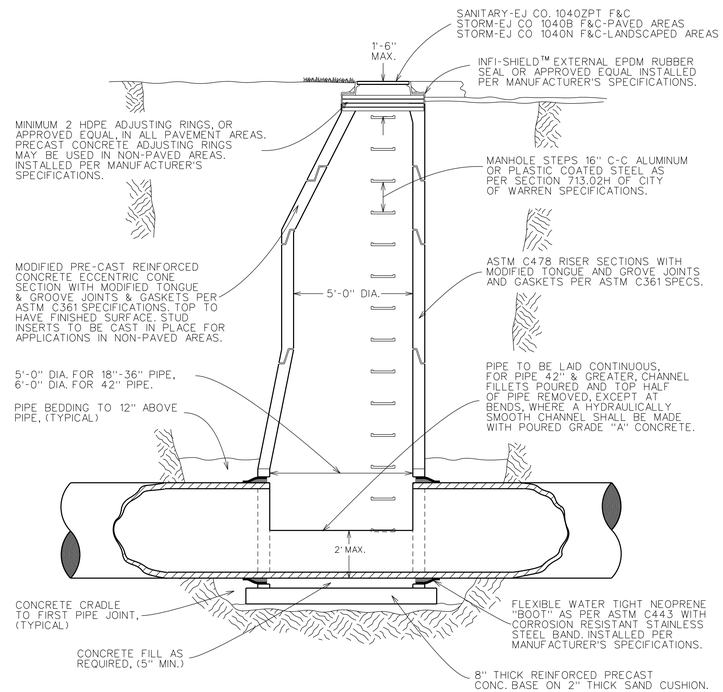


STANDARD MANHOLE WITH 8"-15" DIAMETER SEWER

SCALE: 1"= 3'

NOTES:

PRECAST BASE SECTIONS OF APPROVED DESIGN MAY BE USED FOR BOTTOM SECTION OF MANHOLE. ALL PRECAST MANHOLES & SLAB BASES SHALL BE MANUFACTURED WITH TYPE II,IP OR IIA CEMENT. ALL CONCRETE FOR CHANNELIZATION SHALL BE MADE WITH THE SAME AS ABOVE.

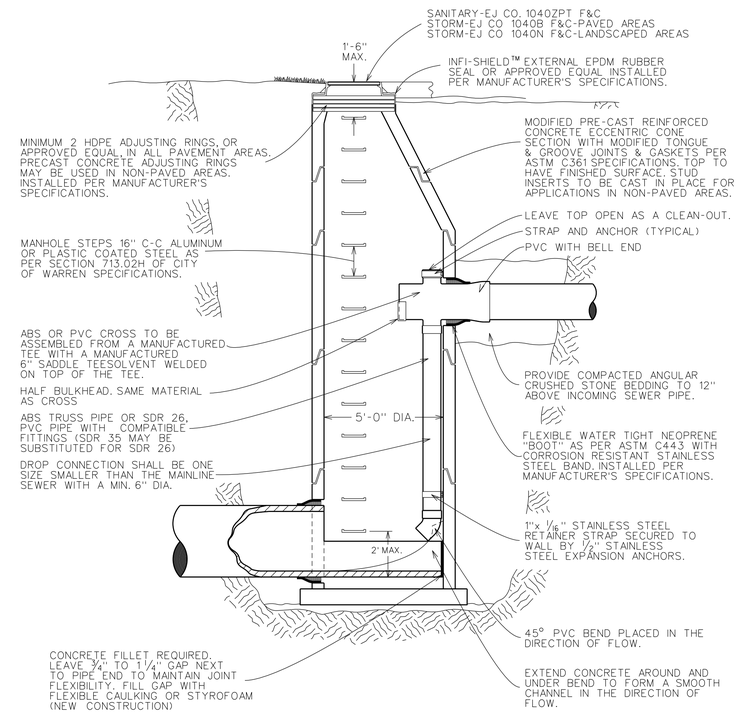


STANDARD MANHOLE FOR 18" THROUGH 42" DIA. SEWER

SCALE: 1"= 3'

NOTES:

1.) DROP CONNECTION REQUIRED WHENEVER THE INVERT BETWEEN INLET & OUTLET IS 24 INCHES OR GREATER.
2.) MANHOLE CONSTRUCTION TO CONFORM TO REQUIREMENTS SPECIFIED ELSEWHERE ON THIS SHEET.
3.) ABS OR PVC JOINTS TO BE WELDED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
4.) ALL BOLTS INSIDE MANHOLE SHALL BE BRASS OR STAINLESS STEEL AND SECURELY FASTENED TO THE WALL.

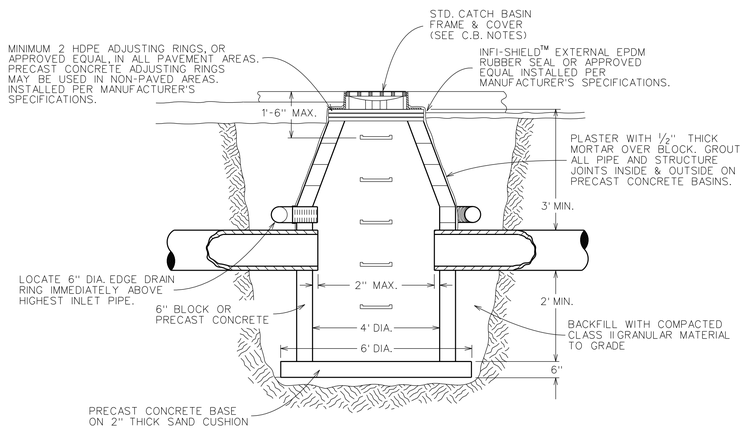


STANDARD MANHOLE WITH DROP CONNECTION

SCALE: 1"= 3'

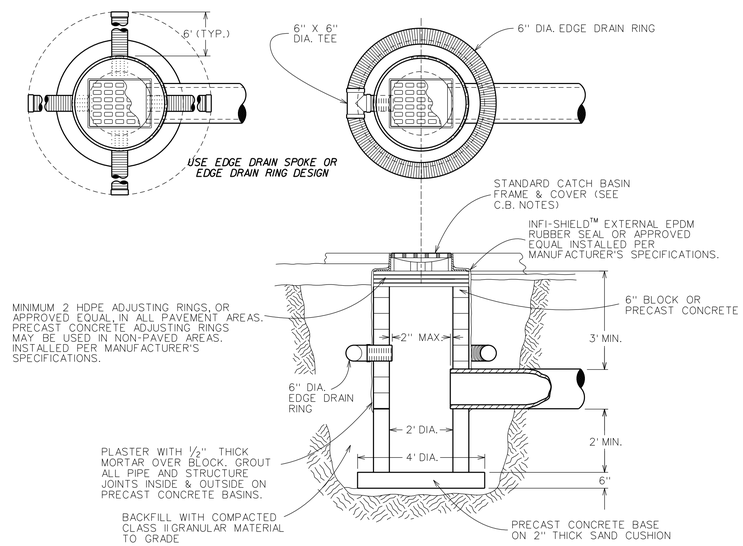
CATCH BASIN NOTES:

1. TYPE "A" CATCH BASINS SHALL BE USED ON ALL STREET PAVING PROJECTS. ALL REAR YARD DRAINAGE STRUCTURES SHALL BE TYPE "A" EXCEPT WHERE ONLY ONE PIPE ENTERS THE CATCH BASIN.
2. STANDARD CATCH BASIN COVERS TO BE USED ON STREET PAVING PROJECT SHALL BE EQUAL TO EJ CO. 5080 TYPE M1 OR NEENAH R-3448-C, TOTAL WEIGHT SHALL NOT BE LESS THAN 285 LBS.
3. STANDARD GRATES TO BE USED ON REAR YARD DRAINAGE STRUCTURES SHALL BE EQUAL TO EJ CO. 1040N OR APPROVED EQUAL, TOTAL WEIGHT SHALL NOT BE LESS THAN 200 LBS.
4. STEPS AT 16" C.-C. SHALL BE INSTALLED IN ALL TYPE "A" CATCH BASINS.
5. EDGE DRAIN RING NOT REQUIRED AT CATCH BASINS CONNECTED TO PAVEMENT EDGE DRAIN.



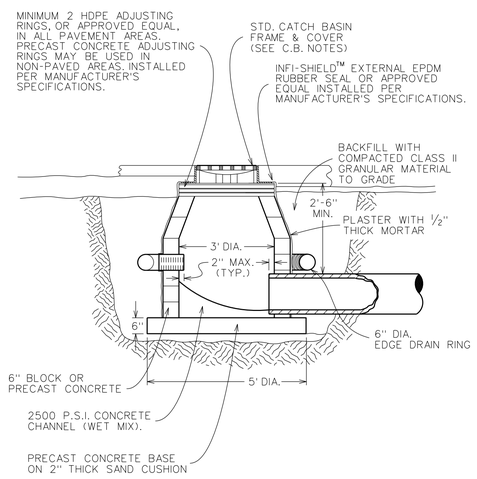
STANDARD CATCH BASIN TYPE "A"

SCALE: N.T.S.



STANDARD CATCH BASIN TYPE "B"

SCALE: N.T.S.



STANDARD INLET

TO BE USED IN INACCESSABLE AREAS

SCALE: N.T.S.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO SECTIONS 700 OF THE CITY OF WARREN STANDARD SPECIFICATIONS FOR SANITARY & STORM SEWERS AND APPURTENANCES.
2. JOINTS FOR PRECAST CONCRETE MANHOLES USED IN SANITARY SEWER CONSTRUCTION SHALL BE MODIFIED GROVED TONGUE WITH RUBBER GASKET. JOINTS FOR PRECAST CONCRETE MANHOLES USED IN STORM SEWER CONSTRUCTION SHALL BE TONGUE & GROOVE BITUMINOUS JOINT.
3. EXISTING PRECAST MANHOLES SHALL BE TAPPED BY CORE DRILLING AND INSTALLING A WATER-TIGHT RUBBER BOOT. EXISTING BRICK MANHOLES SHALL HAVE HOLES DRILLED AT 4" CENTER TO CENTER AROUND THE PERIPHERY OF THE OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING INTO THE SECTION. NON-SHRINK GROUT SHALL BE USED TO SEAL THE OPENING.
4. BRICK PIERS SHALL BE PLACED UNDER CONC. PIPES ADJACENT TO THE STRUCTURES TO MAINTAIN CORRECT ALIGNMENT. THE FIRST PIPE LENGTH ADJACENT TO THE STRUCTURES SHALL BE BEDDED TO THE ℄ OF THE PIPE IN A MIXTURE OF SAND & CEMENT IN THE RATIO OF TWO BAGS OF CEMENT TO EACH YARD OF SAND, FILLING ALL VOIDS TO UNDISTURBED EARTH.
5. PRECAST MANHOLE LIFTING HOLES SHALL BE FILLED WITH PRECAST TAPERED MORTAR PLUGS, WIPED AROUND WITH A COAT OF MASTIC & POINTED WITH MORTAR ON ALL SIDES.
6. ALL EXCAVATIONS FOR NEW CONSTRUCTION OF, REPAIRS TO OR CONNECTIONS TO INLETS, MANHOLES OR JUNCTION CHAMBERS SHALL BE BACKFILLED WITH COMPACTED CLASS II GRANULAR MATERIAL.
7. ALL EDGE DRAIN SHALL BE 6" DIAMETER CORRUGATED PLASTIC TUBING WITH SLOTTED HOLES AND NYLON SCREEN, MEETING ASTM F405.

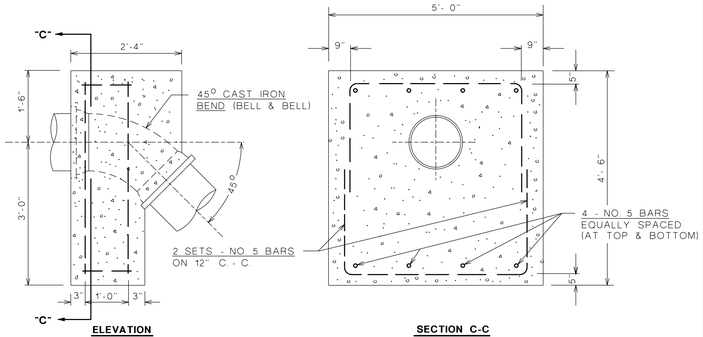
DIVISION OF ENGINEERING
CITY OF WARREN, MICHIGAN

MANHOLE & CATCH BASIN DETAILS

REVISED C.M.K. 02/14
REVISED R.M.A. 8/13
REVISED D.D.Z. 2/98

DS-2a

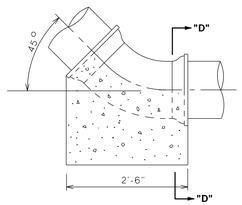
DETAIL "A"



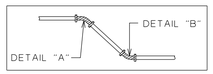
ELEVATION

SECTION C-C

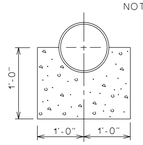
DETAIL "B"



ELEVATION



NOTE: ANCHORS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE (3500 P.S.I.)



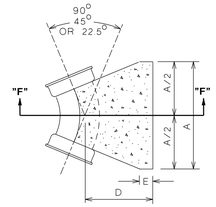
SECTION D-D

STD. ACHORAGE DETAILS FOR 45° & 22 1/2° BENDS

90° BEND DIA. OF MAIN	A	B	C	D	E
6"	2'-0"	2'-4"	1'-8"	1'-6"	0'-9"
8"	3'-4"	3'-0"	1'-11"	1'-9"	0'-9"
12"	5'-6"	4'-0"	2'-4"	2'-1"	0'-9"
16"	6'-0"	5'-0"	3'-0"	2'-8"	1'-0"

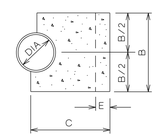
45° BEND DIA. OF MAIN	A	B	C	D	E
8"	2'-4"	2'-0"	1'-11"	1'-9"	0'-9"
12"	3'-6"	2'-6"	2'-4"	2'-1"	0'-9"
16"	5'-4"	3'-0"	3'-0"	2'-8"	1'-0"

22 1/2° BEND DIA. OF MAIN	A	B	C	D	E
12"	2'-6"	2'-0"	2'-0"	1'-9"	0'-9"
16"	3'-4"	2'-6"	3'-0"	2'-8"	1'-0"
20"	4'-0"	3'-0"	4'-0"	3'-6"	1'-0"



PLAN

THRUST BLOCKS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. (3500 P.S.I.)

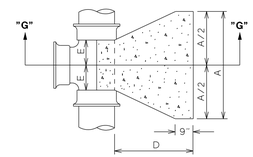


SECTION F-F

STD. THRUST BLOCK AT BENDS

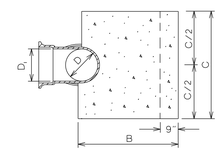
TEE SIZE D	D_1	A	B	C	D	E
8"	8"	3'-0"	2'-3"	2'-0"	1'-9"	0'-6"
12"	8"	3'-0"	2'-5"	2'-0"	1'-9"	0'-6"
12"	12"	4'-0"	2'-9"	3'-0"	2'-1"	0'-8"
16"	8"	3'-0"	2'-9"	2'-0"	1'-9"	0'-6"
16"	12"	4'-0"	3'-1"	3'-0"	2'-1"	0'-8"
16"	16"	5'-0"	3'-8"	4'-0"	2'-8"	0'-11"

PLUG DIA. (D_1) OF PIPE D_1	A	B	C
6"	2'-0"	1'-8"	1'-10"
8"	3'-0"	1'-11"	2'-0"
12"	4'-0"	2'-1"	3'-0"
16"	5'-0"	2'-8"	4'-0"



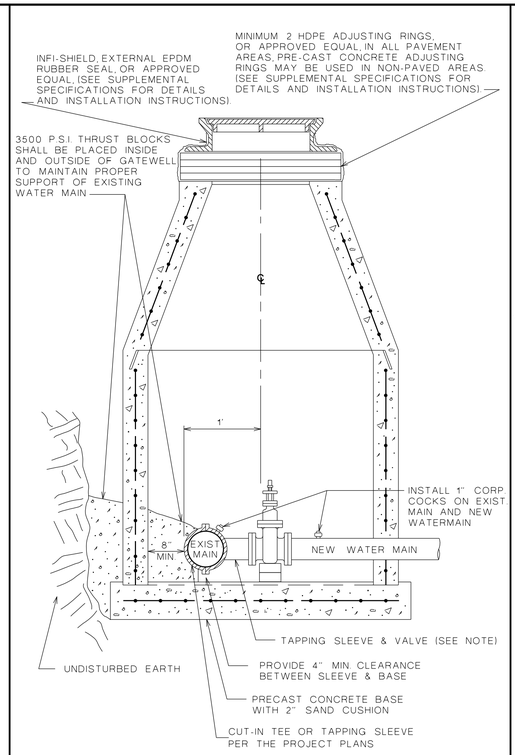
PLAN

THRUST BLOCKS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. (3500 P.S.I.)



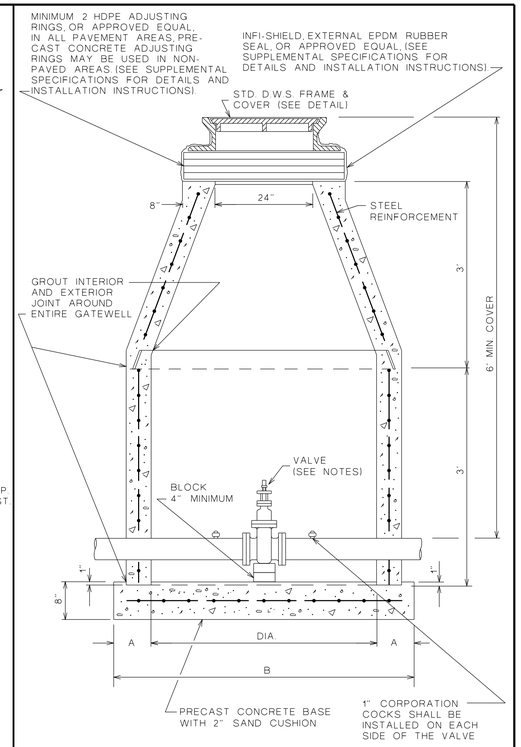
SECTION G-G

STD. THRUST BLOCK AT TEE & PLUG



NOTE: THE TAPPING VALVE & WELL SHALL BE 6' DIA. FOR ALL TAPS FROM 8" ON 8" TO 12" ON 16", SEE CONSTRUCTION DRAWINGS FOR GATE WELL DIMENSIONS IF THE TAP IS OUTSIDE THESE DIMENSIONS.

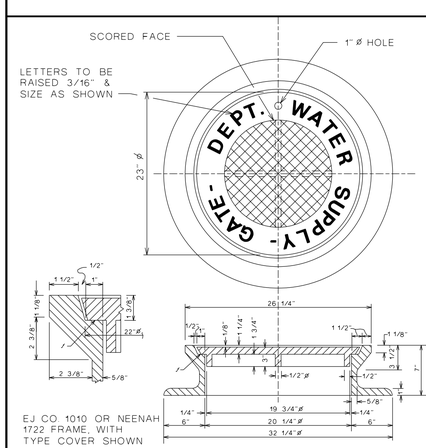
STANDARD PRECAST TAPPING VALVE & WELL



DIA.	60"	72"
A	5"	7"
B	84"	96"

SIZE OF MAIN	DIA. OF GATE WELL
6"	5'-0"
8"	5'-0"
10"	5'-0"
12"	6'-0"
14"	6'-0"
16"	6'-0"

STANDARD PRECAST GATE WELLS

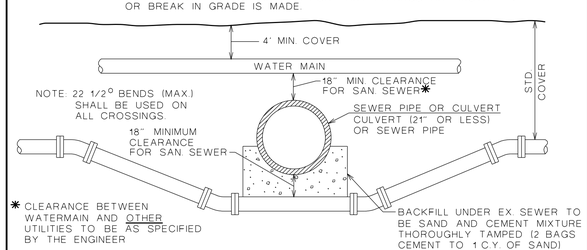


NOTE: GATEWELL FRAME & COVER SHALL BE MADE OF CAST IRON (A.S.T.M. A - 48 CLASS 30) AS DETAILED HERE & D.M.W.D. DETAIL SHEET NO. A - 120 - 234

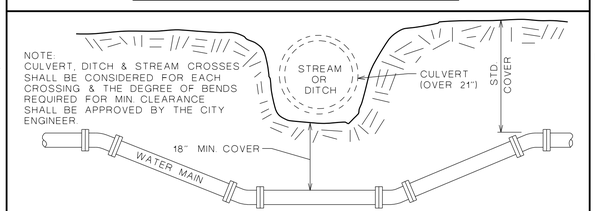
WEIGHT (FRAME & COVER)----------410 LBS. MIN.

STD. GATE WELL FRAME & COVER

NOTE: THE WATERMAIN ELEVATION AT THE ℄ OF THE SEWER PIPE SHALL BE MAINTAINED FOR A DISTANCE EQUAL TO THAT FROM TOP OF BANK TO TOP OF BANK BEFORE ANY FITTINGS ARE INSTALLED OR BREAK IN GRADE IS MADE.

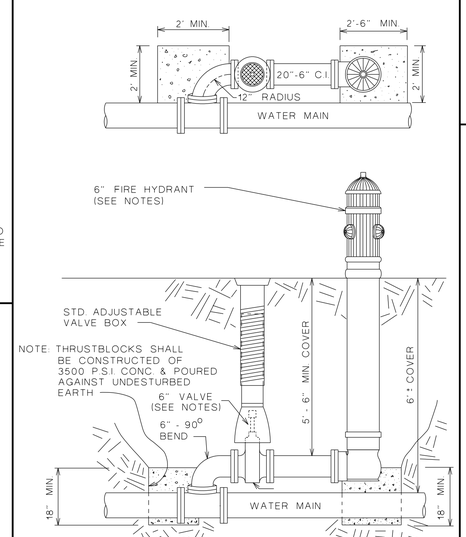


STD. SEWER OR CULVERT CROSSING

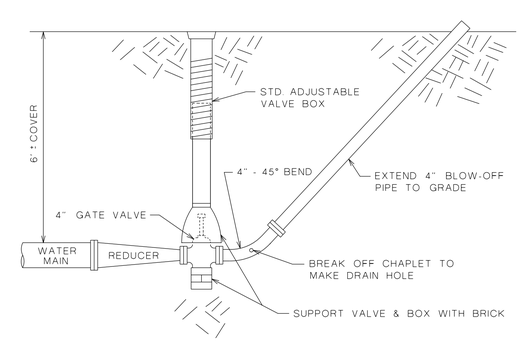


STD. CULVERT, DITCH & STREAM CROSSING

NOTE: THE WATERMAIN ELEVATION AT THE ℄ OF THE DITCH SHALL BE MAINTAINED FOR A DISTANCE EQUAL TO THAT FROM TOP OF BANK TO TOP OF BANK BEFORE ANY FITTINGS ARE INSTALLED OR BREAK IN GRADE IS MADE.



STD. HYDRANT SETTING



STD. BLOW-OFF CONNECTION

NOTES: ALL 4" THROUGH 12" DIA. VALVES TO BE EJ CO. FLOWMASTER® RESILIENT WEDGE GATE VALVES, OR APPROVED EQUAL

FIRE HYDRANTS WILL BE EJ CO. TYPE 5BR250, OR APPROVED EQUAL WITH TWO 3 3/4" PUMPER NOZZLES

TAPPING SLEEVES WILL BE ROMAC® SST, OR APPROVED EQUAL

REVISIONS DATE	BY	CHANGE
12/16/2011	R.M.A.	CHANGED NAME 'EAST JORDAN'
5/19/2009	R.M.A.	NOTE CHANGES
3/10/2005	R.M.A.	ADDED APPURTENANCE INFORMATION
04/14/2004	D.D.Z.	REMOVED STEPS IN GATEWELL
12/4/2002	R.M.A.	ADDED HDPE ADJ. RINGS/INFI-SHIELD
1-29-93	W.L.K.	REDRAWN

DIVISION OF ENGINEERING

CITY OF WARREN, MICHIGAN

WATER MAIN DETAILS

SCALE: NONE

APPROVED BY: J.V.H. DRAWN BY: W.L.K.

SHEET 1 OF 1 SHEETS DATE: 1-29-93

DW-1

PLANTING NOTES:

1. Contractor shall be responsible for contacting and coordinating with all pertinent utility companies 72 hours in advance of any digging to make themselves familiar with all underground utilities, pipes and structures. Contractor shall take sole responsibility for any cost incurred due to damage of said utilities or structures.
2. Contractor shall not willfully proceed with construction as designed when it is obvious that unknown obstructions and/or grade differences exist. Such conditions shall immediately be brought to the attention of the Owner's Representative. The contractor shall assume full responsibility for all necessary revisions due to failure to give such notification.
3. Any discrepancies between dimensioned layout and actual field conditions shall be reported to the Owner's Representative. Failure to make such discrepancies known will result in contractor's responsibility and liability for any changes and associated costs.
4. Contractor shall be responsible for any coordination with subcontractors as required to accomplish construction installation operations.
5. Contractor shall provide and maintain positive surface drainage.
6. Contractor shall be responsible for any existing materials that are damaged during construction.
7. See Plant & Material List and Planting Details for planting requirements, materials and execution.
8. All trees shall have a clay loam or clay root ball. Trees with sand root balls will not be accepted.
9. All tree varieties and substitutions to be approved by he Owners Representative prior to being delivered to site. Any plant material delivered to site not previously approved may be rejected and are the sole responsibility of the contractor.
10. The location of all plant material shall be scaled from drawings or interpreted from plant list. Final location of all plant material shall be subject to approval from the Owner's Representative.
11. The contractor shall "water in" and fertilize all plants immediately after planting.
12. Contractor shall install 2 - 4" of screened Top Soil on all planting areas and all new lawn areas. Contractor shall install Sod at all lawn areas as depicted on drawings.
13. Contractor shall install 3" depth Shredded Hardwood Mulch in all shrub and tree planting beds unless otherwise indicated. Peat Moss is to be installed in all annual flower, perennial flower and ground cover planting beds. Such beds shall have no shredded mulch, typ.
14. The contractor shall guarantee all trees, shrubs, ground cover and other plant materials for one year from the date of acceptance, including labor and removal and disposal of dead material. Project owner shall be responsible maintenance program.
15. All plant material shall be nursery grown. All trees and plant material shall meet the current standards of the American Society of Nurseryman.
16. Landscape Contractor shall install an automated irrigation system for all lawn and planting bed areas on a Design/Build basis. A complete design, materials list, and cost estimate is required as part of the original bid proposal.
17. All diseased, damaged, or dead material shown on the site plan shall be replaced by the end of the following growing season. Property owner shall be responsible to maintain plant material in healthy condition and/or replace dead plant material for the life of the project.
18. Contractor shall adhere to all soil erosion prevention methods as directed within civil engineering drawings and within the municipal Ordinance including maintaining silt fencing and ensuring that soil, silt and other debris is prevented from leaving site or entering area drains, sewer inlets, creeks or natural areas.
19. All perennials and ornamental grasses shall be planted on close centers so as to form a single mass appearance within one planting season.

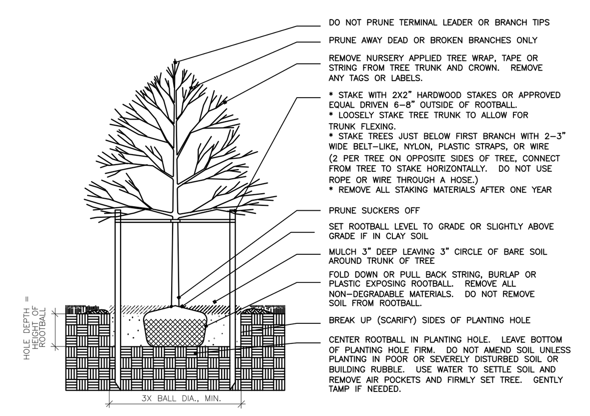
IRRIGATION NOTES:

1. Contractor shall install an automated irrigation system throughout the site as indicated on Sheet LP-01, on a Design / Build basis. Irrigation design shall provide coverage to all lawn and landscape planting areas within the "Limits of Irrigation" area shown on this drawing.
2. All work shall be in compliance with local, state and federal codes and ordinances.
3. Contractor shall be responsible to obtain all related permits and inspections.
4. See project specifications: 322810 - Irrigation

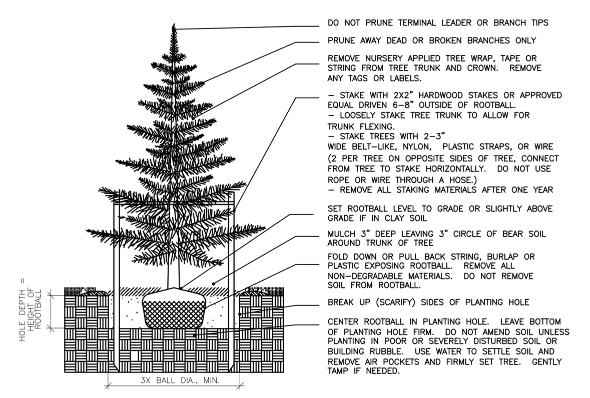
GENERAL LANDSCAPE NOTES:

1. All unpaved areas within development zones to be sod lawn, mulch beds or groundcover as shown on Sheet LP-01, typ.
2. Ryerson Steel edging to be installed at all planting bed lines adjacent to sod lawn areas, typ.
3. Owner shall maintain all landscape and lawn areas on a weekly or bi-weekly basis during the growing season. Owner shall clear snow from parking areas and sidewalks, including public sidewalks, as needed.

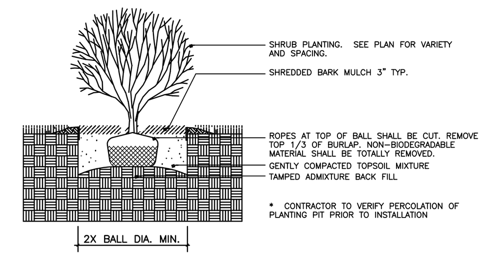
PLANTING DETAILS:



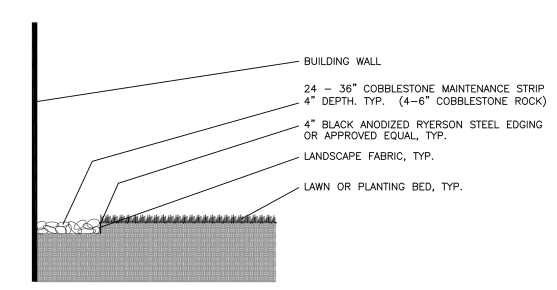
DECIDUOUS TREE PLANTING DETAIL, TYP. NOT TO SCALE



EVERGREEN TREE PLANTING DETAIL, TYP. NOT TO SCALE



SHRUB PLANTING – BALL AND BURLAP, TYP. NOT TO SCALE



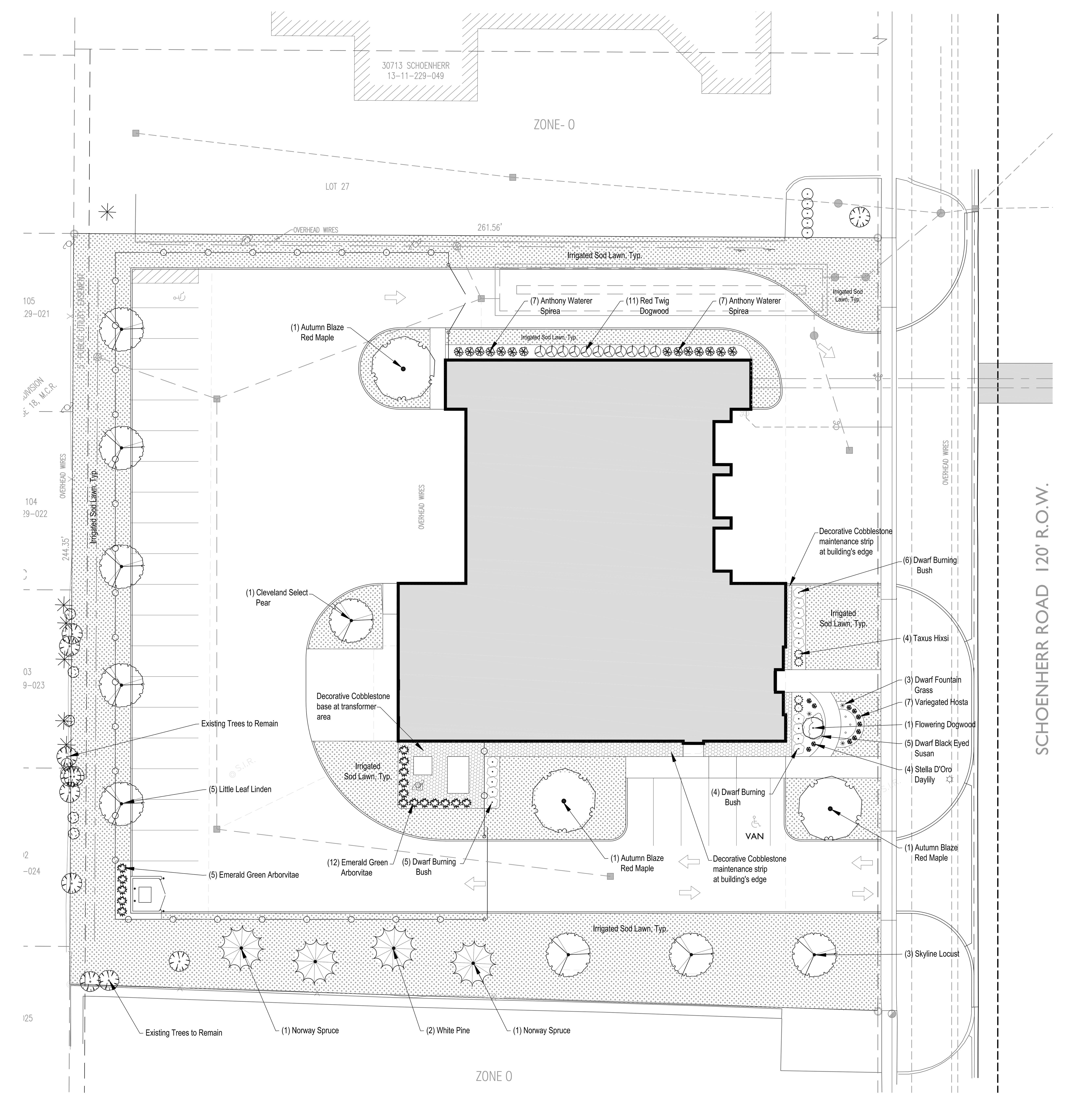
COBBLESTONE MAINTENANCE STRIP AT BUILDING PERIMETER NOT TO SCALE

PLANT DATA CHART:

QTY.	DESCRIPTION	SIZE / ROOT
3	Acer x freemanii 'Jeffsred' Autumn Blaze Maple	3" cal., B&B
3	Gleditsia trcanthos Skyline Locust	3" cal., B&B
5	Tilia Cordata Little Leaf Linden	3" cal., B&B
1	Pyrus calleryana 'Cleveland Select' Cleveland Select Pear	3" cal., B&B
2	Picea glauca White Spruce	8', B&B
2	Picea abies Norway Spruce	8', B&B
1	Cornus florida Flowering Dogwood	1.5" cal., B&B
15	Euonymus alata 'Compacta' Dwarf Burning Bush	30-36", B&B
11	Cornus sercia Red Twig Dogwood	42", B&B
17	Thuja occidentalis Emerald Green Arborvitae	18-24", Container
4	Taxus hicksii Hicks Yew	30-36", B&B
14	Spirea japonica 'Anthony Waterer' Anthony Waterer Spirea	18-24", Container
5	Rudbeckia hirta Black Eyed Susan	2 gal, Container
7	Hosta venusta 'Variegated' Variegated Hosta	2 gal, Container
3	Pennisetum alopecuroides Hamelin Dwarf Fountain Grass	3 gal, Container
4	Hemerocallis 'Stella D'Oro' Sella D'Oro Daylily	2 gal, Container

1 LP-01 LANDSCAPE PLANTING PLAN

Scale: 1" = 20'



3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 FOR THE LOCATION OF UNDERGROUND FACILITIES

PARTNERS

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65 MARKET STREET
MOUNT CLEMENS, MI 48043
P 586.469.3600

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Town Planning
Landscape Architecture
9336 Sashabaw Road
Clarkston, MI 48348
248.922.0415 fax
248.922.0789

J EPPINK PARTNERS INC

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
JTE

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Landscape Planting Plan

SHEET NO.
LP-01

ABBREVIATIONS

A

AFF	ABOVE FINISHED FLOOR
ARF	ABOVE REFERENCE FLOOR
ACCT	ACCENT
AP	ACCESS PANEL
AC	ACOUSTICAL
ACT	ACOUSTICAL TILE (OR ACTIVE)
ADD	ADDENDUM
ADDL	ADDITIONAL
ADJ	ADJACENT
AGG	AGGREGATE
A/C	AIR CONDITIONING
ALT	ALTERNATE OR ALTERNATIVE
AL.ALUM	ALUMINUM
ANCH	ANCHOR, ANCHORAGE
AB	ANCHOR BOLT
ANOD	ANODIZED
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
AUTO	AUTOMATIC
ARS	ARCHITECTURAL ROOF SHINGLES

B

B.F.	BARRIER FREE
BP	BASE PLATE OR BEARING P_L
BRG	BEARING L_L
BM	BENCH MARK OR BEAM
BETWEN	BETWEEN
BIT	BITUMINOUS
BLKG	BLOCKING
BD	BOARD
BS	BOTH SIDES
BOT	BOTTOM
BC	BOTTOM OF CURB
BRK	BRICK
BLDG	BUILDING
BL	BUILDING LINE

C

CABT	CABINET
CR	CARD READER
CPT	CARPET(ED)
CES	CARPET EDGE STRIP
CI	CAST IRON
CIP	CAST-IN-PLACE
CB	CATCH BASIN
CLG	CEILING
CEM	CEMENT
C TO C	CENTER TO CENTER
CM	CENTIMETER(S)
C°	DEGREES CENTIGRADE
CER	CERAMIC
CT	CERAMIC TILE
CHAN	CHANNEL
CHOK PL	CHECKERED PLATE
CL	CLEAR(ANCE)
CLOS	CLOSET
CO	CLEAN OUT
CHK	COAT HOOK
CW	COLD WATER
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESS(ED),(ION),(IBLE)
CONCE	CONCEALED
CONC	CONCRETE
CMU	CONCRETE MASONRY UNIT (CONCRETE BLOCK)
CONN	CONNECTION
CONST	CONSTRUCTION
CONST JT	CONSTRUCTION JOINT
CONT	CONTINUOUS OR CONTINUE
CONTR	CONTRACTOR(S)
CJ	CONTROL JOINT
CORR	CORRUGATED OR CORRIDOR
CTR	CENTER
CTSK	COUNTERSUNK
CF	CUBIC FOOT
CY	CUBIC YARD
CYL	CYLINDER
CS	CAST STONE

D

DPR	DAMPER
DP	DAMPROOFING
DL	DEAD LOAD
DET.	DETAIL
DIAG	DIAGONAL
Ø	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
D/W	DISHWASHER
DO	DOOR OPENING
DN	DOWN
DT	DRAIN TILE
DWG	DRAWING
DF	DRINKING FOUNTAIN

E

EA	EACH
EF	EACH FACE
EW	EACH WAY
E	EAST
ELEC	ELECTRIC(AL)
EWC	ELECTRIC WATER COOLER
EL	ELEVATION
ELEV	ELEVATOR
EMER	EMERGENCY
ENC	ENCLOS(E), (URE)
EP	EPOXY
EQ	EQUAL
EQUIP	EQUIPMENT
ESC	ESCALATOR
EPDM	ETHYLENE PROPYLENE DIENE MONOMERS
EXH	EXHAUST
EB	EXPANSION BOLT
EJ	EXPANSION JOINT
EXP CONST	EXPOSED CONSTRUCTION
EXT	EXTERIOR
ETR	EXISTING TO REMAIN

F

FWP	FABRIC WRAPPED PANEL
FB	FACE BRICK
FOC	FACE OF CONCRETE
FF	FACTORY FINISH
FS	FAR SIDE
F°	DEGREES FAHRENHEIT
FT	FEET/FOOT
FIN	FINISH(ED)
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FVC	FIRE VALVE CABINET
FLD	FIELD
FHS	FIRE HOSE STATION
FPR	FIRE PROOFING
FL	FLOOR(ING)
FD	FLOOR DRAIN
FLUOR	FLUORESCENT
FTG	FOOTING
FDN	FOUNDATION
FA	FRESH AIR
FSRS	FULLY -ADHERED SHEET ROOFING SYSTEM
FURR	FURR(ED), (ING)

G

GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GL	GLASS, GLAZING
GR	GRADE, GRADING
g	GRAM
GRD	GROUND
GYP	GYPSUM
GYP L	GYPSUM LATH
GP	GYPSUM PLASTER
GWB	GYPSUM WALL BOARD
GFMU	GROUND FACE MASONRY UNIT

H

HDCP	HANDICAP(PED)
HDBD	HARDBOARD
HDWE	HARDWARE
HWD	HARDWOOD
HTG	HEATING
H&V	HEATING & VENTILATING
HVAC	HEATING/VENTILATION/ AIR CONDITIONING
HT	HEIGHT
H	HIGH
HP	HIGH POINT
HS	HIGH STRENGTH
HC	HOLLOW CORE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HORSE POWER
HB	HOSE BIBB
HW	HOT WATER
HWH	HOT WATER HEATER
HR	HOUR

I

IN(")	INCH(ES)
INCL	INCLUDE(D), (ING)
INFO	INFORMATION
ID	INSIDE DIMENSION
INSUL	INSULATE(D), (ION)
ICA	INTEGRAL COLOR ANODIZED
INT	INTERIOR/INTERNAL
INTERM	INTERMEDIATE
INV	INVERT
IRR	IRRIGATION

J

JC	JANITOR'S CLOSET
JT	JOINT
JST	JOIST
JB	JUNCTION BOX

K

kg	KILOGRAMS
KV	KILOVOLT
KVA	KILOVOLT/AMPERE
KW	KILOWATT(S)
KWH	KILOWATT-HOUR
kg/m ^{2}	KILOGRAM PER METER
kg/cm ^{2}	KILOGRAM PER SQUARE CENTIMETER
K	KIPS
KSI	KIPS PER SQUARE INCH
KIT	KITCHEN
KO	KNOCKOUT

L

LAB	LABORATORY
LAM	LAMINATE(D)
LAV	LAVATORY
LCC	LEAD COATED COPPER
LH	LEFT HAND
LHR	LEFT HAND REVERSE
L	LENGTH
LT	LIGHT
LTG	LIGHTING
LP	LIGHTING PANEL
LIN	LINEAR, LINEAL
LSWD	LINEAR SUSPENDED WOOD CEILING
LL	LIVE LOAD
LG	LONG
LLBB	LONG LEGS BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLO	LONG LEG OUTSTANDING
LLV	LONG LEG VERTICAL
LOC	LOCATE/LOCATION
L.P.	LOW POINT
LV	LOW VOLTAGE

M

MAG	MAGNETIC
MH	MANHOLE
MFR	MANUFACTURE(R)
MAR	MARBLE
MAR T.	MARBLE THRESHOLD
MKB	MARKER BOARD
MAS	MASONRY
MO	MASONRY OPENING
MAT	MATERIAL(S)
MAX	MAXIMUM
MECH	MECHANICAL
MC	MEDICINE CABINET
MED	MEDIUM
MEM	MEMBER
MEMB	MEMBRANE
MET	METAL
MDS	METAL DIVIDER STRIP
ML	METAL LATH
MET T.	METAL THRESHOLD
MEZZ	MEZZANINE
mm	MILLIMETER(S)
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MISC	MISCELLANEOUS IRON
MON.	MONITOR(ED)
MCC	MOTOR CONTROL CENTER
MTD	MOUNT(ED), (ING)
MULL	MULLION
MWP	METAL WALL PANEL

N

NAT	NATURAL
NCA	NATURAL COLOR ANODIZED
NEG	NEGATIVE
NRC	NOISE REDUCTION COEFFICIENT
NONCOMB	NONCOMBUSTIBLE
NOM.	NOMINAL
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO (#)	NUMBER

O

OFF	OFFICE
O/C	ON CENTER(S)
OPG	OPENING
OPP	OPPOSITE
OPP HD	OPPOSITE HAND
ORIG	ORIGINAL
Oz	OUNCE
OS	OUTSIDE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OH	OVERHEAD

P

PH	PHYSICALLY HANDICAPPED
PT	PAINT(ED) (OR POINT)
PR	PAIR
PNL	PANEL
PTD	PAPER TOWEL DISPENSER
PTD/R	PAPER TOWEL DISPENSER & RECEPTACLE COMBINATION
PKG	PARKING
PBD	PARTICLE BOARD
PARTN	PARTITION
PE	PASSENGER ELEVATOR
PERM	PERMANENT
PLAS	PLASTER
PL	PLASTIC LAMINATE
P_L	PLATE
PLBG	PLUMBING
PLWD	PLYWOOD
POL	POLISHED
PVC	POLYVINYL CHLORIDE
lb/#	POUND(S)
PCF	POUNDS PER CUBIC FOOT
PFF	POUNDS PER FOOT
PLF	POUNDS PER LINEAL FOOT
PSF	POUNDS PER SQUARE FOOT
PC	PRECAST CONCRETE
PRE-FAB	PREFABRICAT(ED)

Q

QT	QUARRY TILE
QB	QUARRY TILE BASE
QTR	QUARTER

R

RAD	RADIUS, RADIATOR, RADIATION
RC	RAINWATER CONDUCTOR
RECV'G	RECEIVING
REC	RECESS(ED)
REF	REFERENCE
REFL	REFLECT(ED), (IVE), (OR)
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCE(D), (ING)
REQD	REQUIRED
RESIL	RESILIENT
RT	RESILIENT TILE
RF	RESINOUS FLOORING
RA	RETURN AIR
REV	REVISION(S), REVISED
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
ROW	RIGHT OF WAY
R	RISER
Rd	ROAD

R (CONT.)

RD	ROOF DRAIN
RS	ROOF SUMP
RFG	ROOFING
RM	ROOM
RO	ROUGH OPENING
RUB	RUBBER
RB	RUBBER BASE (OR RESILIENT BASE)

S

SAN	SANITARY
SND	SANITARY NAPKIN DISPENSER
SNWR	SANITARY NAPKIN WASTE RECEPTACLE
SCH	SCHEDULE
SJ	SCORED JOINT
S.CONC	SEALED CONCRETE
SEAL	SEALER
SECT	SECTION
SS	SERVICE SINK
SHT	SHEET
SLO	SHORT LEG OUTSTANDING
SIM	SIMILAR
SK	SINK
SB	SOIL BORING
STC	SOUND TRANSMISSION CLASS
S	SOUTH
SPC	SPACER, SPACING
SPK	SPEAKER
SPEC(S)	SPECIFICATION(S)
SPEC'D	SPECIFIED
SQ	SQUARE
cm ^{2}	SQUARE CENTIMETER
SF	SQUARE FOOT (OR STOREFRONT) (OR SPORTS FLOORING)
STAG	STAGGERED
SST	STAINLESS STEEL
STD	STANDARD
STA	STATION
STL	STEEL
STN	STONE
STOR	STORAGE
SD	STORM DRAIN
ST	STREET, STAIN
STRUCT	STRUCTURAL
SA	SUPPLY AIR
SUPP	SUPPORTS
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRY(ICAL)
SGMU	STRUCTURAL GLAZED MASONRY UNIT

T

TKB	TACKBOARD
TP	TANGENT POINT
TEL	TELEPHONE
TV	TELEVISION
TEMP	TEMPERATURE, TEMPERED
TERR	TERRAZZO
TT	TERRAZZO TILE
THERM	THERMOSTAT
THK	THICK(NESS)
THRES	THRESHOLD
THRU	THROUGH(THOUGHOUT
TOIL	TOILET
TPH	TOILET PAPER HOLDER
TOL	TOLERANCE
T&G	TONGUE AND GROOVE
T&B	TOP & BOTTOM
TE	TOP ELEVATION
TOC	TOP OF CONCRETE
TC	TOP OF CURB
TOS	TOP OF STEEL
TWC	TOWEL & WASTE CABINET
TRAN	TRANSFORMER
T	TREAD
TYP	TYPICAL

U

UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UR	URINAL

V

VA	VALVE
VB	VAPOR BARRIER
VR	VAPOR RETARDER
VAR	VARNISH
VERT	VERTICAL
VEST	VESTIBULE
VIN	VINYL
VCT	VINYL COMPOSITION TILE
VT	VINYL TILE
VWC	VINYL WALL COVERING
VIT	VITREOUS
VRS	VINYL RESILIENT STRIP

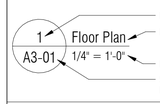
W

WAIN	WAINSCOT
WHYD	WALL HYDRANT
WH	WATER HEATER
WC	WATER CLOSET
WM	WATER MAIN
WP	WATERPROOFING, WALL PROTECTION
WR	WATER RESISTANT
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
W	WIDTH, WIDE, WEST
W/	WITH
W/O	WITHOUT
WD	WOOD

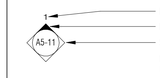
Y

YD	YARD

GRAPHIC SYMBOLS

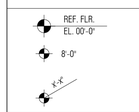


- DETAIL NUMBER
- DETAIL TITLE
- DRAWING SCALE
- SHEET NUMBER FROM WHICH DRAWING IS REFERENCED



- DETAIL NUMBER
- DARKENED ARROW INDICATES ELEVATED WALL
- SHEET NUMBER WHERE ELEVATION IS LOCATED

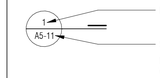
NOTE: ELEVATION SYMBOL USED FOR INTERIOR & EXTERIOR ELEVATIONS.



NOTE: SYMBOL INDICATES A SPECIFIC HEIGHT IN AN ELEVATION OR SECTION VIEW

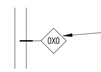
HEIGHT OF FINISHED CEILING ABOVE FINISHED FLOOR IN AN ELEVATION OR SECTION VIEW

HEIGHT OF FINISHED CEILING ABOVE FINISHED FLOOR IN A PLAN VIEW

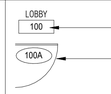


- DETAIL NUMBER
- SHEET NUMBER WHERE SECTION IS LOCATED

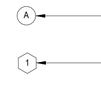
NOTE: SECTION SYMBOL USED FOR WALL & BUILDING SECTIONS.



- WALL TYPE SYMBOL REFER TO SHEET AX-XX FOR ADD'L INFO.



- ROOM NUMBER
- THE ENTRY DOOR NUMBER SHALL BE THE SAME AS THE ROOM NUMBER - IF MORE THAN ONE (1) DOOR IS INDICATED ON THE PLAN FOR ONE ROOM, EACH DOOR IN THAT AREA WILL BE IDENTIFIED



- GENERAL NOTE
- KEY NOTE SYMBOL INDICATES WORK AS DESCRIBED IN KEYNOTE LIST ON SAME DRAWING SHEET AS KEYNOTE OCCURS

TEXT SYMBOLS

≈	APPROXIMATELY	&	AND
℄	CENTERLINE	°	DEGREES (ANGLE)
Ø	DIAMETER	@	AT

LINE TYPE DESIGNATION

	EXISTING ITEM TO REMAIN
	EXISTING ITEM TO BE REMOVED
	NEW ITEM AS NOTED

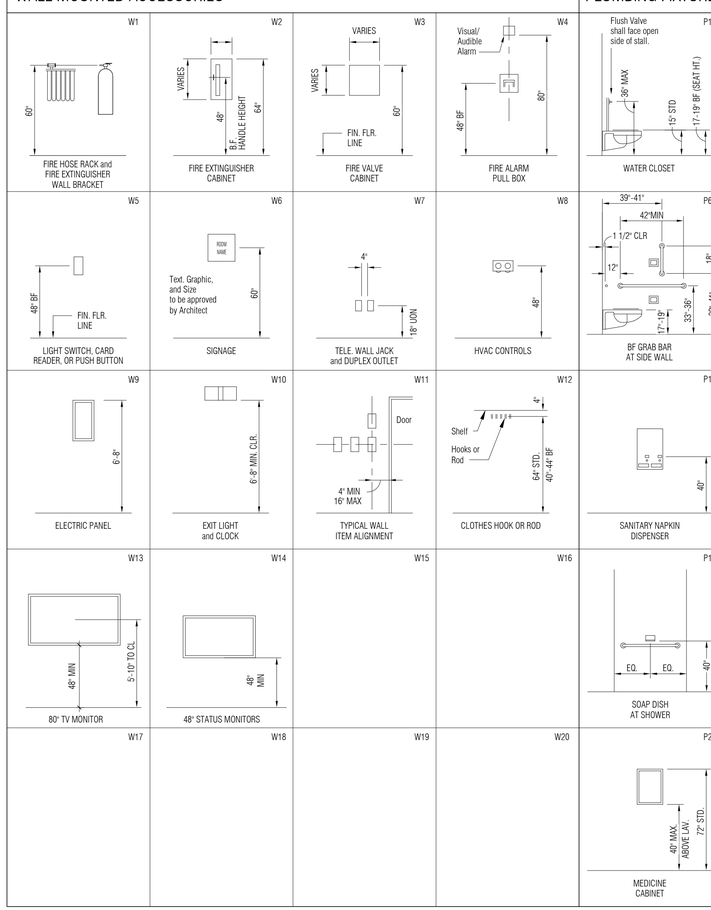
MATERIAL POCHE LEGEND

		SHIM MATERIAL (WOOD, METAL, ETC.) (NOTE MATERIAL)	CONCRETE (SECTION)
		PLYWOOD/PARTICLE BOARD (VENEER FINISH) (NOTE MATERIAL)	STUD WALL (PLAN)
		SOLID SURFACE	INSULATION ACOUSTIC/THERMAL (NOTE TYPE) RIGID/SEMI-RIGID
		INSULATION ACOUSTIC/THERMAL (NOTE TYPE) BATT OR BLANKET	BRICK
		JOINT FILLER	GYPSUM WALL BOARD
		GRAVEL/STONE (GRANULAR MATERIAL)	C.M.U. (CONCRETE BLOCK) C.M.U. - SOLID OR GROUT SOLID CELLS
		SAND/GRAVEL (SUB-BASE MATERIAL)	STEEL/COPPER, METAL, ALUMINUM, ETC. (NOTE MATERIAL)
			WOOD/SOLID SPECIES (FINISH MATERIAL) (NOTE MATERIAL)
			WOOD (CONTINUOUS BLOCKING)

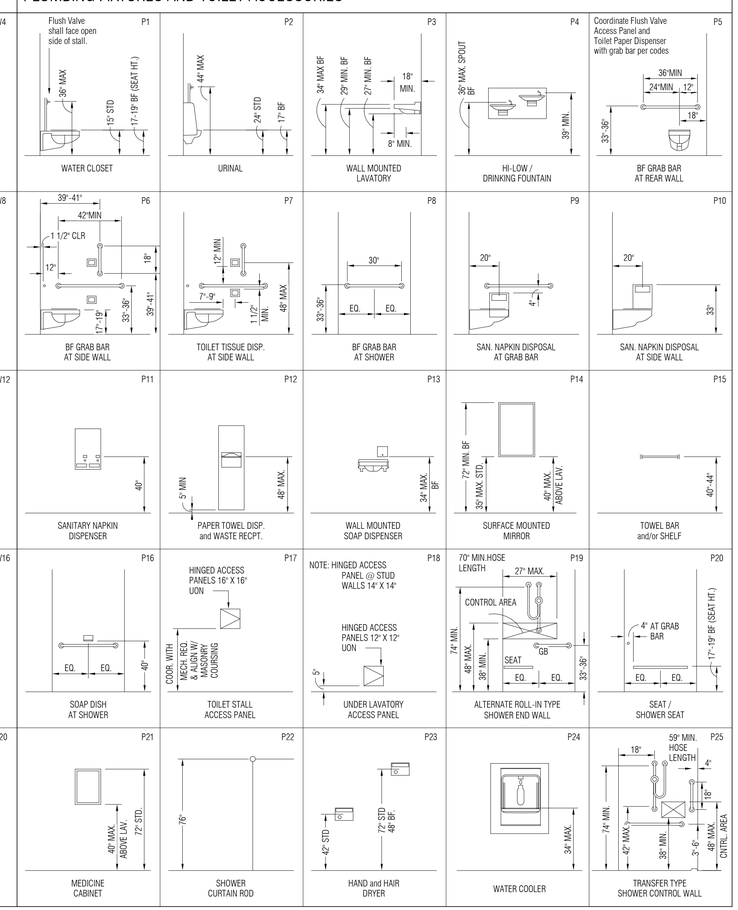
MOUNTING HEIGHT SCHEDULE

NOTE:
- NOT ALL HEIGHTS SHOWN ARE TYPICAL FOR ALL ITEMS WHERE THEY OCCUR
- UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS, (B.F. DENOTES BARRIER FREE REQUIREMENTS)
- NOT ALL ITEMS SHOWN ON THIS DRAWING MAY OCCUR ON THIS PROJECT

WALL MOUNTED ACCESSORIES



PLUMBING FIXTURES AND TOILET ACCESSORIES



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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

DJG

CHECKED BY

DG

APPROVED BY

MAM

SHEET NAME

General Project Information

SHEET NO.

A0-01

CODE INFORMATION

GENERAL PROJECT INFORMATION:

OWNER: CITY OF WARREN - FIRE DEPARTMENT

PROJECT: FIRE STATION #5

ADDRESS: 30619 SCHOENHERR RD. WARREN, MI 48088

GOVERNING CODES:

2015 MICHIGAN BUILDING CODE (MBC)
2015 MICHIGAN MECHANICAL CODE (MMC)
2018 MICHIGAN PLUMBING CODE (MPC)
2015 MICHIGAN ENERGY CODE (MEC)
2017 NATIONAL ELECTRICAL CODE w/ AMENDMENTS (NEC)
2018 INTERNATIONAL FIRE CODE (IFC), (AS REFERENCED IN THE 2015 MBC)
2009 ICC/ANSI A 117.1 & MICHIGAN BARRIER-FREE DESIGN LAW OF PUBLIC ACT 1 OF 1966

CHAPTER 3: USE AND OCCUPANCY CLASSIFICATION

[302] NON-SEPARATED MIXED USE INCLUDING THE FOLLOWING OCCUPANCIES:
[304.1] BUSINESS GROUP B
[310.4] RESIDENTIAL GROUP R-2
[311.3] LOW-HAZARD STORAGE GROUP S-2

CHAPTER 4: SPECIAL REQUIREMENTS

DRYING ROOMS (SECTION 417)
[417.1] SHALL BE CONSTRUCTED ENTIRELY OF APPROVED NONCOMBUSTIBLE MATERIALS OR ASSEMBLIES

GROUP R-3 (SECTION 420):
[420.2] WALLS SEPARATING SLEEPING UNITS IN THE SAME BUILDING AND WALLS SEPARATING SLEEPING UNITS FROM OTHER OCCUPANCIES CONTIGUOUS TO THEM IN THE SAME BUILDING SHALL BE CONSTRUCTED AS FIRE PARTITIONS IN ACCORDANCE WITH SECTION 708
[420.5] OCCUPANCIES SHALL BE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.2.8
[420.6] FIRE ALARM SYSTEMS AND SMOKE ALARMS SHALL BE PROVIDED IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF CHAPTER 9

CHAPTER 5: GENERAL BUILDING HEIGHTS AND AREAS

ALLOWABLE BUILDING HIEGHT AND AREA
[TABLE 504.3] ALLOWABLE BUILDING HEIGHT: 60'-0" (SPRINKLERED) ACTUAL: 39'-0"

[TABLE 504.4] ALLOWABLE STORIES: 3 (SPRINKLERED) ACTUAL: 1+MEZZANINE

[506.2.1] TOTAL ALLOWABLE AREA: 40,500 SF MAX. **14,415 (ACTUAL)**
1 STORY, EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM

[506.2.3] BASIS OF ALLOWABLE: MIXED OCCUP./ONE STORY

[506.3.3] AREA FACTOR INCREASE DUE TO FRONTAGE: .75

MEZZANINES
[505.2] NO. OF AREAS: 2

[505.2.1] AREA LIMITATIONS: <1/3 AGGREGATE AREAS OF SPACES
MEZZANINE NO.1: 18% OF AGGREG.
MEZZANINE NO.2: 19% OF AGGREG.

[505.2.2] MEANS OF EGGRESS: PER CHAPTER 10

[505.2.3] OPENESS: MEZZ NO.1 REQ'D OPEN TO ROOM. MEZZ NO.2 ALLOWED CLOSED PER EXCEPTION #1

MIXED USE OCCUPANCY
[508.3.2] MOST RESTRICTIVE USE GOVERNS: **36,000 (B)**, UNLIMITED (R-2), 54,000 (S-2)

[TABLE 508.4] FIRE SEPERATIONS: NOT REQ'D
OCCUPANCIES: NON-SEPERATED

INCIDENTAL USES
[TABLE 509] 1280 SF ROOM/AREA, 0 HR SEPERATION

CHAPTER 6: TYPES OF CONSTRUCTION

[602.5] TYPE V-B

[TABLE 601] FIRE RESISTANCE RATING REQUIREMENTS

PRIMARY STRUCTURAL FRAME	0 HR
BEARING WALLS	
INTERIOR	0 HR
EXTERIOR	0 HR
NONBEARING WALLS & PARTITIONS	
INTERIOR	0 HR
EXTERIOR	0 HR
FLOOR CONSTRUCTION	0 HR
ROOF CONSTRUCTION	0 HR

CHAPTER 7: FIRE AND SMOKE PROTECTION FEATURES

[704.11] BOTTOM FLANGE PROTECTION: NOT REQUIRED

[TABLE 705.8] MAX AREA OF WALL OPENINGS: UNLIMITED (X>30'-0")

[706.1] FIRE WALLS: NOT REQUIRED

[707.1] FIRE BARRIERS: NOT REQUIRED

[708.3] FIRE RESISTANCE RATING OF FIRE PARTITIONS: 1 HR.MIN. FOR CEILINGS, & 1/2 HR FOR SLEEPING UNIT SEPERATIONS PER EXCEPTION NO.2.

[708.4] FIRE PARTITION CONTINUITY EXCEPTION 3: ALLOWS FOR FIRE PARTITION WALLS TO TERMINATE INTO 1 HOUR RATED CEILING ASSEMBLIES INSTEAD OF ROOF DECK.

[709.1] SMOKE BARRIERS: NOT REQUIRED

[710.1] SMOKE PARTITIONS: NOT REQUIRED

[712.1.11] VERTICAL OPENINGS BETWEEN A MEZZANINE COMPLYING WITH SECTION 505 AND THE FLOOR BELOW SHALL BE PERMITTED

[714.3.1] THROUGH PENETRATION OF FIRE PARTITIONS: ANNULAR SPACE AROUND ITEM PACKED WITH FIRE SAFING PER EXCEPTION NO.2

[717.3.2.4] CORRIDOR DAMPER RATING: 1HR

[717.5.4] DUCT PENETRATIONS OF FIRE PARTITIONS: DAMPERS NOT REQ'D PER EXCEPTION NO.1 AND 714.3.1

[718.2] FIRE BLOCKING: REQ'D IN CONCEALED SPACE, IF CONBUSTIBLE CONST.

[718.4.3] DRAFT STOPPING, ATTICS: NOT REQ'D, FULLY SPRINKLERED

CHAPTER 8: INTERIOR FINISHES

[TABLE 803.11] INTERIOR WALL/CEILING FINISHES (SPRINKLERED BUILDING)
STAIRWAYS: CLASS B
EXIT PASSAGEWAYS: CLASS B
CORRIDORS: CLASS B
ROOMS: CLASS C

[804.4.2] MINIMUM CRITICAL RADIENT FLUX: CLASS II

CHAPTER 9: FIRE PROTECTION SYSTEMS

[903.2] FIRE SUPPRESION: PROVIDED THROUGHOUT

[903.2.8] GROUP R FIRE AREAS: SPRINKLERS REQ'D

[903.2.11.6] INCIDENTAL AREAS: SPRINKLERS REQ'D IF CALLED FOR PER TABLE

[903.3.1.1.1] EXEMPT LOCATIONS: NOT REQ'D PER EXPECTION NO.4 (ATTIC)

[906.1] FIRE EXTINGUISHERS, WERE REQ'D: WITHIN 30' OF COMMERICAL COOKING, EG ALL USE GROUPS, SPECIAL HAZARD AREAS (APPARATUS BAY), AS REQ'D PER IFC.

[TABLE 906.3(1)] FIRE EXTINGUISHER SIZES AND DISTRIBUTION:
HAZARD LEVEL: M
EXTINGUISHER: 2A MIN RATED
FLOOR AREA/UNIT OF A: 1500 FT
DISTANCE OF TRAVEL TO EXTINGUISHER: 75'-0"

[907.2] FIRE ALARM SYSTEM: NOT REQ'D

[907.2.11.2] SMOKE ALARMS: REQ'D ON CLGS OR WALLS OUTSIDE SLEEPING UNITS AND WITHIN EACH FOR USE GROUP R3

[907.2.11.3] SMOKE ALARM NEAR COOKING APPLIANCES: 20'-0" MIN DISTANCE

[907.2.11.4] SMOKE ALARM NEAR RESTROOMS: 3'-0" MIN FROM DR.

[907.5.2.3.1] VISIBLE ALARM NOTIFICATION: REQ'D IN PUBLIC USE AND COMMON AREA

[915.1.2.3] CARBON MONOXIDE DETECTION: REQ'D IN SLEEPING UNITS, OR PER EXCEP.

CHAPTER 10: MEANS OF EGRESS

[TABLE 1004.1.2] MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT:
A3 (15 SF GROSS) - 25 (COMM. RM.)
A3 (15 SF GROSS) - 71 ALLOW., LIMITED TO 10 (FITNESS AREA)
B (100 SF GROSS) - 15
R2 (200 SF GROSS) - 13
S2 (300 SF GROSS) - 27 (PLUS MECH./ELEC.)

OCCUPANT LOAD TOTALS:
TOTAL: 90 ALLOW, 15 ACTUAL

[1004.1.1.2] THE OCCUPANT LOAD OF A MEZZANINE SHALL BE ADDED TO THE OCCUPANT LOAD OF THE ROOM THROUGH WHICH REQUIRED EGRESS OCCURS

[TABLE 1005.3.1] MEANS OF EGRESS SIZING:
STAIRWAYS: 0.2 PER OCCUPANT
OTHER ELEMENTS: 0.15 PER OCCUPANT

[TABLE 1006.2.1] MIN NUMBER OF EXITS WITHIN MEANS OF EGRESS SYSTEM:
SPACES (TABLE 1006.2.1):
OCCUPANT LOAD>49: NONE, 1 EXIT REQ'D, 1 EXIT PROVIDED PER SPACE
COMMON PATH OF EGRESS TRAVEL:
S2 USE GROUP: 100 MAX, 100 ACTUAL (WHERE GREATEST)
R3 USE GROUP: 125 MAX, 117 ACTUAL

[TABLE 1006.3.1] MIN. NUMBER OF EXITS FROM MEANS OF EGRESS SYSTEM:
STORIES (TABLE 1006.3.1): 1-500 PERSONS
OCCUPANT LOAD: 60 PERSONS MAX
EXITS: 2 REQ'D, 4 PROVIDED

[1007.1.1] DISTANCE APART OF REQ'D EXITS:
1/3 LENGTH OF MAX DIAG. DIM. OF BLDG/SPACE
NO. OF ACCESSIBLE MEANS OF EGRESS (1009.1): 2 REQ'D, 4 PROVIDED

[1010.1.1] MIN REQ'D CLEAR DOOR WIDTH: 32" MIN, 36" PROVIDED
[1010.1.2.1] EXCEPTION 1: DIRECTION OF SWING WITH EGRESS TRAVEL UNLESS OCCUPANCY OF AREA ≤ 50 PERSONS

STAIRWAYS
[1011.2] STAIRWAYS: NON-ACCESSIBLE:
CLEAR WIDTH: 36" MIN, 44" ACTUAL
[1011.3] HEADROOM BELOW FOR STAIRS: 80" MIN
[1014.2] HANDRAILS:
MIN HGT: 34" REQ'D, 34" PROVIDED
[1014.2] GUARDRAILS:
MIN HGT: 42" REQ'D, 42" PROVIDED

[1016.2.2] EGRESS THROUGH INTERVENING SPACES: PERMITTED PER EXCEPTION 2

[TABLE 1017.2] EXIT ACCESS TRAVEL DISTANCE (SPRINKLERED):
USE A3 = 250'-0"
USE R2 = 250'-0"
USE B = 300'-0"
USE S2 = 400'-0"
MAX. ALLOW. 250'-0" (MOST RESTRICTIVE)

CORRIDORS
[TABLE 1020.1] RATINGS: 0HR MIN, 1/2HR PROVIDED (@R3 SPACES)
[TABLE 1020.2] WIDTHS: 44" MIN, 64 ACTUAL (MIN)
[TABLE 1020.4] DEAD END CORRIDORS: 50' MAX, 31' ACTUAL

CHAPTER 11: ACCESSIBILITY

[1103.2.1] REQUIRED: YES, WHERE: PUBLIC AREAS
NO, ALL OTHER AREAS PER (1103.2.15)

[1104.1] ACCESSIBLE ROUTE PROVIDED: YES

[1105.1] 60% OF PUBLIC ENTRANCES ACCESSIBLE: YES, 1 PROVIDED

[TABLE 1106.1] ACCESSIBLE PARKING SPACES: MIN 2 REQ'D, 2 PROVIDED

TOILET AND BATH FACILITIES
[1109.2] NO. OF EA. FIXTURE TYPE/ACCESS. TOILET: 1 MIN, 1 PROVIDED
[1109.5.1] B.F. DRINKING FOUNTAINS: 1 MIN, 1 PROVIDED

2015 MICHIGAN MECHANICAL CODE:

[505.1] DOMESTIC KITCHEN EXHAUST SYSTEMS SHALL DISCHARGE TO THE OUTDOORS THROUGH AIR TIGHT SHEET METAL DUCTS EQUIPPED WITH BACKDRAFT DAMPERS AND SHALL BE INDEPENDENT OF ALL OTHER EXHAUST SYSTEMS

[717.5.4] EXCEPTION #3: FIRE DAMPERS ARE NOT REQUIRED AT FIRE PARTITION PENETRATIONS WHERE THE DUCT SYSTEM IS CONSTRUCTED OF APPROVED MATERIALS, AND COMPLIES WITH THE REQUIREMENTS OF THIS SECTION

ENERGY STANDARDS REQUIREMENTS (ASHRAE 90.1-2013)

GENERAL DATA
CLIMATE ZONE: 5
BUILDING TYPE: NON-RESIDENTIAL

BUILDING ELEMENTS
ROOF: INSULATION ABOVE DECK
WALLS (ABOVE GRADE): MASS
SLAB ON GRADE: UNHEATED
DOORS: ACTIVE
WINDOWS (40% OF WALL MAX): METAL (FIXED, METAL (ENTRANCE DR'S)
SKYLIGHTS (3% OF ROOF MAX): N/A

PROJECT THERMAL DATA

BUILDING ELEMENT	MIN. R VALUE	ACTUAL R VALUE	MIN. U VALUE	ACTUAL U VALUE
ROOF	R30 c.i.	R 30	U 0.032	U 0.033
WALLS (ABOVE GRADE)	R11.4 c.i.	R 16	U 0.090	U 0.063
SLAB-ON-GRADE (UNHEATED)	R15, MIN. 24"	R 15	F 0.520	F 0.067
DOORS			U 0.500	
WINDOWS			U 0.32	

R = RESISTANCE U = RATE OF HEAT TRANSFER

C = AMOUNT OF HEAT PASSING THROUGH 12" OF INSUL

F = LOSS OF HEAT PER PERIMETER OF LENGHT (S.O.G)

PLUMBING FIXTURE CALCULATION (PER 2018 MICHIGAN PLUMBING CODE - TABLE 403.1)

TOTAL BUILDING OCCUPANT LOAD = 90 (15 ACT.) PERSONS

PER SECTION 403.1.1: DIVIDE TOTAL OCCUPANT LOAD IN HALF
90 / 2 = 45 MALE
45 FEMALE

PER SECTION 403.2: SEPARATE FACILITIES NOT REQUIRED WHERE TOTAL OCCUPANT LOAD <15

PER SECTION 403.3: PUBLIC ACCESS AREA <300 SF - PUBLIC TOILET FACILITIES NOT REQUIRED

REFER TO CALCULATIONS BELOW FOR NUMBER OF REQUIRED PLUMBING FIXTURES

CLASSIFICATION / OCCUPANCY		WATER CLOSETS		LAVATORIES	DRINKING FOUNTAINS	SHOWER	SERVICE SINKS
		MALE	FEMALE				
DORMITORY R-2	REQUIRED RATIO	1 / 10		1 / 10	1 / 100	1 / 8	1 SINK
	# REQUIRED	4		4	1	4	1
	# PROVIDED	6		6	1	5	1
BUSINESS B	REQUIRED RATIO	1 / 25 (≤50) + 1 / 50 (≥50)		1 / 25 (≤50)	1 / 100	-	1 SINK
	# REQUIRED	1	1	1	1	-	1
	# PROVIDED	2 SINGLE OCCUPANT		2	1	-	1
APPARATUS BAY S-2	REQUIRED RATIO	1 / 100		1 / 100	1 / 1,000	-	1 SINK
	# REQUIRED	1		1	1	-	1
	# PROVIDED	1		1	1*	2	1
FITNESS AREA A-3 (ACCESSORY TO S-2)	REQUIRED RATIO	1 / 125	1 / 65	1 / 200	1 / 500	-	1 SINK
	# REQUIRED	1	1	1	1	-	1
	# PROVIDED	1**	1**	1	1*	2	1

* USE DRINKING FOUNTAIN IN R-3 NON-SEPARATED USE GROUP AREA
** SECOND RESTROOM IN R-3 NON-SEPARATED USE GROUP AREA

LIFE SAFETY PLAN LEGEND

1/2-HOUR FIRE RATED STUD WALL
1/2 HOUR "FIRE PARTITION" WALL PER THE 2015 MBC SECTION 708. DOOR OPENINGS TO BE EQUIPPED WITH A 20 MIN. ASSEMBLY RATING. PROVIDE FIRE SEAL AT ALL WALL AND ROOF / FLOOR DECK INTERSECTIONS. CONSTRUCT PER UL DESIGN DETAIL U407 THIS SHEET.

1/2-HOUR FIRE RATED HORIZONTAL ASSEMBLY
1/2-HOUR "HORIZONTAL ASSEMBLY" PER THE 2015 MBC SECTION 711.2.4.3 PROVIDE FIRE SEAL AT ALL WALL AND ROOF / FLOOR DECK INTERSECTIONS. CONSTRUCT PER UL DESIGN DETAIL U407 THIS SHEET.

EXIT ACCESS TRAVEL DISTANCE LINE

COMMON PATH OF EGRESS TRAVEL DISTANCE LINE

20 — OCCUPANT LOAD EXITING THROUGH EGRESS COMPONENT

160 — OCCUPANT CAPACITY OF EGRESS COMPONENT

4975 SF — AREA OF ROOM OR AREA (SQUARE FEET)

50 — OCCUPANT LOAD OF ROOM OR AREA

FEC — LOCATION OF FIRE EXTINGUISHER / CABINET

FE — LOCATION OF FIRE EXTINGUISHER MOUNTED TO WALL

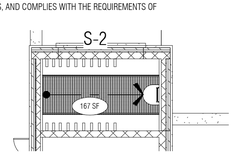
OCCUPANCY TYPE: R-3

GENERAL LIFE SAFETY NOTES

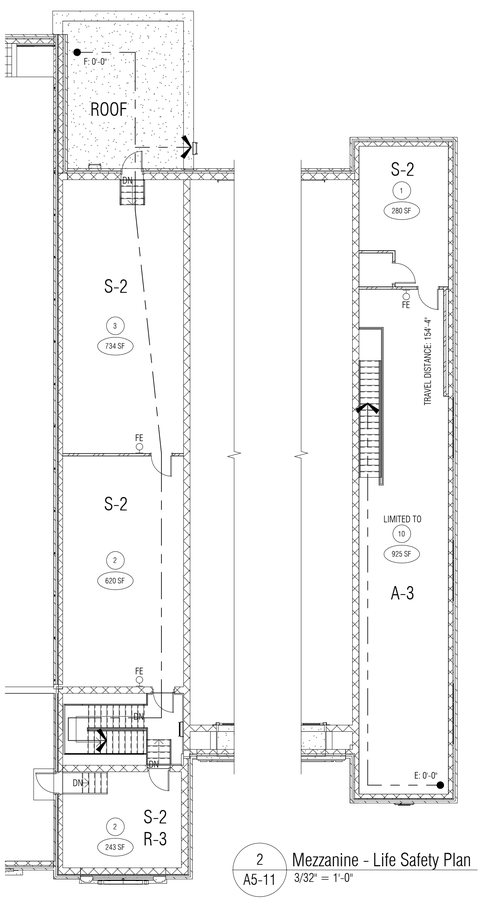
1. ALL WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS SHALL BE IDENTIFIED WITH SIGNS OF STENCILING (WHERE WALL AREAS ARE CONCEALED FROM VIEW) LETTERSMUST BE A MIN. 1/2" HEIGHT AND READ "FIRE AND/OR SMOKE BARRIER. PROTECT ALL OPENINGS" - SPACED AT 30'-0" O.C. (OWNER TO PROVIDE / INSTALL)

2. THESE CODE ANALYSIS DRAWINGS (SHEET A0-02), NOTES, PLANS AND WALL IDENTIFICATION TYPES AND LOCATIONS ARE FOR FIRE RATINGS AND / OR SMOKE BARRIERS AS REQ'D FOR LIFE SAFETY AND BUILDING CODE COMPLIANCE. REFER TO OTHER DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL CONSTRUCTION REQUIREMENTS

3. ALL FIRE RATED WALLS OF ANY TYPE SHALL BE SEALED TIGHT TO ROOF DECK SYSTEM ABOVE AND ALL PENETRATIONS SHALL BE PROPERLY SEALED WITH UL APPROVED FIRE SEALANT SYSTEM. REFER TO SPECIFICATION SECTIONS 078413, EACH BID CATEGORY CONTRACTOR RESPONSIBLE FOR INSTALLATION OF APPROVED FIRE SEALANT SYSTEM AT TOPS OF WALLS AND ROOF DECK JUNCTIONS

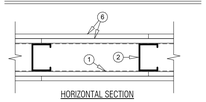


3 / A5-11 Hose Tower - Life Safety Plan
3/32" = 1'-0"



2 / A5-11 Mezzanine - Life Safety Plan
3/32" = 1'-0"

UL DESIGN DETAIL #U407



HORIZONTAL SECTION

VERTICAL SECTION @ TRANSITION TO CEILING

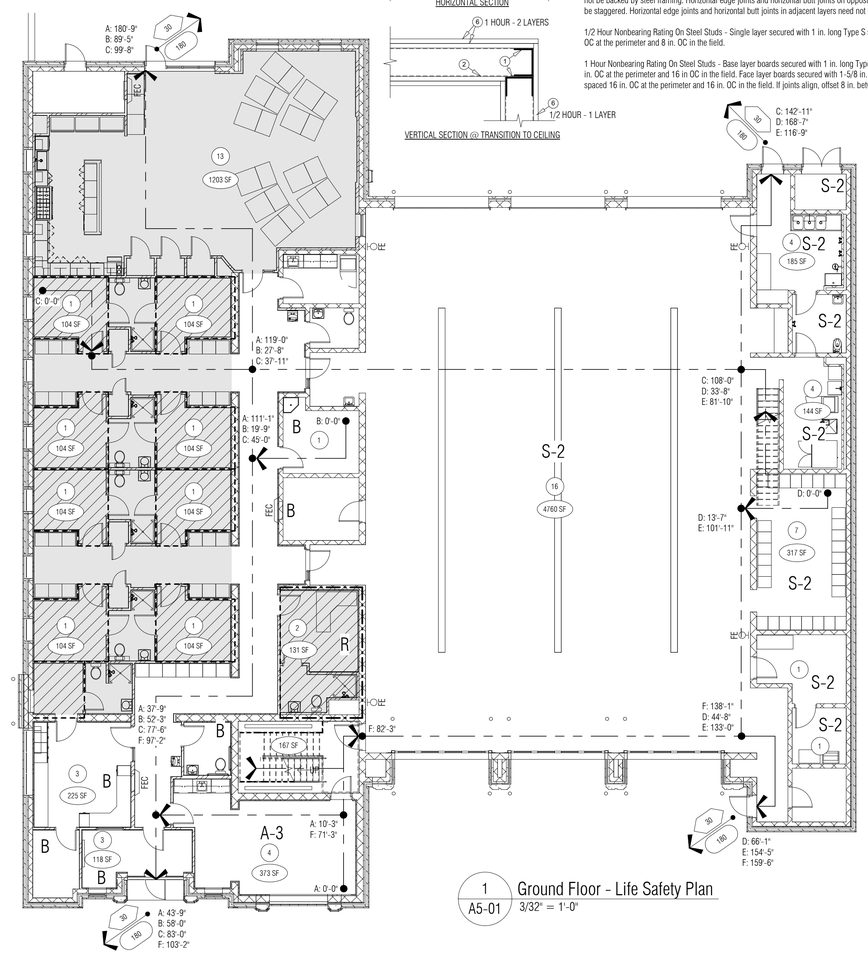
1. Floor and Ceiling Runners — (For the 1/2 or 1 Hour Nonbearing Wall Ratings) — For use with Item 2 - Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

2. Steel Studs — (For the 1/2 or 1 Hour Nonbearing Wall Ratings) Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min. 3-5/8 in. deep, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

6. Gypsum Board* — 5/8 in. thick paper surfaced, with beveled, square, or tapered edges, applied either horizontally or vertically. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers need not be staggered.

1/2 Hour Nonbearing Rating On Steel Studs - Single layer secured with 1 in. long Type S steel screws spaced 8 in. OC at the perimeter and 8 in. OC in the field.

1 Hour Nonbearing Rating On Steel Studs - Base layer boards secured with 1 in. long Type S steel screws spaced 16 in. OC at the perimeter and 16 in OC in the field. Face layer boards secured with 1-5/8 in. long Type S steel screws spaced 16 in. OC at the perimeter and 16 in. OC in the field. If joints align, offset 8 in. between layers.



1 / A5-01 Ground Floor - Life Safety Plan
3/32" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY
DJG

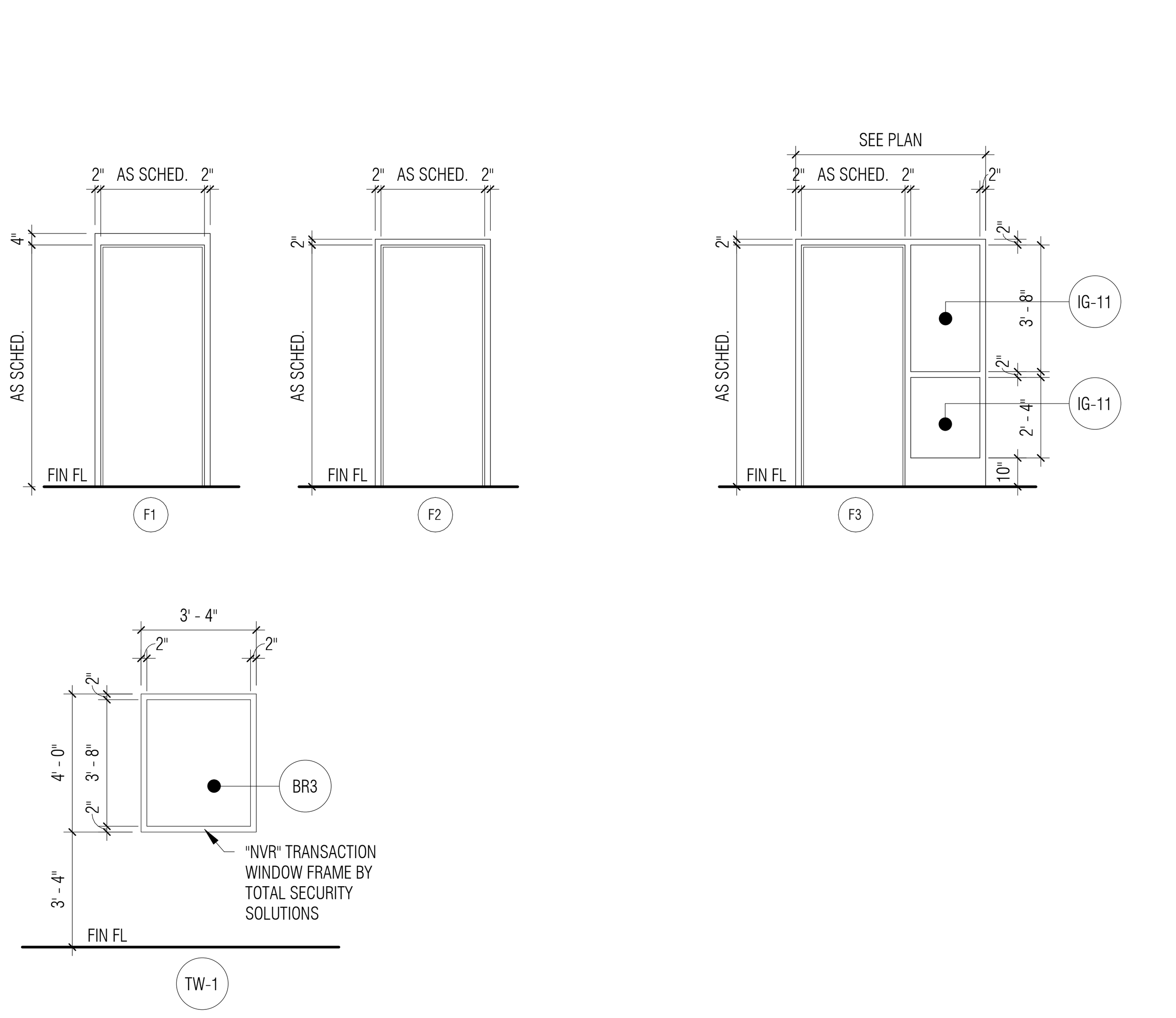
CHECKED BY
DG

APPROVED BY
MAM

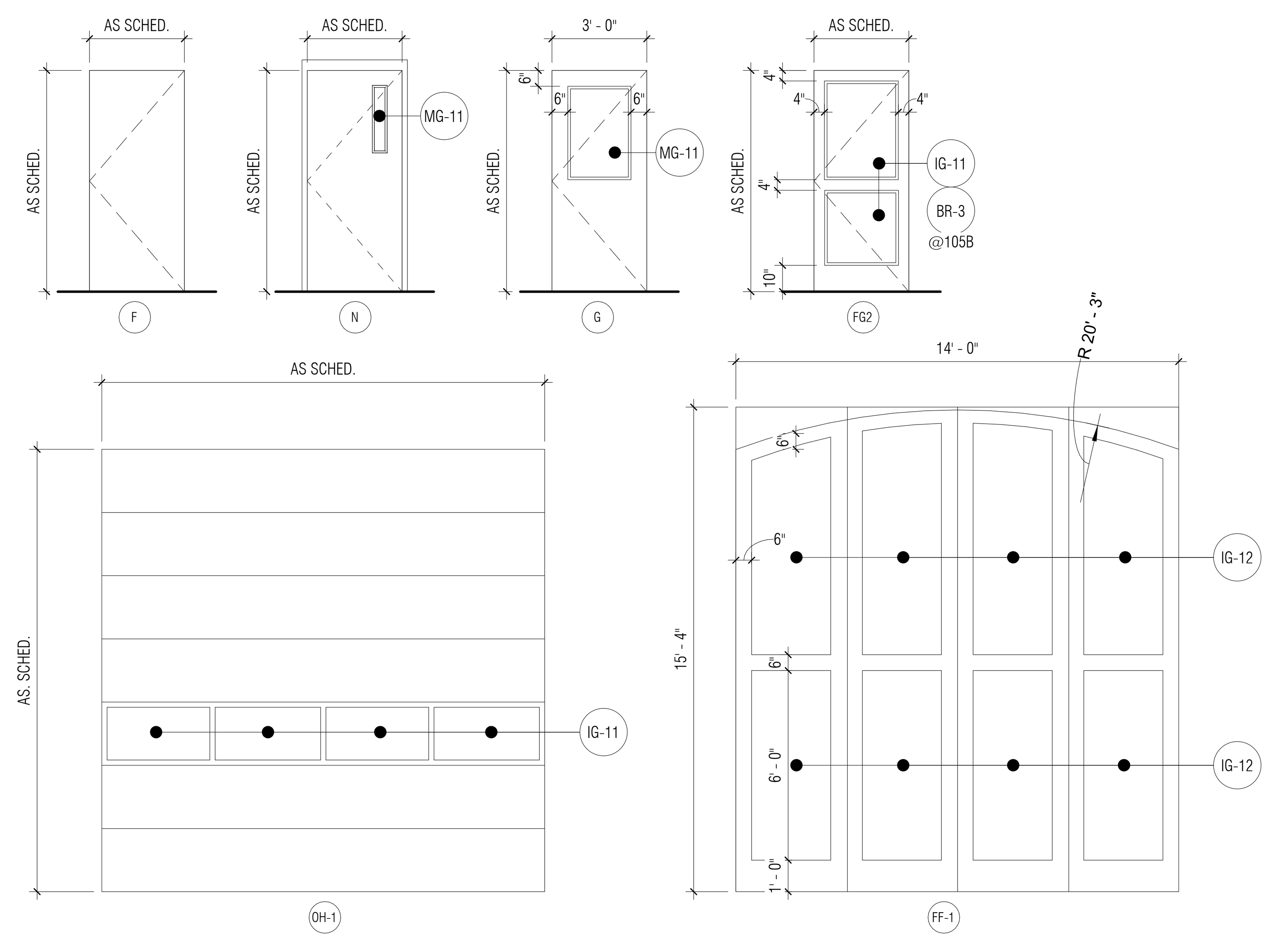
SHEET NAME
Life Safety Plan & Code Information

SHEET NO.
A0-02

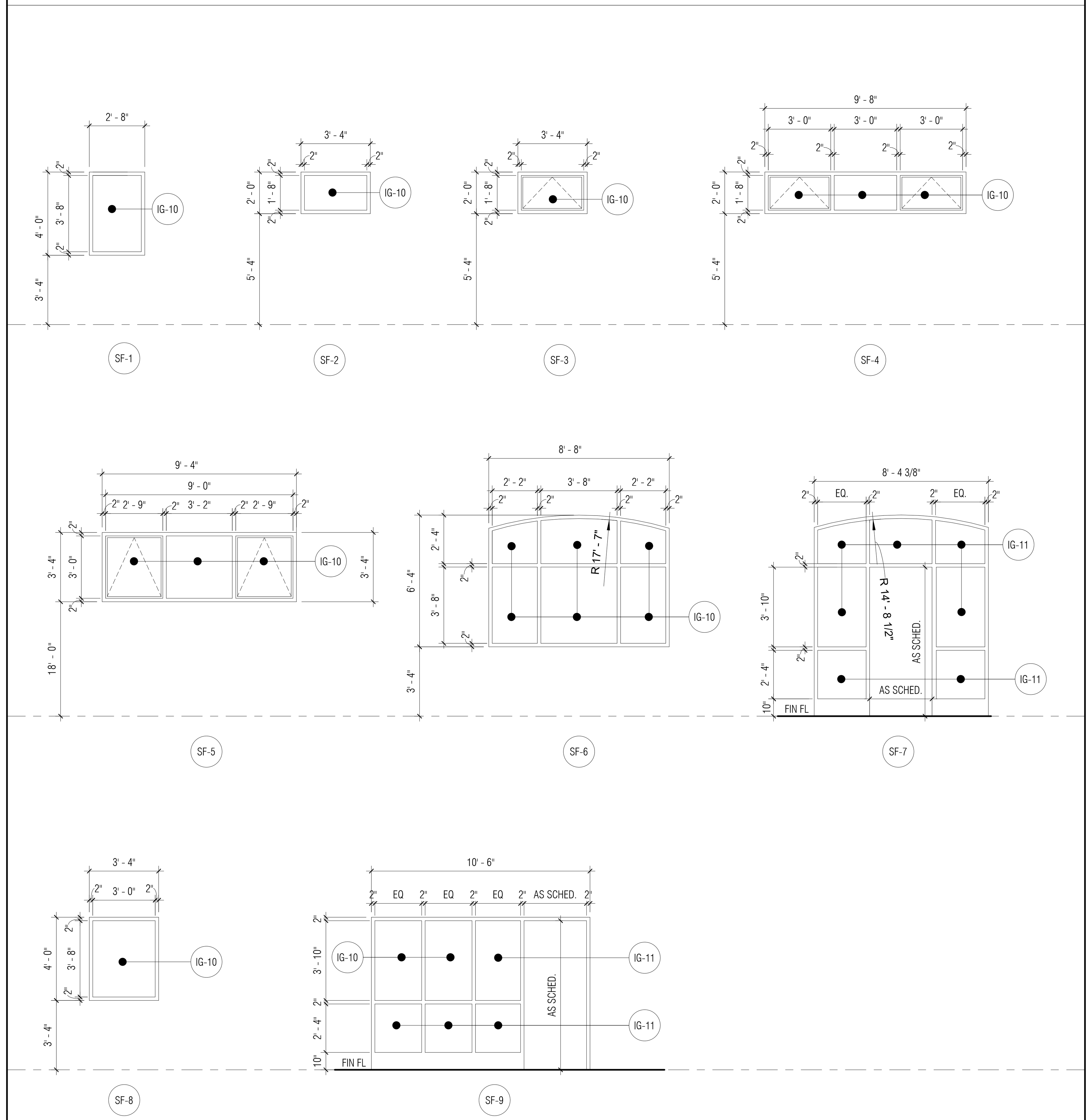
DOOR / OPENING FRAME TYPES:



DOOR TYPES:



ALUMINUM STOREFRONT FRAME ELEVATIONS:



GLAZING TYPE LEGEND:

MG-10 STANDARD MONOLITHIC CLEAR GLASS
MG-11 TEMPERED MONOLITHIC CLEAR GLASS

IG-10 CLEAR, LOW-E INSULATING GLASS
IG-11 TEMPERED, CLEAR, LOW-E INSULATING GLASS
IG-12 LAMINATED, CLEAR, LOW-E INSULATING GLASS

LG-10 LAMINATED 20 MINUTE FIRE RATED GLASS
LG-11 LAMINATED 45 MINUTE FIRE RATED GLASS

BR-3 BULLET RESISTANT GLASS (UL LEVEL 3)

DOOR / OPENING GENERAL NOTES:

A. FIELD VERIFY ALL OPENINGS PRIOR TO DOOR & FRAME FABRICATION
B. REFER TO SPECIFICATION SECTION 088000 GLAZING FOR ALL GLASS TYPES
C. DOOR TYPE NAMING CONVENTIONS ARE BASED ON SDI 108-18 STANDARDS

DOOR / OPENING KEY NOTES:

1. FOUR-FOLD STEEL DOOR
2. OVERHEAD DOOR
3. UL LEVEL 3 BALLISTIC RESISTANCE RATING
4. REFER TO SHEET A0-09 FOR THE DETACHED GARAGE.
5. GALVANIZED STEEL DOOR AND FRAME
6. INTERCOM AT MAIN ENTRY DOOR
7. MAIN ENTRY GATE - PROVIDE ACCESS CONTROL PEDASTAL W/ WIRELESS AND CARD READER OPERATION.
8. EXIT ONLY GATE - OPERATED BY VEHICLE SENSOR
9. ELECTROMECHANCIAL GATE LATCH OPERATED BY C.R.

DOOR / OPENING LEGEND:

ALUM ALUMINUM DOOR OR FRAME
B ANOD BLACK ANODIZED FINISH
DK BRZ DARK BRONZE
GL GLASS
HM HOLLOW METAL DOOR OR FRAME
PNT PAINTED FINISH
PREFIN. PREFINISHED METAL DOOR FRAME
STL STEEL
STN STAINED FINISH
WD WOOD DOOR OR FRAME
FRP FIBERGLASS DOOR & FRAME

Door / Opening Schedule

DOOR NO.	OPENING SIZE (W x H)	DOOR			FRAME			DETAILS			HARDWARE SET #	LABEL (MIN.)	DOOR / OPENING KEY NOTES
		TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	HEAD	JAMB	SILL			
101A	14' - 0" x 15' - 4"	FF-1	STL	PNT-4		STL	PRE-FIN	6/A6-14	2/A3-22	-	32.0		1
101B	14' - 0" x 15' - 4"	FF-1	STL	PNT-4		STL	PRE-FIN	6/A6-14	2/A3-22	-	32.0		1
101C	14' - 0" x 15' - 4"	FF-1	STL	PNT-4		STL	PRE-FIN	6/A6-14	2/A3-22	-	32.0		1
101D	14' - 0" x 15' - 4"	OH-1	STL	PRE-FIN.		STL	PRE-FIN		D5	-	33.0		2
101E	14' - 0" x 15' - 4"	OH-1	STL	PRE-FIN.		STL	PRE-FIN		D5	-	33.0		2
101F	14' - 0" x 15' - 4"	OH-1	STL	PRE-FIN.		STL	PRE-FIN		D5	-	33.0		2
102A	3' - 8" x 7' - 2"	F	FRP	DK. BRNZ	F2	ALUM	B. ANOD.	D7	D6	-	31.0		
102B	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T3	28.0		
103	3' - 0" x 7' - 0"	N	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	27.0		
104	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T4	24.0		
105A	3' - 0" x 7' - 2"	FG2	ALUM	B. ANOD.	SF-7	ALUM		1/A6-14	1/A3-21	T3	4.0		6
105B	3' - 0" x 7' - 2"	G	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	9.0		3
106	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	12.0		
107	3' - 0" x 7' - 0"	FG2	WD	WD-1	F3	HM	PNT-3	D8	D9	T5	15.0		
108	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	26.0	20	
109	2' - 8" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	16.0		
110	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
111A	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	22.0	20	
111B	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	23.0	20	
112	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
113	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
114A	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	22.0	20	
114B	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	23.0	20	
115	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
116	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
117A	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	22.0	20	
117B	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	23.0	20	
118	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
119	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
120A	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	22.0	20	
120B	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	23.0	20	
121	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	25.0	20	
122	3' - 0" x 7' - 0"	F								T2	3.0		
122A	2' - 10" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	19.0		
122B	2' - 10" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	19.0		
122C	2' - 10" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	19.0		
123	3' - 0" x 7' - 2"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T1	8.0		
124	3' - 0" x 7' - 0"	G	WD	WD-1	F3	HM	PNT-3	D8	D9	T5	11.0		
125	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D7	D6	T5	16.0		
126	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D7	D6	T5	21.0		
127	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T2	16.0		
128	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	19.0		5
129	3' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D7	D6	T5	15.0		
130	2' - 8" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	20.0		
131	3' - 0" x 7' - 2"	G	HM	PNT-3	F3	HM	PNT-3	D7	D6	T2	10.0		5
132	3' - 0" x 7' - 2"	G	HM	PNT-3	F3	HM	PNT-3	D7	D6	T2	10.0		5
145	2' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	14.0		
146	2' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T2	14.0		
147	2' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	14.0		
148	2' - 0" x 7' - 0"	F	WD	WD-1	F2	HM	PNT-3	D8	D9	T5	14.0		
150	5' - 8" x 7' - 2"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T1	5.0		
151A	3' - 0" x 7' - 2"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T1	1.0		
151B	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1			5
152A	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	24.0		5
152B	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	17.0		5
156	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	18.0		5
157	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	13.0		5
158	3' - 0" x 7' - 2"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T1	13.0		5
159	3' - 0" x 7' - 2"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T1	2.0		
160A	3' - 0" x 7' - 10"	F	FRP	DK. BRNZ		ALUM	B. ANOD.	D7	D6	T1	6.0		4
160B	10' - 0" x 8' - 0"	OH-1	STL	PRE-FIN.						-	33.0		2, 4
200	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D7	D6	T6	29.0		5
201	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D8	D9	T1	30.0		
202	3' - 0" x 7' - 0"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T9	7.0		
203A	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D7	D8	T7	30.0		5
203B	3' - 0" x 7' - 2"	F	FRP	FRP	F2	ALUM	B. ANOD.	D11	D10	T8	7.0		
205A	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D8	D9	T1	19.0		
205B	3' - 0" x 7' - 0"	F	HM	PNT-3	F2	HM	PNT-3	D8	D9	T1	-		
GATE 1	---	---											7
GATE 2	---	---											8
GATE 3	---	---											9

WINDOW SCHEDULE

WINDOW NO.	WINDOW		DETAILS			WINDOW NOTES
	STYLE	MATERIAL	HEAD	JAMB	SILL	
SF-1	STOREFRONT	ALUM	2/A6-12	1,6,9/A3-21	10/A6-11	
SF-2	STOREFRONT	ALUM	6/A6-11	D12/A0-05	5/A6-11	
SF-3	STOREFRONT	ALUM	6/A6-11	D11/A0-05	5/A6-11	
SF-4	STOREFRONT	ALUM	10/A6-11	D12/A0-05, 9/A3-21	5/A6-11	
SF-5	STOREFRONT	ALUM	3/A6-13	D12/A0-05	3/A6-13	
SF-6	STOREFRONT	ALUM	2/A6-11	D10/A0-05	1/A6-11	
SF-7	STOREFRONT	ALUM	2/A6-11	D10/A0-05		
SF-8	STOREFRONT	ALUM	2/A6-12	1,6,9/A3-21	10/A6-11	
SF-9	STOREFRONT	ALUM	2/A6-12	1,6,9/A3-21		
TW-1	BORROWED LIGHT	HM	HOLLOW METAL	HOLLOW METAL	HOLLOW METAL	1

Window General Notes:

A. REFER TO SPECIFICATION FOR INTERIOR OR EXTERIOR FINISHES
B. PROVIDE INSECT SCREEN AT OPERABLE WINDOW PANELS

Window Key Notes:

1. "NATURAL VOICE THRU" TYPE FRAME, UL LEVEL 3 BALLISTIC RESISTANCE RATING
2.
3.

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 6/13/23

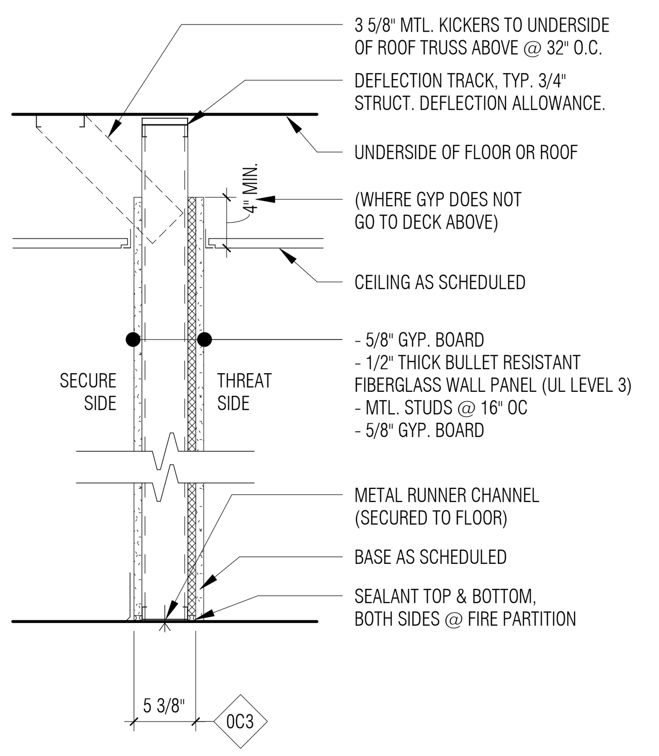
DRAWN BY
DJG

CHECKED BY
DG

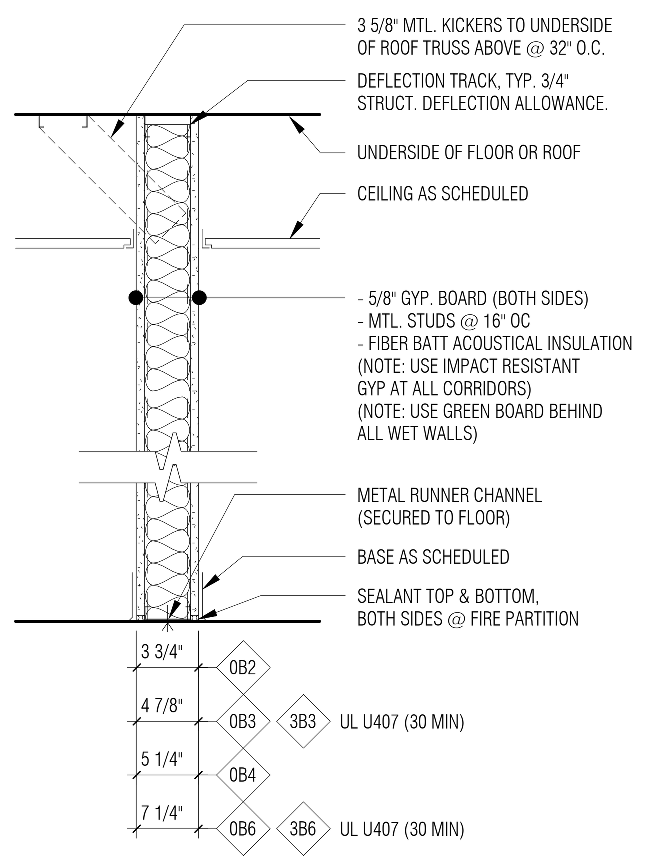
APPROVED BY
MAM

SHEET NAME
Door Schedule, Door & Frame Types, Storefronts

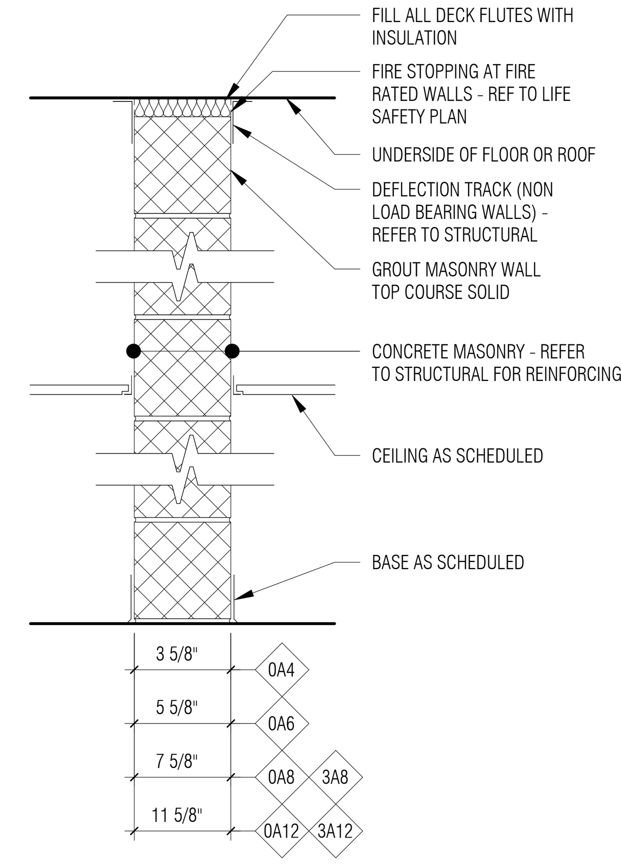
SHEET NO.
A0-03



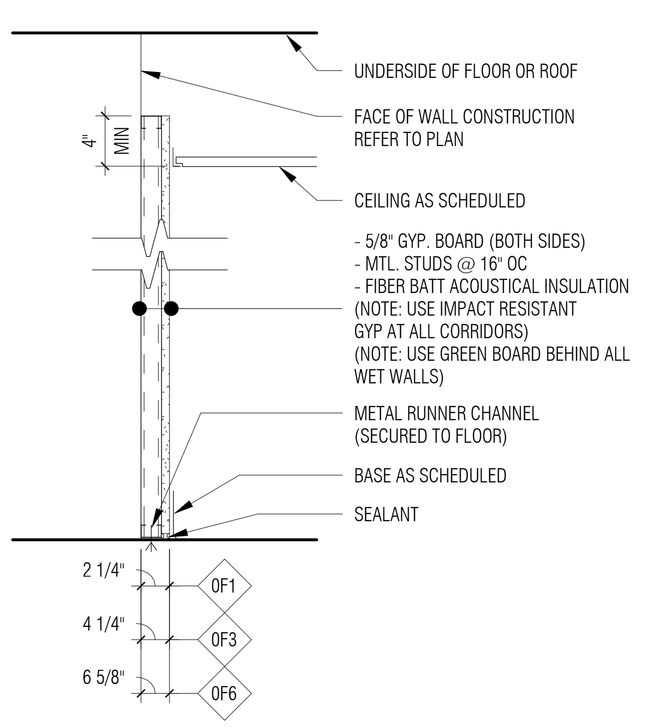
C — PARTITION SERIES 'C'
1" = 1'-0"



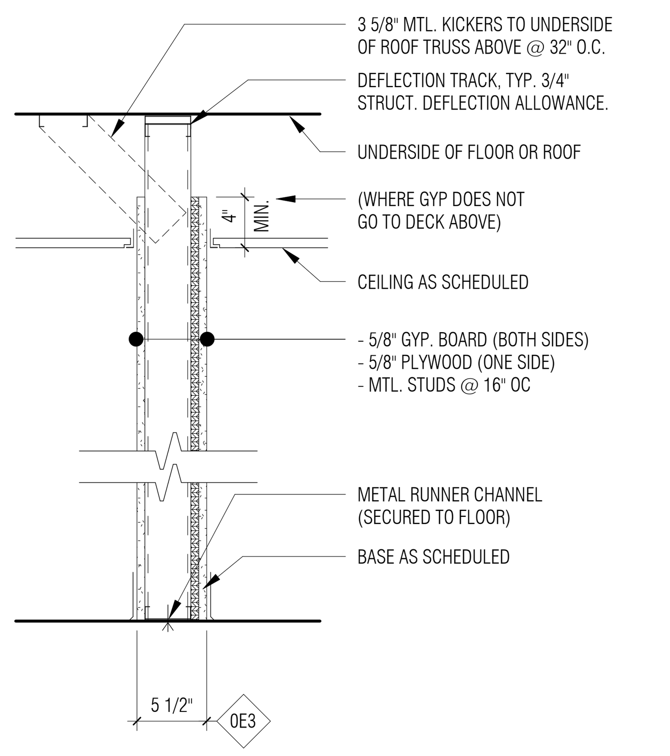
B — PARTITION SERIES 'B'
1" = 1'-0"



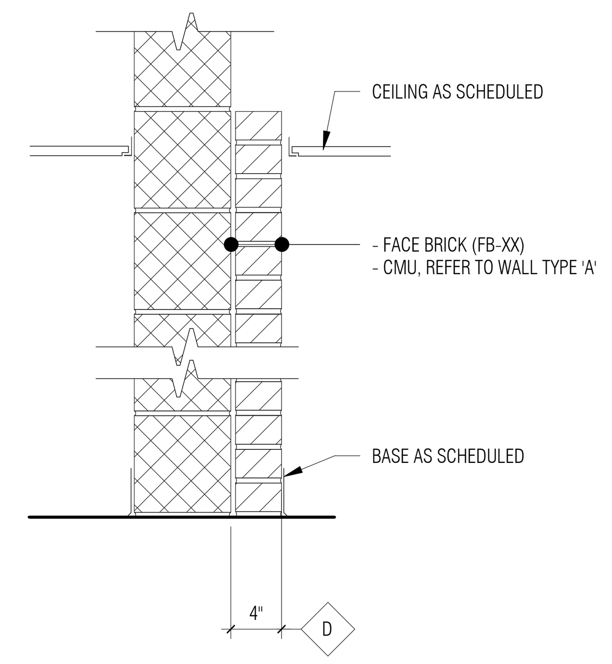
A — PARTITION SERIES 'A'
1" = 1'-0"



F — PARTITION SERIES 'F'
1" = 1'-0"



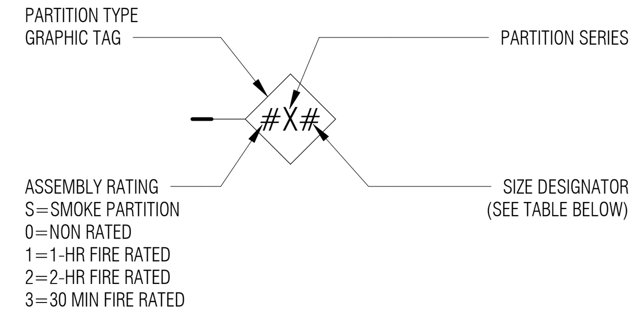
E — PARTITION SERIES 'E'
1" = 1'-0"



D — PARTITION SERIES 'D'
1" = 1'-0"

WALL TYPE GENERAL NOTES:

1. "WALL" AND "PARTITION" ARE USED TO DENOTE EITHER WALLS OR PARTITIONS AND ARE USED INTERCHANGEABLY
2. REFER TO STRUCTURAL FOR ALL REQUIRED REINFORCING AND FOR WALL CONNECTIONS TO FLOORS AND ROOFS
3. AT FIRE RATED WALLS FILL ALL VOIDS, PENETRATIONS ETC. AND SEAL - REFER TO DRAWING A0-02 LIFE SAFETY PLANS & CODE INFORMATION FOR ALL PARTITION FIRE RATINGS
4. WHERE A WALL RUNS PARALLEL TO THE DIRECTION OF A ROOF TRUSS AND DOES NOT ALIGN UNDERNEATH A TRUSS - PROVIDE MTL. STUD BRIDGING BETWEEN THE ROOF TRUSSES @ 48" O.C. MAX. TO ATTACH TO
5. REFER TO ROOM FINISH SCHEDULE FOR WALL FINISHES AND WALL BASE
6. PARTITION TYPE GRAPHIC TAG



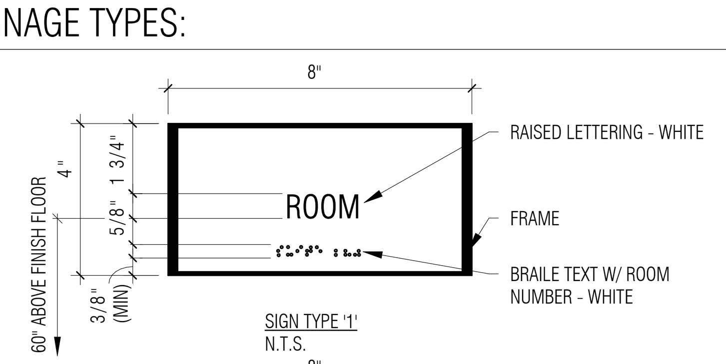
MATERIAL	DESIGNATION SIZE	ACTUAL SIZE	SPACING
MASONRY	4 6 8 12	3 5/8" 5 5/8" 7 5/8" 11 5/8"	N/A
STEEL STUDS	1 2 3 4 6	1 5/8" 2 1/2" 3 5/8" 4" 6"	16" OC
FURRING	0 1 2 3	7/8" 1 5/8" 2 1/2" 3 5/8"	16" OC
SHAFTWALL C-H STUDS	2 4 6	2 1/2" 4" 6"	24" OC

7. SUBSTITUTE TILE BACKING BOARD AT LOCATIONS TO RECEIVE A TILE WALL FINISH
8. ALL NON-LOAD BEARING METAL WALL FRAMING SHALL BE BASED ON TOTAL STUD HEIGHT
9. AT INTERSECTIONS OF DIS-SIMILAR PARTITION TYPES, THE HIGHEST RATED PARTITION IS TO RUN THROUGH THE INTERSECTION TO MAINTAIN ENCLOSURE
10. FIRE-RATED PARTITIONS SHALL BE CONSTRUCTED ACCORDING TO THE FIRE TEST INDICATED. NO SUBSTITUTIONS OF MATERIALS OR DEVIATIONS FROM CONSTRUCTION ARE ALLOWED. ADDITIONAL LAYERS MAY BE REQUIRED FOR ACOUSTICAL OR OTHER REASONS AND MUST BE EXECUTED AS SHOWN
11. STC RATINGS ARE MINIMUM ACOUSTICAL PERFORMANCE REQUIREMENT. SPECIFIC ACOUSTICAL TESTS ARE GIVEN FOR REFERENCE ONLY. SOUND ATTENUATION BLANKET THICKNESS SHALL BE AS FOLLOWS:
    - A. 1 1/2" FOR PARTITIONS WITH 1 5/8" AND 2 1/2" STUDS (INCLUDING SHAFTWALLS)
    - B. 3" FOR PARTITIONS WITH 3 5/8", 4" OR 6" STUDS UON
    - C. 3" FOR SHAFTWALLS WITH 4" OR 6" STUDS UON
    - D. AS REQUIRED FOR FIRE RATING
12. AT ALL FIRE RATED WALL CONSTRUCTION, PROVIDE SIGNAGE ABOVE THE ADJACENT ACCESSIBLE CEILING THAT STATES: "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS." THE LETTERS ARE TO BE 3" HIGH MIN. AND ARE TO BE STENCILED IN PAINT DIRECTLY ONTO THE WALL. LOCATE THE SIGNS 30'-0" O.C. MAXIMUM. AND NO MORE THAN 15'-0" FROM THE END OF EACH WALL. [703.7]

Room Finish Schedule

ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS: NORTH	WALLS: EAST	WALLS: SOUTH	WALLS: WEST	CEILING	ROOM FINISH KEY NOTES	SIGNAGE SCHEDULE: ROOM SIGN TYPE	SIGNAGE SCHEDULE: SIGN NAME	SIGNAGE SCHEDULE: MOUNT SURFACE
101	APPARATUS BAY	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
102	HOSE TOWER	SEALED CONCRETE	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-2 ON LANDING				
103	COMMUNITY ROOM	CPT-3 / RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	COMMUNITY ROOM	GYP
104	WC	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	ACT-1	1	2	RESTROOM	GYP
105	SECURE VEST	CPT-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
106	STOR / IT	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
107	WATCH DESK	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	WATCH DESK	GYP
108	SLEEP	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
109	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2	1			
110	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 3	GYP
111	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2 / PT-1	1			
112	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 1	GYP
113	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 4	GYP
114	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2 / PT-1	1			
115	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 2	GYP
116	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 7	GYP
117	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2 / PT-1	1			
118	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 5	GYP
119	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 8	GYP
120	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2 / PT-1	1			
121	DORM	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1		1	DORM 6	GYP
122	DAY/DINE/KITCHEN	CPT-2 / CPT-3 / RTF-1 / PT-7	RB-1 / PT-8	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1 / PNT-2				
122A	PANTRY	PT-7	PT-8	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
122B	PANTRY	PT-7	PT-8	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
122C	PANTRY	PT-7	PT-8	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
123	ELEC	CONC-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
125	LAUNDRY	RTF-1	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	ACT-1				
126	WC	PT-1	PT-2	PT-5 / PT-6 / PT-7 / EP-PNT-1	PT-5 / PT-6 / PT-7 / EP-PNT-1	PT-5 / PT-6 / PT-7 / EP-PNT-1	PT-5 / PT-6 / PT-7 / EP-PNT-1	ACT-1	1			
127	STORAGE/JC	RTF-1	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	ACT-1				
128	EMS STORAGE	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1				
129	SENIOR OFFICER	CPT-2	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
130	BATH	PT-1	PT-2	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PT-4 / PT-5 / PT-6 / PT-9 / EP-PNT-1	PNT-2 / PT-1	1			
131	HOT ZONE	EP-1	EP-1	- -	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
132	HOT ZONE	EP-1	EP-1	- -	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
140	CORRIDOR	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
141	CORRIDOR	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
142	CORRIDOR	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
143	CORRIDOR	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	ACT-1				
144	CORRIDOR	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
145	CLOSET	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
146	CLOSET	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
147	CLOSET	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
148	CLOSET	RTF-1	RB-1	PNT-1	PNT-1	PNT-1	PNT-1	PNT-2				
150	OUTDOOR STOR	CONC-1	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
151	DECON	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
152	BATH	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
153	ALCOVE	EP-1	EP-1	EP-PNT-1	EP-PNT-1	- -	EP-PNT-1	PNT-1				
154	PPE LAUNDRY	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
155	PPE STORAGE	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
156	SCBA	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
157	COMPRESSOR	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
158	UTIL	SEALED CONCRETE	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
159	ENTRY	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	PNT-1				
160	GARAGE	EP-1	EP-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
201	MEZZANINE/STORAGE	SEALED CONCRETE	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
202	MECHANICAL/ELECTRICAL	SEALED CONCRETE	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
203	STORAGE	SEALED CONCRETE	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
203	HOSE STORAGE											
204	FITNESS AREA	RAF-1	RB-2	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
205A	OPEN TRAINING/STORAGE	SEALED CONCRETE	RB-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EP-PNT-1	EXP				
205B	IT											

SIGNAGE TYPES:



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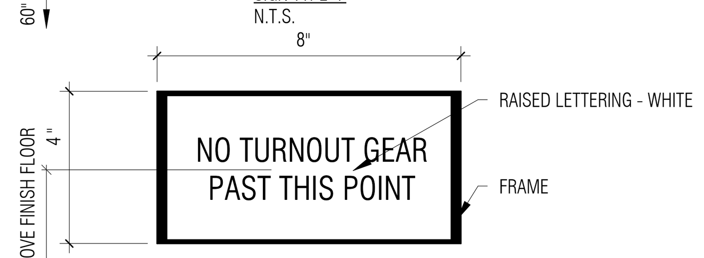

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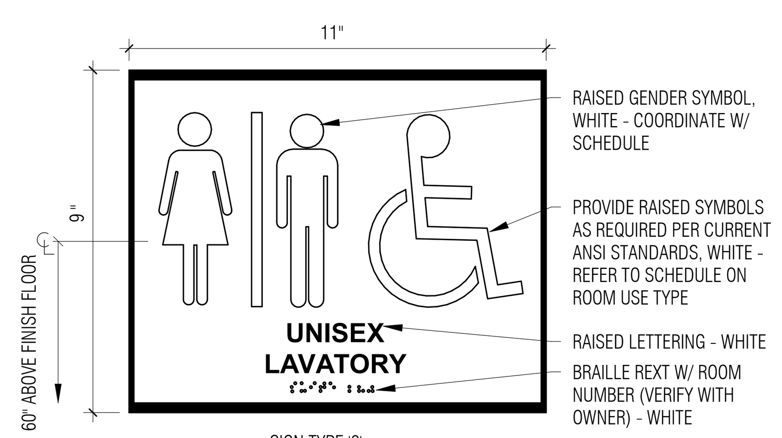

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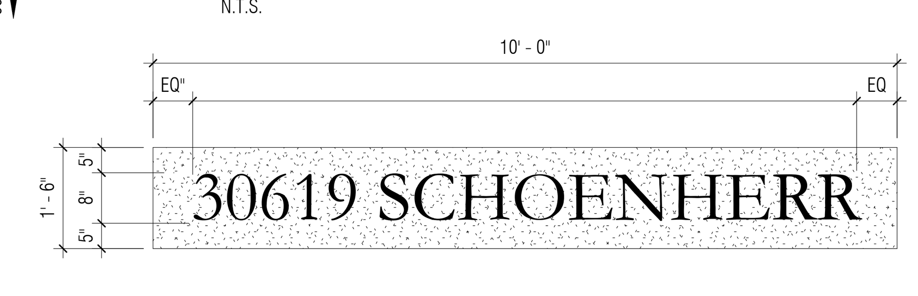

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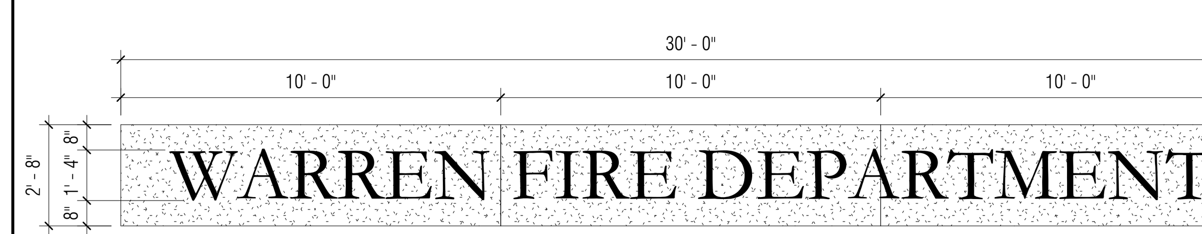

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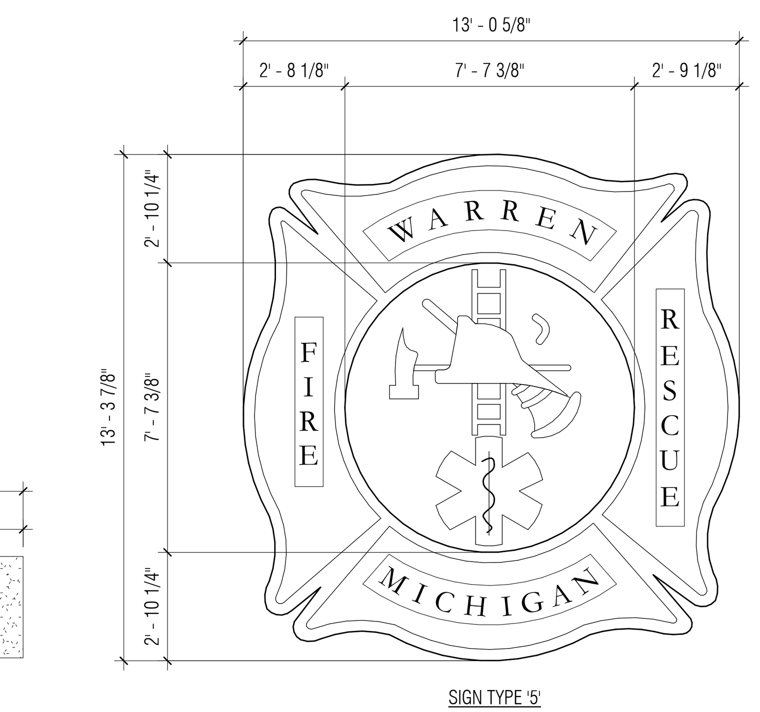

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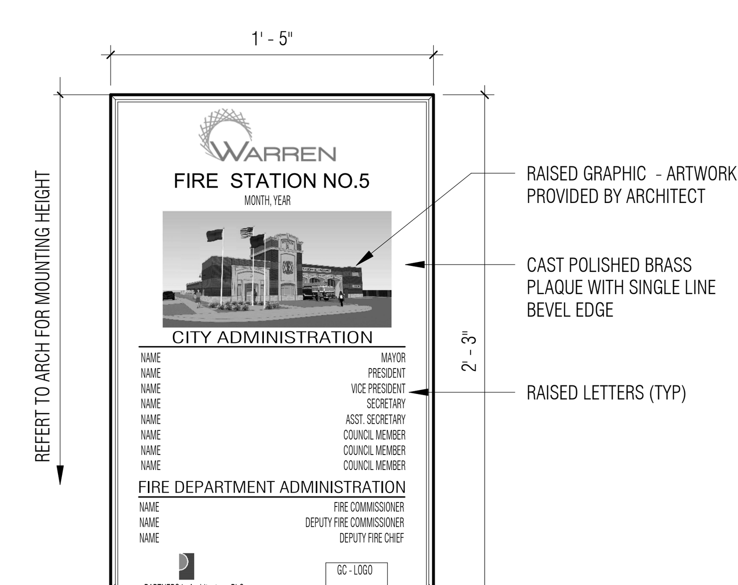

SIGN TYPE '6'
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ROOM FINISH GENERAL NOTES

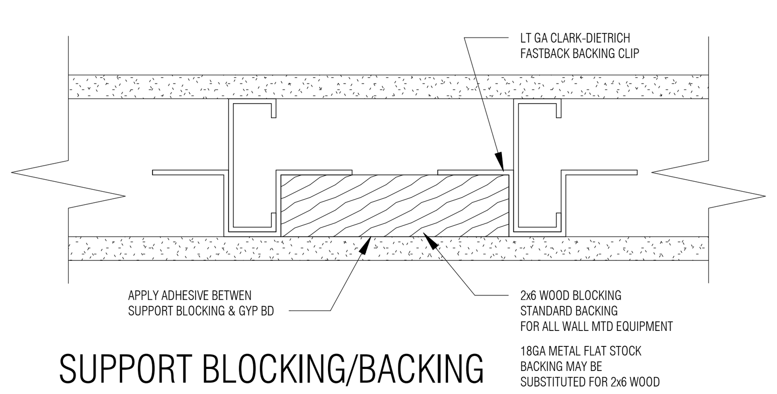
- A. REFER TO REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND FINISH FLOOR PLANS FOR LOCATIONS OF MATERIAL / PAINT TRANSITIONS.
- B. REFER TO MATERAL FINISH & COLOR SCHEDULE, SPECIFICATION SECTION 000200.
- C. PROVIDE REDUCER STRIP AT FLOOR MATERIAL TRANSITIONS AS NEEDED, REFER TO THRESHOLD DETAILS AND DOOR SCHEDULE.

ROOM FINISH KEY NOTES

1. REFER TO INTERIOR ELEVATIONS FOR WALL TILE LAYOUT & DESIGN.

ROOM FINISH LEGEND

RAF	ATHLETIC FLOORING
ACT	ACOUSTIC TILE AND GRID CEILING SYSTEM
CONC	CONRETE
CPT	CARPET
CT	CERAMIC TILE
EP	EPOXY FLOORING
EP PNT	EPOXY PAINT
LVT	LUXURY VINYL TILE FLOORING
PC	EXPOSED PRECAST CONCRETE PLANK CEILING
PT	PORCELAIN TILE
PNT	PAINT
RB	RESILIENT WALL BASE
RTF	RESILIENT TILE FLOORING
SS	SOLID SURFACING
VCT	VINYL COMPOSITION TILE
MP	FORMED METAL CEILING PANEL



SUPPORT BLOCKING/BACKING
3" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 6/13/23

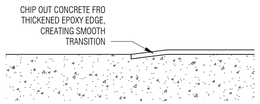
DRAWN BY
DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Room Finish Schedule, Wall Types & Signage

SHEET NO.
A0-04



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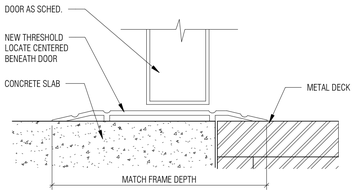

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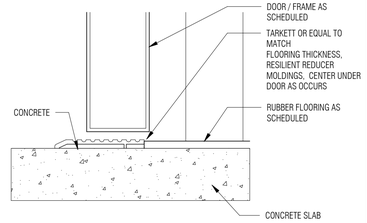

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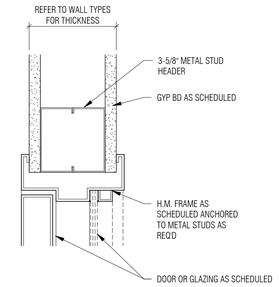

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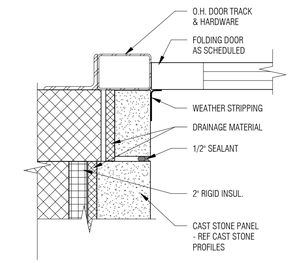

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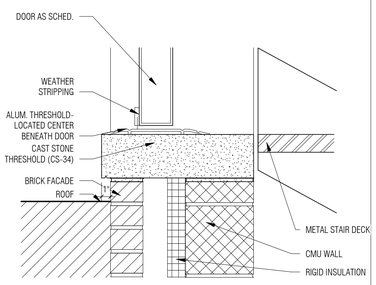

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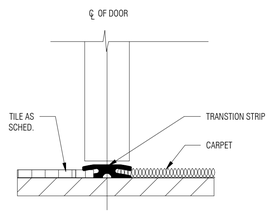

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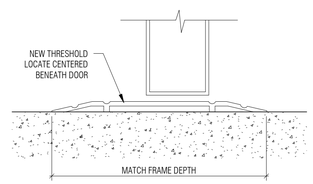

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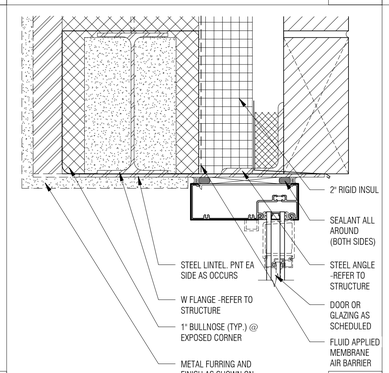

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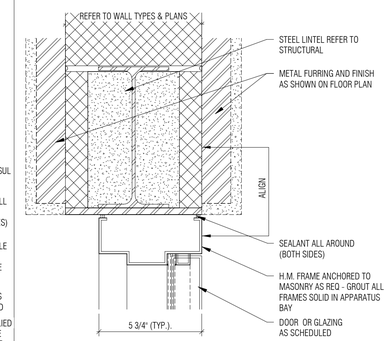

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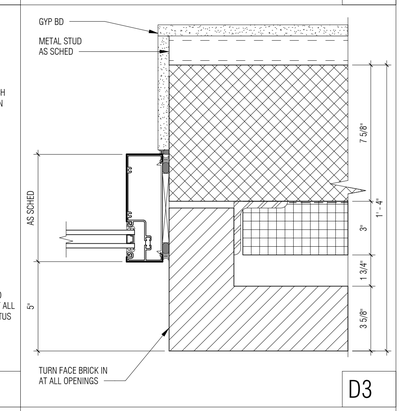

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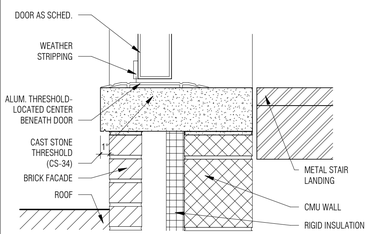

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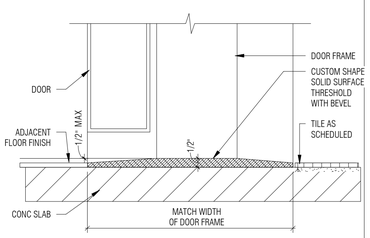

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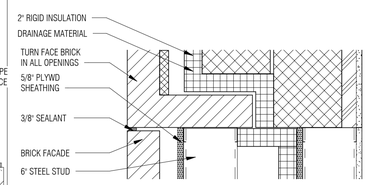

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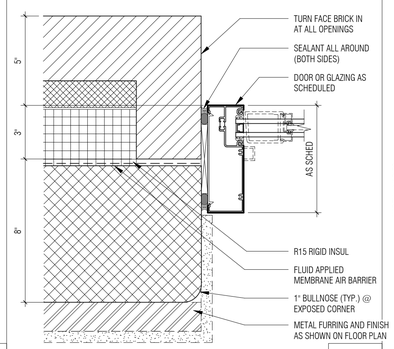

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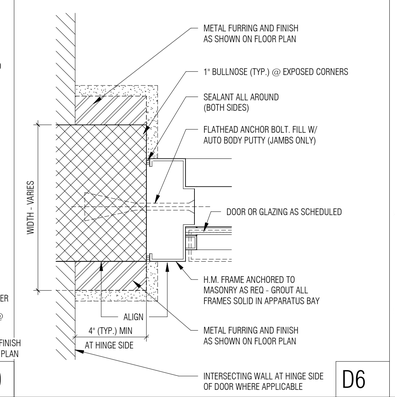

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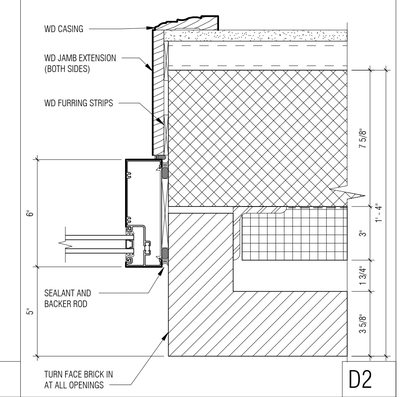

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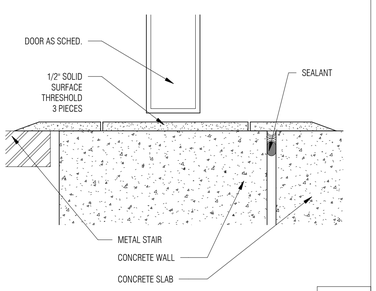

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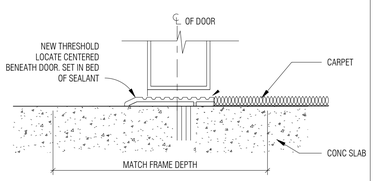

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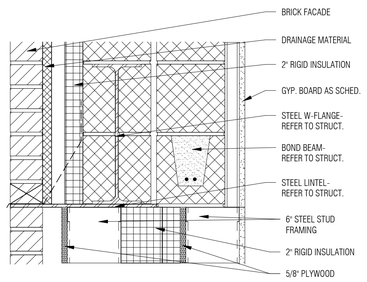

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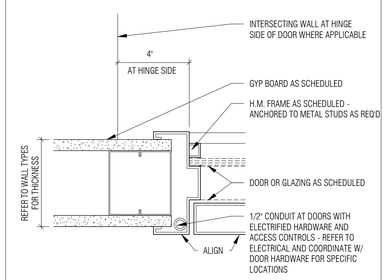

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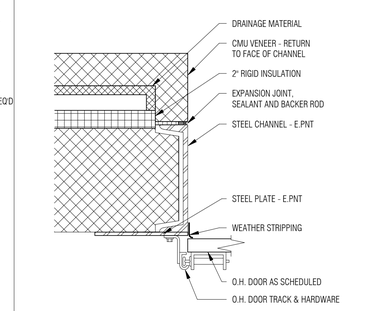

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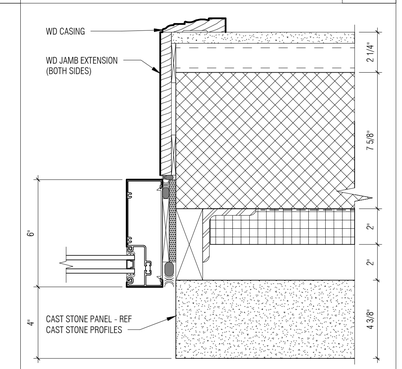

D1

6/13/2023 11:42:57 AM C:_revit\local\21-146 WFD STATION 1 CD_DGwozdzDHMdSH.rvt

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Mount Clemens, MI 48043
P 586.469.3600
F 586.469.3607

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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

DJG

CHECKED BY

DG

APPROVED BY

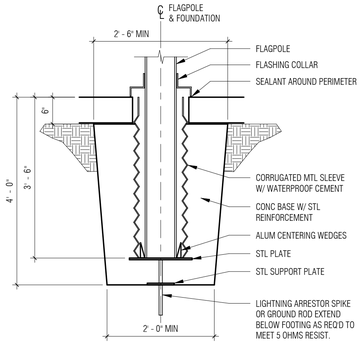
MAM

SHEET NAME

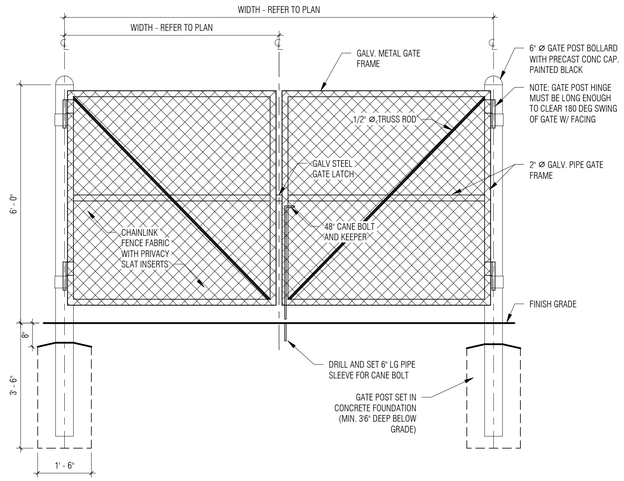
Door & Typical
Opening Details

SHEET NO.

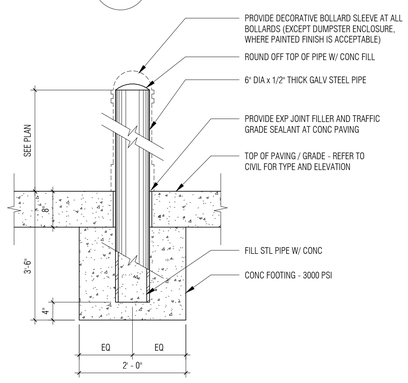
A0-05



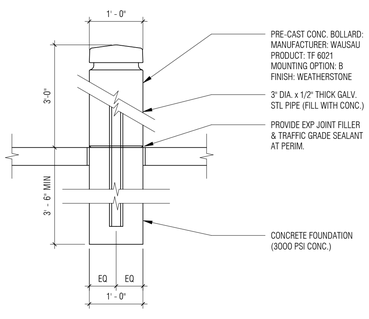
6 Flag Pole Base
3/4" = 1'-0"



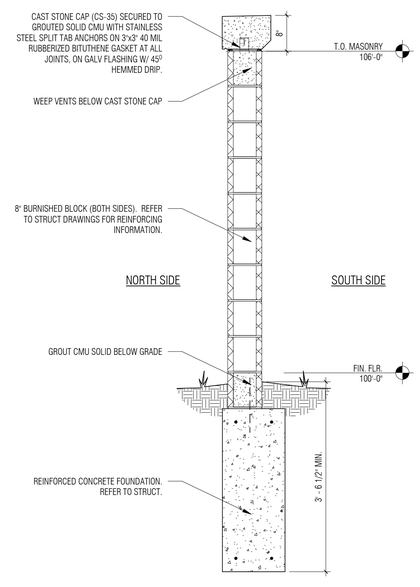
3 Dumpster Enclosure Gate
1/2" = 1'-0"



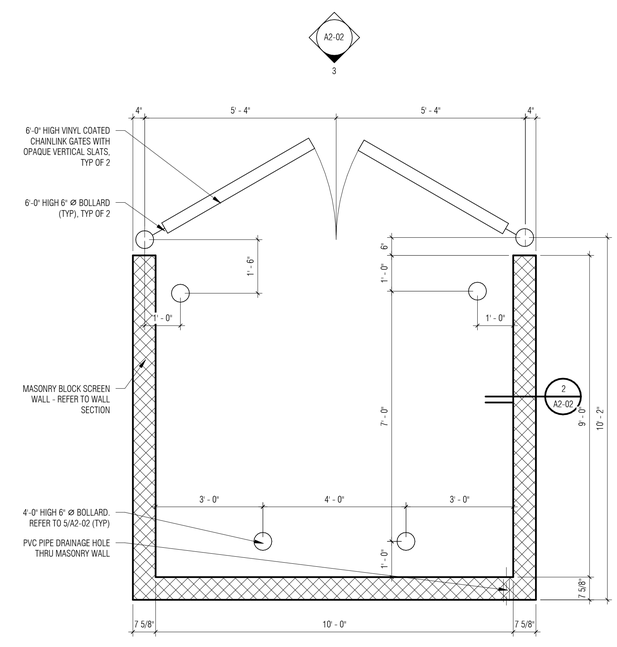
5 Typ. Steel Pipe Bollard
3/4" = 1'-0"



4 Concrete Bollard
3/4" = 1'-0"



2 Masonry Screen Wall Section
3/4" = 1'-0"



1 Dumpster Enclosure Plan
1/2" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

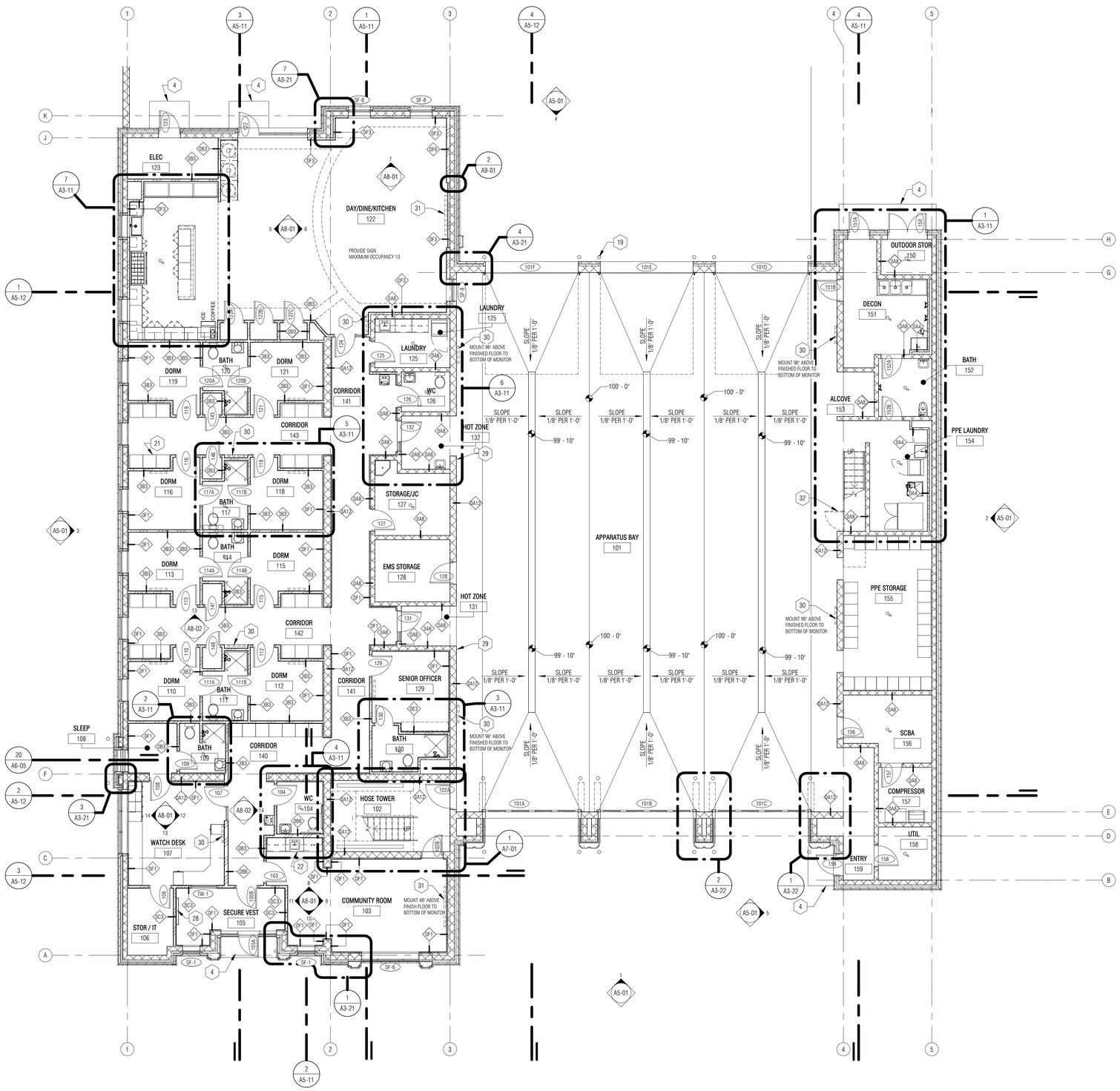
DRAWN BY
Author

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Architectural Site Plan Details

SHEET NO.
A2-02



N

1 / A3-01 Ground Floor
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

A. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

B. ALL PLAN DIMENSIONS ARE NOMINAL TO THE FACE OF WALLS. REFER TO WALL TYPES ON A0-05 FOR ACTUAL WALL THICKNESSES.

C. COORDINATE SIZE AND LOCATION OF ALL DUCT, SHAFT, AND LOUVER OPENINGS IN WALLS WITH MECHANICAL.

D. ALL EXPOSED CORNERS OF CONCRETE MASONRY UNITS ARE TO BE BULLNOSED.

E. REQUIRED FIRE RATED PARTITIONS, FLOORS, AND CEILINGS ARE INDICATED ON SHEET A0-03, LIFE SAFETY PLAN, AS WELL AS FIRE EXTINGUISHER & CABINET LOCATIONS.

F. REFER TO REFER TO PLUMBING DRAWINGS AND SPECIFICATIONS FOR PLUMBING FIXTURE IDENTIFICATION & LEGEND

G. REFER TO SHEETS A3-01d & A3-11 FOR DIMENSIONING INFORMATION

FLOOR PLAN KEYNOTES

1 THICKENED CONCRETE EQUIPMENT SLAB, CORDINATE SIZE & LOCATION WITH MECH & ELEC EQUIPMENT. REFER TO 3/A6-12

2 WALL MTD. PPE STORAGE - READY RACK - OWNER FURNISHED/ CONTRACTOR INSTALLED

3 ELECTRIC WATER COOLER WITH BOTTLE FILL (SEE MECH)

4 FROST SLAB AT BUILDING ENTRY, TYP. (SEE STRUCT)

5 WORK SURFACE - REFER TO INTERIOR ELEVATIONS

6 DISHWASHER - OWNER FURNISHED/ CONTRACTOR INSTALLED

7 FLOOR MOUNTED LOCKER

8 MILLWORK/ CASEWORK - REFER TO ENLARGED PLANS & ELEVATIONS

10 REFRIGERATOR, OWNER FURNISHED/ CONTRACTOR INSTALLED

11 RANGE & OVEN, OWNER FURNISHED/ CONTRACTOR INSTALLED

13 WORK SURFACE DATA GROMMET. CONFIRM SIZE & LOCATIONS w/ OWNER.

14 HOSE DRYER CABINET - READY RACK - FH6G EXPRESS GEAR 6 DRYER - REF MECH PLANS FOR DUCTING.

15 PLUMBING FIXTURE - REFER TO PLUMBING

16 WASHER/DRYER - OWNER PROVIDED/ CONTRACTOR INSTALLED - REFER TO MECH.

17 FLOOR DRAIN - REFER TO MECH - SLOPE FLOOR TO DRAIN

18 SOLID SURFACE TRANSITION AT SHOWER - REFER TO DETAIL T6 ON A0-09

19 PIPE BOLLARD - REF DET 6/A2-02

20 SITE PAVING - REFER TO CIVIL DRAWINGS

21 FLOOR MOUNTED LOCKER

22 MILLWORK - REFER TO INTERIOR ELEVATIONS

23 WALL MOUNTED MURPHY BED IN FURNITURE PACKAGE. PROVIDE 3/4" PLYWOOD WALL BACKING BEHIND GYPSUM BOARD.

24 EXTRACTOR - SEE MECH

26 DECONTAMINATION SHOWER SYSTEM. REFER TO MECH

27 EYE WASH STATION. REFER TO MECH

28 BULLETIN BOARD DISPLAY CASE AS SPECIFIED

29 'NO TURNOUT GEAR BEYOND THIS POINT' SIGN

30 STATUS MONITOR- REFER TO ELECT.

31 TV MONITOR- REFER TO ELECT.

32 UNDER-STAIR RAILING AND ACCESS GATE.

33 ELEVATED EQUIPMENT SLAB, TYP. FOR ALL MECH. EQUIPMENT.

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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

DJG

CHECKED BY

DG

APPROVED BY

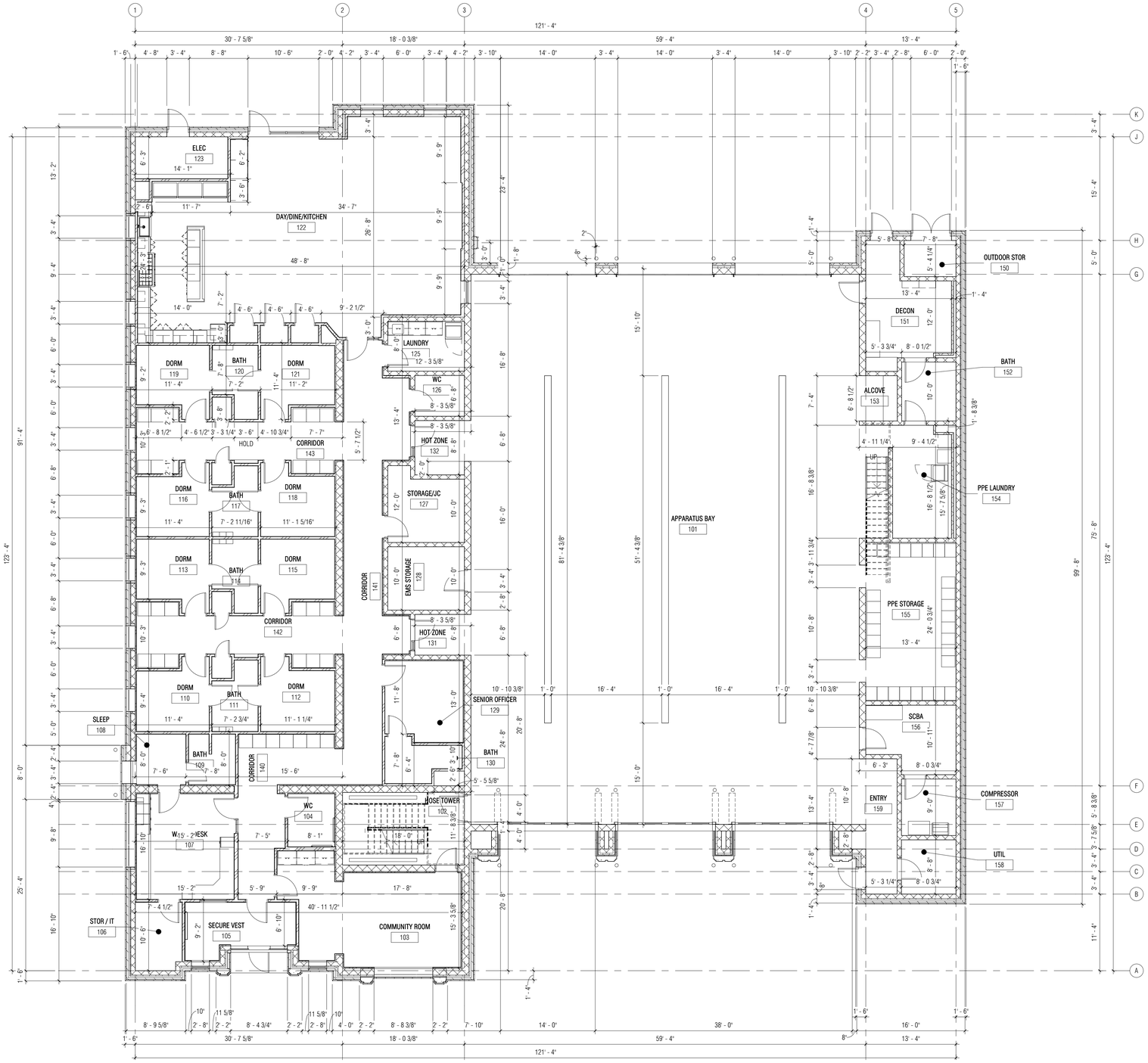
MAM

SHEET NAME

Ground Floor Plan

SHEET NO.

A3-01



N

1 / A3-01d Ground Floor - Dimensions
1/8" = 1'-0"

6/13/2023 11:43:13 AM C:_revitlocal\21-146 WFD STATION 1 CD_DGwestcDHMEH.rvt

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City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

DJG

CHECKED BY

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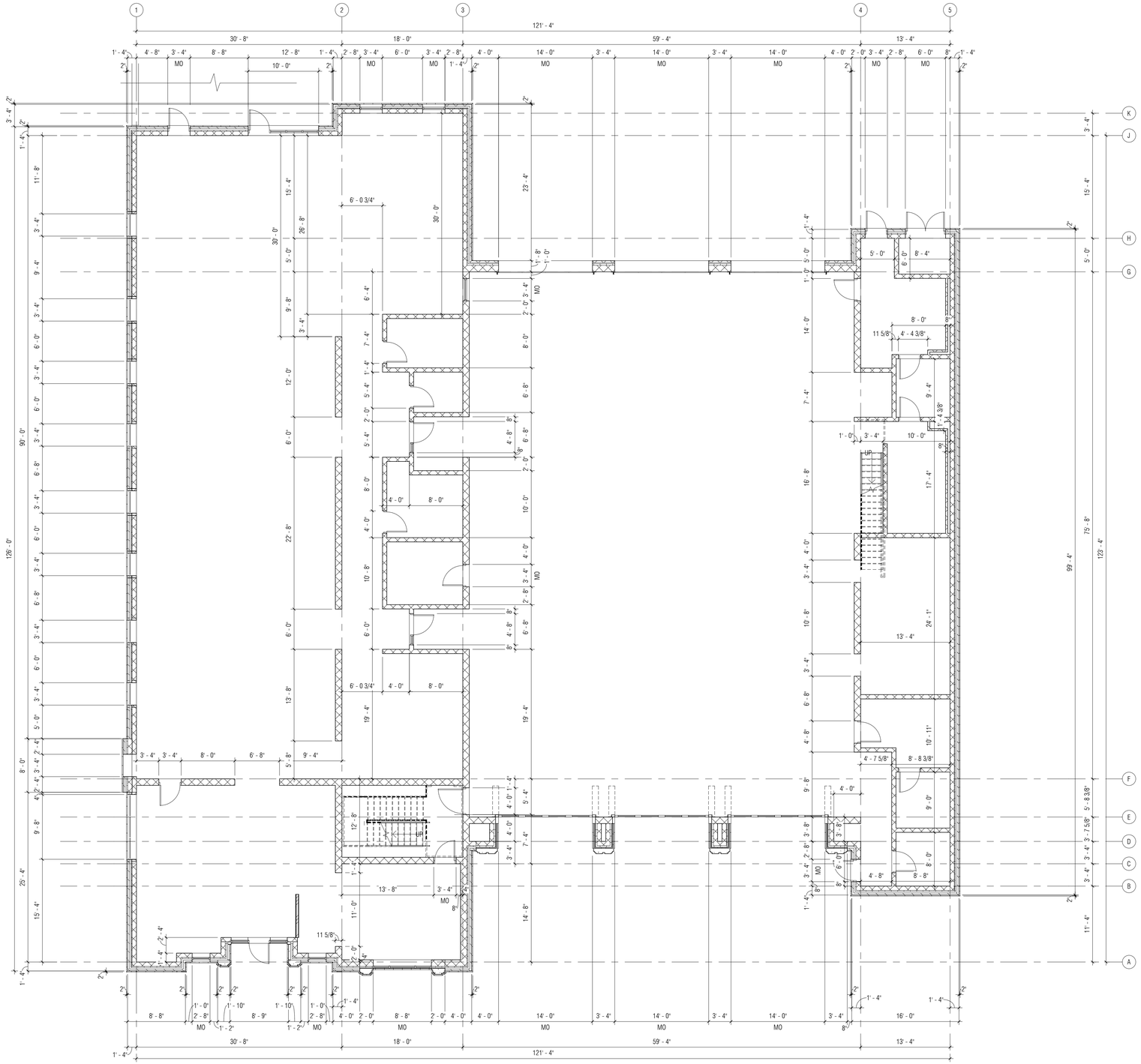
MAM

SHEET NAME

Ground Floor Plan Dimensions

SHEET NO.

A3-01d



1 A3-01m Ground Floor - Dimensions - Masonry
1/8" = 1'-0"

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Mount Clemens, MI 48043
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Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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DG

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MAM

SHEET NAME

Ground Floor Plan
Masonry Dimensions

SHEET NO.

A3-01m

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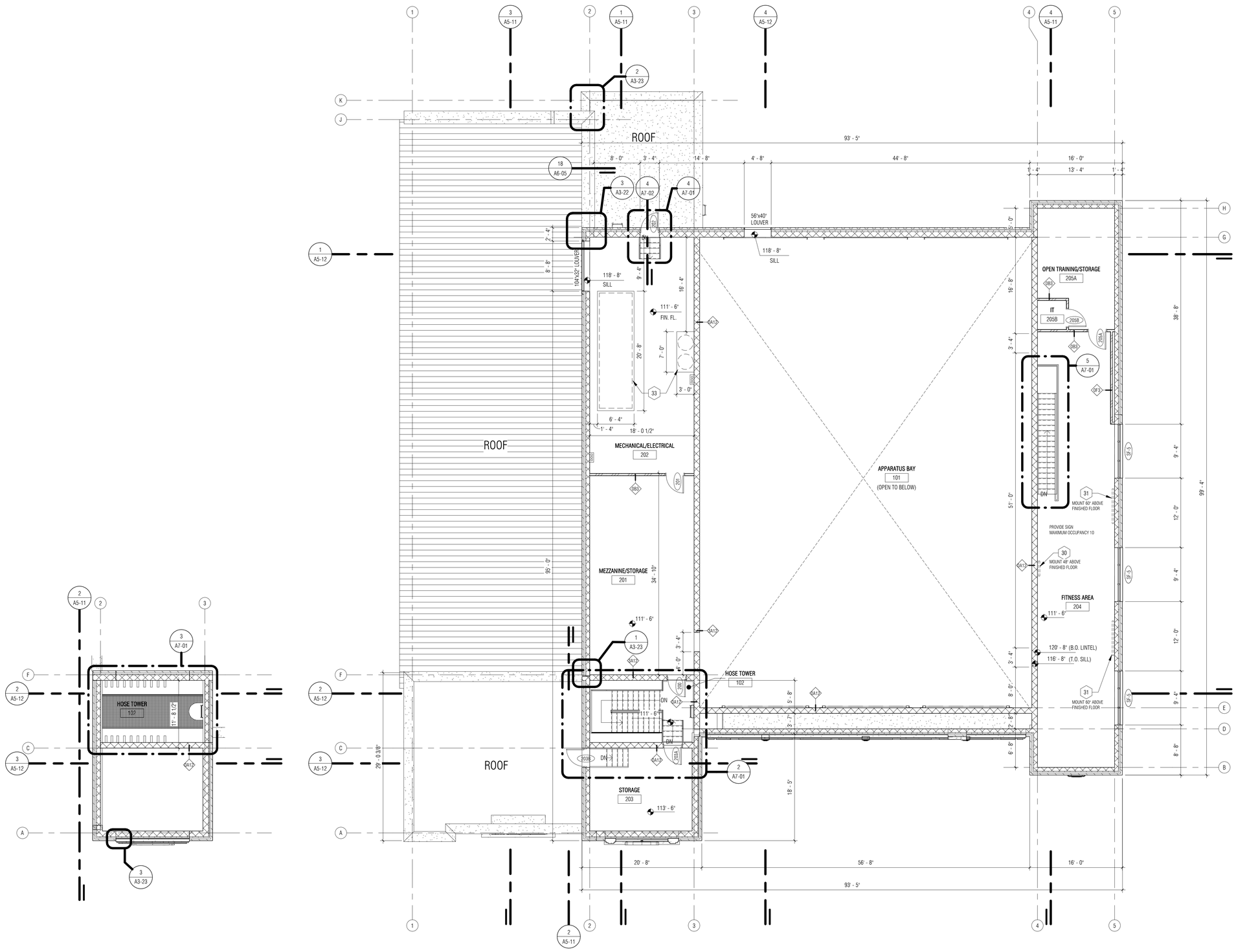

2 A3-02 Hose Tower
1/8" = 1'-0"

1 A3-02 Mezzanine
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

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4 FROST SLAB AT BUILDING ENTRY, TYP. (SEE STRUCT)

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6 DISHWASHER - OWNER FURNISHED/ CONTRACTOR INSTALLED

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15 PLUMBING FIXTURE - REFER TO PLUMBING

16 WASHER/DRYER - OWNER PROVIDED/ CONTRACTOR INSTALLED - REFER TO MECH.

17 FLOOR DRAIN - REFER TO MECH - SLOPE FLOOR TO DRAIN

18 SOLID SURFACE TRANSITION AT SHOWER - REFER TO DETAIL T6 ON A0-09

19 PIPE BOLLARD - REF DET 6/A2-02

20 SITE PAVING - REFER TO CIVIL DRAWINGS

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24 EXTRACTOR - SEE MECH

26 DECONTAMINATION SHOWER SYSTEM. REFER TO MECH

27 EYE WASH STATION. REFER TO MECH

28 BULLETIN BOARD DISPLAY CASE AS SPECIFIED

29 'NO TURNOUT GEAR BEYOND THIS POINT' SIGN

30 STATUS MONITOR- REFER TO ELECT.

31 TV MONITOR- REFER TO ELECT.

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33 ELEVATED EQUIPMENT SLAB, TYP. FOR ALL MECH. EQUIPMENT.

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Mount Clemens, MI 48043
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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY
DJG

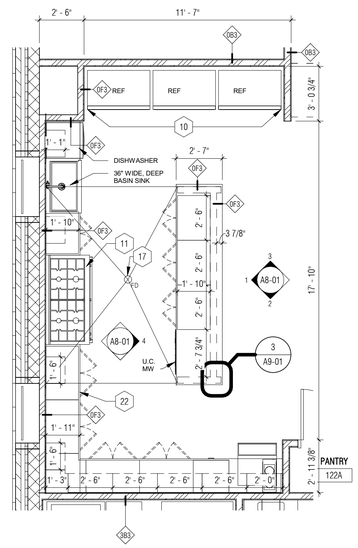
CHECKED BY
DG

APPROVED BY
MAM

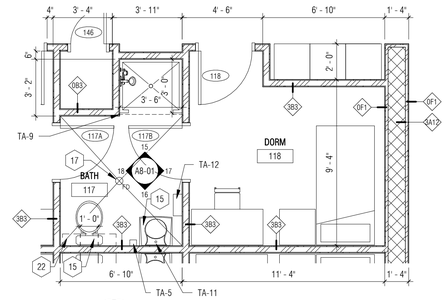
SHEET NAME

Mezzanine & Hose Tower Plan

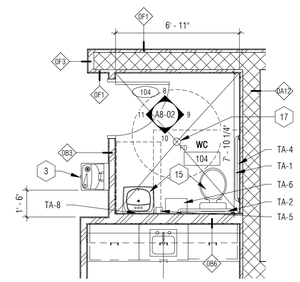
SHEET NO.
A3-02



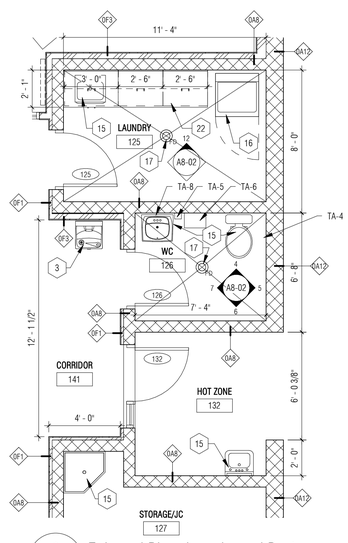
7 A3-01 Enlarged Plan - Kitchen Dayroom
1/4" = 1'-0"



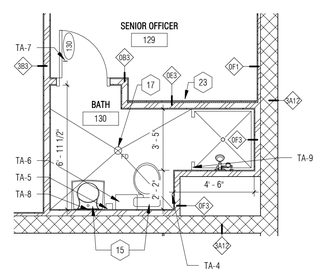
5 A3-01 Enlarged Plan- TYP. Dorm
1/4" = 1'-0"



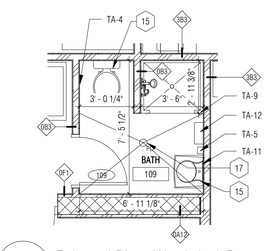
4 A3-01 Enlarged Plan- Public Restroom
1/4" = 1'-0"



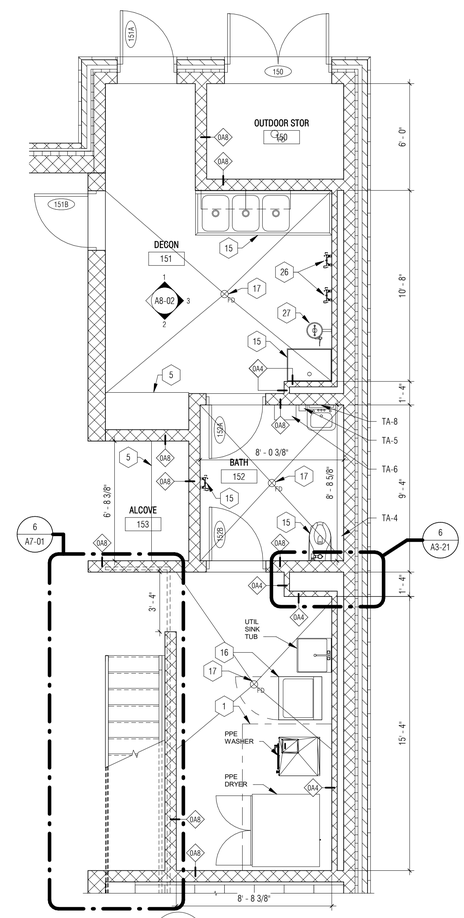
6 A3-01 Enlarged Plan- Laundry and Restroom
1/4" = 1'-0"



3 A3-01 Ground Floor -Office
1/4" = 1'-0"



2 A3-01 Enlarged Plan- Watchdesk Restroom
1/4" = 1'-0"



1 A3-01 Decon Suite
1/4" = 1'-0"

GENERAL NOTES - TOILET ACCESSORIES

A. REFER TO SPECIFICATION SECTION 102800 FOR DESCRIPTION OF TOILET ACCESSORIES.

B. CENTER FLOOR DRAIN IN ROOM UON. ENSURE 1/8" PER FOOT SLOPE TOWARD FLOOR DRAINS. (TYP.)

C. PROVIDE WD BLOCKING SUPPORT AT ALL GRAB BAR LOCATIONS PER GRAB BAR MANUFACTURER'S RECOMMENDATION.

D. FOR ALL TOILET ROOMS TO RECEIVE NEW WALL TILE AS SCHEDULED, REFER TO INTERIOR ELEVATIONS FOR WALL TILE PATTERN.

LEGEND - TOILET ACCESSORIES

TA-1 42" GRAB BAR

TA-2 36" GRAB BAR

TA-3 18" VERTICAL GRAB BAR

TA-4 STANDARD DUAL ROLLER

TA-5 PLASTIC GOJO MANUAL PUMP WALL SOAP DISPENSER

TA-6 ENMOTION PAPER TOWER ROLL DISPENSER

TA-7 DUAL HOOKS ON DOORS IN RESTROOMS

TA-8 WALL MOUNTED MIRROR (2' x 3' MIN.)

TA-9 SHOWER ROD

TA-10 CUSTODIAL/ UTILITY SHELF

TA-11 WALL MOUNTED MIRROR W/ SHELF (2' x 3' MIN.)

TA-12 SEMI RECESSED PAPER TOWER ROLL DISPENSER

FLOOR PLAN GENERAL NOTES

A. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

B. ALL PLAN DIMENSIONS ARE NOMINAL TO THE FACE OF WALLS. REFER TO WALL TYPES ON A0-05 FOR ACTUAL WALL THICKNESSES.

C. COORDINATE SIZE AND LOCATION OF ALL DUCT, SHAFT, AND LOUVER OPENINGS IN WALLS WITH MECHANICAL.

D. ALL EXPOSED CORNERS OF CONCRETE MASONRY UNITS ARE TO BE BULLNOSED.

E. REQUIRED FIRE RATED PARTITIONS, FLOORS, AND CEILINGS ARE INDICATED ON SHEET A0-03, LIFE SAFETY PLAN, AS WELL AS FIRE EXTINGUISHER & CABINET LOCATIONS.

F. REFER TO REFER TO PLUMBING DRAWINGS AND SPECIFICATIONS FOR PLUMBING FIXTURE IDENTIFICATION & LEGEND

G. REFER TO SHEETS A3-01d & A3-11 FOR DIMENSIONING INFORMATION

FLOOR PLAN KEYNOTES

1 THICKENED CONCRETE EQUIPMENT SLAB. CORDINATE SIZE & LOCATION WITH MECH & ELEC EQUIPMENT. REFER TO 3/A6-12

2 WALL MTD. PPE STORAGE - READY RACK - OWNER FURNISHED/ CONTRACTOR INSTALLED

3 ELECTRIC WATER COOLER WITH BOTTLE FILL (SEE MECH)

4 FROST SLAB AT BUILDING ENTRY, TYP. (SEE STRUCT)

5 WORK SURFACE - REFER TO INTERIOR ELEVATIONS

6 DISHWASHER - OWNER FURNISHED/ CONTRACTOR INSTALLED

7 FLOOR MOUNTED LOCKER

8 MILLWORK/ CASEWORK - REFER TO ENLARGED PLANS & ELEVATIONS

10 REFRIGERATOR, OWNER FURNISHED/ CONTRACTOR INSTALLED

11 RANGE & OVEN, OWNER FURNISHED/ CONTRACTOR INSTALLED

13 WORK SURFACE DATA GROMMET. CONFIRM SIZE & LOCATIONS w/ OWNER.

14 HOSE DRYER CABINET - READY RACK - FH6G EXPRESS GEAR 6 DRYER - REF MECH PLANS FOR DUCTING.

15 PLUMBING FIXTURE - REFER TO PLUMBING

16 WASHER/DRYER - OWNER PROVIDED/ CONTRACTOR INSTALLED - REFER TO MECH.

17 FLOOR DRAIN - REFER TO MECH - SLOPE FLOOR TO DRAIN

18 SOLID SURFACE TRANSITION AT SHOWER - REFER TO DETAIL T6 ON A0-09

19 PIPE BOLLARD - REF DET 6/A2-02

20 SITE PAVING - REFER TO CIVIL DRAWINGS

21 FLOOR MOUNTED LOCKER

22 MILLWORK - REFER TO INTERIOR ELEVATIONS

23 WALL MOUNTED MURPHY BED IN FURNITURE PACKAGE. PROVIDE 3/4" PLYWOOD WALL BACKING BEHIND GYPSUM BOARD.

24 EXTRACTOR - SEE MECH

26 DECONTAMINATION SHOWER SYSTEM. REFER TO MECH

27 EYE WASH STATION. REFER TO MECH

28 BULLETIN BOARD DISPLAY CASE AS SPECIFIED

29 'NO TURNOUT GEAR BEYOND THIS POINT' SIGN

30 STATUS MONITOR- REFER TO ELECT.

31 TV MONITOR- REFER TO ELECT.

32 UNDER-STAIR RAILING AND ACCESS GATE.

33 ELEVATED EQUPMENT SLAB, TYP. FOR ALL MECH. EQUIPMENT.

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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

DJG

CHECKED BY

DG

APPROVED BY

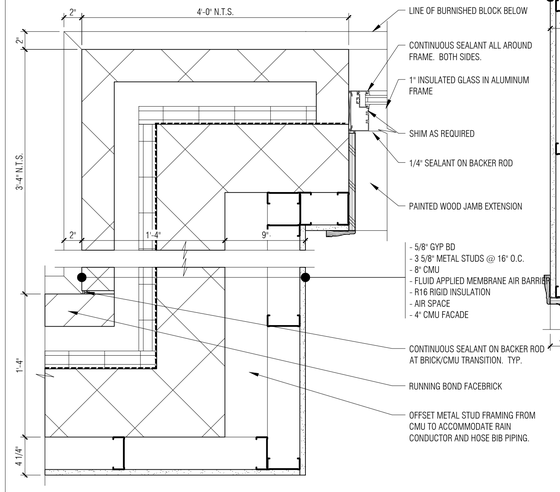
MAM

SHEET NAME

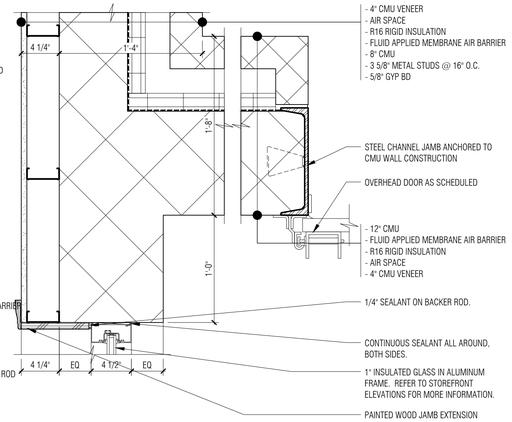
Enlarged Floor Plans

SHEET NO.

A3-11



7 A3-01 Plan Detail
1 1/2" = 1'-0"



4 A3-01 Plan Detail
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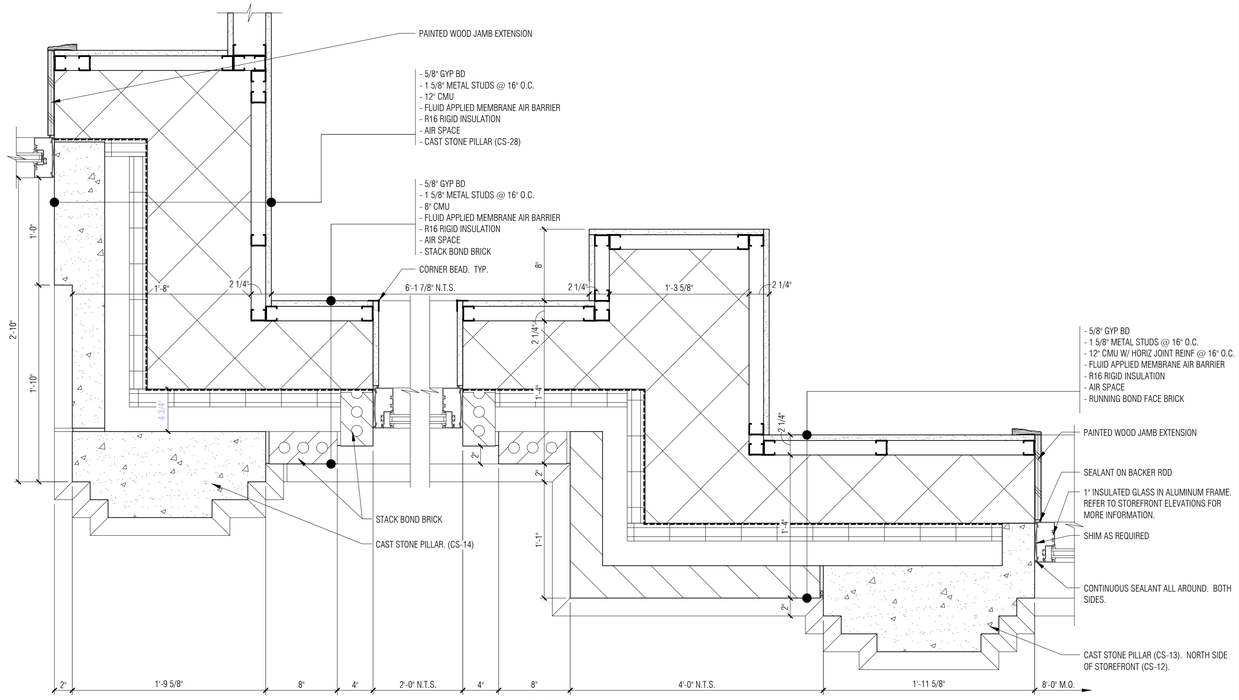
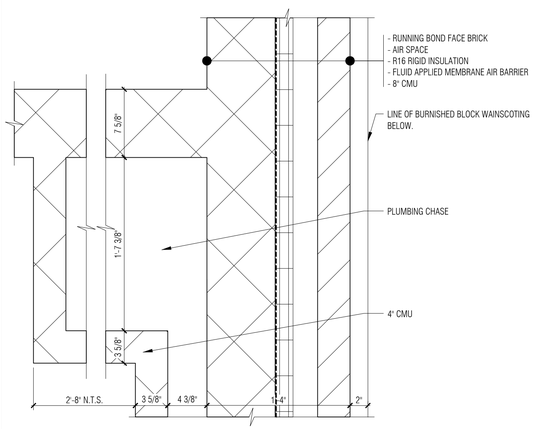
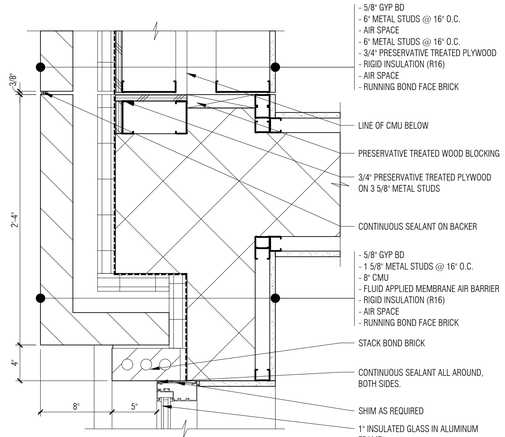


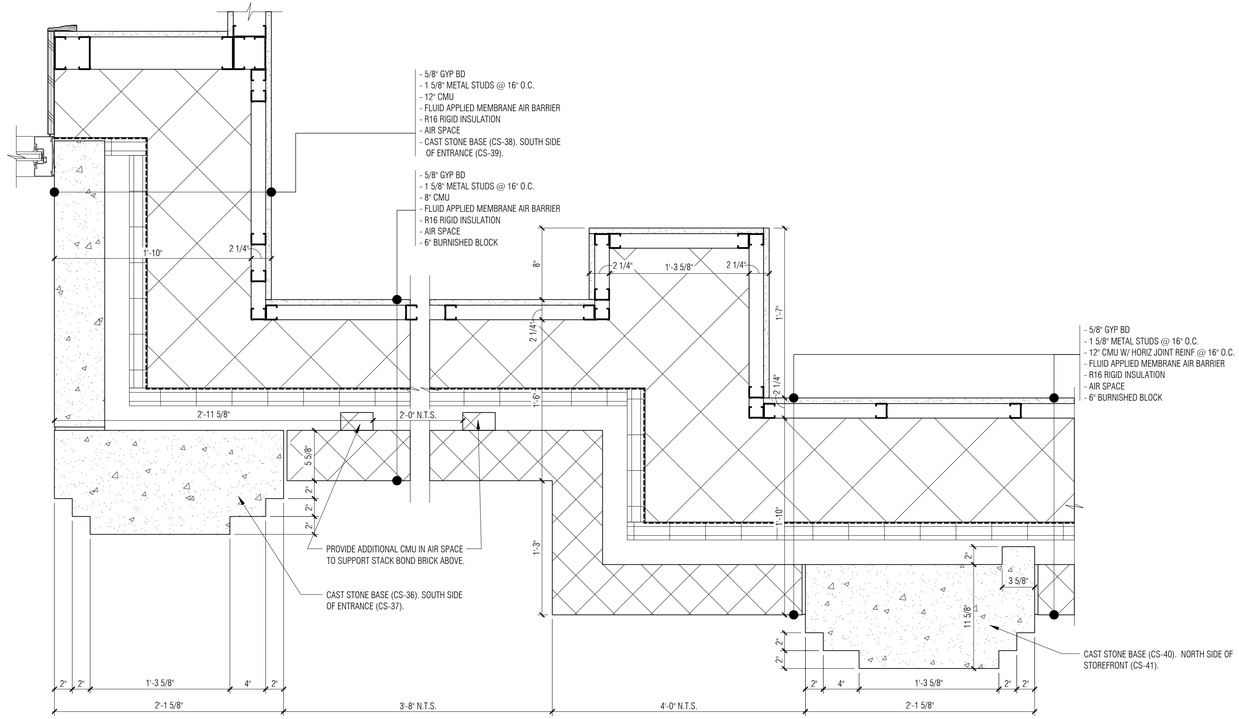
@ 3'-6" A.F.F.



6 A3-11 Plan Detail
1 1/2" = 1'-0"



3 A3-01 Plan Detail
1 1/2" = 1'-0"



@ 2'-0" A.F.F.

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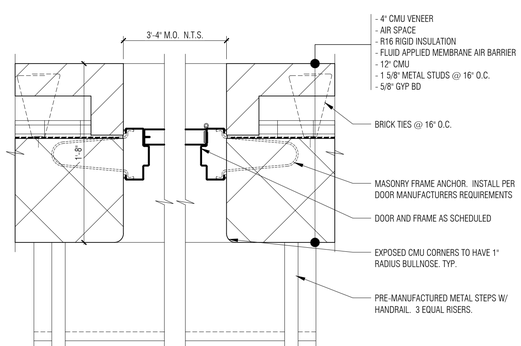

5 A7-01 Plan Detail
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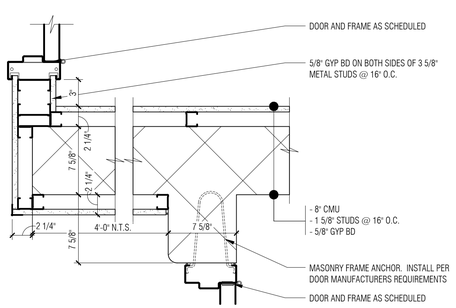

2 A3-01 Plan Detail
1 1/2" = 1'-0"

P:\2021\21-146-Warren Civic Center South Fire Station\02_CAD\03_St 1 - Civic Center South\A3-21- Plan Details.dwg - 6/13/2023 10:24:46 AM - Chris Prieb

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

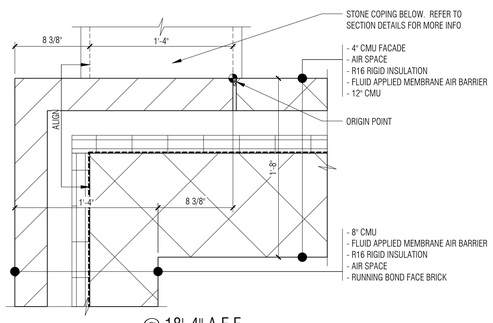
DRAWN BY
CWP

CHECKED BY
DG

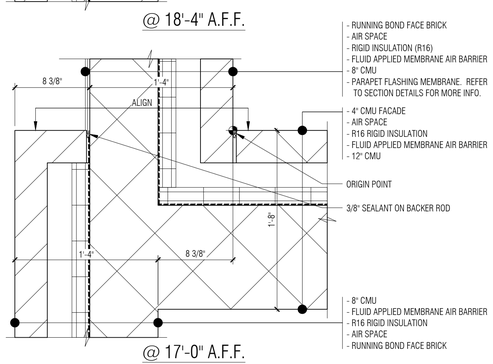
APPROVED BY
MAM

SHEET NAME
Plan Details

SHEET NO.
A3-21



@ 18'-4" A.F.F.



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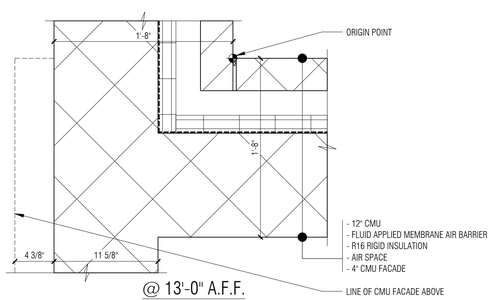

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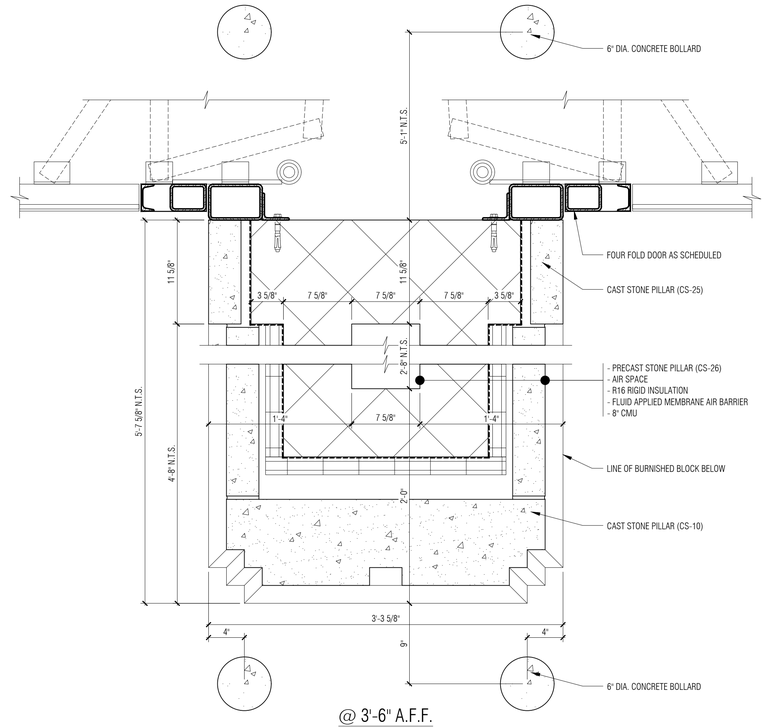
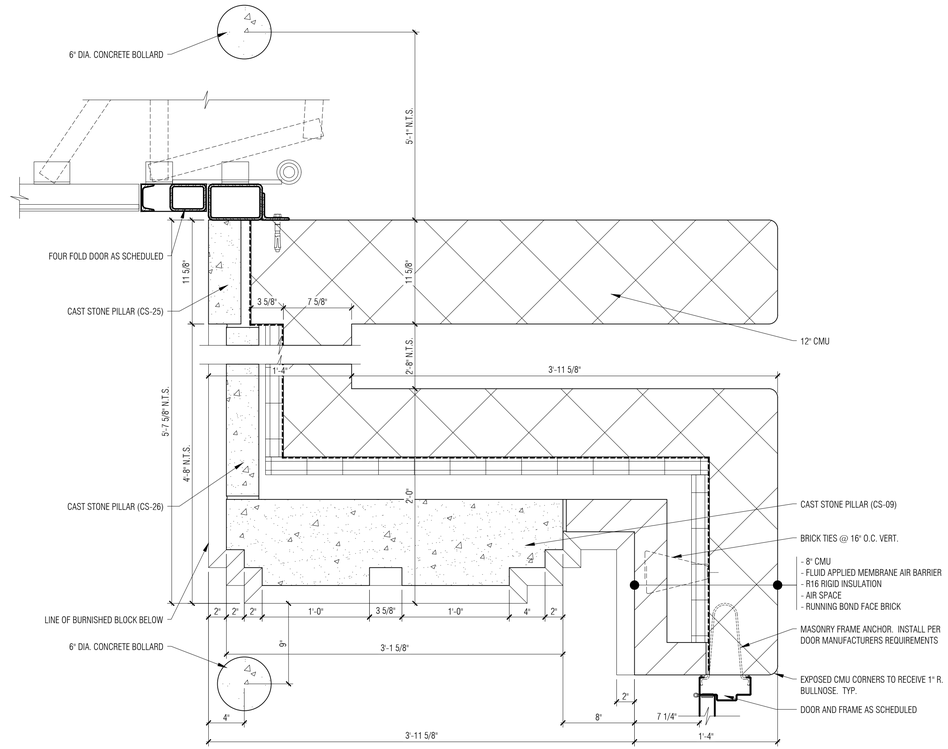
3 A3-02 Plan Detail
1 1/2" = 1'-0"



@ 3'-6" A.F.F.



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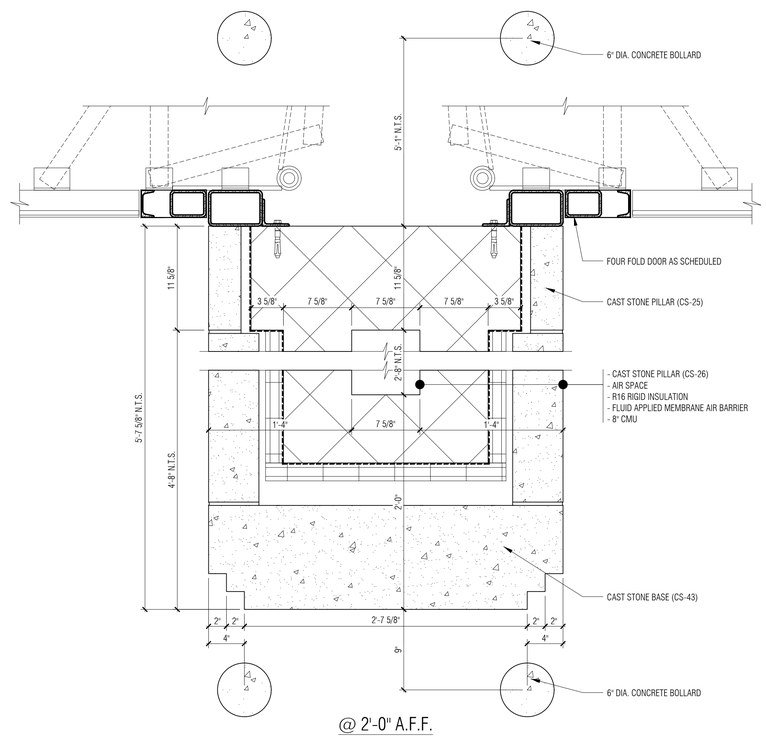
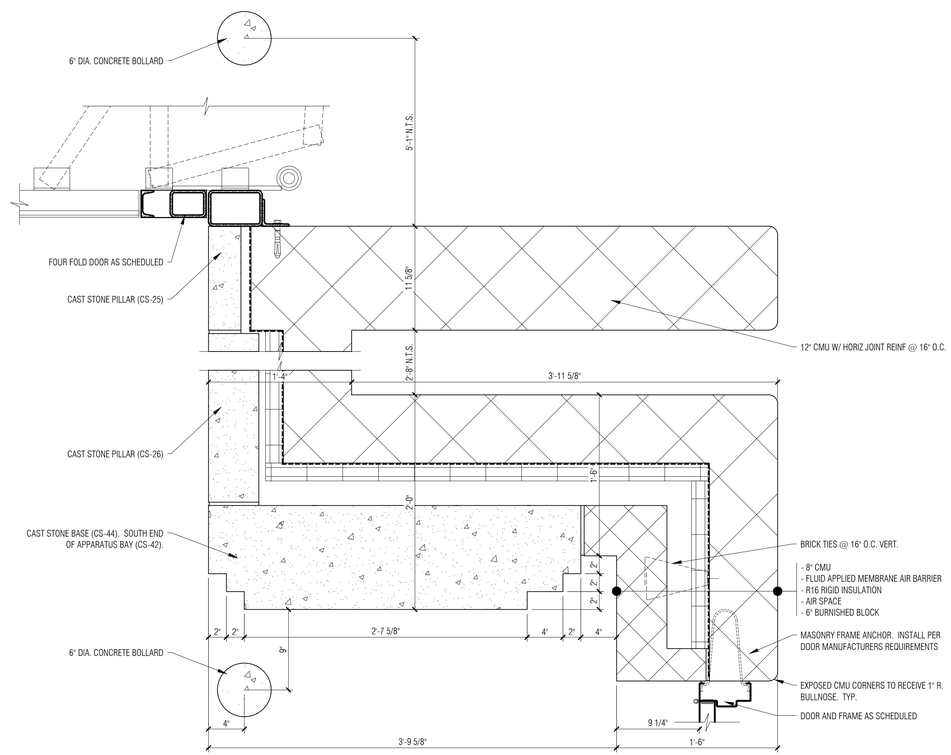


@ 2'-0" A.F.F.

2 A3-01 Plan Detail
1 1/2" = 1'-0"



@ 2'-0" A.F.F.

1 A3-01 Plan Detail
1 1/2" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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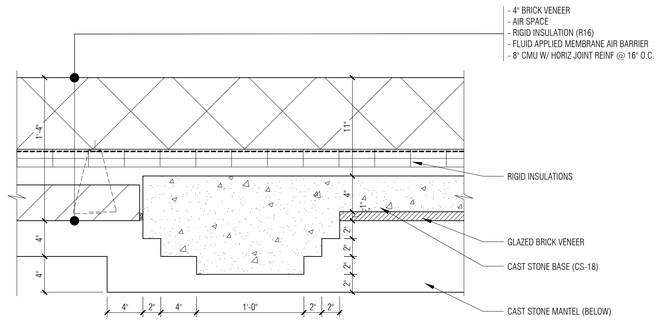
CWP

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Plan Details

SHEET NO.
A3-22



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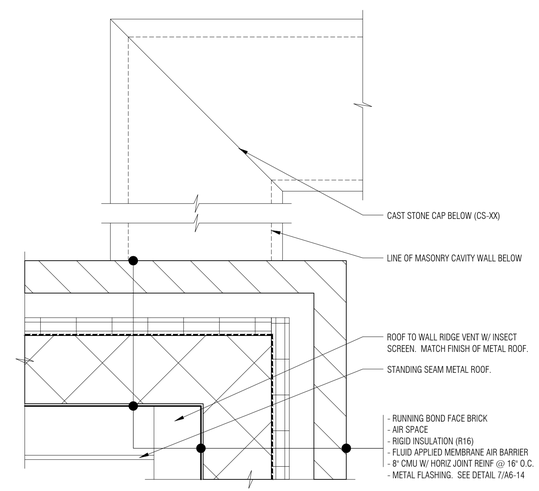

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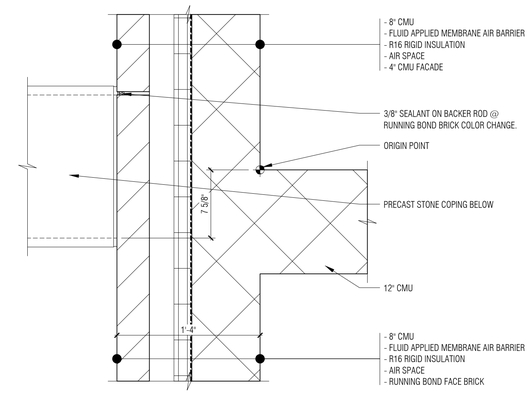
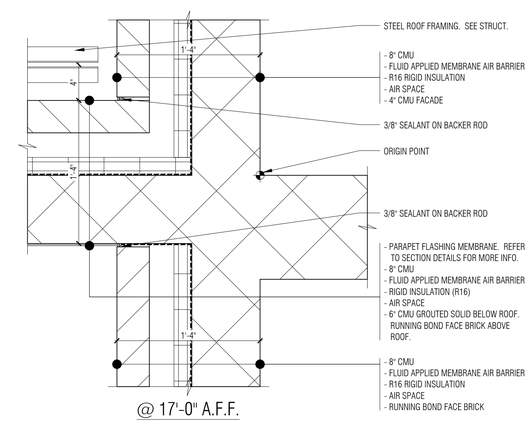


@ 18'-4" A.F.F.



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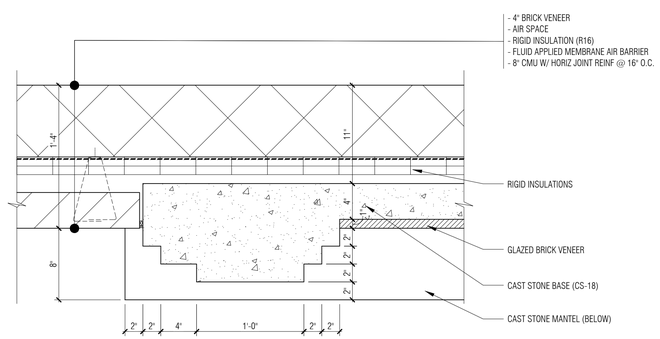

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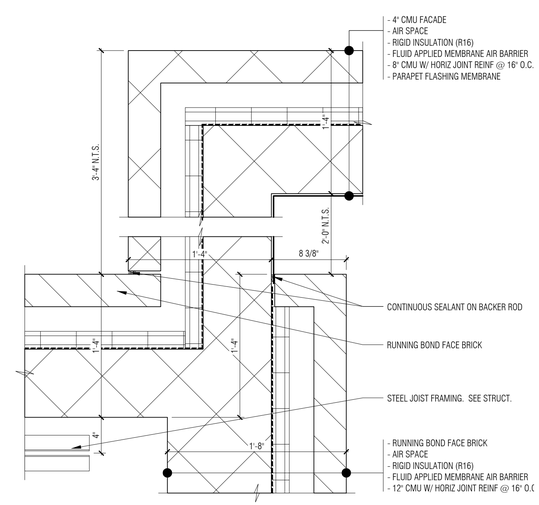

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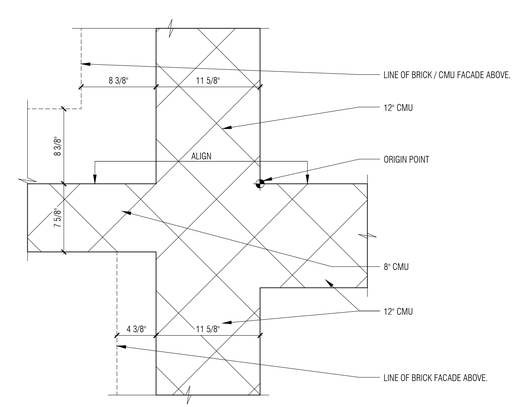

@ 11'-8" A.F.F.

3 / A3-02 Plan Detail
1 1/2" = 1'-0"

2 / A3-02 Plan Detail
1 1/2" = 1'-0"

1 / A3-02 Plan Detail
1 1/2" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

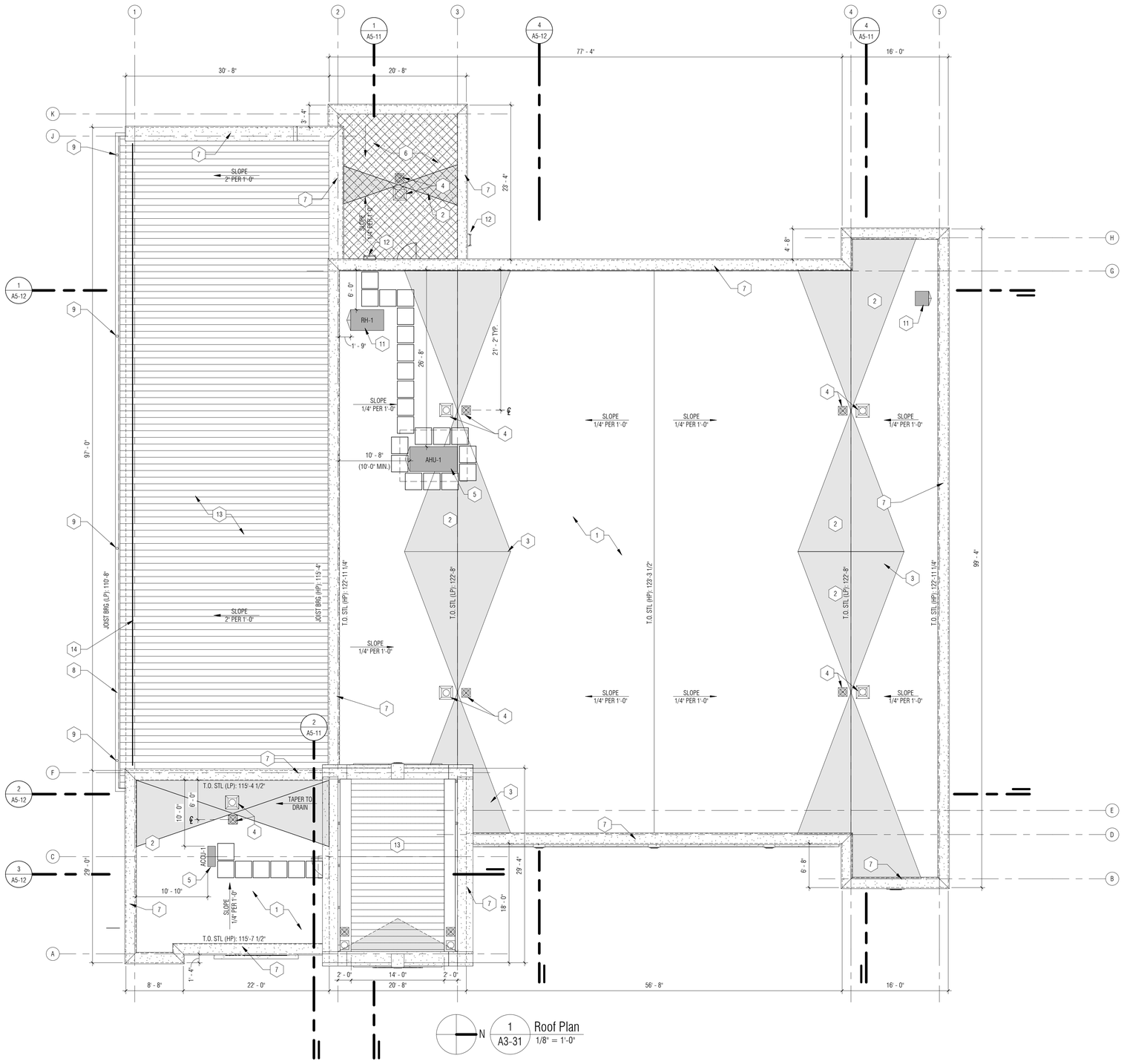
DRAWN BY
CWP

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Plan Details

SHEET NO.
A3-23



1 A3-31 Roof Plan
1/8" = 1'-0"

ROOF PLAN GENERAL NOTES

A. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.

B. ALL PLAN DIMENSIONS ARE NOMINAL TO THE FACE OF WALLS.

C. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION ABOUT ALL ROOF RELATED ITEMS.

D. REFER TO MECHANICAL FOR ALL VENT AND PIPE PENETRATION LOCATIONS. REFER TO SHEET A3-32, ROOF DETAILS.

E. REFER TO EXTERIOR ELEVATIONS FOR ALL GUTTER DOWNSPOUT LOCATIONS.

F. PROVIDE POSITIVE SLOPE TO ALL ROOF DRAINS.

ROOF PLAN KEYNOTES

1 SINGLE-PLY MEMBRANE ROOFING SYSTEM REFER TO 7/A3-32

2 AREA OF TAPERED ROOF INSULATION BENEATH SINGLE-PLY MEMBRANE ROOFING SYSTEM

3 ROOF INSULATION SADDLE

4 ROOF DRAIN AND OVERFLOW DRAIN- REFER TO 2/A3-32

5 ROOF TOP UNIT - REFER TO MECH

6 COMPOSITE ROOF PAVER SYSTEM- REFER TO 10/A3-32

7 CAST STONE PARAPET CAP

8 PRE-FIN MTL GUTTER. A-STYLE PROFILE. 4" DEEP X 6" WIDE, MIN.

9 PRE-FIN METAL DOWNSPOUT. RECTANGULAR PROFILE. 4" SQUARE. CONNECT INTO POWDERCOATED, CAST IRON DOWNSPOUT BOOT. COLOR AS SELECTED BY ARCHITECT.

10 ADHERED WALKWAY PADS - REF SPEC

11 ROOF EXHAUST ON CURB - REF MECH

12 WALL MOUNTED ROOF LADDER (PNT-X) REFER TO 11/A3-32

13 STANDING SEAM METAL ROOF ON CONT. ICE/WATER SHIELD

14 RAIL TYPE SNOW GUARD- REFER TO SPEC.

ROOF SYMBOLS LEGEND

SLOPE 1/4" PER 1'-0"	ROOF SLOPE INDICATION
	ROOF SUMP
	OVERFLOW ROOF SUMP
	ROOF HATCH
	WALKWAY PAD
	TAPERED INSULATION
	COMPOSITE ROOF PAVER SYSTEM
	CURB MOUNTED EQUIPMENT
	ICE AND WATER SHIELD
	STANDING SEAM ROOM

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Mount Clemens, MI 48043
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F 586.469.3607

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KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 6/13/23

DRAWN BY
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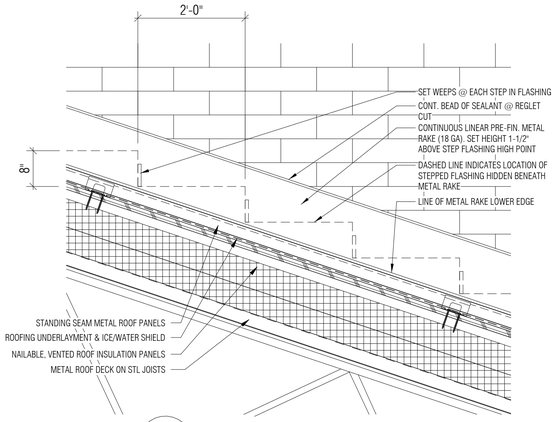
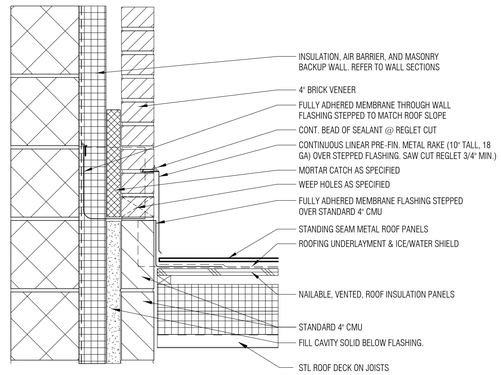
APPROVED BY
MAM

SHEET NAME
Roof Plan

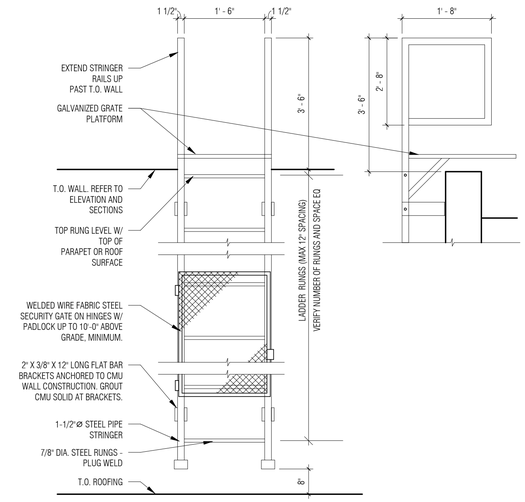
SHEET NO.
A3-31



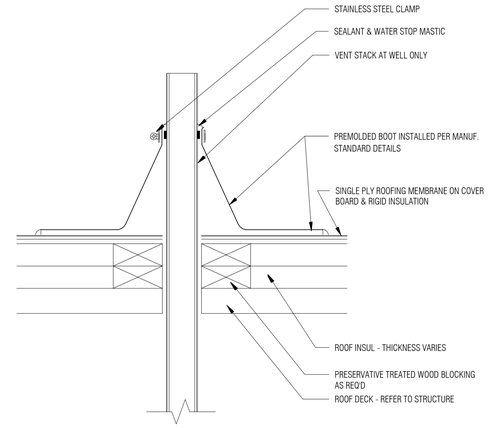
12 Step Flashing Elevation Detail
3/4" = 1'-0"



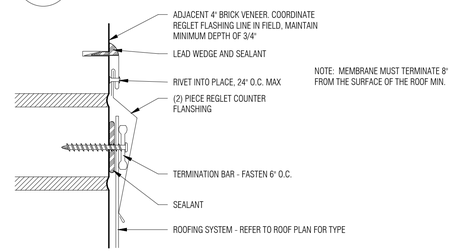
10 Thru-Wall Step Flashing Section Detail - New Construction
1-1/2" = 1'-0"



7 Roof Ladder Detail
3/4" = 1'-0"

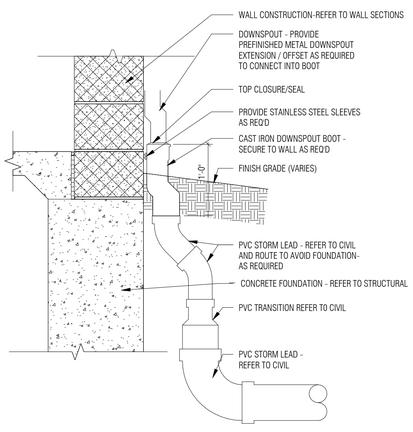


4 Low Slope Roof Pipe Penetration
1 1/2" = 1'-0"

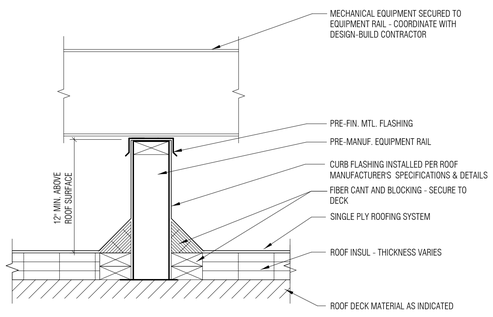


NOTE: MEMBRANE MUST TERMINATE 8" FROM THE SURFACE OF THE ROOF MIN.

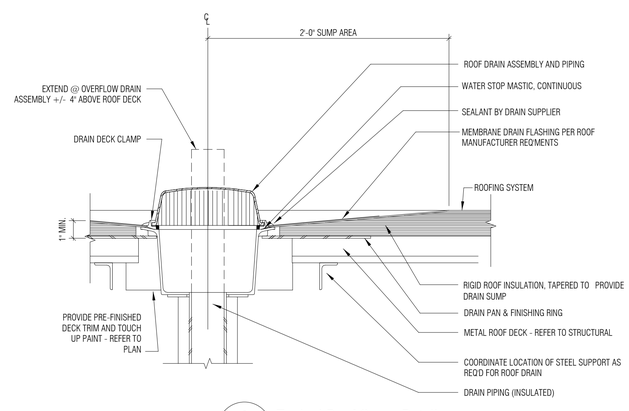
3 Two Piece Reglet Counter Flashing
1 1/2" = 1'-0"



11 Downspout "Boot"
1" = 1'-0"

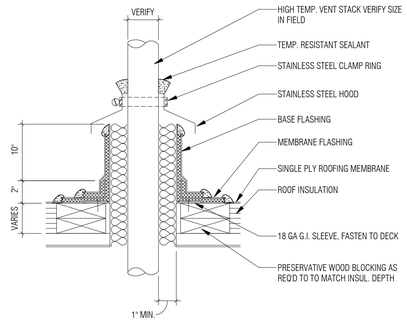


9 Typ. Equip. Support Rail
1 1/2" = 1'-0"

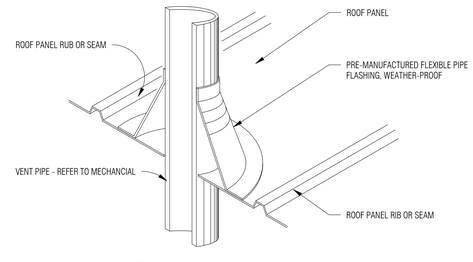


6 Typical Roof Sump Detail
1 1/2" = 1'-0"

2 Typ. Roof Section @ Pavers
1 1/2" = 1'-0"

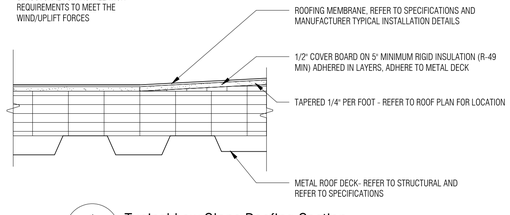


8 Hot Vent Stack Detail
1 1/2" = 1'-0"



5 Steep Slope Pipe Penetration Detail
1 1/2" = 1'-0"

NOTE: REFER TO SPECIFICATION AND STRUCTURAL FOR INSTALLATION REQUIREMENTS TO MEET THE WIND/UPLIFT FORCES



1 Typical Low Slope Roofing Section
1 1/2" = 1'-0"

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KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

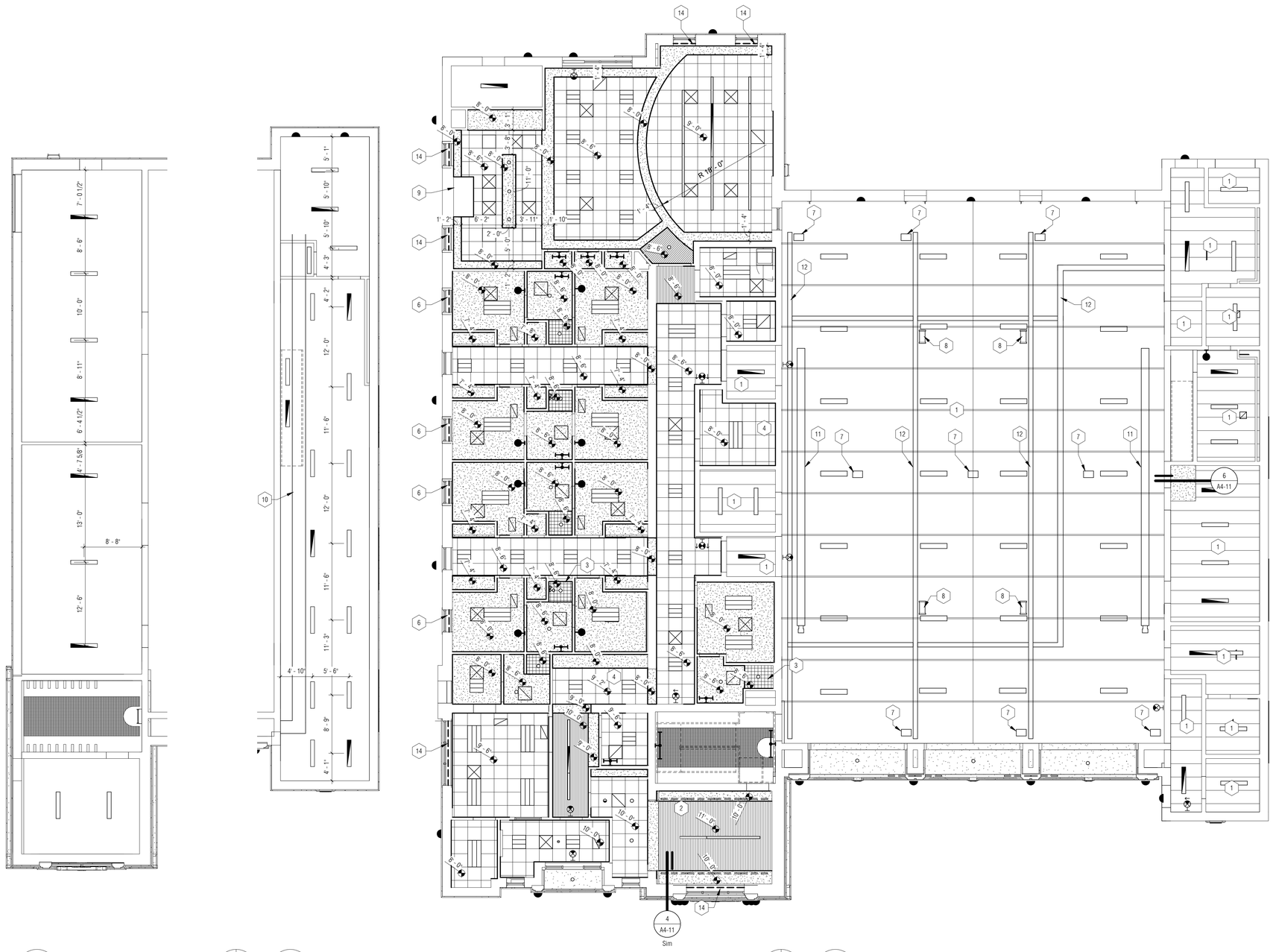
DRAWN BY
DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Roof Details

SHEET NO.
A3-32



3 A4-01 South Mezzanine RCP
1/8" = 1'-0"

2 A4-01 North Mezzanine RCP
1/8" = 1'-0"

1 A4-01 Reflected Ceiling Plan
1/8" = 1'-0"

REFLECTED CEILING PLAN GENERAL NOTES

A. REFER TO FLOOR PLANS FOR ROOM NAMES, NUMBERS, AND DIMENSIONS

B. REFER TO ELECTRICAL FOR LIGHT FIXTURE TYPES AND SCHEDULES

C. REFER TO MECHANICAL FOR DIFFUSER, REGISTER, & RETURN TYPES AND SCHEDULES

D. ALL LIGHT FIXTURES ARE TO CENTERED WITH THE CEILING TILE GRID AND GYPSUM BOARD SOFFITS, U.O.N.

E. CEILING GRID IS TO BE CENTERED IN THE ROOM, U.O.N.

F. PAINT ALL EXPOSED STRUCTURE, MECHANICAL, AND ELECTRICAL

G. ALL EXPOSED FIRE SUPPRESSION PIPES TO BE PAINTED

H. FIRE SUPRESSION HEADS TO BE CENTERED IN CEILING TILES IN BOTH DIRECTIONS

I. REFER TO EXTERIOR, INTERIOR ELEVATIONS AND ROOM FINISH SCHEDLE FOR FINISHES

REFLECTED CEILING PLAN KEYNOTES

1 EXPOSED UNDER SIDE OF METAL DECK/ CONCRETE PLANK

2 GYP CEILING

3 TILED CEILING

4 ACOUSTIC TILE CEILING

6 WINDOW SHADE DUAL ROLLER (RS-2)- REF SPEC

7 POWER REEL- REF ELEC

8 HOSE REEL- REF MECH

9 RANGE HOOD -REF MECH

11 GAS RADIANT TUBE HEATER- REF MECH

12 VEHICLE EXHAUST SYSTEM- REF MECH

14 WINDOW SHADE SINGLE ROLLER (RS-1)- REF SPEC

Ceiling Symbols Legend

	Light Fixture (Above). Used to represent cove lighting & exterior sign lighting.
	Linear Recessed/ Pendant Light
	24" x 24" Recessed Light
	Linear Recessed Light
	24"x48" Lay-In Fixture
	Wall Mounted Linear Light
	Rectangular Recessed Light
	Linear Light Fixture
	Surface Mount Light
	Wall Mounted Light
	Wall Mounted Light
	Pendant Light
	Recessed Downlight
	Recessed Light Fixture
	12" x 24" Return Grill
	24" x 24" Return Grill
	12" x 12" Return Grill
	4' Supply Diffuser
	24" x 24" Supply Diffuser
	Exit Light. Arrow indicates direction. Filled area indicates facing. "⊥" shape indicates wall mounted.

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SHEET NAME
Ground Floor & Mezzanine Reflected Ceiling Plans

SHEET NO.
A4-01

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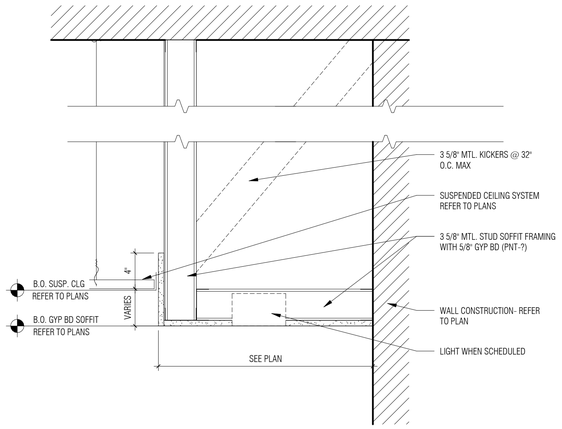
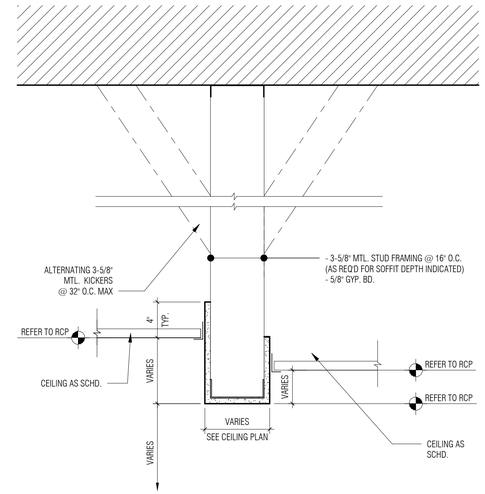
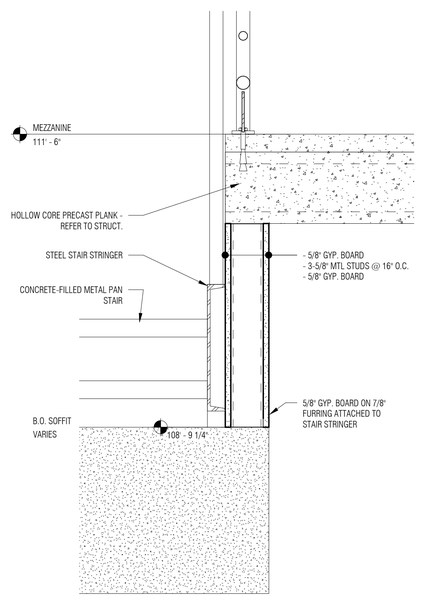


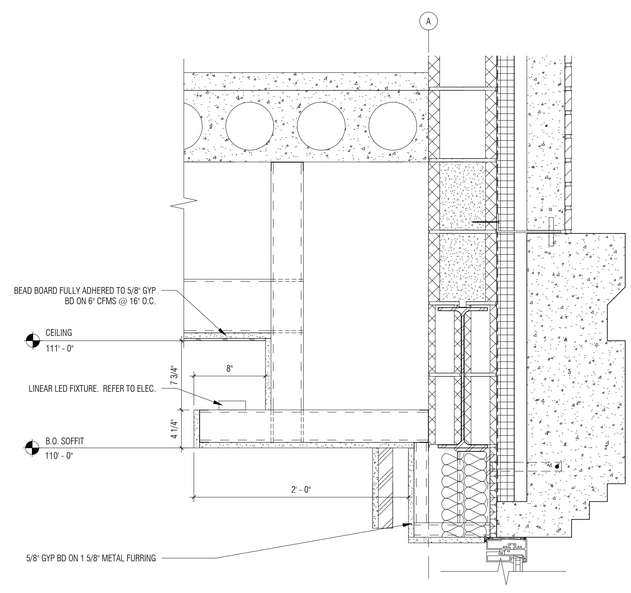
5 Typ. Perimeter Soffit Detail
1 1/2" = 1'-0"



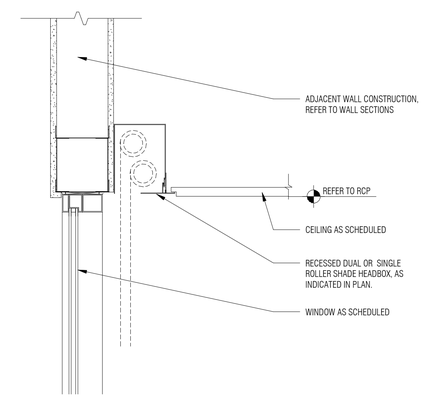
3 Ceiling Transition Detail
1 1/2" = 1'-0"



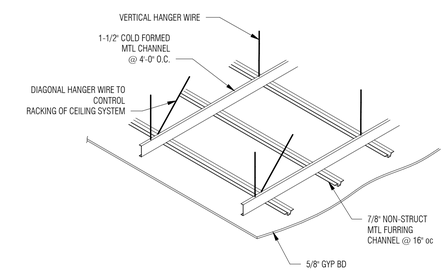
6 A4-01 Ceiling Under Stair Detail
1 1/2" = 1'-0"



4 A4-01 Ceiling Cove Detail
1 1/2" = 1'-0"



2 Roller Shade Detail
1 1/2" = 1'-0"



1 Typ. Suspended Ceiling
1 1/2" = 1'-0"

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Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 6/13/23

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DJG

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DG

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MAM

SHEET NAME
Ceiling Details

SHEET NO.
A4-11

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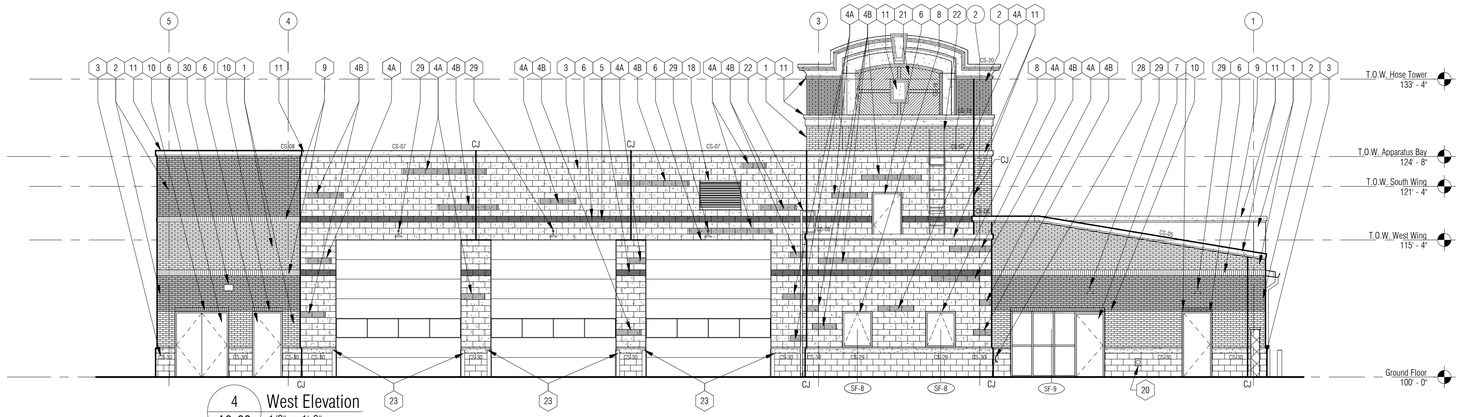
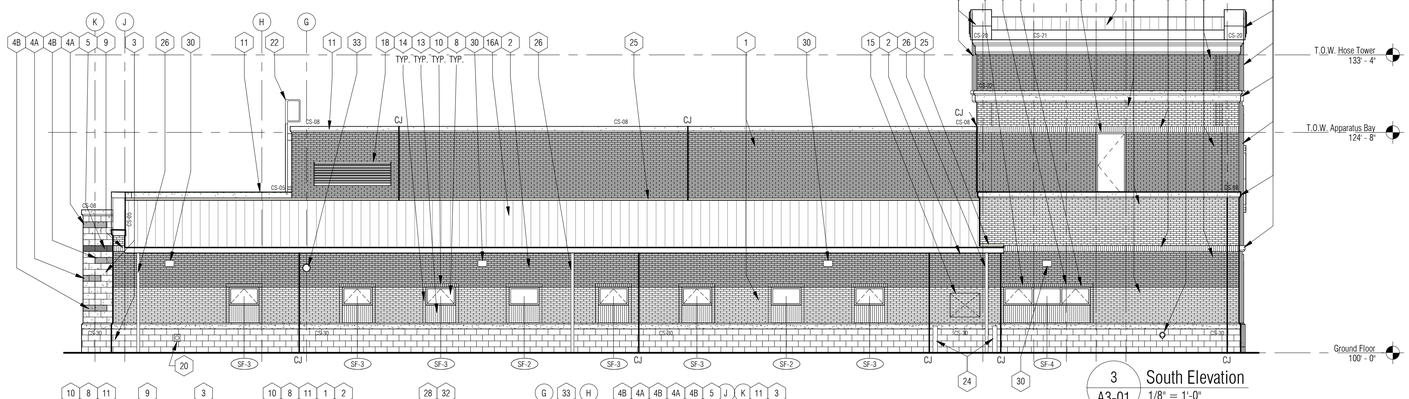
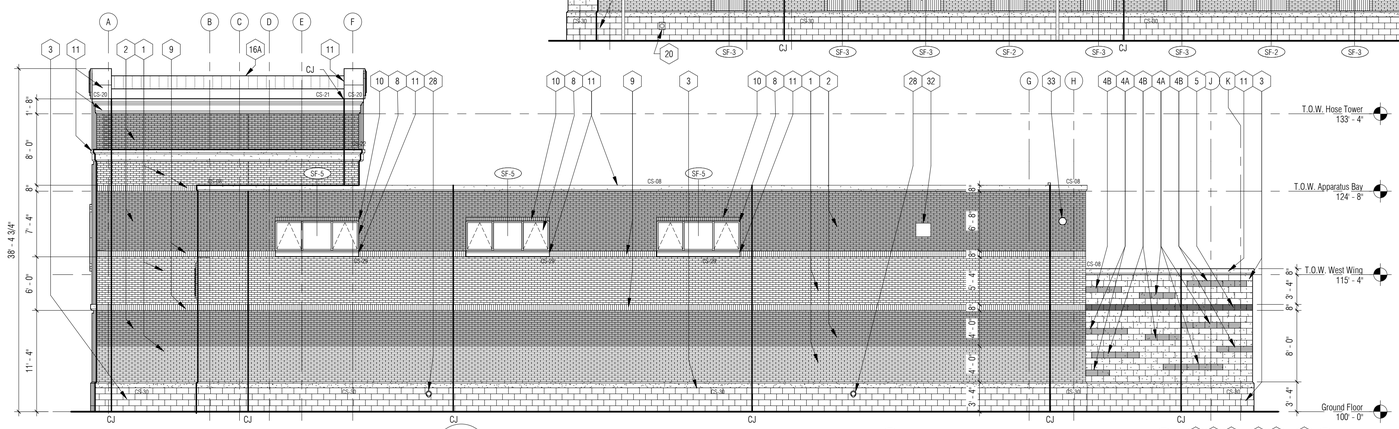


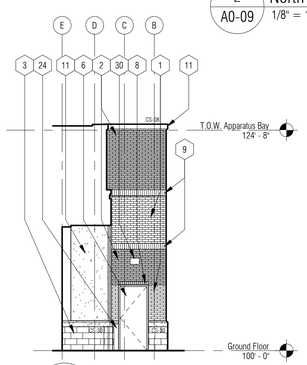
4 A0-09 West Elevation 1/8" = 1'-0"



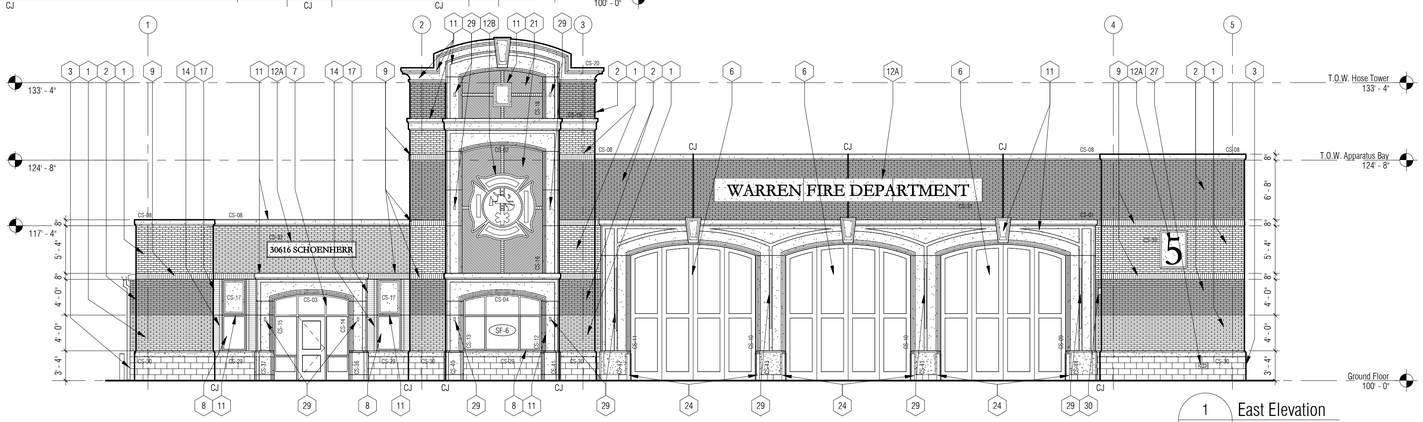
3 A3-01 South Elevation 1/8" = 1'-0"



2 A0-09 North Elevation 1/8" = 1'-0"



5 A3-01 South Elevation 1/8" = 1'-0"



1 A3-01 East Elevation 1/8" = 1'-0"

ELEVATION GENERAL NOTES

A. REFER TO 002000 MATERIAL FINISH COLOR SCHEDULE FOR COLOR SELECTIONS.

B. REFER TO A6-20 SERIES DRAWINGS FOR CAST STONE DIMENSIONS AND PROFILES.

EXTERIOR ELEVATION KEY NOTES

1	CLAY BRICK (FB-1)
2	CLAY BRICK (FB-2)
3	GROUND FACE MASONRY BLOCK (GFM-2)
4A	GROUND FACE MASONRY BLOCK (RECESS MASONRY BLOCK UNITS 1" AS INDICATED BY SHADED AREA)(GFM-1)
4B	GROUND FACE MASONRY BLOCK (PROJECT MASONRY BLOCK UNITS 1" AS INDICATED BY SHADED AREA) (GFM-1)
5	GROUND FACE MASONRY BLOCK (GFM-3)
6	EXTERIOR DOOR AS SCHEDULED
7	ALUMINUM STOREFRONT ENTRANCE SYSTEM
8	ALUMINUM STOREFRONT WINDOW SYSTEM
9	SOLDIER BRICK BAND (FB-1)
10	CUT SOLDIER BRICK OPENING(FB-2)
11	CAST STONE
12A	ENGRAVED CAST STONE SIGNAGE - REFER TO A0-05
12B	CAST STONE & CAST METAL MEDALLION
13	3 COURSE SOLDIER BRICK RECESSED 1" (FB-1)
14	ROWLOCK BRICK WINDOW FRAME (FB-1)
15	KNOCK-DOWN PANEL
16A	STANDING SEAM METAL ROOF
16B	ASPHALT SHINGLE ROOF W/ ICE/WATER SHIELD AROUND PERIMETER
17	STACKED BRICK (FB-1)
18	PRE-FINISHED LOUVER - REFER TO MECH
20	UTILITY METER - REF MECH/ELEC
21	FLEMISH BOND GLAZED BRICK @ 45 - REFER TO DETAIL 2/A6-11
22	BUILDING MOUNTED LADDER - REF DET 7/A3-32
23	PIPE BOLLARD - REF DET 7/A2-02
24	CONCRETE BOLLARD - REF DET 3/A2-02
25	ROOF TO WALL FLASHING 8" MIN
26	PRE-FIN METAL DOWNSPOUT - REFER TO CIVIL
27	FIRE DEPARTMENT CONNECTION. MIN 18" ABOVE GRADE. REFER TO MECH
28	OVERFLOW RAIN CONDUCTOR COWSTOUNGE. CL OF PIPE AT 2'-0" A.F.F. REFER TO MECH
29	WALL SCONCE. REFER TO ELEC FOR MOUNTING HEIGHT AND TYPE
30	WALL PACK. REFER TO ELEC FOR MOUNTING HEIGHT AND TYPE
31	PRE-FIN METAL GUTTER
32	MECH EXAUST HOOD-REFER TO MECH. PRIME AND PAINT.
33	PRE-FINISHED EXHAUST VENT - REFER TO MECH. PRIME AND PAINT.

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KEY PLAN

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PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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DJG

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DG

APPROVED BY

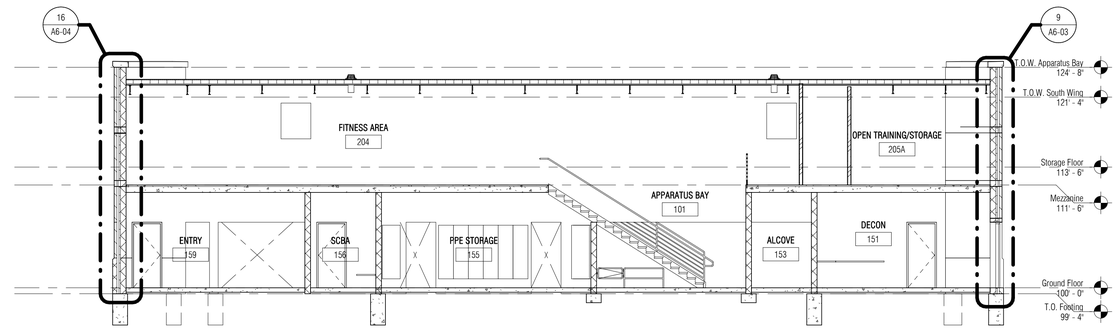
MAM

SHEET NAME

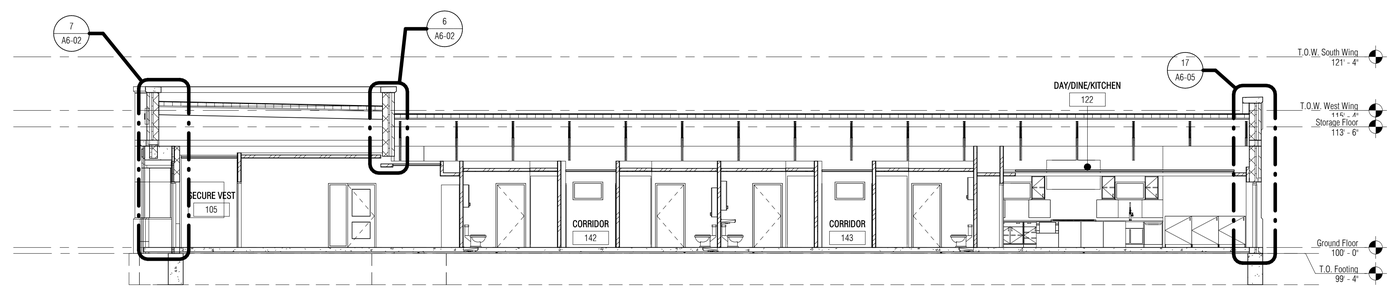
Exterior Elevations

SHEET NO.

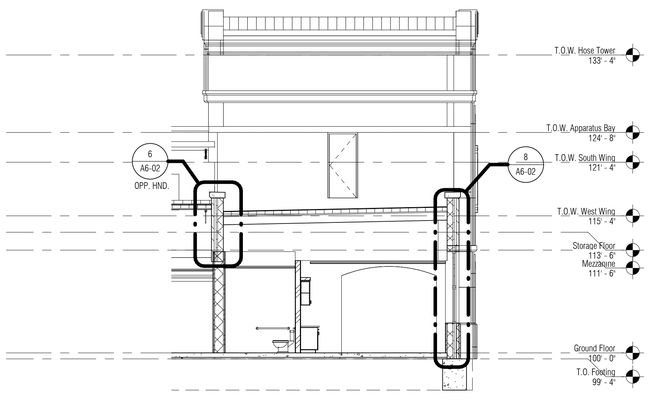
A5-01



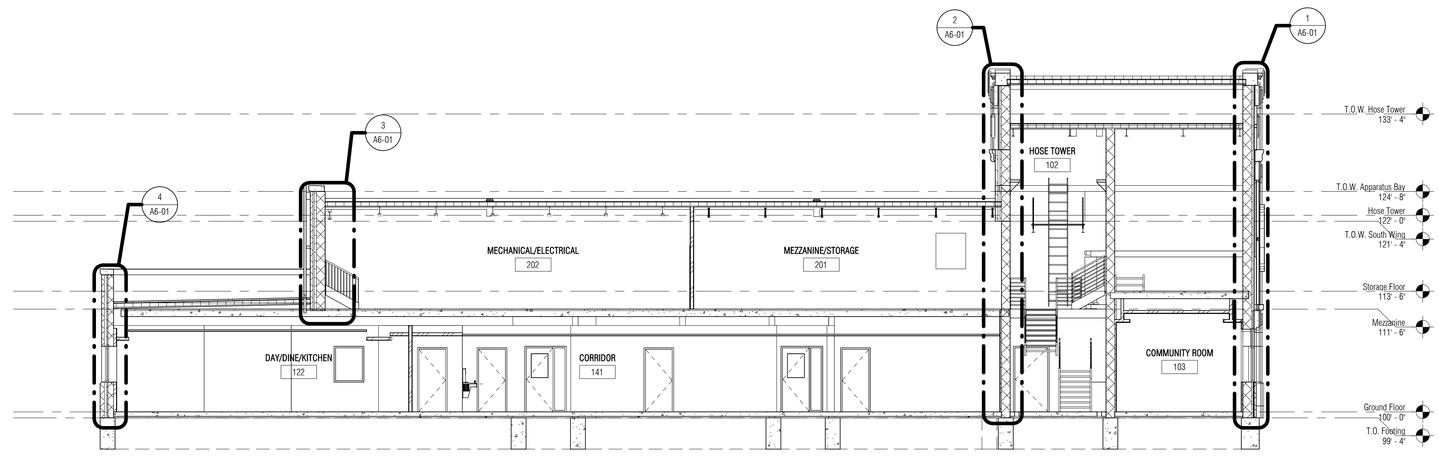
4 A3-01 Building Section
1/8" = 1'-0"



3 A3-01 Building Section
1/8" = 1'-0"



2 A3-01 Building Section
1/8" = 1'-0"



1 A3-01 Building Section
1/8" = 1'-0"

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PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

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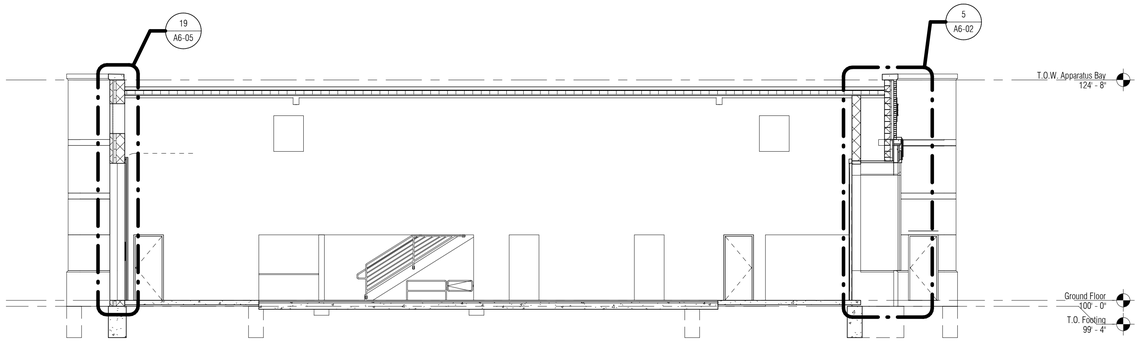
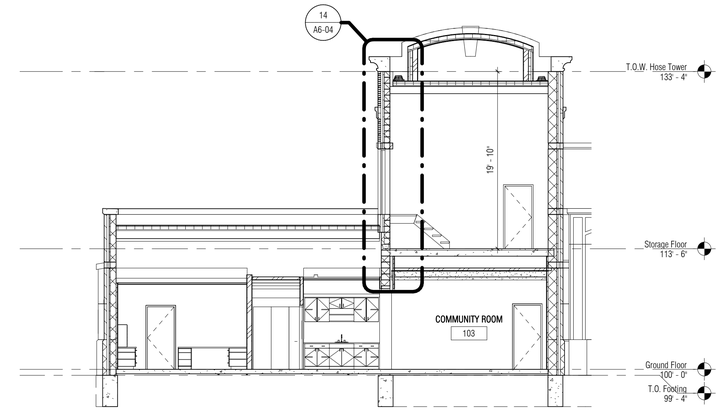
SHEET NAME
Building Sections

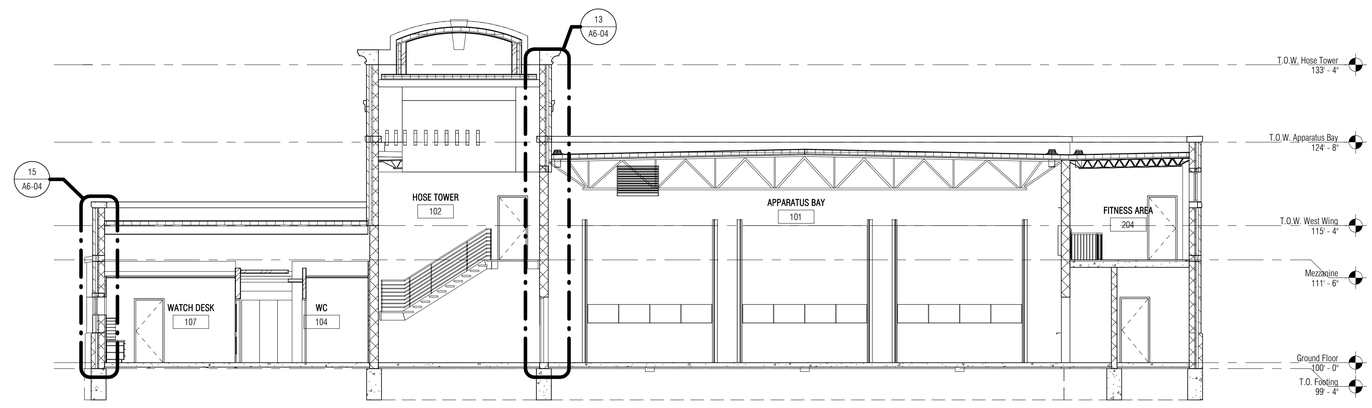
SHEET NO.
A5-11



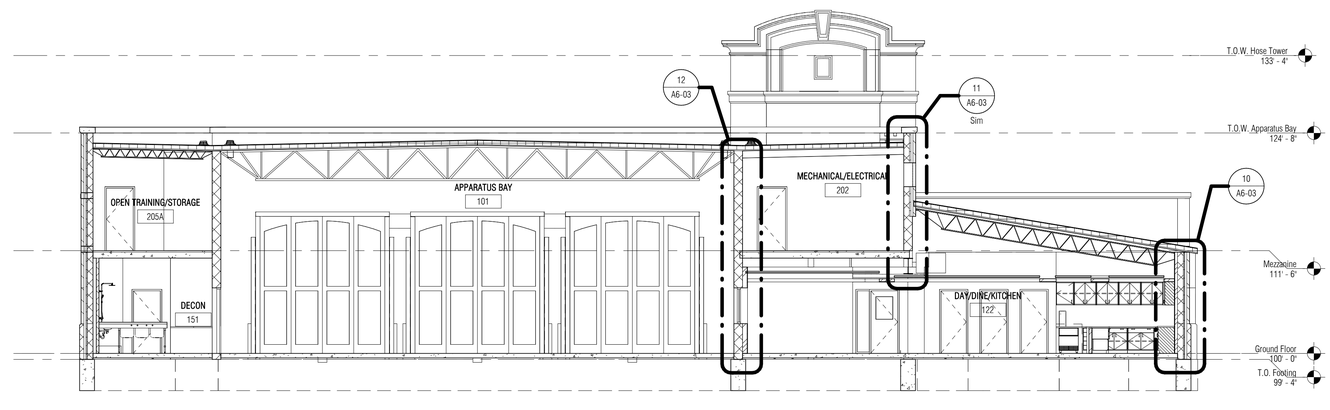
4 A3-01 Building Section
1/8" = 1'-0"



3 A3-01 Building Section
1/8" = 1'-0"



2 A3-01 Building Section
1/8" = 1'-0"



1 A3-01 Building Section
1/8" = 1'-0"

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Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Building Sections

SHEET NO.
A5-12

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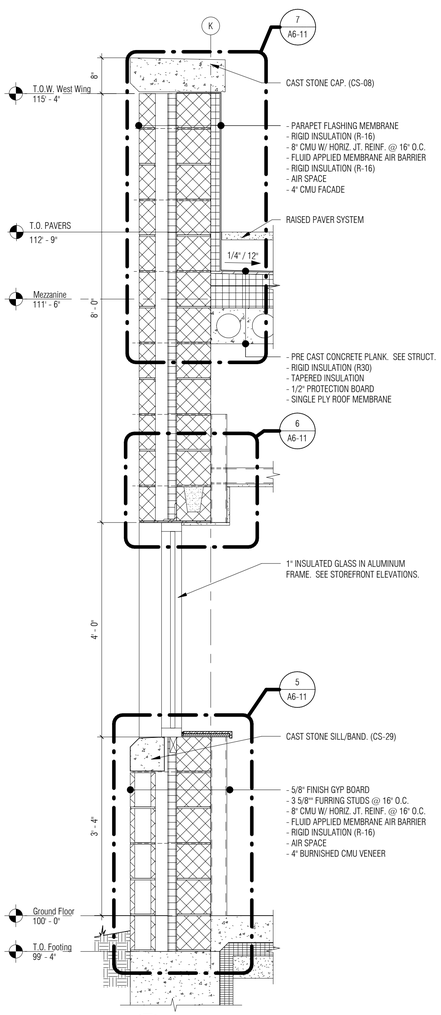
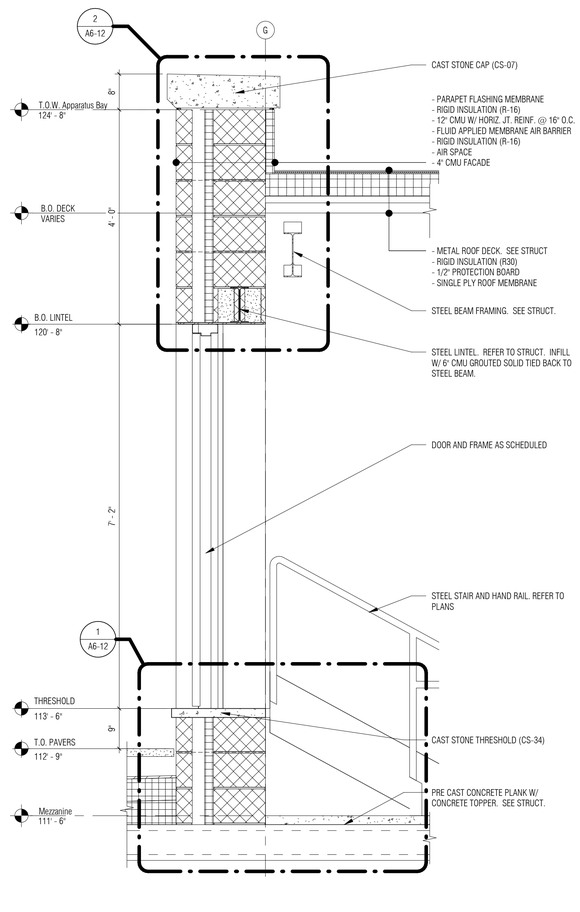
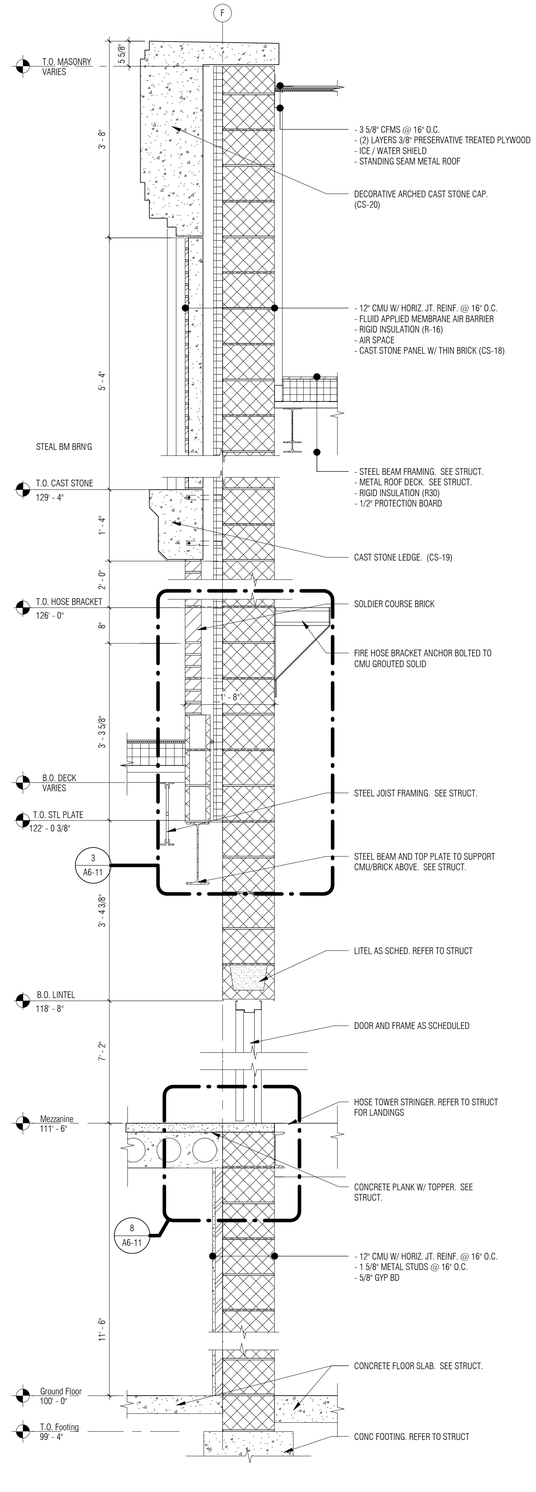


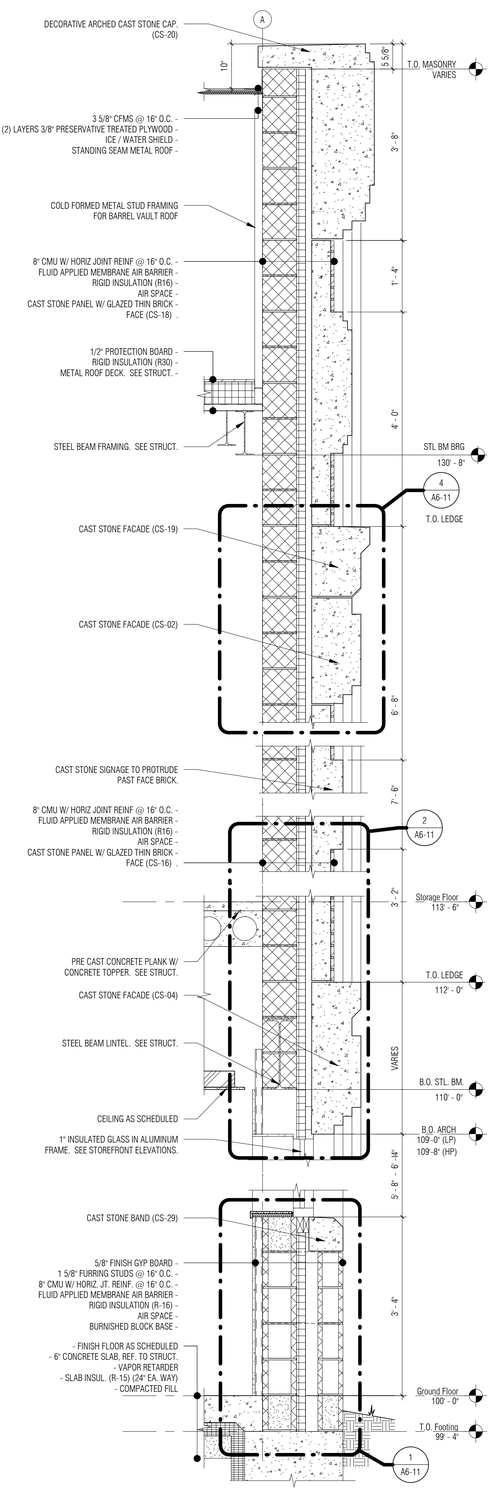
4 A5-11 Wall Section
3/4" = 1'-0"



3 A5-11 Wall Section
3/4" = 1'-0"



2 A5-11 Wall Section
3/4" = 1'-0"



1 A5-11 Wall Section
3/4" = 1'-0"

6/13/2023 11:43:47 AM C:_revitlocal\21-146 WFD STATION 1 FD_DownsCHDMKH.rvt

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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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DG

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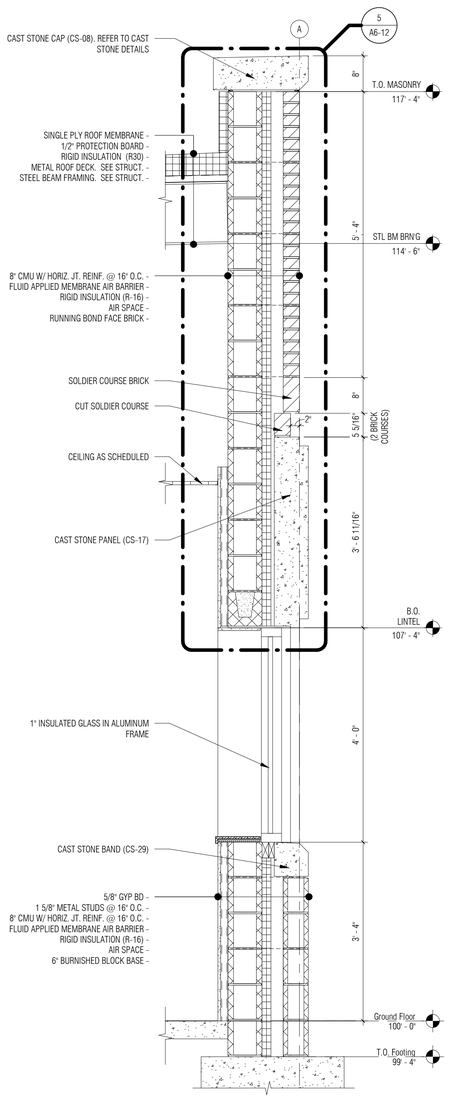
SHEET NAME

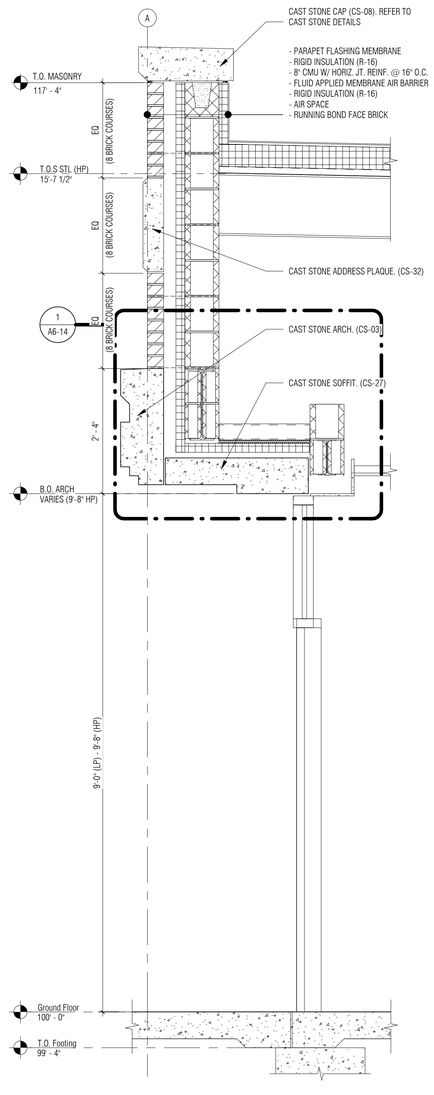
Wall Sections

SHEET NO.

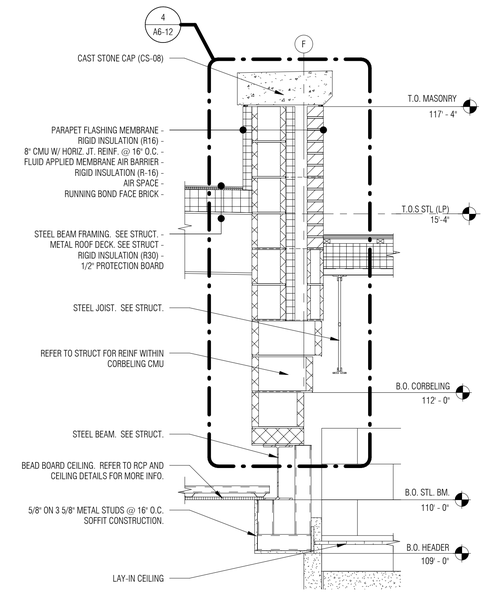
A6-01



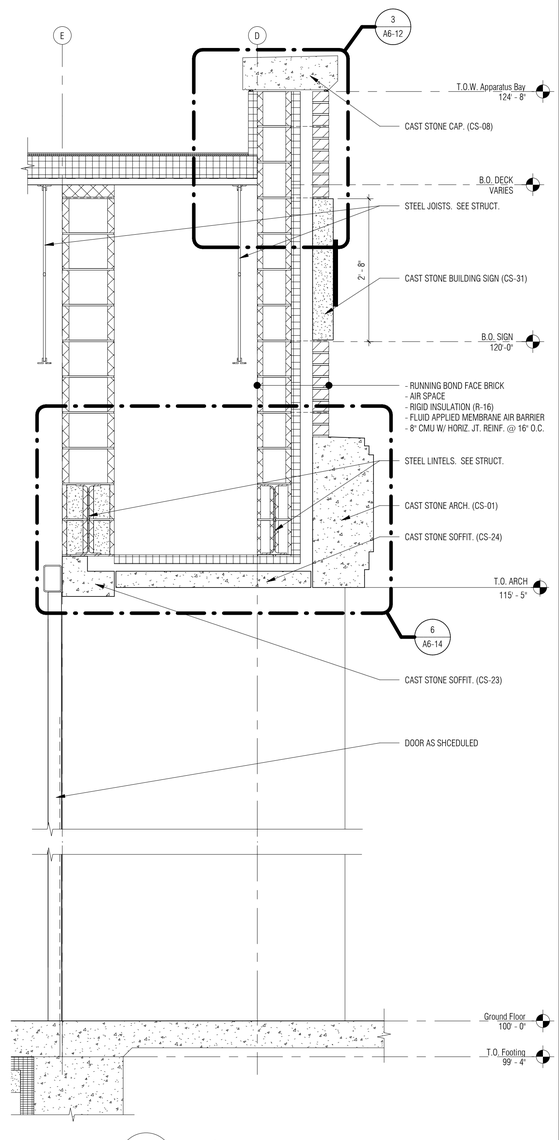
8 / A5-11 Wall Section
3/4" = 1'-0"



7 / A5-11 Wall Section
3/4" = 1'-0"



6 / A5-11 Wall Section
3/4" = 1'-0"



5 / A5-12 Wall Section
3/4" = 1'-0"

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OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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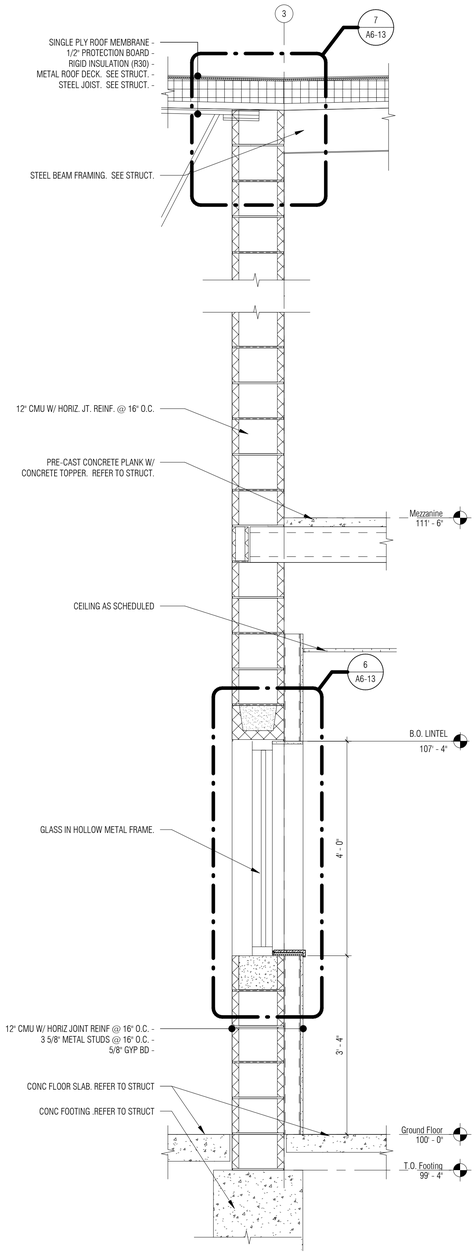
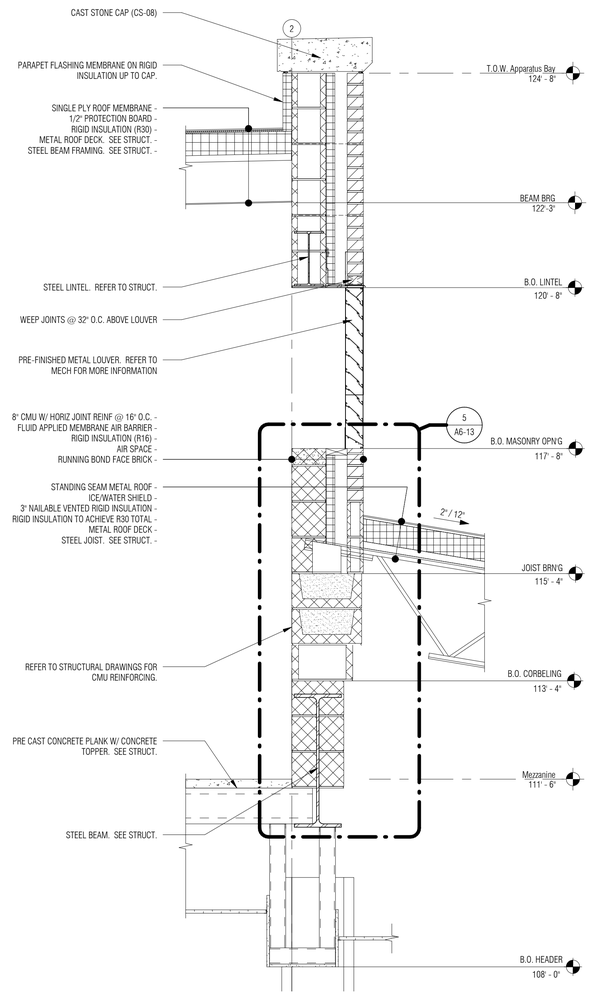
SHEET NAME
Wall Sections

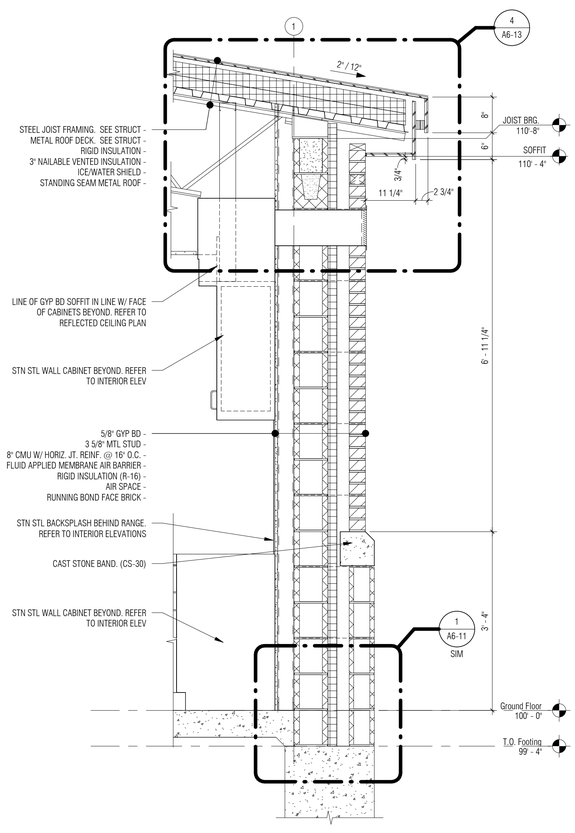
SHEET NO.
A6-02



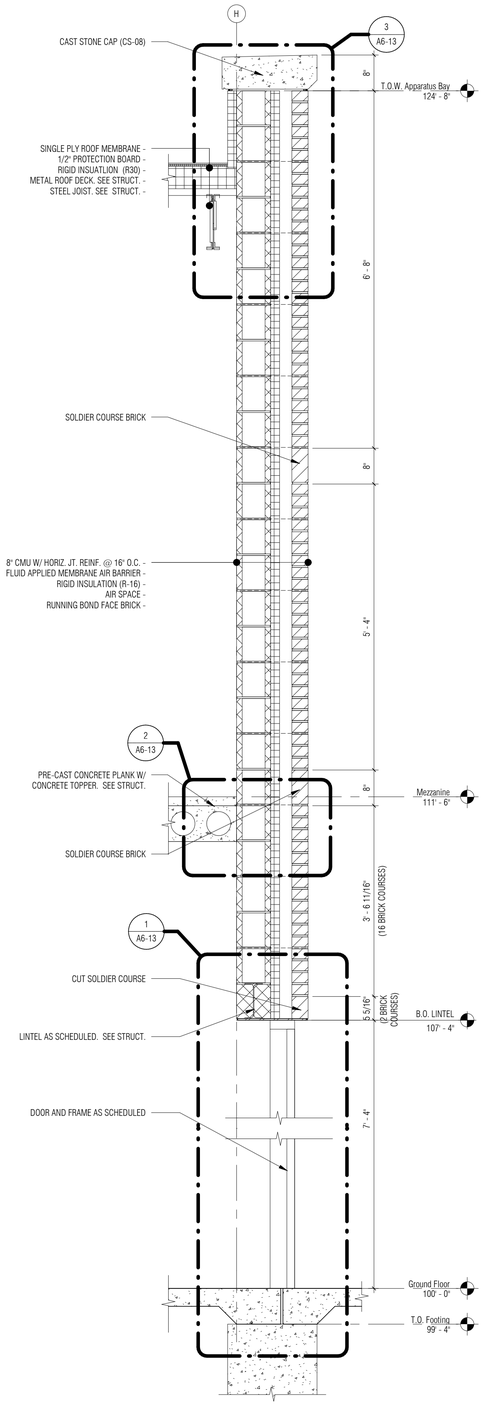
12 / A5-12 Wall Section
3/4" = 1'-0"



11 / A5-12 Wall Section
3/4" = 1'-0"



10 / A5-12 Wall Section
3/4" = 1'-0"



9 / A5-11 Wall Section
3/4" = 1'-0"

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KEY PLAN

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City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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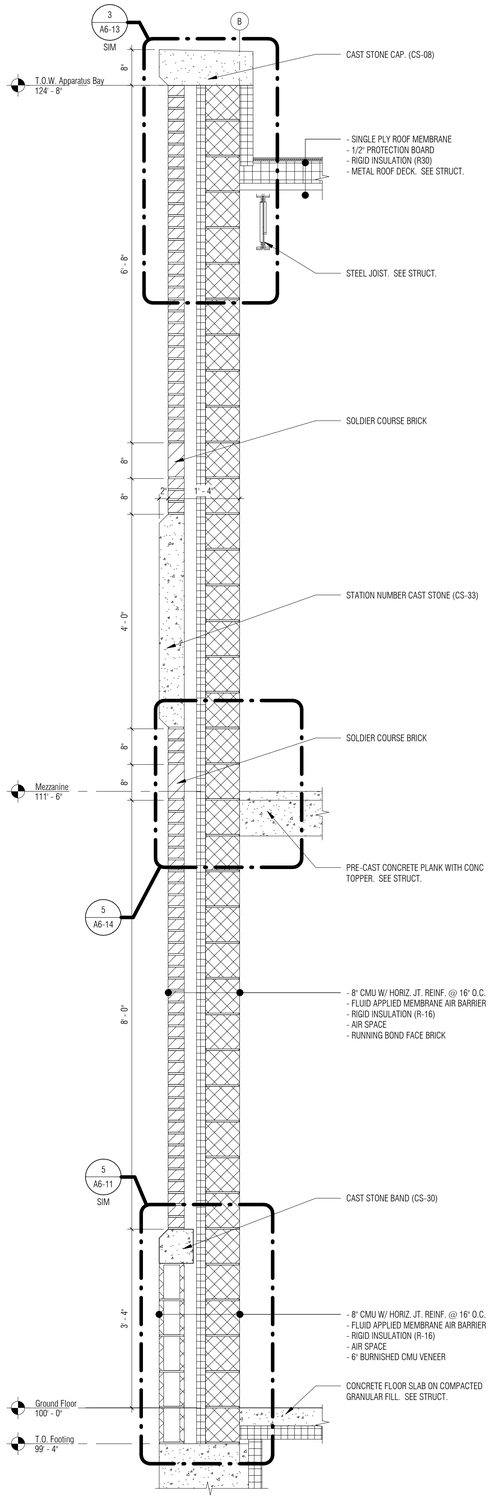
SHEET NAME

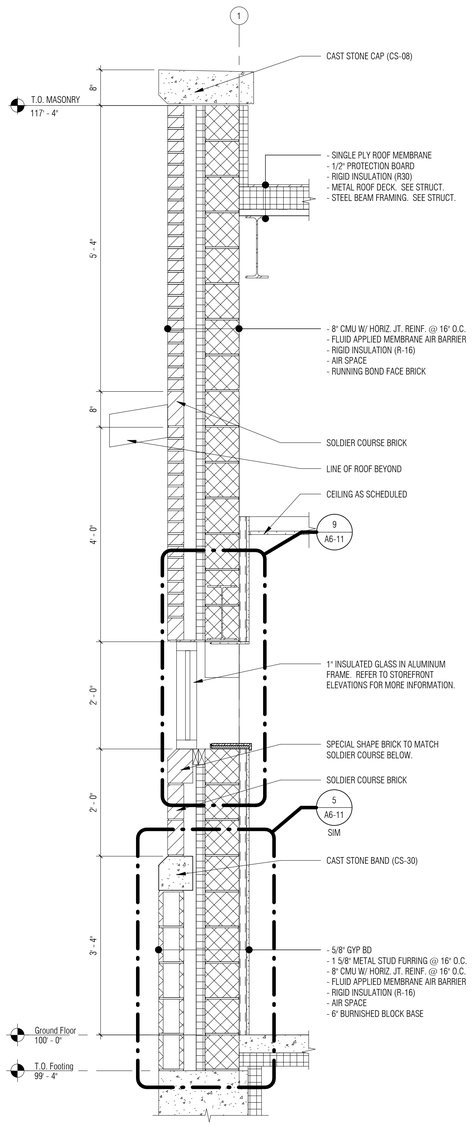
Wall Sections

SHEET NO.

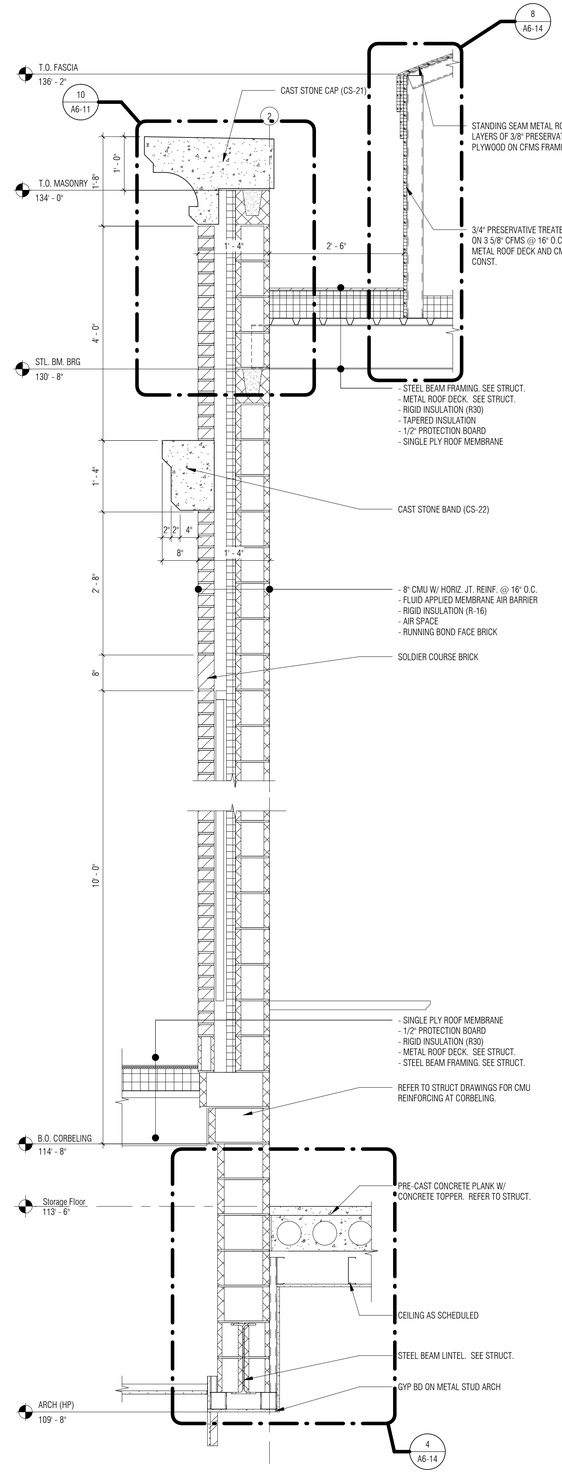
A6-03



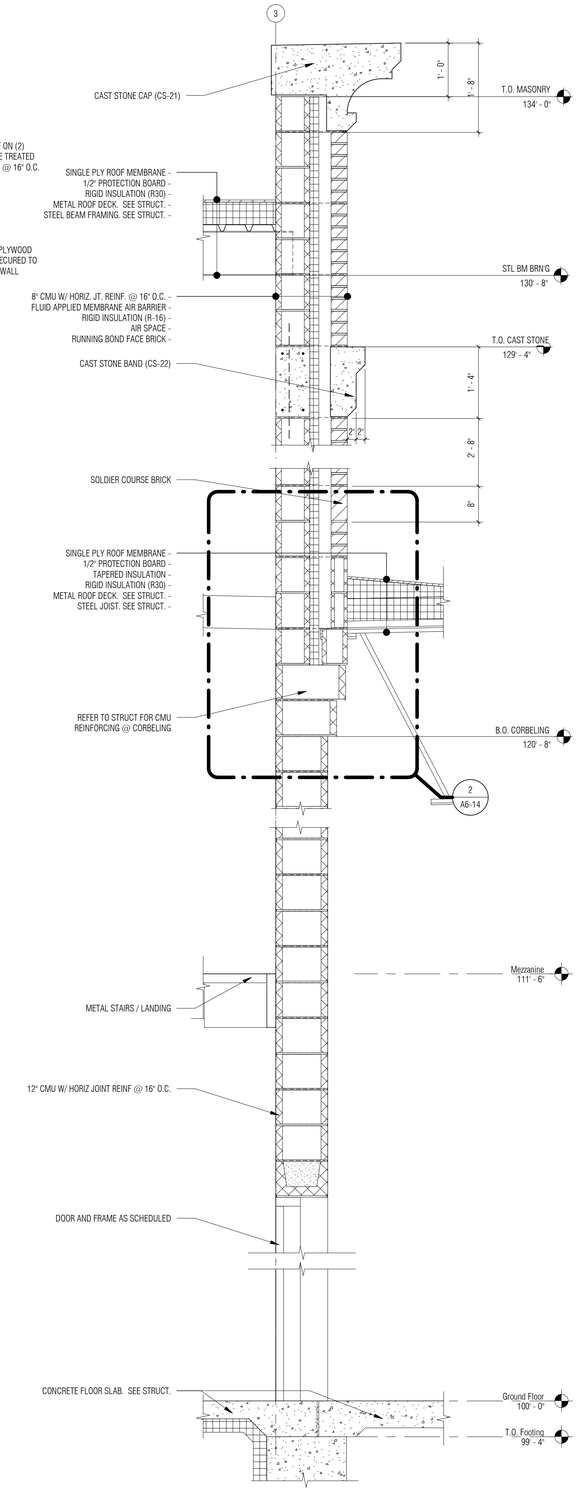
16 / A5-11 Wall Section
3/4" = 1'-0"



15 / A5-12 Wall Section
3/4" = 1'-0"



14 / A5-12 Wall Section
3/4" = 1'-0"



13 / A5-12 Wall Section
3/4" = 1'-0"

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City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

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DG

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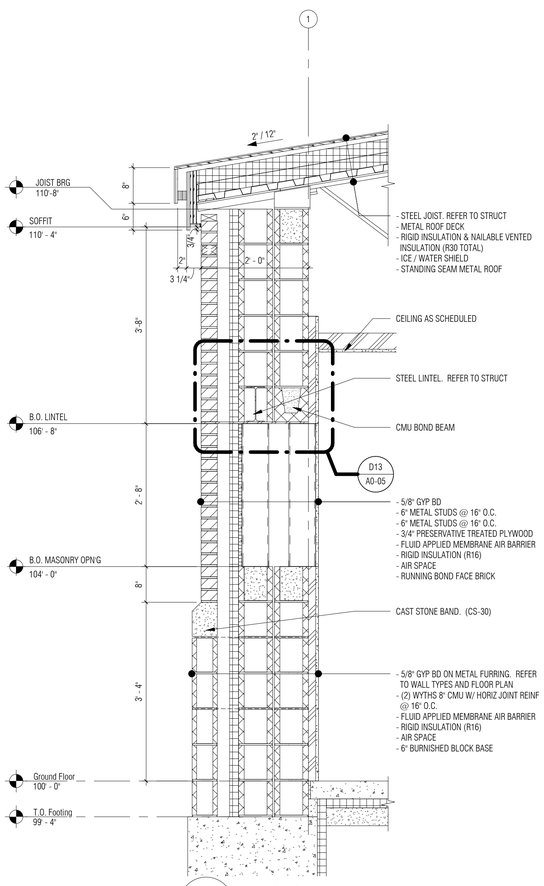
MAM

SHEET NAME

Wall Sections

SHEET NO.

A6-04



20 / A3-01 Wall Section
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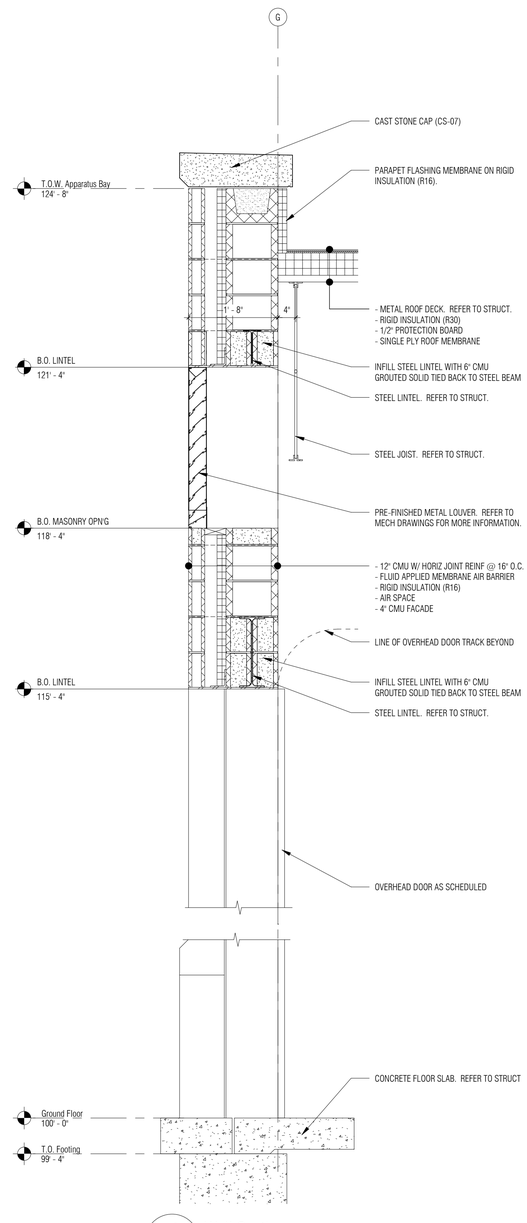
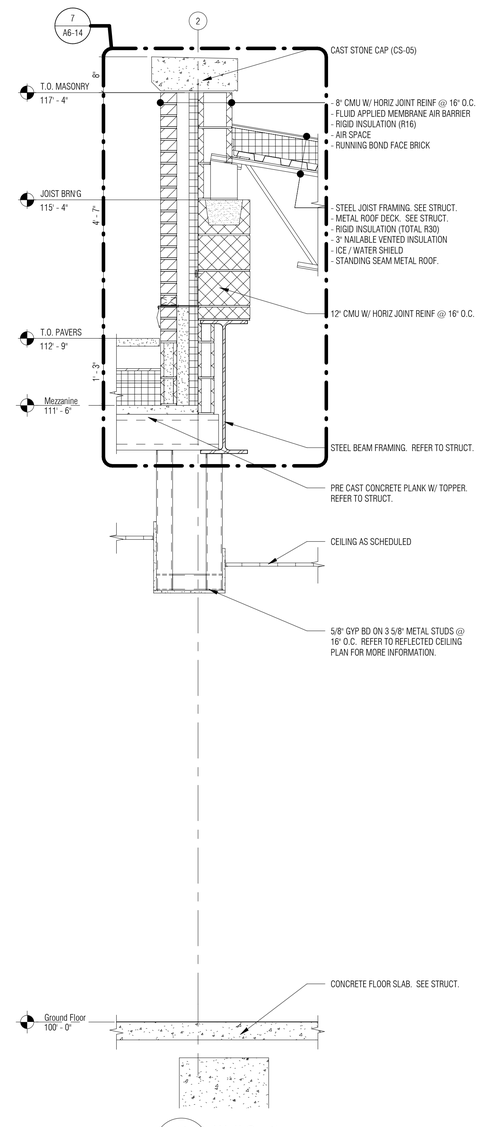
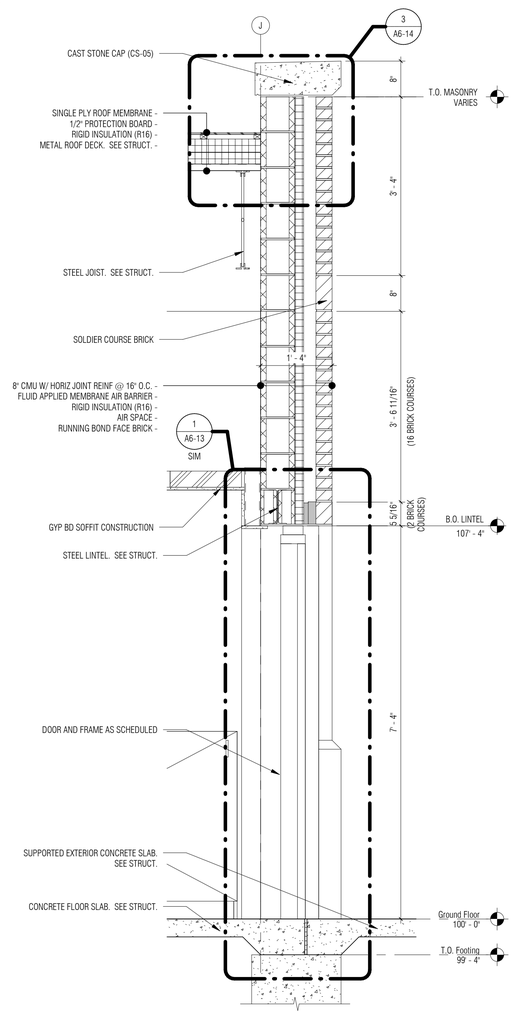


19 / A5-12 Wall Section
3/4" = 1'-0"



18 / A3-02 Wall Section
3/4" = 1'-0"



17 / A5-11 Wall Section
3/4" = 1'-0"

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City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

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SHEET NAME
Wall Sections

SHEET NO.
A6-05

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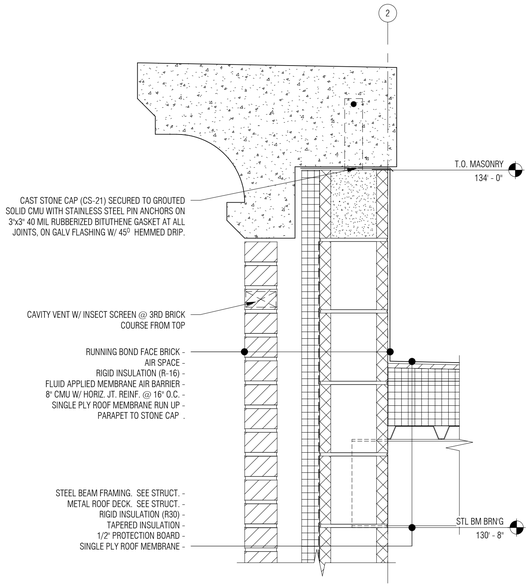
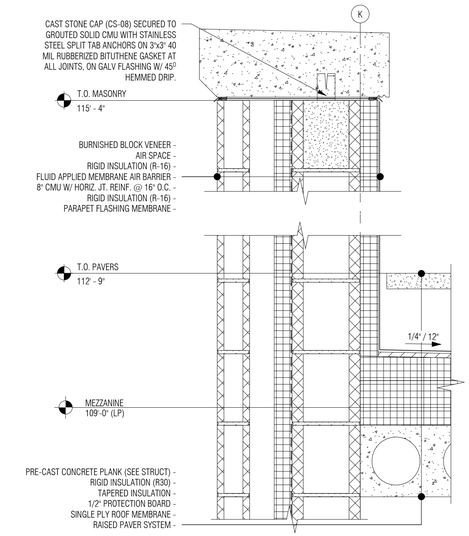
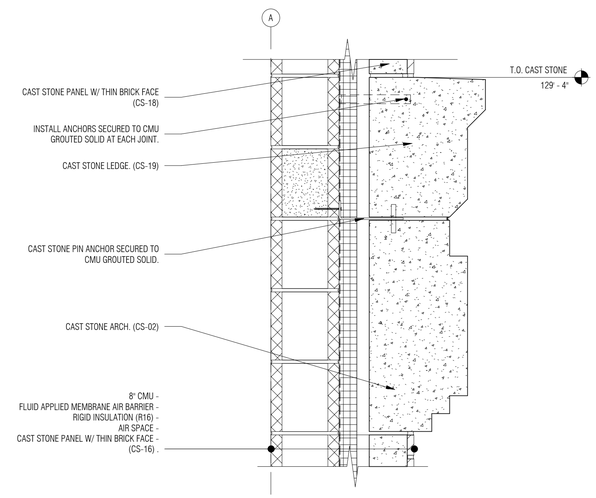


10 / A6-04 Section Detail
1 1/2" = 1'-0"



7 / A6-01 Section Detail
1 1/2" = 1'-0"



4 / A6-01 Section Detail
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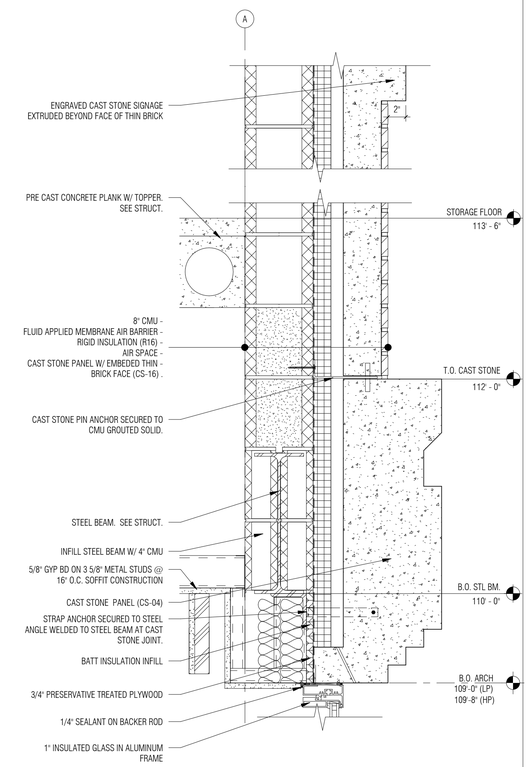

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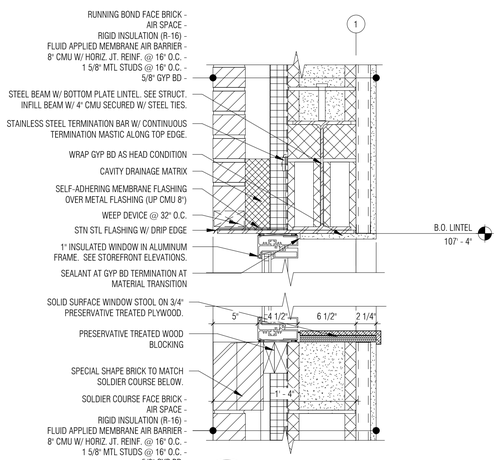
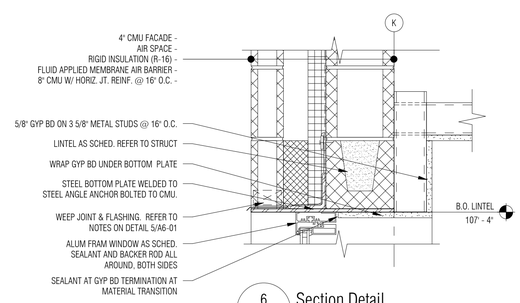
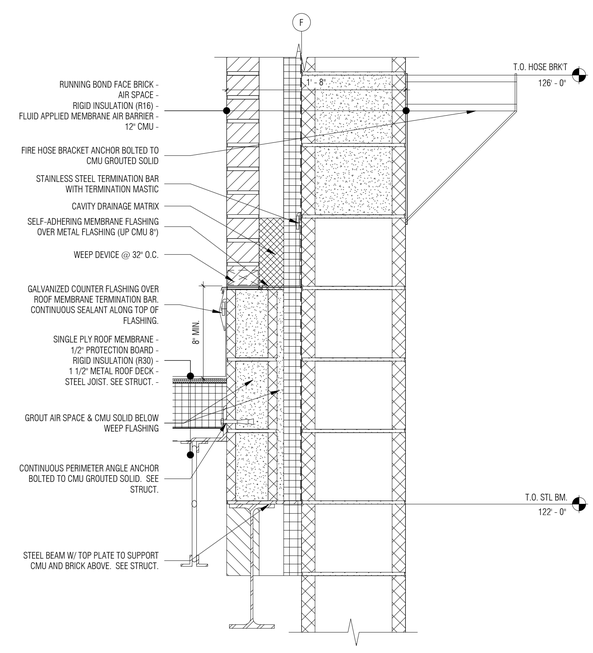


9 / A6-04 Section Detail
1 1/2" = 1'-0"



6 / A6-01 Section Detail
1 1/2" = 1'-0"



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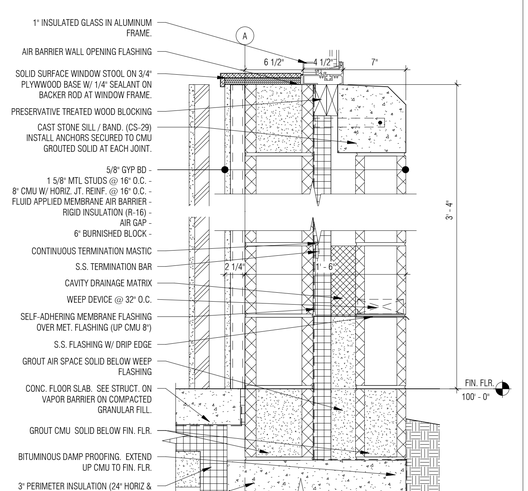

1 / A6-01 Section Detail
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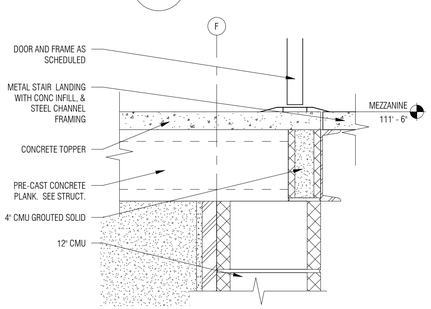

8 / A6-01 Section Detail
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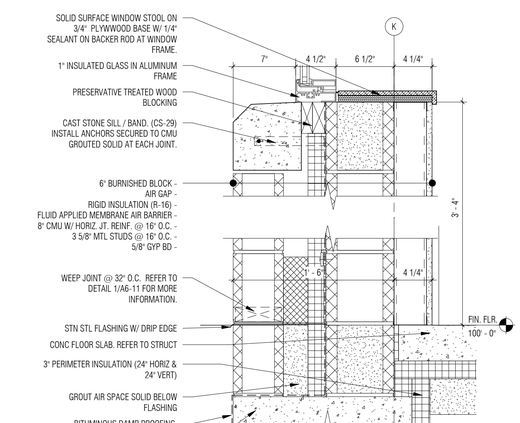

5 / A6-01 Section Detail
1 1/2" = 1'-0"

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ISSUES / REVISIONS

Bidding / Construction	6/13/23

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SHEET NAME
Section Details

SHEET NO.
A6-11

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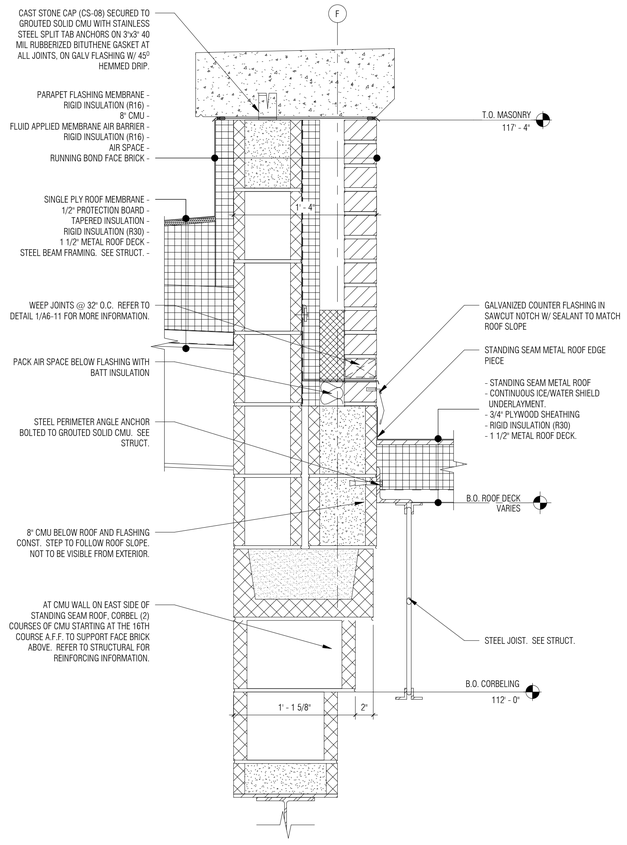

4 A6-02 Section Detail
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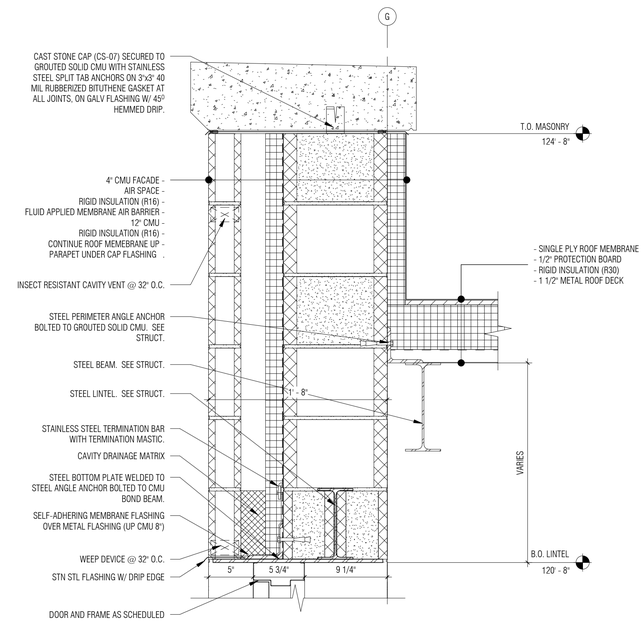

2 A6-01 Section Detail
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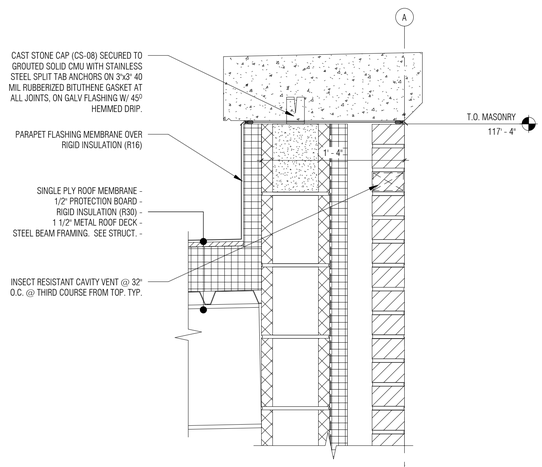

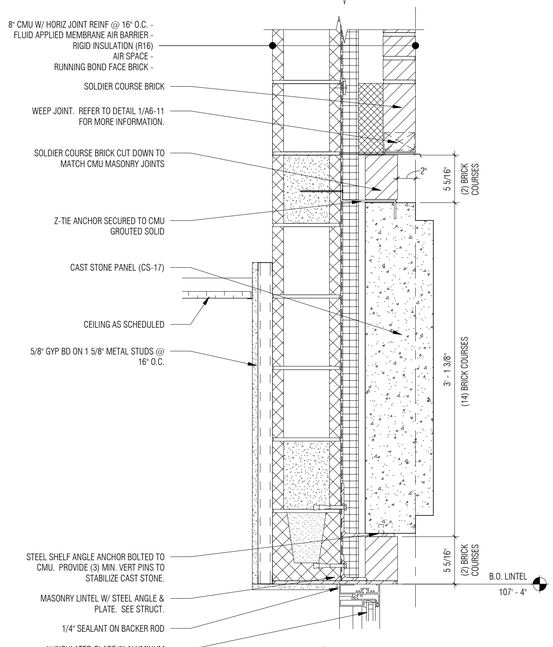

5 A6-02 Section Detail
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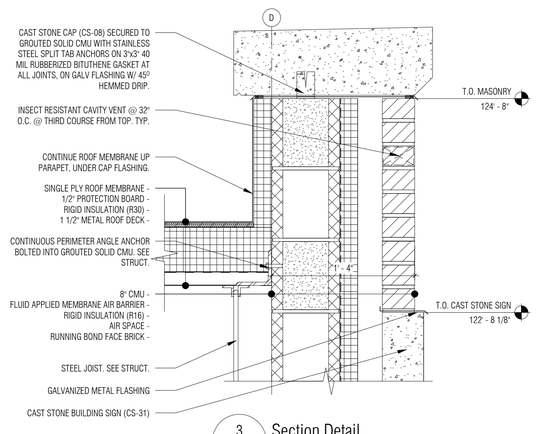

3 A6-02 Section Detail
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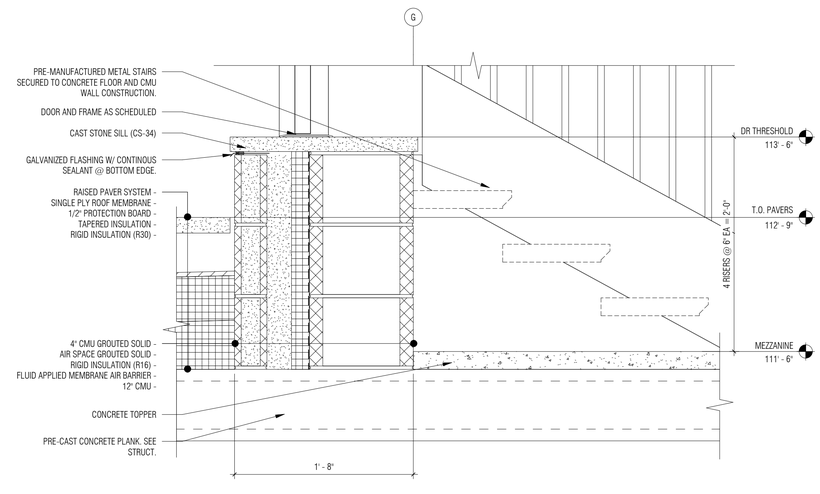

1 A6-01 Section Detail
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65 Market Street
Mount Clemens, MI 48043
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F 586.469.3607

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

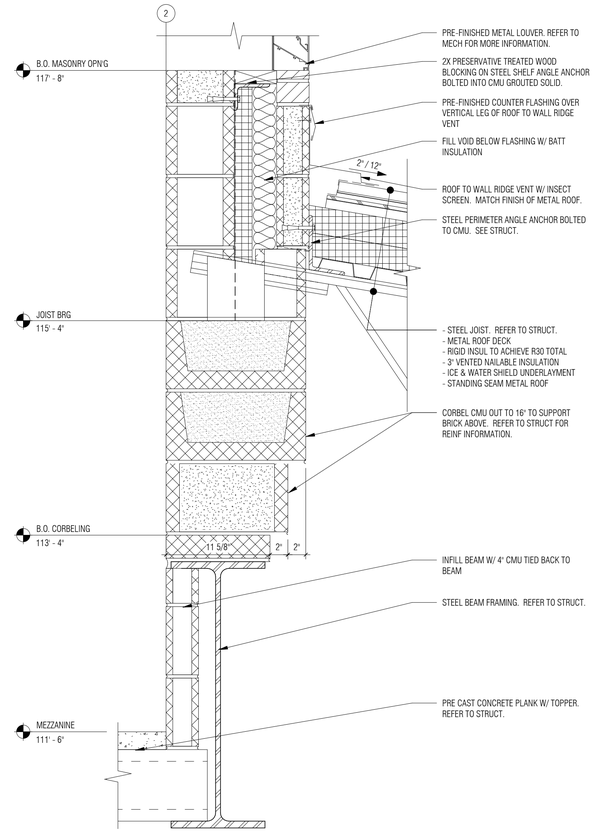
DRAWN BY
DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Section Details

SHEET NO.
A6-12



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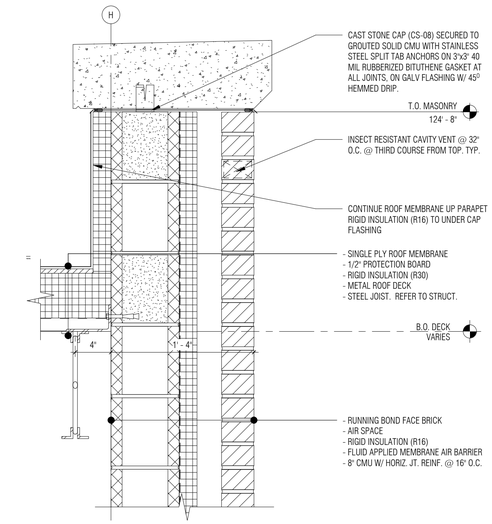

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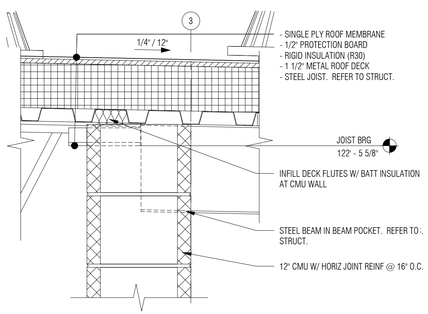

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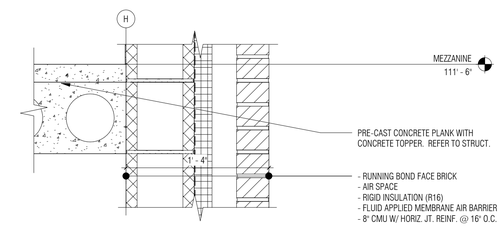

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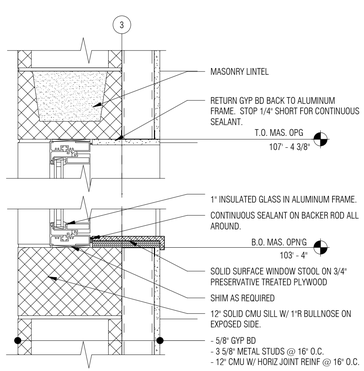

6 A6-03 Section Detail
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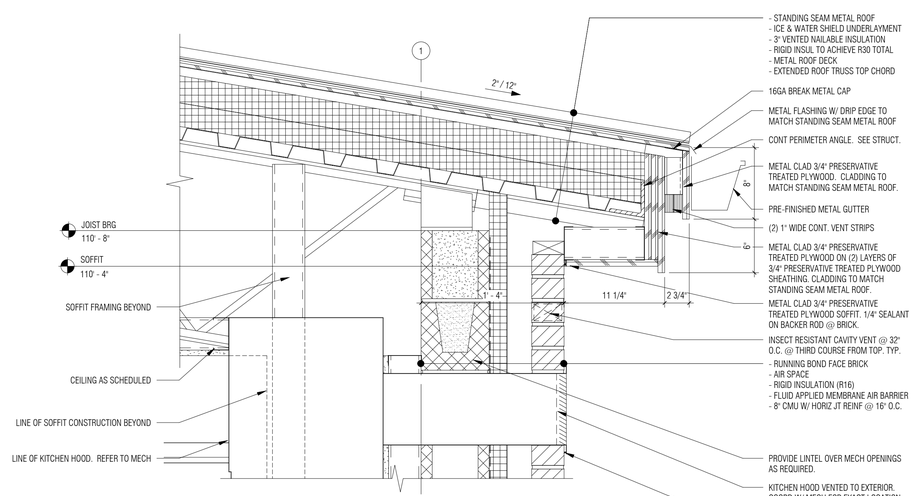

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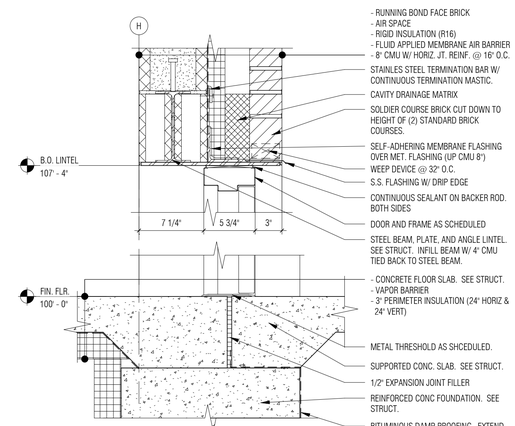

1 A6-03 Section Detail
1 1/2" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY
DJG

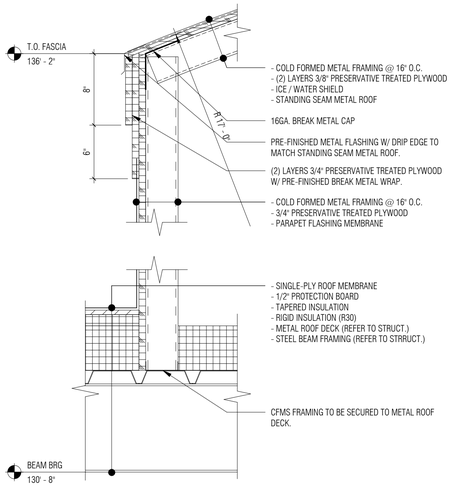
CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Section Details

SHEET NO.
A6-13

CAST STONE PIECES ARE SHOWN ONLY FOR BASIC SUPPORT, PROFILE, AND HEIGHT INFORMATION. CAST STONE MANUFACTURER FREE TO REDUCE VOLUME AS REQUIRED TO MINIMIZE WEIGHT, MAINTAINING ABILITY TO SELF SUPPORT WHERE REQUIRED. REFER TO EXTERIOR ELEVATIONS.



8 / A6-04 Section Detail
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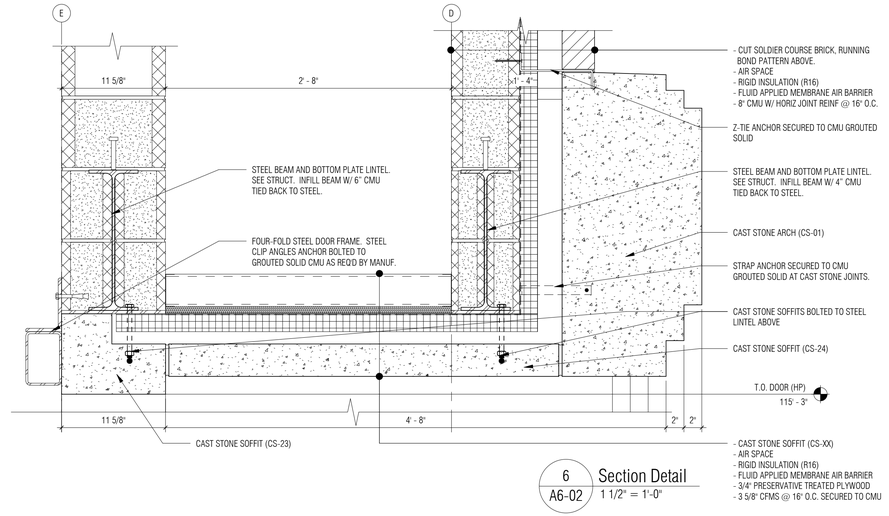

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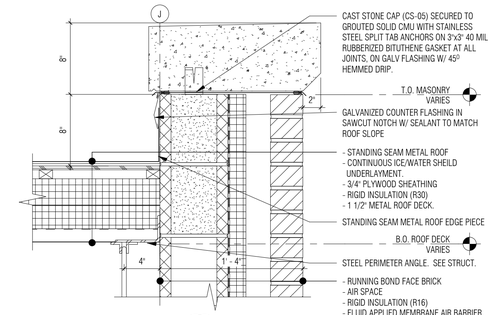

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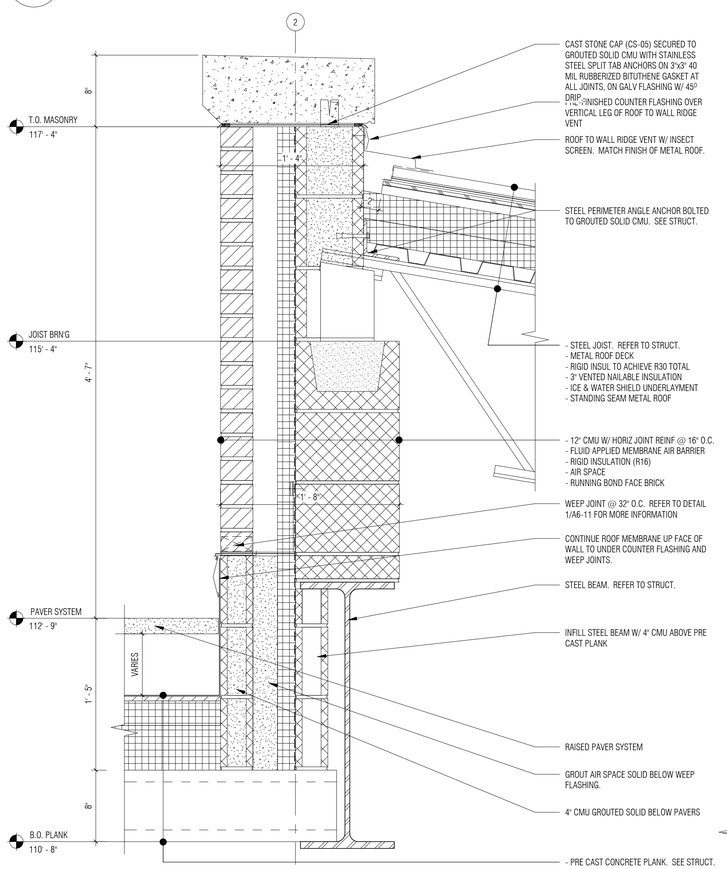

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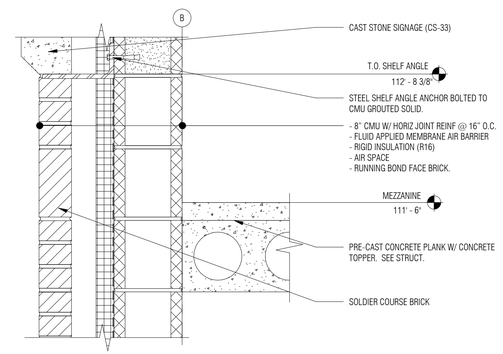

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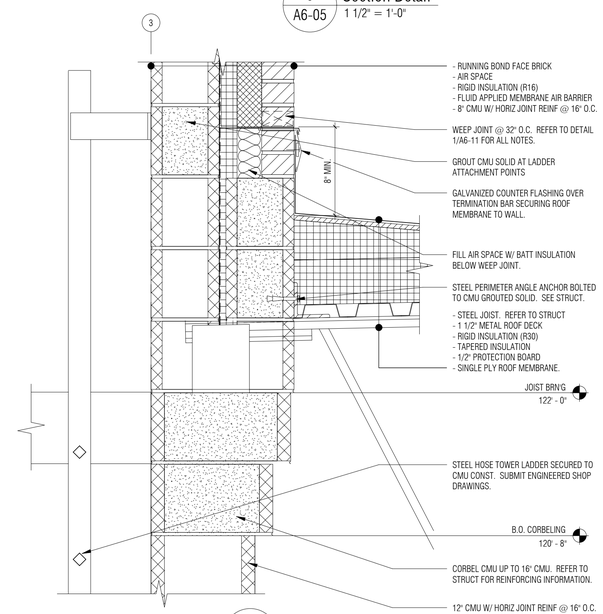

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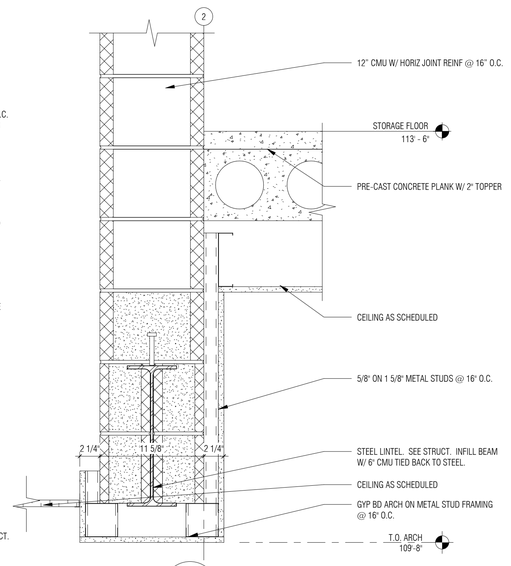

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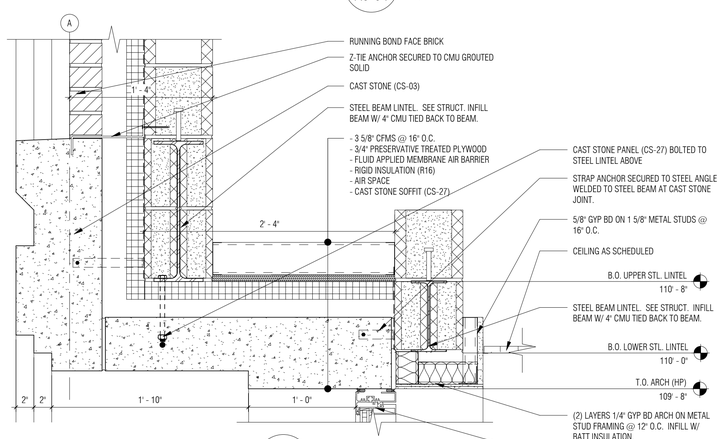

1 / A6-02 Section Detail
1 1/2" = 1'-0"

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Mount Clemens, MI 48043
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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

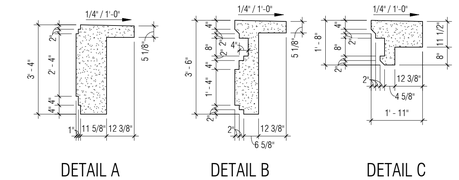
DRAWN BY
DJG

CHECKED BY
DG

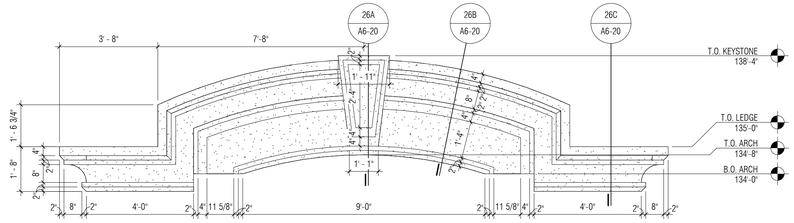
APPROVED BY
MAM

SHEET NAME
Section Details

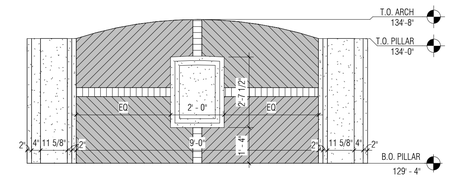
SHEET NO.
A6-14



26 Hose Tower Parapet Profile (CS-20)
3/8" = 1'-0"



25 Hose Tower Parapet (CS-20)
3/8" = 1'-0"



24 Hose Tower Upper Pillers (CS-18)
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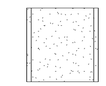
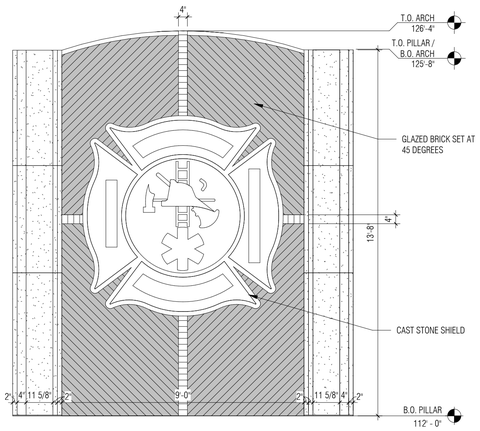
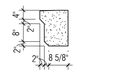


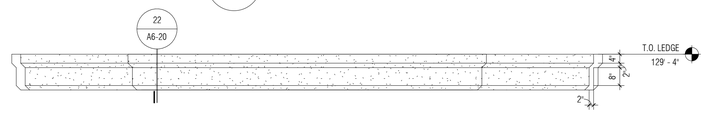
23 Entrance Cast Stone Squares (CS-17)
3/8" = 1'-0"



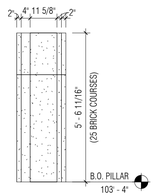
20 Hose Tower Central Cast Stone Pillar (CS-16)
3/8" = 1'-0"



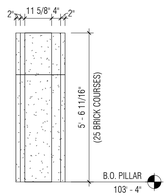
22 Hose Tower E/W Ledge Profile (CS-19)
3/8" = 1'-0"



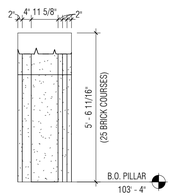
21 Hose Tower E/W Ledge (CS-19)
3/8" = 1'-0"



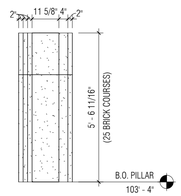
19 Entrnace South Cast Stone Pillar (CS-15)
3/8" = 1'-0"



18 Entrnace North Cast Stone Pillar (CS-14)
3/8" = 1'-0"



17 Hose Tower Lower South Cast Stone Pillar (CS-13)
3/8" = 1'-0"



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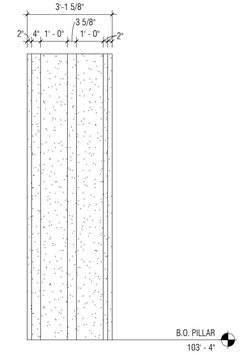
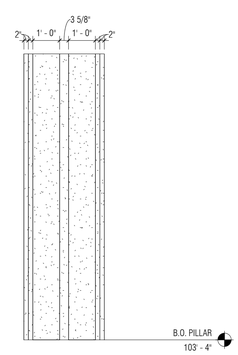


15 Apparatus Bay South End Cast Stone Pillar (CS-11)
3/8" = 1'-0"



14 Apparatus Bay Center Cast Stone Pillar (CS-10)
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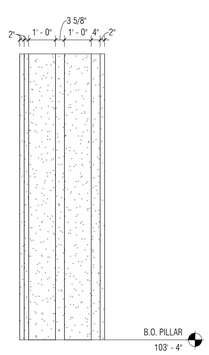

13 Apparatus Bay North End Cast Stone Pillars (CS-09)
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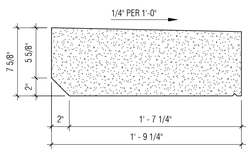

12 Cast Stone Coping (CS-08)
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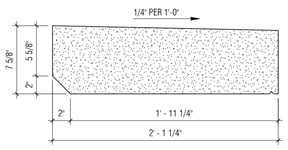

11 Cast Stone Coping (CS-07)
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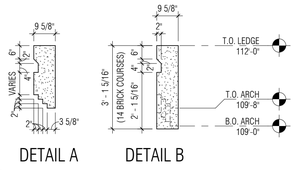
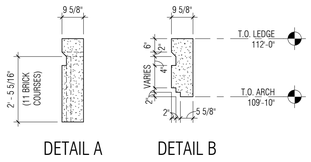


8 Hose Tower Lower Cast Stone Beam Profile (CS-04)
3/8" = 1'-0"



6 Entrance Cast Stone Lower Beam Profile (CS-03)
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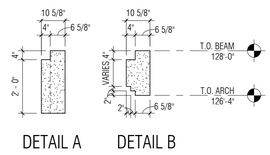

4 Hose Tower Upper Cast Stone Beam Profile (CS-02)
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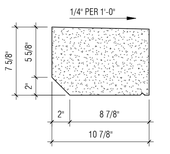

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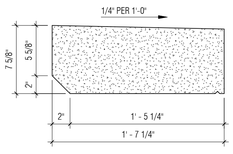

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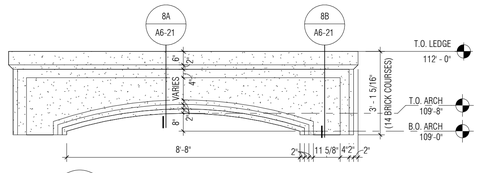

7 Hose Tower Lower Cast Stone Beam (CS-04)
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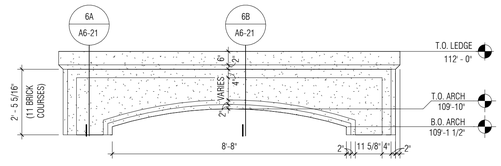

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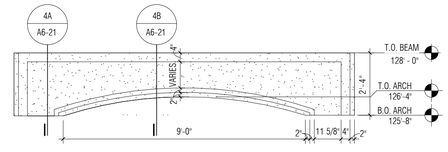

3 Hose Tower Upper Cast Stone Beam (CS-02)
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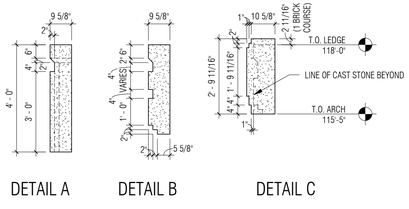
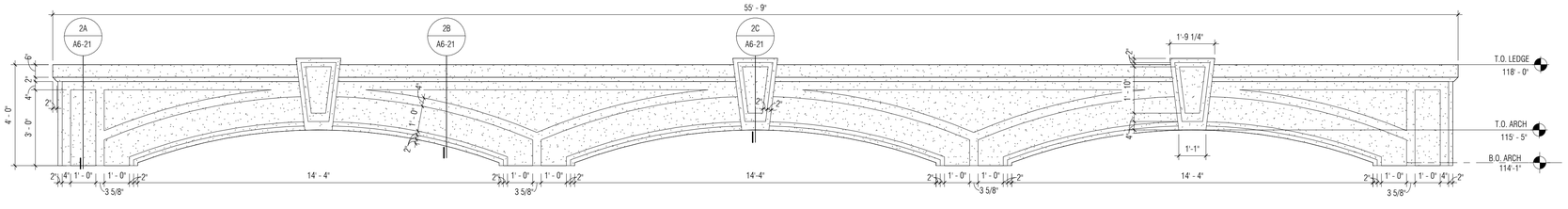


2 Cast Stone App Bay Beam Profile (CS-01)
3/8" = 1'-0"



1 Cast Stone Apparatus Bay Beam (CS-01)
3/8" = 1'-0"

6/13/2023 11:44:05 AM C:_revitlocal\21-146 WFD STATION 1 CD_DGwcdzDHMdSH.rvt

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65 Market Street
Mount Clemens, MI 48043
P 586.469.3600
F 586.469.3607

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

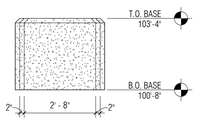
DRAWN BY
MAA

CHECKED BY
DG

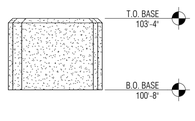
APPROVED BY
MAM

SHEET NAME
Cast Stone Profiles

SHEET NO.
A6-20



28 Apparatus Bay Center Cast Stone Base (CS-43)
3/8" = 1'-0"



27 Apparatus Bay South End Cast Stone Base (CS-42)
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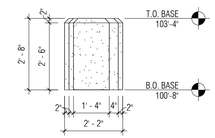

26 Cast Stone Hose Tower Base (CS-41)
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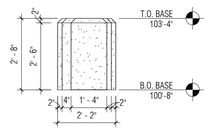

25 Cast Stone Hose Tower Base (CS-40)
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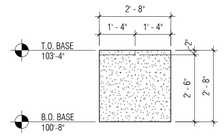
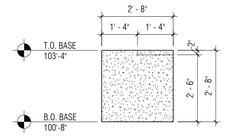
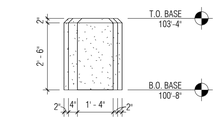


24 Cast Stone Entrance Inner Base (CS-39)
3/8" = 1'-0"



23 Cast Stone Entrance Inner Base (CS-38)
3/8" = 1'-0"



22 Cast Stone South Entrance Base (CS-37)
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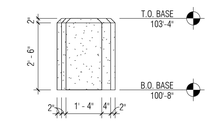

21 Cast Stone North Entrance Base (CS-36)
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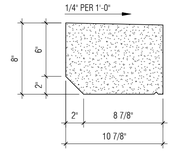

20 Cast Stone Coping (CS-35)
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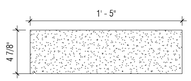
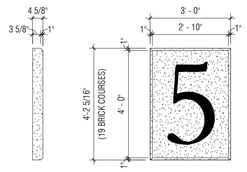
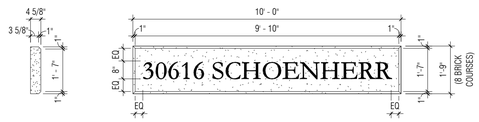


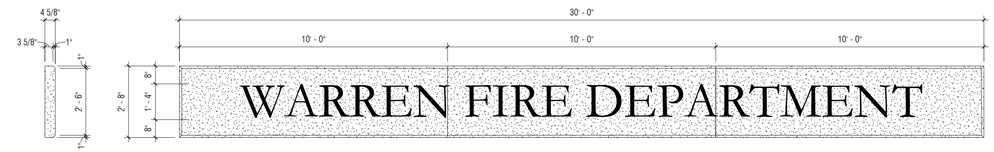
19 Cast Stone Threshold (CS-34)
1 1/2" = 1'-0"



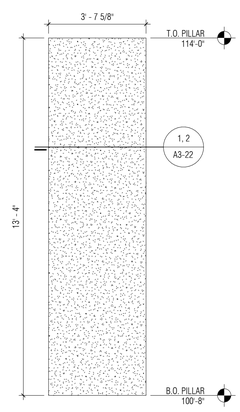
18 Cast Stone Apparatus Bay Station Number (CS-33)
3/8" = 1'-0"



17 Entrance Cast Stone Address (CS-32)
3/8" = 1'-0"



16 Cast Stone Apparatus Bay Signage (CS-31)
3/8" = 1'-0"



10 Cast Stone Apparatus Bay Typ Middle Pillar (CS-26)
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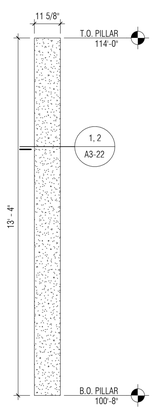

9 Cast Stone Apparatus Bay Typ Inner Pillar (CS-25)
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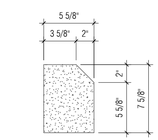
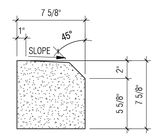
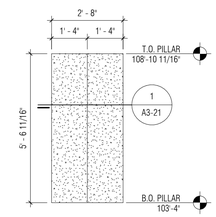


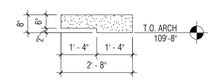
15 Cast Stone Band (CS-30)
1 1/2" = 1'-0"



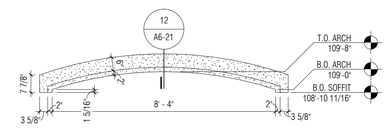
14 Cast Stone Window Sill (CS-29)
1 1/2" = 1'-0"



13 Entrance Cast Stone Inner Pillar (CS-28)
3/8" = 1'-0"

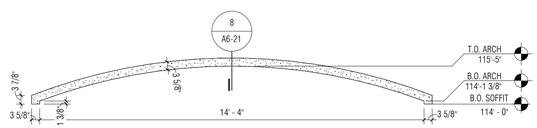


12 Entrance Cast Stone Soffit Profile (CS-27)
3/8" = 1'-0"

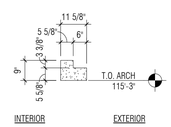


11 Entrance Cast Stone Soffit (CS-27)
3/8" = 1'-0"

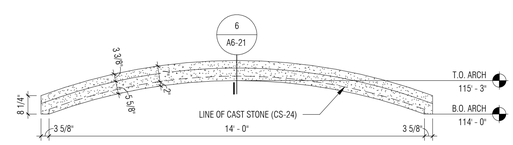
8 Cast Stone Apparatus Bay Beam Middle Profile (CS-24)
3/8" = 1'-0"



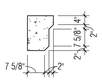
7 Cast Stone Apparatus Bay Soffit Middle (CS-24)
3/8" = 1'-0"



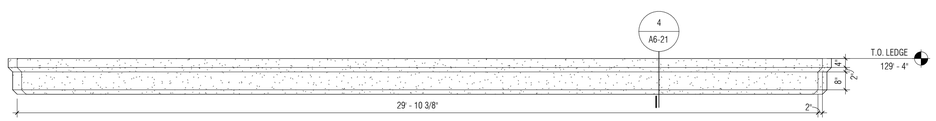
6 Cast Stone Apparatus Bay Beam Inner Profile (CS-23)
3/8" = 1'-0"



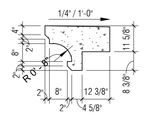
5 Cast Stone Apparatus Bay Soffit Inner (CS-23)
3/8" = 1'-0"



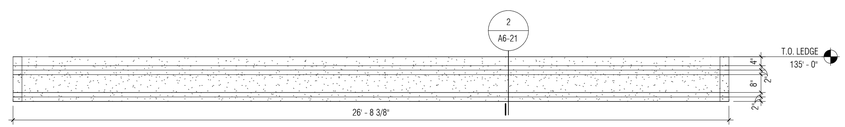
4 Hose Tower N/S Lower Ledge Profile (CS-22)
3/8" = 1'-0"



3 Hose Tower N/S Lower Ledge (CS-22)
3/8" = 1'-0"



2 Hose Tower N/S Upper Ledge Profile (CS-21)
3/8" = 1'-0"



1 Hose Tower N/S Upper Ledge (CS-21)
3/8" = 1'-0"

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65 Market Street
Mount Clemens, MI 48043
P 586.469.3600
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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

CWP

CHECKED BY

DG

APPROVED BY

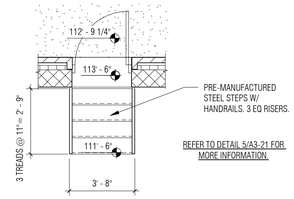
MAM

SHEET NAME

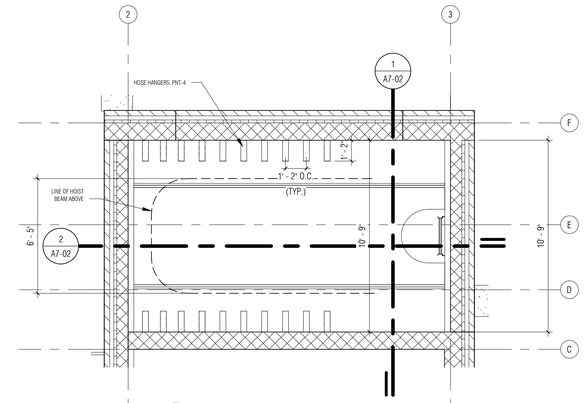
Cast Stone Profiles

SHEET NO.

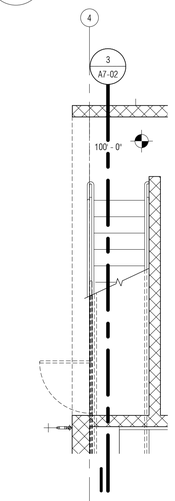
A6-21



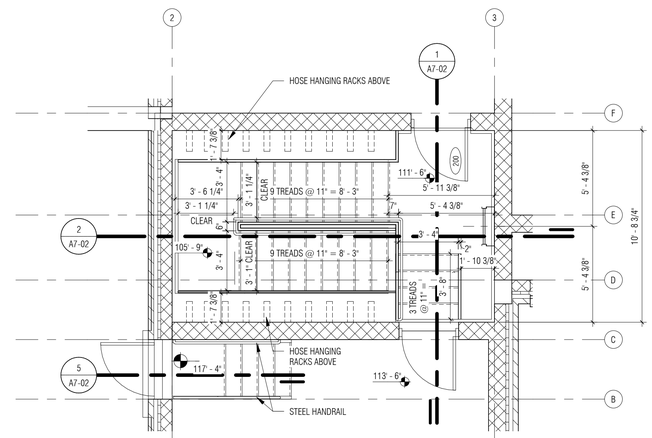
4 / A3-02 Roof Access Stair
1/4" = 1'-0"



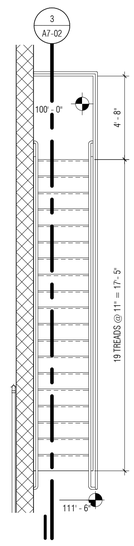
3 / A3-02 Hose Tower Catwalk Dimensions
1/4" = 1'-0"



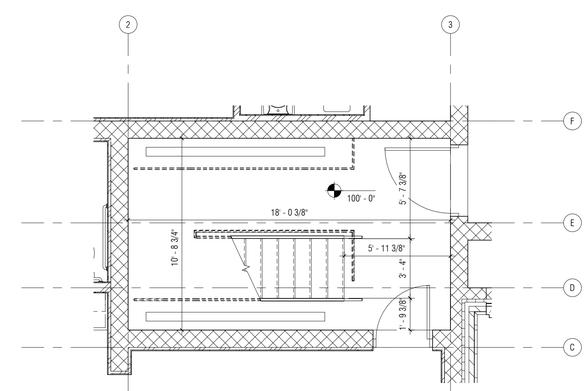
6 / A3-11 Apparatus Stair Ground Level
1/4" = 1'-0"



2 / A3-02 Hose Tower Mezzanine Dimensions
1/4" = 1'-0"



5 / A3-02 Apparatus Stair Mezzanine Level
1/4" = 1'-0"



1 / A3-01 Hose Tower Ground Floor Dimensions
1/4" = 1'-0"

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Mount Clemens, MI 48043
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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

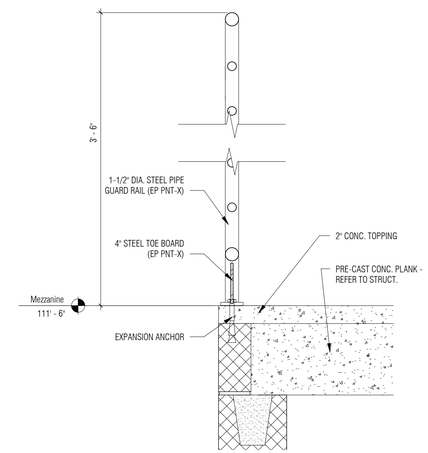
DRAWN BY
DJG

CHECKED BY
DG

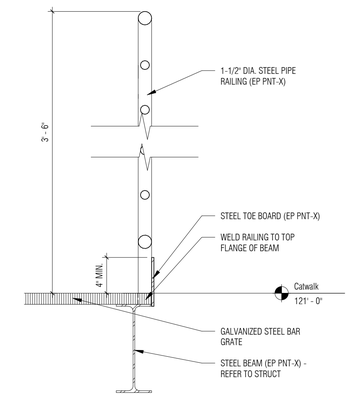
APPROVED BY
MAM

SHEET NAME
Vertical Circulation Plans

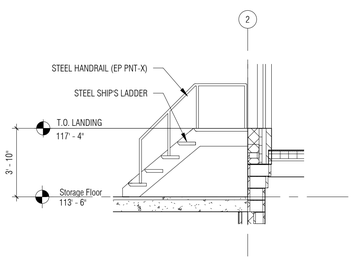
SHEET NO.
A7-01



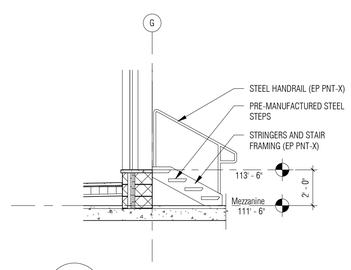
7 A7-02 Railing Detail @ Mezzanine
1 1/2" = 1'-0"



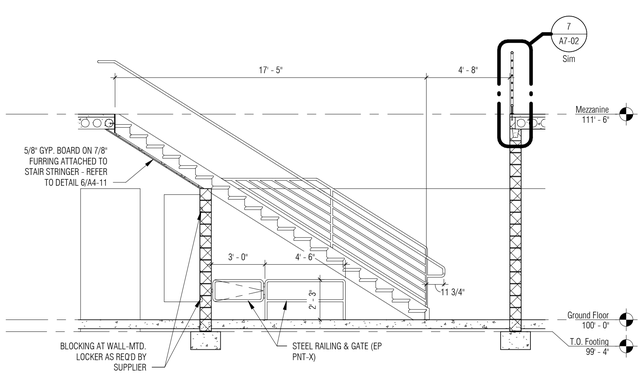
6 A7-02 Railing Detail @ Hose Tower Catwalk
1 1/2" = 1'-0"



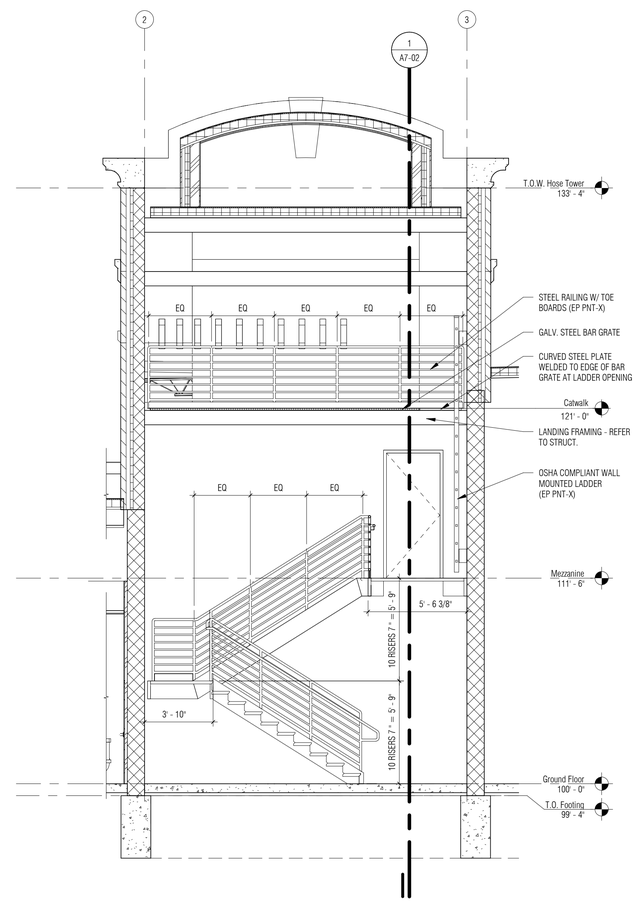
5 A7-01 Roof Access Ship's Ladder
1/4" = 1'-0"



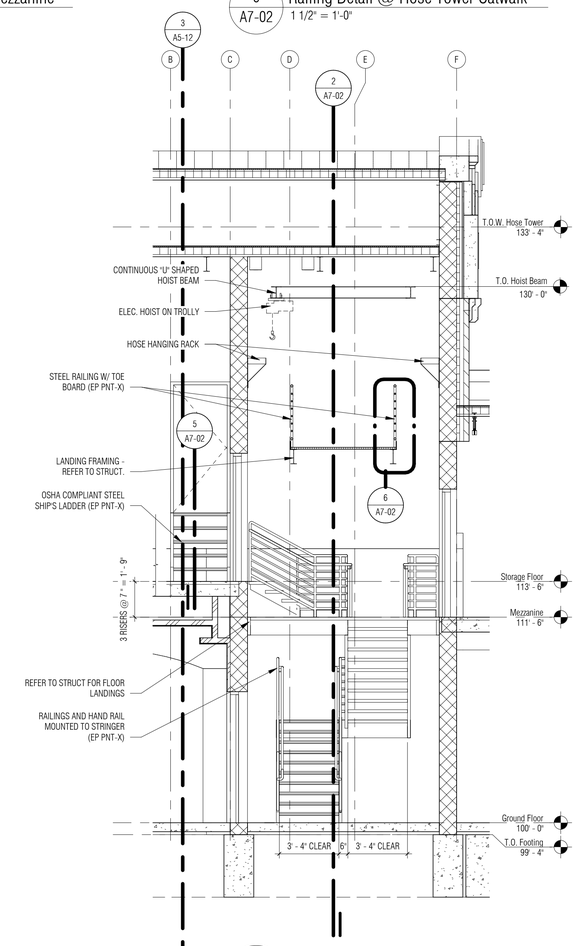
4 A3-02 Roof Access Stair Section
1/4" = 1'-0"



3 A7-01 Apparatus Stair Cross Section
1/4" = 1'-0"



2 A7-01 Hose Tower Longitudinal Section
1/4" = 1'-0"



1 A7-01 Hose Tower Cross Section
1/4" = 1'-0"

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

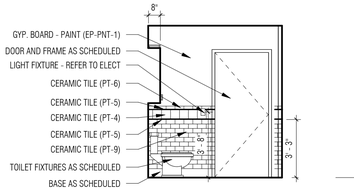
DRAWN BY
Author

CHECKED BY
DG

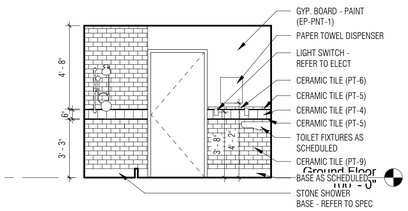
APPROVED BY
MAM

SHEET NAME
Vertical Circulation Sections

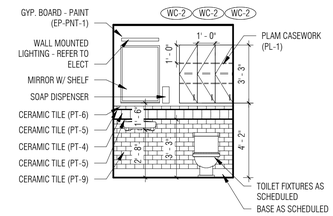
SHEET NO.
A7-02



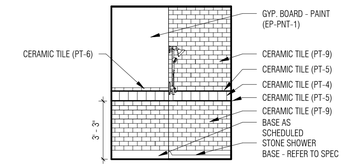
18 A3-11 Interior Elevation - Dorm Bath TYP
1/4" = 1'-0"



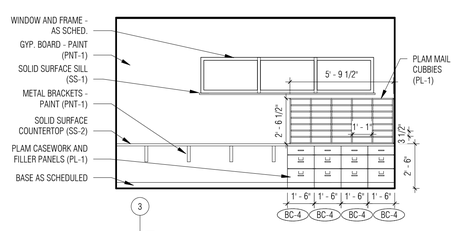
17 A3-11 Interior Elevation - Dorm Bath TYP.
1/4" = 1'-0"



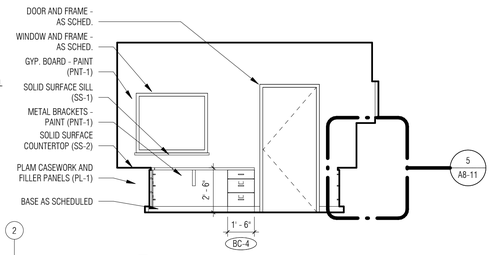
16 A3-11 Interior Elevation - Dorm Bath TYP.
1/4" = 1'-0"



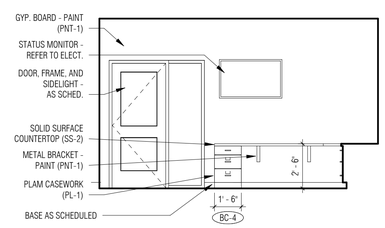
15 A3-11 Interior Elevation - Dorm Bath TYP.
1/4" = 1'-0"



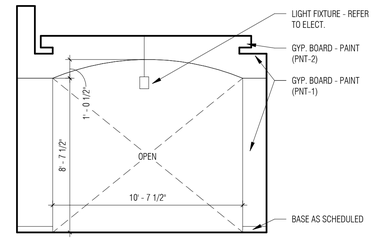
14 A3-01 Interior Elevation - Watch Desk 107 - West
1/4" = 1'-0"



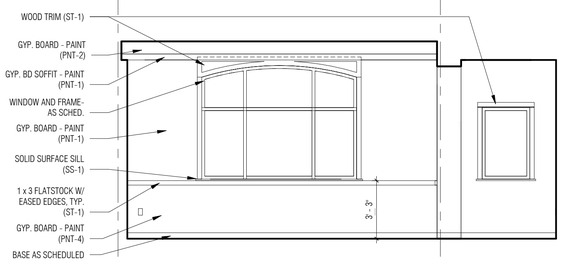
13 A3-01 Interior Elevation - Watch Desk 107 - South
1/4" = 1'-0"



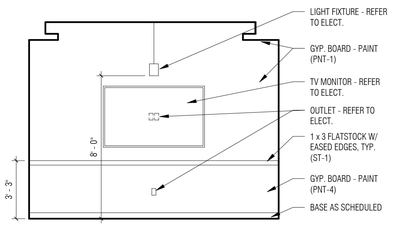
12 A3-01 Interior Elevation - Watch Desk 107 - East
1/4" = 1'-0"



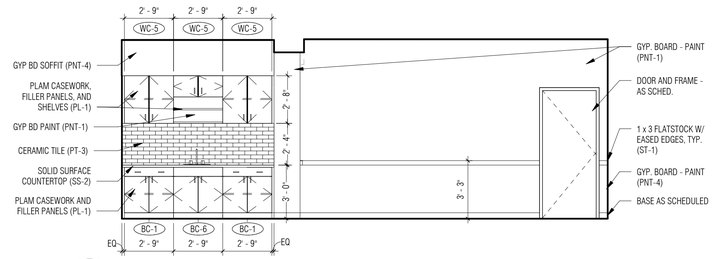
11 A3-01 Interior Elevation - Community Room 103 - West
1/4" = 1'-0"



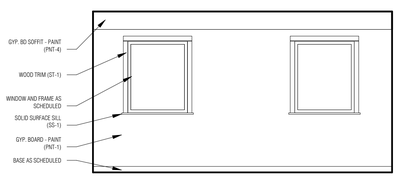
10 A3-01 Interior Elevation - Community Room 103 - South
1/4" = 1'-0"



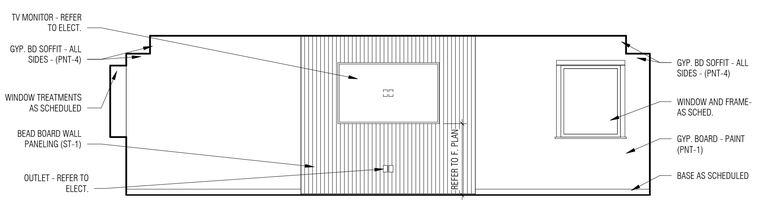
9 A3-01 Interior Elevation - Community Room 103 - East
1/4" = 1'-0"



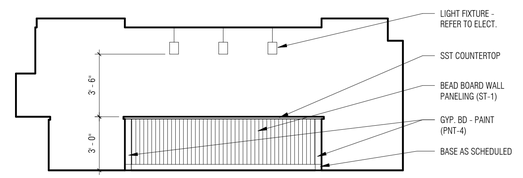
8 A3-01 Interior Elevation - Community Room 103 - North
1/4" = 1'-0"



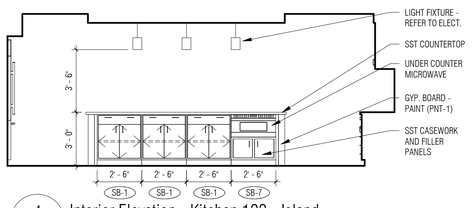
7 A3-01 Interior Elevation - Dayroom 122 - North
1/4" = 1'-0"



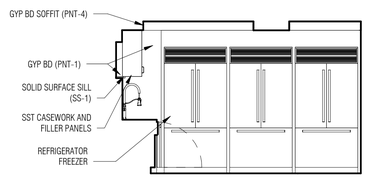
6 A3-01 Interior Elevation - Dayroom 122
1/4" = 1'-0"



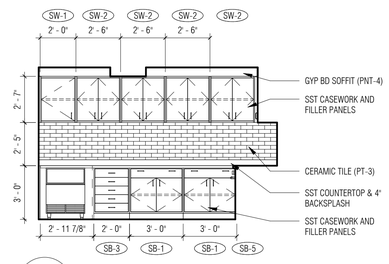
5 A3-01 Interior Elevation - Kitchen 122 - Island
1/4" = 1'-0"



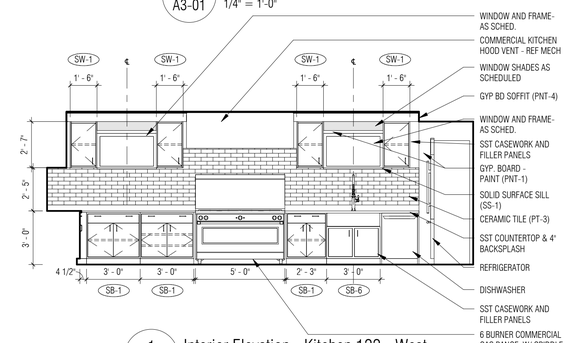
4 A3-11 Interior Elevation - Kitchen 122 - Island
1/4" = 1'-0"



3 A3-11 Interior Elevation - Kitchen 122 - North
1/4" = 1'-0"



2 A3-11 Interior Elevation - Kitchen 122 - South
1/4" = 1'-0"



1 A3-11 Interior Elevation - Kitchen 122 - West
1/4" = 1'-0"

CASEWORK LEGEND

CASEWORK MODEL NUMBERS ARE DERIVED FROM NAAWS CDS CABINET DESIGN SERIES AS A BASIS OF DESIGN

BASE CABINETS:

BC-1	DOORS W / DRAWERS STORAGE - 212
BC-2	DOOR W / DRAWERS STORAGE - 211
BC-3	DOORS / CORNER STORAGE - 197
BC-4	(3) DRAWER STORAGE - 253
BC-5	(2) DOORS STORAGE - 102
BC-6	(2) DOORS STORAGE W/ SINK - 152
BC-7	(5) DRAWER STORAGE -254

STAINLESS STEEL CABINETS:

SB-1	HINGED DOUBLE DOOR / SINGLE DRAWER BASE UNIT - BJ362235, BJ302235
SB-2	SINK DOUBLE DOOR BASE UNIT - BX302235
SB-3	DRAWER BASE UNIT - BL242235
SB-4	BASE CABINET END SCRIBE - BSF01(W)35
SB-5	BASE CABINET CORNER FILLER - BSF05(W)35
SB-6	DOUBLE DOOR STORAGE SINK -XXX
SB-7	DOUBLE DOOR W/ MICROWAVE SHELF - XXX

SW-1	SOLID HINGED DOOR WALL UNIT - WB241330, WB181330
SW-2	DOUBLE HINGED DOOR WALL UNIT - WC301330
SW-3	WALL CABINET SCRIBE - WFS01(W)1330
SW-4	WALL CABINET CLOSURE PANELS - WSF0313

WALL HUNG CABINETS:

WC-1	STORAGE W/ DOORS - 302
WC-2	STORAGE W/ DOOR - 301
WC-3	CORNER STORAGE W/ DOORS - 308
WC-4	STORAGE W/ SHELF - 300
WC-5	STORAGE W/ DOORS - 312

TALL CABINETS:

TC-1	WARDROBE CABINET W/ DOOR - 501

GENERAL NOTES

1. REFER TO MATERIAL FINISH/COLOR SCHEDULE (SPEC SECTION 000200) FOR COLORS.
2. ALL WOOD TRIM TO HAVE EASED EDGES

GENERAL CASEWORK NOTES

1. ALL EXPOSED SURFACES ARE TO BE FINISHED
2. PROVIDE FINISHED FILLER PANELS AS REQUIRED AT ALL SPACES BETWEEN CABINETS AND BETWEEN CASEWORK AND WALLS
3. CAULK AROUND ENTIRE PERIMETER OF ALL CABINETS AND COUNTERTOPS AT INTERSECTION OF DISIMILAR SURFACES
4. BASE CABINET DEPTH IS TO BE 24" DEEP NOMINAL (U.O.N.), WALL CABINET DEPTH IS TO BE 14" DEEP NOMINAL (U.O.N.)
5. REFER TO OTHER ELEVATIONS WITHIN THE SAME ROOM FOR SIMILAR APPLICABLE NOTES AND REQUIREMENTS
6. PROVIDE LOCKS AT ALL DRAWER LOCATIONS - KEYED PER ROOM
7. WHERE COUNTER TOP ABUTS WALL, PROVIDE PAINTED WOOD CLEAT
8. PROVIDE LIGHT VALANCES AT UPPER CABINETS WHERE UNDER CABINET LIGHTS ARE TO BE PROVIDED - COORD. W/ ELECTRICAL
9. REFER TO MATERIAL FINISH/COLOR SCHEDULE (SPEC SECTION 000200) FOR LAMINATE (PL-#) COLORS

PARTNERS

PARTNERS in Architecture, PLC

65 Market Street
Mount Clemens, MI 48043
P 586.469.3600
F 586.469.3607

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CONSULTANT

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY

CTG

CHECKED BY

DG

APPROVED BY

MAM

SHEET NAME

Interior Elevations

SHEET NO.

A8-01

CASEWORK LEGEND

CASEWORK MODEL NUMBERS ARE DERIVED FROM NAAWS CDS CABINET DESIGN SERIES AS A BASIS OF DESIGN

BASE CABINETS:

BC-1	DOORS W / DRAWERS STORAGE - 212
BC-2	DOOR W / DRAWERS STORAGE - 211
BC-3	DOORS / CORNER STORAGE - 197
BC-4	(3) DRAWER STORAGE - 253
BC-5	(2) DOORS STORAGE - 102
BC-6	(2) DOORS STORAGE W/ SINK - 152
BC-7	(5) DRAWER STORAGE -254

STAINLESS STEEL CABINETS:

SB-1	HINGED DOUBLE DOOR / SINGLE DRAWER BASE UNIT - BJ362235, BJ302235
SB-2	SINK DOUBLE DOOR BASE UNIT - BX302235
SB-3	DRAWER BASE UNIT - BL242235
SB-4	BASE CABINET END SCRIBE - BSF01(W)35
SB-5	BASE CABINET CORNER FILLER - BSF05(W)35
SB-6	DOUBLE DOOR STORAGE SINK -XXX
SB-7	DOUBLE DOOR W/ MICROWAVE SHELF - XXX
SW-1	SOLID HINGED DOOR WALL UNIT - WB241330, WB181330
SW-2	DOUBLE HINGED DOOR WALL UNIT - WC301330
SW-3	WALL CABINET SCRIBE - WFS01(W)1330
SW-4	WALL CABINET CLOSURE PANELS - WSF0313

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WC-1	STORAGE W/ DOORS - 302
WC-2	STORAGE W/ DOOR - 301
WC-3	CORNER STORAGE W/ DOORS - 308
WC-4	STORAGE W/ SHELF - 300
WC-5	STORAGE W/ DOORS - 312

TALL CABINETS:

TC-1	WARDROBE CABINET W/ DOOR - 501

GENERAL NOTES

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2. ALL WOOD TRIM TO HAVE EASED EDGES

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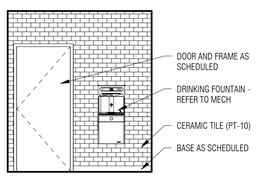
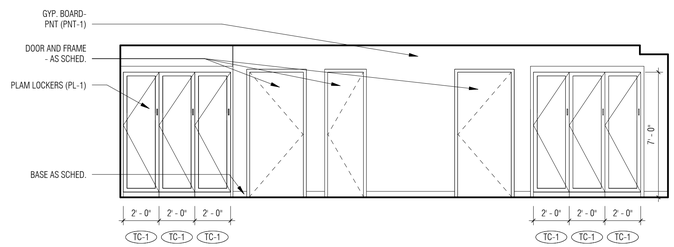
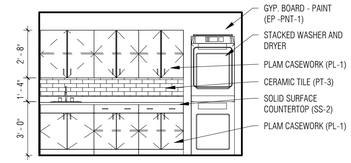


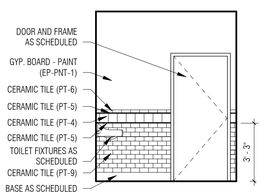
14 A3-01 Interior Elevation - Corridor 140
1/4" = 1'-0"



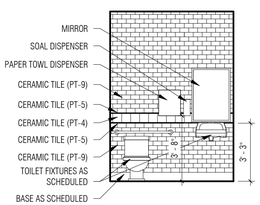
13 A3-01 Interior Elevation-Corridor 142- North
1/4" = 1'-0"



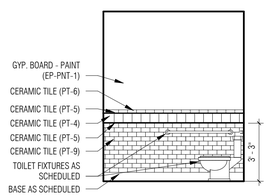
12 A3-11 Interior Elevation - Laundry 125
1/4" = 1'-0"



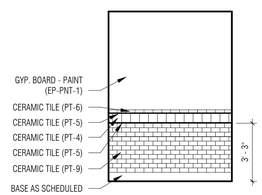
11 A3-11 Interior Elevation - Water Closet TYP
1/4" = 1'-0"



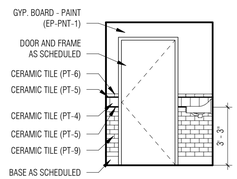
10 A3-11 Interior Elevation - Water Closet TYP
1/4" = 1'-0"



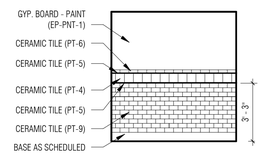
9 A3-11 Interior Elevation - Water Closet TYP
1/4" = 1'-0"



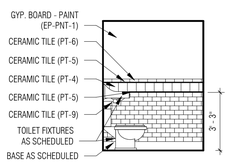
8 A3-11 Interior Elevation - Water Closet TYP
1/4" = 1'-0"



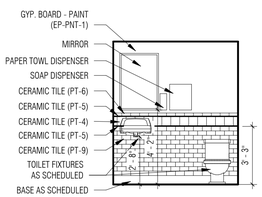
7 A3-11 Interior Elevation - Water Closet 126 - West
1/4" = 1'-0"



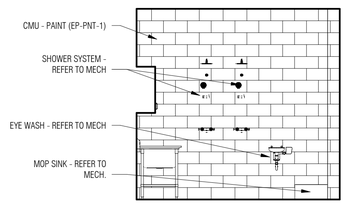
6 A3-11 Interior Elevation - Water Closet 126 - South
1/4" = 1'-0"



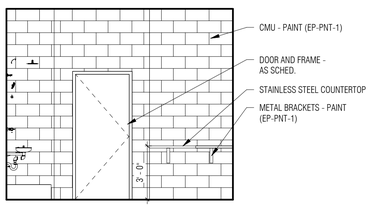
5 A3-11 Interior Elevation - Water Closet 126 - East
1/4" = 1'-0"



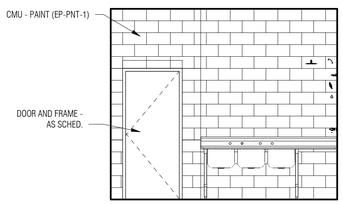
4 A3-11 Interior Elevation - Water Closet 126 - North
1/4" = 1'-0"



3 A3-11 Interior Elevation - Decon 151 - East
1/4" = 1'-0"



2 A3-11 Interior Elevation - Decon 151 - South
1/4" = 1'-0"



1 A3-11 Interior Elevation - Decon 151 - North
1/4" = 1'-0"

PARTNERS

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Mount Clemens, MI 48043
P 586.469.3600
F 586.469.3607

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OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

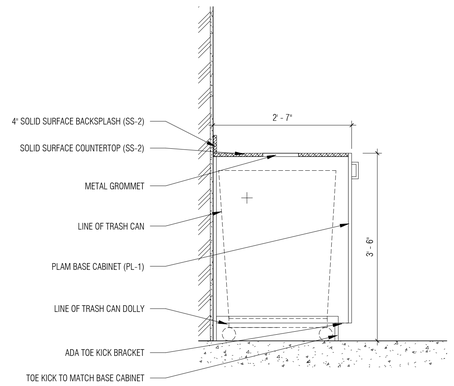
DRAWN BY
DJG

CHECKED BY
DG

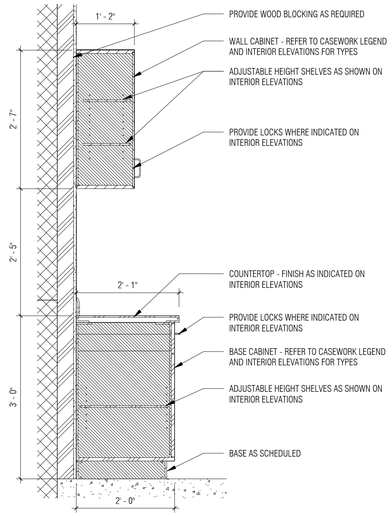
APPROVED BY
MAM

SHEET NAME
Interior Elevations

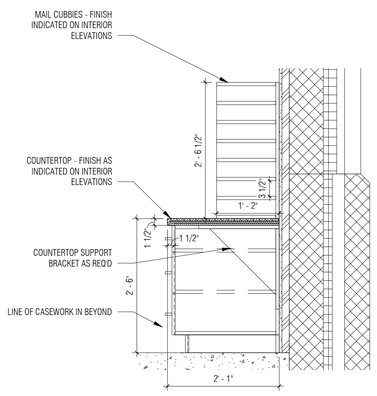
SHEET NO.
A8-02



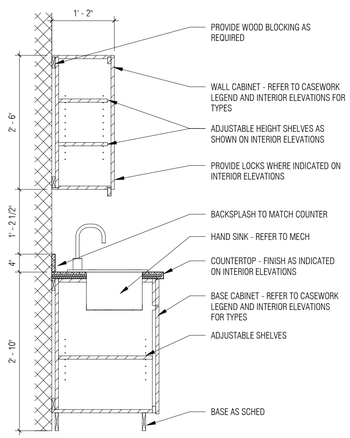
7 Kitchen 122 Trash & Recycling Casework
3/4" = 1'-0"



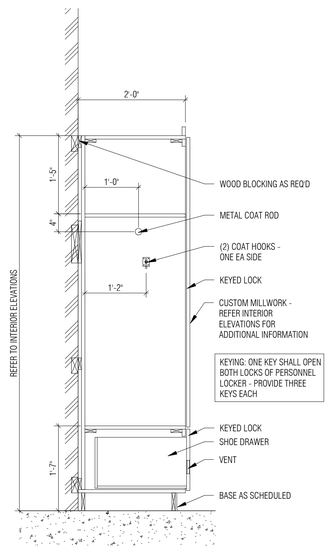
6 Typ Kitchen Stainless Steel Cabinets
3/4" = 1'-0"



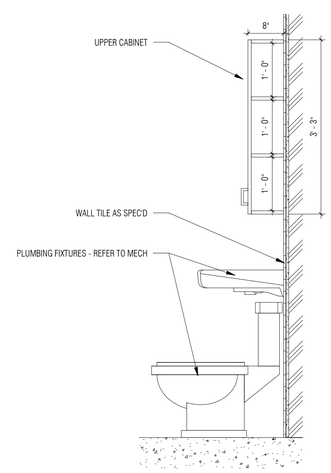
5 A8-01 Watch Desk 107 Millwork
3/4" = 1'-0"



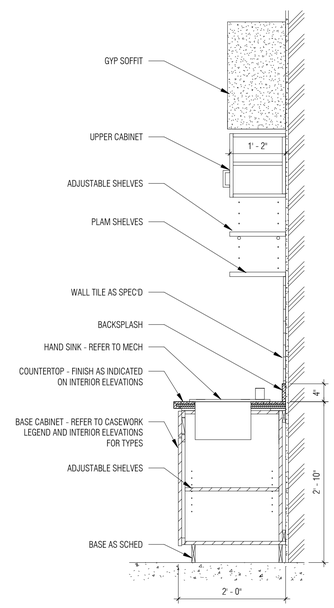
4 Laundry 126 Millwork
3/4" = 1'-0"



3 Typ Dorm Personnel Lockers
3/4" = 1'-0"



2 Typ Dorm Millwork
3/4" = 1'-0"



1 Community Room 103 Sink and Millwork
3/4" = 1'-0"

6/13/2023 11:44:20 AM C:_revitlocal\21-146 WFD STATION 1 CD_DGwardsDHMSH.rvt

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CONSULTANT

KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS

Bidding / Construction	6/13/23

DRAWN BY
DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Casework Details

SHEET NO.
A8-11

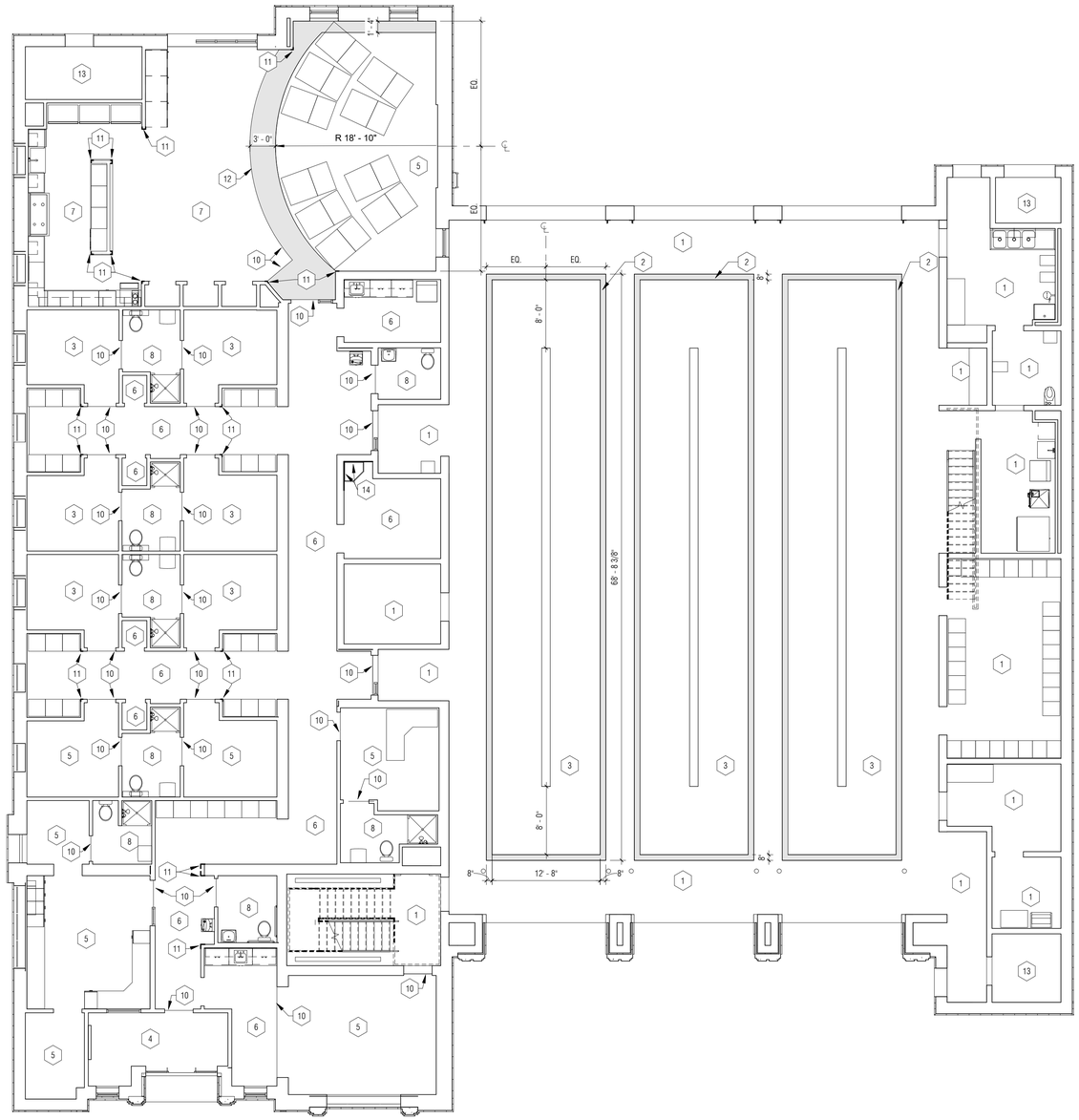
FINISH FLOOR PLAN GENERAL NOTES

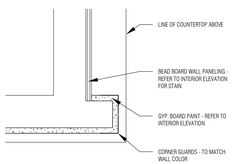
A. REFERENCE THE ROOM FINISH SCHEDULE AND THE SPECIFICATION SECTION 000200 FOR ADDITIONAL INFORMATION.

B. UNLESS OTHERWISE NOTED, FLOOR FINISH TRANSITIONS SHALL OCCUR UNDERNEATH THE CENTERLINE OF DOORS.

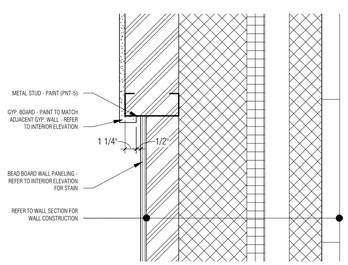
FINISH FLOOR PLAN KEYNOTES

1. EPOXY FLOORING (EP-1) w/ INEGRAL 4" BASE
2. EPOXY FLOORING (EP-2)
3. EPOXY FLOORING (EP-3)
4. WALK OFF CARPET (CPT-1)
5. CARPET TILE (CPT-2)
6. RUBBER FLOORING (RTF-1)
7. RESILIENT ATHLETIC FLOORING (RAF-1)
8. FLOOR TILE (PT-1)
9. FLOOR TILE (PT-7)
10. FLOORING TRANSITION-REFER TO SHEET (A0-05) FOR DETAIL
11. CORNER GUARD
12. CARPET TILE (CPT-3)
13. SEALED CONCRETE
14. FRP UP TO 48" AFF @ J.C.





3 / A3-11 Kitchen Island
1 1/2" = 1'-0"



2 / A3-01 Dayroom - Beadboard Wall
1 1/2" = 1'-0"

N

1 / A9-01 Ground Floor- Finished Floor Plan
1/8" = 1'-0"

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DJG

CHECKED BY
DG

APPROVED BY
MAM

SHEET NAME
Ground Floor Finish Plan

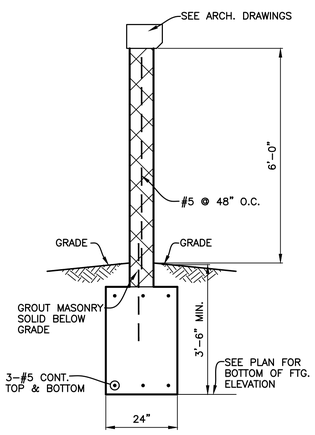
SHEET NO.
A9-01

FOUNDATION SCHEDULE

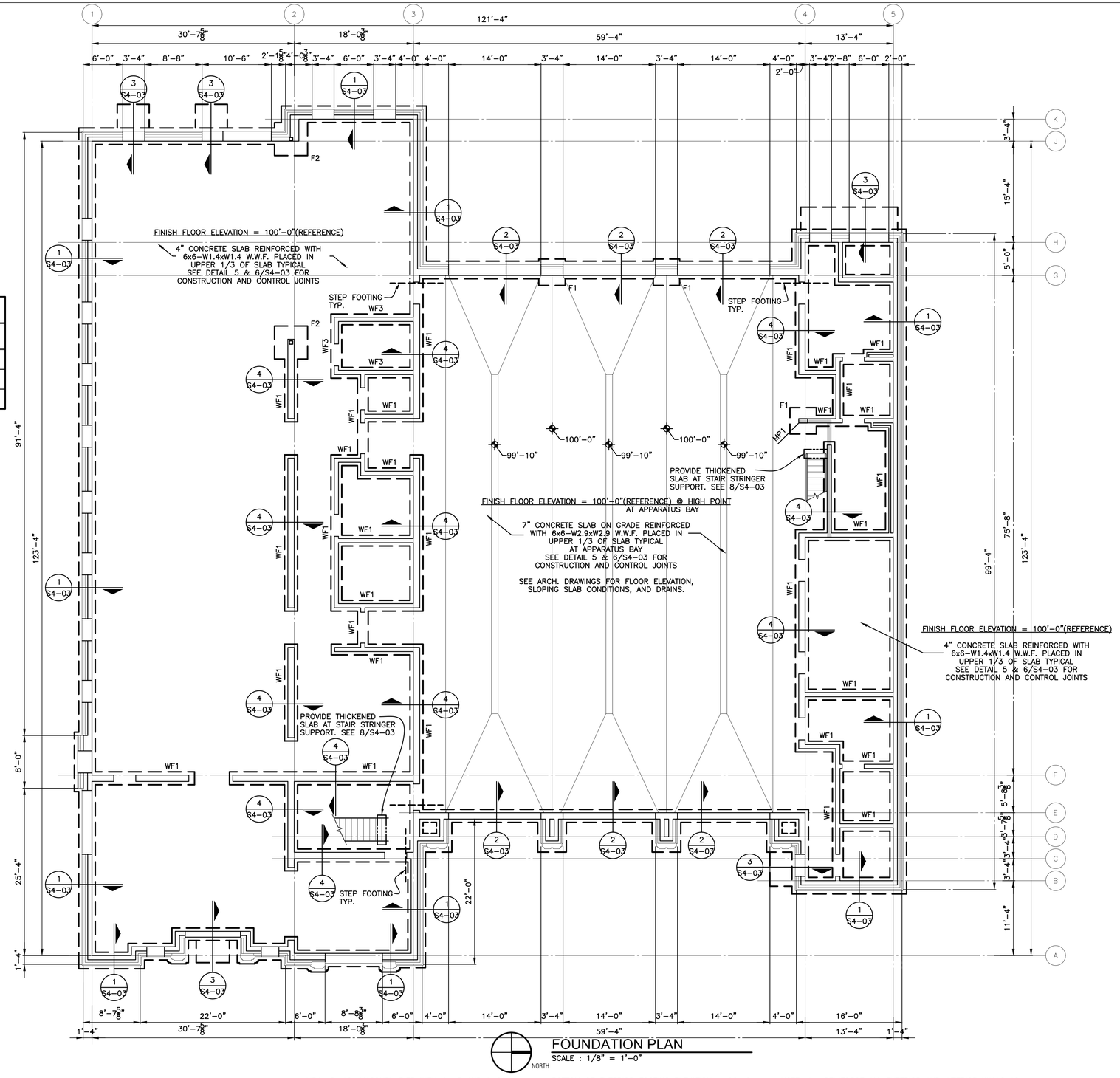
	F2	F1	MARK
	5'–0"x5'–0"	4'–0"x4'–0"	SIZE
	16"	12"	THICKNESS
	5–#5 EACH WAY	6–#4 EACH WAY	REINFORCING EACH WAY–BOTTOM UNLESS OTHERWISE NOTED
			REMARKS

WALL FOOTING SCHEDULE

MARK	SIZE W	SIZE D	REINFORCING STEEL BOTTOM U.O.N.	REMARKS
WF1	18"	12"	2–#5	
WF2	24"	12"	2–#5	
WF3	16"	12"	2–#5	



1 / S3-01 DUMPSTER SCREEN WALL SECTION
SCALE : 1/2" = 1'–0"



FOUNDATION PLAN
SCALE : 1/8" = 1'–0"
NORTH

MP1: 8"x16" MASONRY PIER WITH 4–#5 AND 9 GA. WIRE TIES @ 16" O.C.

BOTTOM OF EXTERIOR FOOTING ELEVATION = 96'–0" UNLESS OTHERWISE NOTED (X'–X")

TOP OF INTERIOR FOOTING ELEVATION = 99'–4" UNLESS OTHERWISE NOTED

NOTE "A": REINFORCE ALL EXTERIOR AND INTERIOR WALLS AS NOTED MASONRY WALLS WITH #5 @ 48" O.C. FULL HEIGHT VERTICAL UNLESS OTHERWISE NOTED, GROUT REINFORCED CORES SOLID, DOWEL TO FOOTING. PLACE BARS AT CORNERS AND FACE OF OPENINGS AND EACH SIDE OF CONTROL JOINTS. SEE DETAILS 1, 2, 3, 4, 5, & 6/S4–02

T.S.: THICKENED SLAB. SEE DETAIL 7/S4–03

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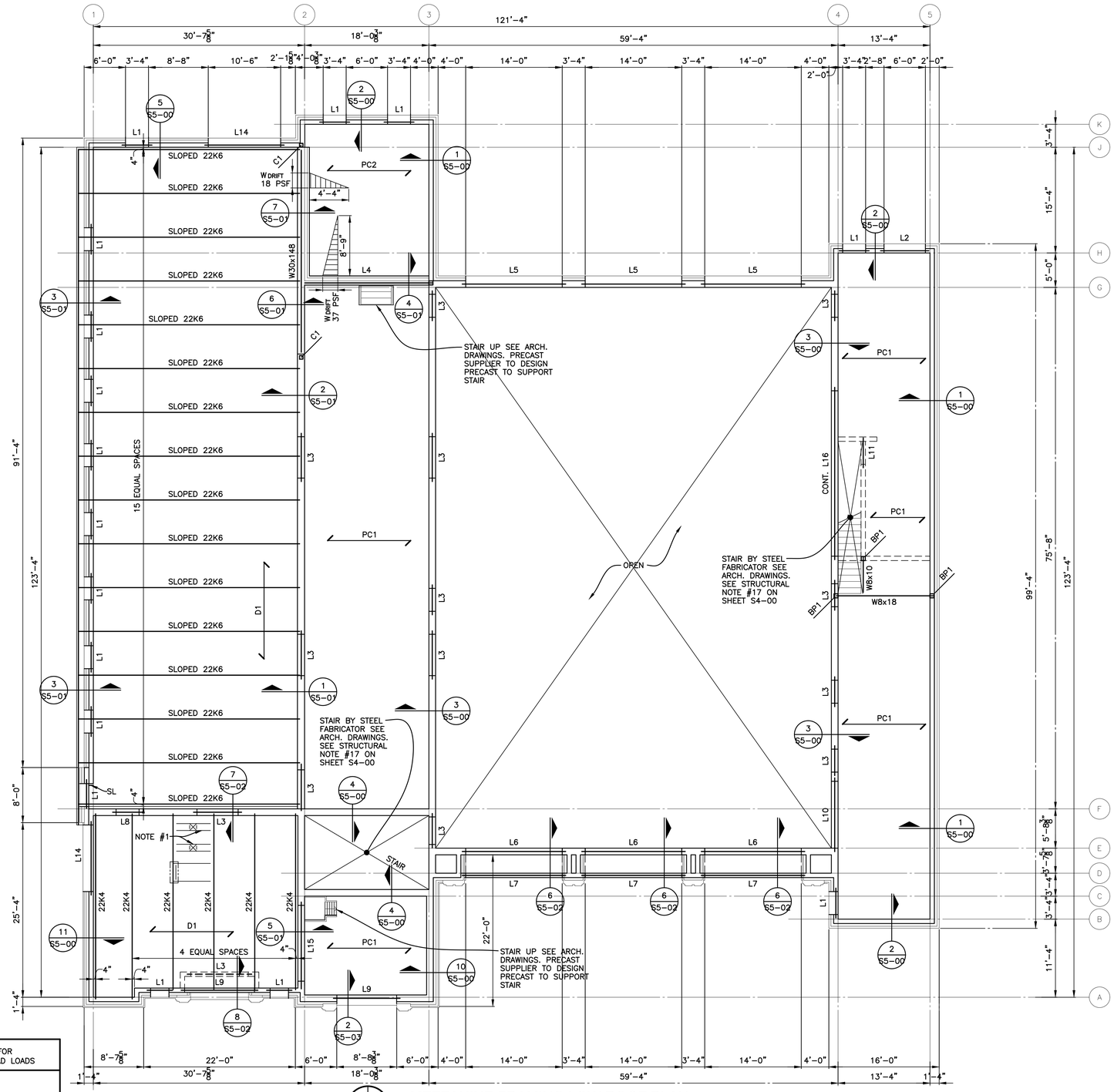
SHEET NAME

FOUNDATION PLAN

SHEET NO.

S3-01



MEZZANINE FRAMING/LOW ROOF PLAN

SCALE : 1/8" = 1'-0"

NORTH

D1 — 1 1/2-20 GA. WIDE RIB METAL DECK (3 SPAN MINIMUM). SEE 5/S5-02

NOTE #1: PROVIDE L3x3x1/4 ALL AROUND AT ROOF OVERFLOW DRAINS. COORDINATE LOCATION WITH ARCH. DRAWINGS.

NOTE #2: PROVIDE L5x3 1/2x5/16 LLV ALL AROUND AT RTU SUPPORT CURB AND ROOF HATCH. VERIFY LOCATION WITH MECH. CONTRACTOR. SEE DETAILS 1 & 2/S5-02

JOIST FRAMING NOTES:

1: JOIST SUPPLIER TO PROVIDE BRIDGING AS REQUIRED PER SJI

2: JOIST SUPPLIER TO DESIGN ALL ROOF JOISTS FOR A NET UPLIFT OF 15 PSF (DO NOT REDUCE BY 0.6W).

SEE SHEET S4-02 FOR COLUMN SCHEDULE

SEE SHEET S4-02 FOR LINTEL SCHEDULE

SEE SHEET S4-02 FOR BEARING PLATE SCHEDULE

PRECAST PLANK SCHEDULE

NOTE: SEE ARCHITECTUAL DRAWINGS FOR ADDITIONAL SUPERIMPOSED DEAD LOADS

MARK	SIZE	LIVE LOAD	MINIMUM SUPERIMPOSED DEAD LOAD	REMARKS
PC1	8" HOLLOWCORE UNIT + 2" CONCRETE TOPPING	125 PSF		
PC2	8" HOLLOWCORE UNIT	100 PSF	PAVERS & ROOFING + CEILING	DESIGN TO CARRY SNOW DRIFT AS SHOWN ON PLAN

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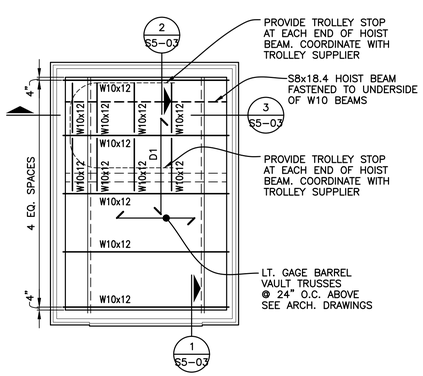
SHEET NAME

MEZZANINE FRAMING/LOW ROOF PLAN

SHEET NO.

S3-02

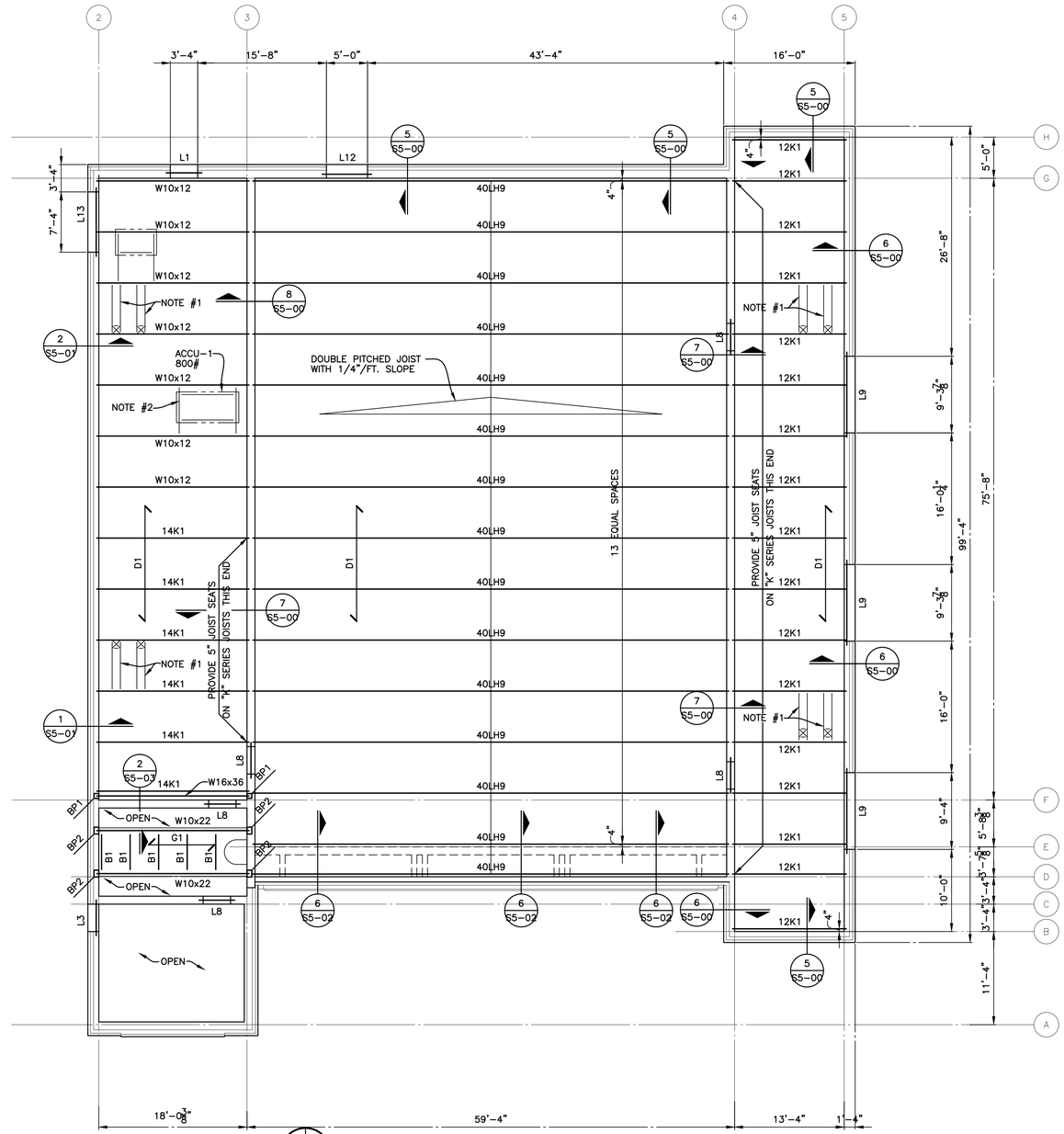


HIGH ROOF FRAMING PLAN

SCALE : 1/8" = 1'-0"

NORTH

D1 — 1 1/2-20 GA. WIDE RIB METAL DECK (3 SPAN MINIMUM)



ROOF FRAMING PLAN

SCALE : 1/8" = 1'-0"

NORTH

D1 — 1 1/2-20 GA. WIDE RIB METAL DECK (3 SPAN MINIMUM)

G1 — INDICATES GALVANZIED BAR GRATING 1 1/2"x3/16" BEARING BARS 1 3/16" O.C. WITH CROSS BARS @ 4" O.C.

NOTE #1: PROVIDE L3x3x1/4 ALL AROUND AT ROOF OVERFLOW DRAINS. COORDINATE LOCATION WITH ARCH. DRAWINGS.

NOTE #2: PROVIDE L5x3 1/2x5/16 LLV ALL AROUND AT RTU SUPPORT CURB AND ROOF HATCH. VERIFY LOCATION WITH MECH. CONTRACTOR. SEE DETAILS 1 & 2/S5-02

SEE SHEET S4-02 FOR LINTEL SCHEDULE

SEE SHEET S4-02 FOR BEARING PLATE SCHEDULE

JOIST FRAMING NOTES:

1: JOIST SUPPLIER TO PROVIDE BRIDGING AS REQUIRED PER SJI

2: JOIST SUPPLIER TO DESIGN ALL ROOF JOISTS FOR A NET UPLIFT OF 15 PSF (DO NOT REDUCE BY 0.6W).

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SHEET NAME

ROOF FRAMING PLAN

SHEET NO.

S3-03

G E N E R A L N O T E S

GENERAL CONDITIONS

1. IF ANY GENERAL NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.

2. THE STRUCTURAL DRAWINGS ARE FOR THE PLACEMENT AND SIZE OF STRUCTURAL COMPONENTS ONLY. O.S.H.A., LOCAL GOVERNMENT CODES AND SAFETY CODE REQUIREMENTS SHALL BE ADHERED TO BY THE CONTRACTOR.

3. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES PROVIDING TEMPORARY BRACING, SHORING, GUYS OR TIE- DOWNS. THESE TEMPORARY SUPPORTS WILL REMAIN IN PLACE UNTIL ALL STRUCTURAL COMPONENTS ARE IN PLACE AND COMPLETED.

4. USE OF ENGINEERING DRAWINGS AS ERECTION DRAWINGS BY THE CONTRACTOR IS STRICTLY PROHIBITED. DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR BUILDING LAYOUT AND LOCATION. SEE ARCHITECTURAL DRAWINGS AND SITE PLAN FOR THESE PURPOSES.

5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AT THE RATE OF NO MORE THAN 8O DRAWINGS PER WEEK. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF SHOP DRAWINGS PRIOR TO SUBMITTAL. THE CONTRACTOR SHALL CHECK SHOP DRAWINGS PRIOR TO SUBMITTAL AND IS SOLELY RESPONSIBLE FOR ERRORS & OMISSION IN THE PREPARATION OF SHOP DRAWINGS TO CONFORM TO THE DESIGN DRAWINGS. SUBMIT NO MORE THAN ONE REPRODUCIBLE AND TWO PRINTS OF SHOP DRAWINGS FOR ENGINEER REVIEW. TWO COPIES WILL BE RETURNED TO THE ARCHITECT.

6. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST PURCHASED MANUFACTURER'S CERTIFIED EQUIPMENT DRAWINGS. DIMENSIONS THAT DEPEND UPON SPECIFIC EQUIPMENT SUCH AS ELEVATOR OPENINGS, MECHANICAL EQUIPMENT SUPPORTS, ETC. SHALL BE COORDINATED BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER. SUCH DIMENSIONS SHALL BE PROVIDED ON THE SHOP DRAWINGS BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER.

7. PRE-MANUFACTURED ITEMS SUCH AS CANOPIES, AWNINGS, SUNSHADES, ETC. SHALL BE DESIGNED BY SUPPLIER. SUPPLIER SHALL SUBMIT SIGNED AND SEALED SHOP DRAWINGS AND CALCULATIONS BY A REGISTERED ENGINEER IN THE STATE OF MICHIGAN FOR RECORD TO ARCHITECT. SHOP DRAWINGS SHALL INDICATE ALL DESIGN LOADS AND INCLUDE ALL CONNECTIONS AND MATERIAL NECESSARY FOR INSTALLATION OF PRE-MANUFACTURED ITEMS.

FOUNDATIONS

1. FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL WITH AN ASSUMED SAFE BEARING CAPACITY OF 2500 P.S.F. IF SOIL OF THIS CAPACITY IS NOT FOUND AT THE ELEVATIONS INDICATED, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE ARCHITECT. VERIFY FOUNDATION SOIL BEARING PRESSURE IN FIELD BY SOILS ENGINEER.

2. WHERE NEW FOOTINGS ABUT EXISTING FOUNDATIONS, CAREFULLY HAND EXCAVATE AND PLACE BOTTOM OF NEW FOOTING AT THE SAME ELEVATION AS THE EXISTING.

3. PROVIDE NECESSARY SHEETING SHORING BRACING, ETC. AS REQUIRED DURING EXCAVATIONS TO PROTECT SIDES OF EXCAVATIONS.

4. COMPLY FULLY WITH REQUIREMENTS OF OSHA AND OTHER REGULATORY AGENCIES FOR SAFETY PROVISIONS.

CONCRETE

1. MINIMUM CONCRETE STRENGTH TO BE 3000 P.S.I. @ 28 DAYS, U.O.N.; SLABS SHALL BE 3500 P.S.I. MIN. U.O.N. EXPOSED CONCRETE SHALL BE 4000 PSI WITH 6% + 1% ENTRAINED AIR U.O.N.

   A. PROVIDE 3000 P.S.I. 28-DAY COMPRESSIVE STRENGTH; W/C RATIO, 0.58 MAXIMUM (NON-AIR-ENTRAINED), 5.0 BAG CEMENT MIX FOR ALL FOUNDATION WORK UNLESS NOTED OTHERWISE.

   B. PROVIDE 3500 P.S.I. 28-DAY COMPRESSIVE STRENGTH; W/C RATIO, 0.53 MAXIMUM (NON-AIR-ENTRAINED), 5.5 BAG CEMENT MIX FOR ALL INTERIOR SLABS UNLESS NOTED OTHERWISE.

   C. PROVIDE 4000 P.S.I. 28-DAY COMPRESSIVE STRENGTH; W/C RATIO, 0.45 MAXIMUM (AIR-ENTRAINED), 6.0 BAG CEMENT MIX FOR ALL EXTERIOR CONCRETE UNLESS NOTED OTHERWISE.

2. FLYASH OR GROUND GRANULATED BLAST FURNACE SLAG MAY BE SUBSTITUTED UP TO 25% MAXIMUM OF MIX DESIGN CEMENT CONTENT IN NON-EXPOSED CONCRETE MIXES. DO NOT USE IN EXPOSED MIX DESIGNS.

3. ALL CONCRETE WORK AND PLACEMENT SHALL CONFORM TO THE LATEST RECOMMENDATIONS OF A.C.I.

4. ALL REINFORCING BARS, DOWELS AND TIES SHALL CONFORM TO A.S.T.M. A615 GRADE 60. REINFORCING STEEL SHALL BE CONTINUOUS AND SHALL HAVE MINIMUM 36 BAR DIAMETER LAP AND BE FABRICATED AND PLACED IN ACCORDANCE WITH A.C.I. - 315 LATEST EDITION.

5. REINFORCED CONCRETE WALLS AND WALL FOOTINGS SHALL HAVE CORNER BARS AT ALL INTERSECTIONS OF THE SAME SIZE AND SPACING AS THE MAIN HORIZONTAL REINFORCING.

6. ALL SLABS ON GROUND SHALL BE 4" THICK AND HAVE 6" X 6" W1.4 X W1.4 WELDED WIRE FABRIC IN THE TOP 1/3 OF THE SLAB, UNLESS OTHERWISE NOTED.

7. CONCRETE CONTRACTOR SHALL INCLUDE IN HIS COST ADDITIONAL CONCRETE QUANTITY AS REQUIRED TO COMPENSATE FOR DEFLECTIONS OF METAL DECK AND UNSHORED COMPOSITE BEAMS AND TO PROVIDE A LEVEL CONCRETE SURFACE.

8. BONDED TOPPING SLABS ON PRECAST CONCRETE SHALL MEET ALL THE REQUIREMENTS OF ACI 302.1R, SECTION 8.10.

9. FIELD AND SHOP TESTING OF CONCRETE WORK SHALL INCLUDE INSPECTION OF REINFORCING STEEL PLACEMENT, REBARS, NUMBER, LOCATION, AND LAP SPLICE LENGTH.

10. PROVIDE DOWELS INTO FOUNDATION TO MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT AT ALL COLUMNS AND WALLS, UNLESS OTHERWISE NOTED.

11. UNLESS OTHERWISE SHOWN, PROVIDE THE FOLLOWING COVER FOR REINFORCING STEEL:

A. UNFORMED SURFACES IN CONTACT WITH EARTH	-3	IN.
B. UNFORMED SURFACES OVER MOISTURE BARRIERS	-2	IN.
C. FORMED SURFACES EXPOSED TO EARTH OR WEATHER OR WATER PROOFING/DAMP PROOFING		
#6 OR LARGER	-2	IN.
#5 OR SMALLER	-1 1/2	IN.
D. FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER		
SLABS AND WALLS	-3/4	IN.
COLUMNS	-1 1/2	IN.
BEAMS AND GIRDERS	-1 1/2	IN.

MASONRY

1. THE MASONRY PORTIONS OF THIS STRUCTURE ARE DESIGNED ACCORDING TO THE LATEST ALLOWABLE STRESS DESIGN PROVISIONS OF THE MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530/ASCE 602) INCLUDING SECTIONS 2106 AND 2107 OF CHAPTER 21 IN THE MICHIGAN BUILDING CODE. MASONRY COMPONENTS HAVE BEEN DESIGNED ACCORDING TO THE PROVISIONS FOR SEISMIC DESIGN CATEGORY B.

2. ALL STRUCTURAL MASONRY IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 402/ACI 530/ASCE 5) AND SPECIFICATIONS FOR MASONRY STRUCTURES (TMS 602/ACI 530.1/ASCE 6) MASONRY SUBMITTALS ARE REQUIRED BY ACI 530.1/ASCE 6/TMS 602. SECTION 1.5 MASONRY TESTING AND INSPECTIONS ARE REQUIRED BY ACI 530.1/ASCE 6/TMS 602 SECTION 1.6, TABLE 5.

3. ALL STRUCTURAL MASONRY HAS BEEN ENGINEERED IN ACCORDANCE WITH CHAPTER 2 ALLOWABLE STRENGTH DESIGN. COMPRESSION STRENGTH SHALL BE DETERMINED ACCORDING TO THE UNIT STRENGTH METHOD FOR CONCRETE MASONRY MSJC SECTION 1.4. B.2.b.

4. ALL BLOCK SHALL CONFORM TO ASTM C90, TYPE I, WITH A MINIMUM UNIT NET AREA COMPRESSIVE STRENGTH OF 2800 PSI.

5. MASONRY COMPRESSIVE STRENGTH f'm = 2000 PSI MINIMUM.

6. MORTAR SHALL BE TYPE "S" (1800 PSI) CONFORMING TO ASTM C-270. USE MORTAR CEMENT WHERE EXTERIOR WALLS ARE UNREINFORCED.

7. PROVIDE HORIZONTAL WIRE TYPE REINFORCING WITH 9 GAUGE SIDE AND CROSS MEMBERS IN EVERY SECOND COURSE (16" O.C.), IN ALL MASONRY WALLS. WALLS WITH VERTICAL REINFORCING SHALL ONLY HAVE "LADDER" TYPE REINFORCING.

8. ALL REINFORCING BARS, DOWELS AND TIES SHALL CONFORM TO A.S.T.M. A615 GRADE 60. REINFORCING STEEL SHALL BE CONTINUOUS, FABRICATED AND PLACED IN ACCORDANCE WITH A.C.I. - 315 LATEST EDITION AND HAVE THE FOLLOWING MINIMUM LAP LENGTHS:

BAR SIZE	8" CMU	12" CMU
#3	18"	18"
#4	24"	24"
#5	30"	30"
#6	38"	36"
#7		42"
#8	PROVIDE MECH. SPLICE	

9. ALL MASONRY BEARING STEEL BEAMS AND LINTELS TO BEAR 8" MINIMUM ON 3 COURSES SOLID MASONRY, WITH 2-3/4" DIAMETER BOLTS EACH END, UNLESS OTHERWISE NOTED.

10. UNLESS OTHERWISE NOTED WHERE STEEL JOISTS BEAR ON MASONRY, PROVIDE A MINIMUM OF ONE COURSE OF SOLID BLOCK BELOW K-SERIES JOISTS AND A MINIMUM OF TWO COURSES SOLID BELOW LH SERIES JOISTS.

11. ALL MASONRY BELOW GRADE SHALL BE GROUTED SOLID.

12. MASONRY GROUT SHALL CONFORM TO ASTM C 476, WITH PEA GRAVEL AGGREGATE AND A MINIMUM STRENGTH OF 2000 PSI, BUT NOT LESS THAN SPECIFIED f'm.

13. UNLESS OTHERWISE NOTED, AT ALL MASONRY WALLS PROVIDE THE FOLLOWING LINTELS:

    8" WALLS

    (2) L4x3 1/2 x 5/16 LLV FOR OPENINGS UP TO 4'-0"
    (2) L5x3 1/2 x 5/16 LLV FOR OPENINGS UP TO 5'-4"
    W8x18 + 3/8" PLATE FOR OPENINGS UP TO 8'-0"
    W8x28 + 3/8" PLATE FOR OPENINGS UP TO 12'-4"

    12" WALLS:

    (3) L4x3- 1/2 x 5/16 LLV FOR OPENINGS UP TO 4'-0"
    (3) L5x3-1/2 x 5/16 LLV FOR OPENINGS UP TO 5'-4"
    W8x18 + 3/8" PLATE FOR OPENINGS UP TO 8'-0"
    W8x28 + 3/8" PLATE FOR OPENINGS UP TO 12'-4"

14. ALL DOUBLE ANGLE LINTELS SHALL BE WELDED BACK TO BACK WITH A MINIMUM 2 INCH STITCH WELD EVERY 8 INCHES.

15. UNLESS OTHERWISE NOTED, PROVIDE L5 X 3-1/2 X 5/16 L.L.V. LINTEL FOR EACH 4" OF MASONRY FOR SPANS UP TO 5'-4" MAX.

16. PROVIDE DOWELS INTO FOUNDATION TO MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT AT ALL COLUMNS AND WALLS, UNLESS OTHERWISE NOTED.

STRUCTURAL STEEL

1. STEEL DESIGN, FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH THE LATEST A.I.S.C. MANUAL AND SPECIFICATION FOR STRUCTURAL STEEL FOR BUILDINGS. ALL WIDE FLANGE BEAMS AND COLUMNS SHALL CONFORM TO THE LATEST ASTM. SERIAL DESIGNATION A992, GR50; ALL MISCELLANEOUS STEEL PLATES, BARS, ANGLES, ETC., SHALL CONFORM TO ASTM A36; STEEL TUBING TO BE ASTM A500, GRADE B; STEEL PIPE ASTM. A-53, GRADE B. ANCHOR BOLTS TO BE ASTM F1554 GRADE 36 KSI MINIMUM UNLESS OTHERWISE NOTED

2. UNLESS OTHERWISE NOTED OR SHOWN, ALL BEAM CONNECTIONS TO HSS 5 X 5 OR SMALLER COLUMN,5"Ø OR SMALLER COLUMN, OR ANY TUBE COLUMN REGARDLESS OF SIZE WITH A WALL THICKNESS LESS THAN 3/8" SHALL BE MADE WITH THRU PLATES WELDED TO BOTH WALLS OF COLUMN.

3. ALL WELDED CONNECTIONS SHALL BE IN ACCORDANCE WITH THE LATEST AWS CODE, E70XX ELECTRODES, WITH WELDING PERFORMED BY QUALIFIED WELDERS.

4. BOLTED CONNECTIONS SHALL BE MADE WITH A-325 OR A-490 BOLTS. ALL BOLTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS FOR "STRUCTURAL JOINTS USING A.S.T.M. A-325 OR A-490 BOLTS." TYPICAL BOLTED CONNECTIONS ARE "BEARING TYPE" UNLESS NOTED OTHERWISE.

5. DESIGN CONNECTIONS FOR MINIMUM ONE-HALF THE TOTAL ALLOWABLE UNIFORM LOAD PER A.I.S.C. BEAM LOAD TABLES, UNLESS OTHERWISE NOTED. (MIN. 2 BOLTS EACH CONNECTION).

6. THE STRUCTURAL STEEL CONTRACTOR SHALL INCLUDE (5) TONS OF ADDITIONAL STEEL, INCLUDING FABRICATION AND ERECTION, TO BE USED AT THE DISCRETION OF THE STRUCTURAL ENGINEER. TONNAGE COST IS TO BE BASE ON TONNAGE PRICE PER JOB. ADDITIONAL STEEL NOT USED IS TO BE CREDITED BACK TO THE OWNER. GENERAL CONTRACTOR IS TO COORDINATE WITH STEEL FABRICATOR AND OWNER.

7. THE DESIGN, CONFIGURATION & ERECTION SAFETY OF ALL STRUCTURAL STEEL CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE STRUCTURAL STEEL FABRICATOR. REVIEW AND ACCEPTANCE OF THE SHOP DRAWINGS BY THE ENGINEER SHALL CONSTITUTE APPROVAL OF THE LOAD CARRYING ADEQUACY ONLY.

STRUCTURAL STEEL(CONT.)

8. TYPE OF CONSTRUCTION PER ASCE A2.2 IS TYPE 2 "SIMPLE FRAMING" UNLESS NOTED OTHERWISE.

9. TEMPORARY ERECTION SEATS SHALL BE PROVIDED AS RECOMMENDED ON PAGE 3-59 OF THE A.I.S.C. PUBLICATION "ENGINEERING FOR STEEL CONSTRUCTION".

10. STEEL JOISTS AND JOIST GIRDERS ARE TO BE FABRICATED BY A MEMBER OF THE STEEL JOIST INSTITUTE AND BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE S.J.I.

11. ALL PROVISIONS OF THE RECOMMENDED CODE OF STANDARD PRACTICE FOR STEEL JOISTS AS ADOPTED BY THE STEEL JOIST INSTITUTE SHALL BE ADHERED TO.

12. STEEL JOIST BEARING ON STEEL BEAMS OR PLATES, TO BE WELDED TO STEEL WITH 2" LONG BEAD EACH SIDE OF BEARING.

13. STAGGER JOISTS AS REQUIRED TO ACHIEVE NECESSARY BEARING ON WALLS OR GIRDERS.

14. METAL DECK SHALL CONFORM TO ALL REQUIREMENTS OF "BASIC DESIGN SPECIFICATION" AS ADOPTED BY THE STEEL DECK INSTITUTE (S.D.I.). METAL ROOF DECK SHALL BE WIDE RIB WITH NESTING SIDE SEAMS OF DEPTH AND GAGE INDICATED ON THE DRAWINGS. DECK SHALL BE WELDED TO ALL SUPPORTING STEEL WITH PUDDLE WELDS (5/8" DIAMETER MINIMUM), AT 12" ON CENTER MAXIMUM SPACING AND 6" O/C (ALL FLUTES) AT END LAP SUPPORT POINTS AND BUILDING PERIMETER ATTACHMENTS. SIDE LAP CONNECTIONS SHALL BE MADE AT MAXIMUM 3'-0" ON CENTER.(AT MIDPOINT OF SPAN FOR SPAN LESS THAN 6'-0" AT THIRD POINTS OF SPAN FOR SPANS GREATER THAN 6'-0") WITH #10 TEK SCREW MIN. REFER TO SPECIFICATIONS FOR ADDITIONAL ERECTION PROCEDURES.

15. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL ANGLES, PLATES, BARS, CLIPS, ETC., ATTACHED TO STRUCTURAL STEEL.

16. UNLESS OTHERWISE NOTED, ALL FLOOR AND ROOF OPENINGS SHALL BE FRAMED WITH L 5 X 3-1/2 X 5/16 L.L.V. VERIFY EXACT SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND WITH CONTRACTOR INVOLVED.

17. THE DESIGN OF THE STEEL FRAMED STAIRS AND RAILINGS SHALL BE THE RESPONSIBILITY OF THE STEEL FABRICATOR. PROVIDE COMPLETE ENGINEERED STAIR ASSEMBLIES, CONFORMING TO THE ARCHITECTURAL INTENT (SHOP DRAWINGS), AND CALCULATIONS UNDER THE SEAL OF AN ENGINEER REGISTERED IN THE STATE OF MICHIGAN INCLUDING METAL FRAMING, HANGERS, MASONRY BEARING PLATES, COLUMNS, RAILING ASSEMBLIES, AND OTHER COMPONENTS NECESSARY TO SUPPORT THE STAIRS AND LANDINGS INCLUDING ANCHORAGE TO THE SUPPORTING STRUCTURE.

18. THE CONTRACTOR SHALL FURNISH ALL ACCESSORIES INCLUDING CLOSURES, "Z" CLOSURES, COLUMN CLOSURES, SCREED ANGLES AND GIRDER FILLERS AS REQUIRED.

19. NO LOADS SHALL BE PERMITTED TO BE HUNG FROM ANY ROOF DECK. ALL HANGERS FOR CEILINGS, DUCTWORK, ELECTRICAL CONDUIT, PIPING, ETC., SHALL BE HUNG DIRECTLY FROM STRUCTURAL STEEL WORK OR SUPPLEMENTARY MEMBERS.

20. MASONRY AND BRICK LINTELS SHALL BE GALVANIZED G90 PER ASTM A123.

21. PROVIDE L4X4X1/4 SEATS AT COLUMN WEBS WHERE REQUIRED FOR SUPPORT OF ROOF AND FLOOR DECKS. PROVIDE ANGLE OUTRIGGER FROM EXTERIOR COLUMNS FOR SLAB AND ROOF EDGE PLATE SUPPORT.

22. ALL BOLTED MOMENT CONNECTIONS REQUIRE SLIP CRITICAL BOLTS.

23. ALL WIDE FLANGE LINTELS TO HAVE MINIMUM 7"x3/8"x0'-7" BEARING PLATE, ALL WIDE FLANGE FLOOR OR ROOF BEAMS TO HAVE MINIMUM 7"x3/8"x0'-7" BEARING PLATE UNLESS OTHERWISE NOTED

LIGHT GAGE FRAMING

1. LIGHT GAGE FRAMING SUPPLIER SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN INDICATING ALL DESIGN LOADS AND MATERIALS INCLUDING VERIFYING ANY MEMBER SIZES SHOWN. DESIGN BY SUPPLIERS ENGINEER SHALL INCLUDE ALL CONNECTIONS AND MISCELLANEOUS MATERIALS NECESSARY FOR A COMPLETE STRUCTURE. THE FINAL MEMBER SIZES AND GAGES SHALL BE CALCULATED BY THE LIGHT GAGE ENGINEER. LIGHT GAGE SHOP DRAWINGS NOT SIGNED AND SEALED WILL BE REJECTED.

2. LIGHT GAGE MEMBERS SHALL BE DESIGNED, MANUFACTURED AND INSTALLED IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE AMERICAN IRON AND STEEL INSTITUTE (AISI) INCLUDING ANY REQUIRED CLIPS, STIFFENERS, AND BRACING.

3. MEMBER SIZES INDICATED ON DRAWINGS ARE MINIMUM DEPTH AND GAGE REQUIRED TO MEET THE DESIGN INTENT AND ARE BASED ON THE PROPERTIES AND MATERIALS LISTED IN THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA) PRODUCT CATALOG. ALTERNATE MANUFACTURERS ARE ACCEPTABLE IF THE PHYSICAL PROPERTIES ARE EQUAL OR BETTER THAN THOSE LISTED ACCEPTABLE TO THE PROJECT ARCHITECT AND ENGINEER, AND MEET OR EXCEED PERFORMANCE CRITERIA.

4. LIGHT GAGE DOCUMENTS SUBMITTED BY THE LIGHT GAGE FRAMING SUPPLIER IS A "DEFERRED SUBMITTAL" PER SECTION 107.3.4.1 OF THE MBC 2015

5. ALL LIGHT GAGE BACK UP STUDS FOR BRICK VENEER TO BE 16 GA. MINIMUM (54) AND BE DESIGNED FOR L/600 MINIMUM LATERAL DEFLECTION REQUIREMENT.

PRECAST CONCRETE

1. SHOP DRAWINGS AND CALCULATIONS FOR ALL PRECAST STRUCTURAL COMPONENTS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN AND SHALL INDICATE ALL DESIGN LOADS. SHOP DRAWINGS NOT SIGNED AND SEALED WILL BE REJECTED.

2. THE PRECAST CONCRETE PRODUCT SUPPLIER SHALL BE A MEMBER OF THE PRESTRESSED CONCRETE INSTITUTE (PCI). THE DESIGN AND MANUFACTURE OF ALL PRECAST CONCRETE PRODUCTS SHALL CONFORM TO ALL PROVISIONS OF THE "PCI DESIGN HANDBOOK" AND TO THE LATEST ACI STANDARDS AND GUIDELINES.

3. ALL HOLES IN PRECAST PLANK ARE TO BE CORE DRILLED THROUGH THE VOID. DO NOT CUT STRANDS. THE PRECAST PLANK SUPPLIER SHALL BE NOTIFIED OF ALL HOLES TO BE CUT AND SHALL VERIFY THE ADEQUACY OF THE PRECAST COMPONENT FOR THE DESIGN LOADS. PROVIDE THE LOCATION OF ALL REQUIRED HOLES TO THE PRECAST CONCRETE SUPPLIER TO CONFIRM STRUCTURAL ADEQUACY.

4. PREPARE STRUCTURAL PRECAST CONCRETE FOR BONDED TOPPINGS PER ACI 302.1R, SECTION 8.10, WHERE BONDED TOPPINGS OCCUR PER THE CONTRACT DRAWINGS.

5. PRECAST CONCRETE HOLLOW CORE SLABS (PLANK) SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, THE DESIGN RECOMMENDATIONS OF PCI MNL 120 "PCI DESIGN HANDBOOK" 5TH EDITION, THE DESIGN RECOMMENDATIONS OF PCI "MANUAL FOR THE DESIGN OF HOLLOW CORE SLABS" AND IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

6. PROVIDE CONNECTIONS COMPLYING WITH ACI 318, CHAPTER 16 AND PCI RECOMMENDATIONS.

7. PRECAST DOCUMENTS SUBMITTED BY THE PRECAST SUPPLIER IS A "DEFERRED SUBMITTAL" PER SECTION 107.3.4.1 OF THE MBC 2015

CAST STONE PANELS

1. CAST STONE PANELS, COMPONENTS, ETC. SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN INDICATING ALL DESIGN LOADS. SHOP DRAWINGS NOT SIGNED AND SEALED WILL BE REJECTED.

2. CAST STONE PANELS AS INDICATED ON DRAWINGS SHALL BE DESIGNED TO SPAN BETWEEN CAST STONE COLUMNS EACH END AND SUPPORT BRICK VENEER ABOVE. REINFORCEMENT, CONNECTIONS, & ANCHORS SHALL BE THE RESPONSIBILITY OF THE CAST STONE SUPPLIER.

3. CAST STONE SUPPLIER SHALL FURNISH ALL REQUIRED BRACING AND SUPPORT STEEL SHOWN OR NOT SHOWN, ON THE DRAWINGS AND SHALL EITHER ATTACH IT TO THE STRUCTURE OR FURNISH THE STEEL AND DETAILS TO THE FABRICATOR FOR FABRICATION AND/OR ATTACHMENT TO THE STRUCTURE.

4. CAST STONE PANELS SUBMITTED BY THE CAST STONE PANEL SUPPLIER IS A "DEFERRED SUBMITTAL" PER SECTION 107.3.4.1 OF THE MBC 2015

SPECIAL INSPECTION

1. WORK CONSTRUCTED SHALL BE INSPECTED BY AN INDEPENDENT TESTING AGENCY TO ENSURE COMPLIANCE WITH THE REQUIREMENTS SHOWN ON THE DRAWINGS. INSPECTIONS REQUIRED BY CHAPTER 17 OF THE MICHIGAN BUILDING CODE; LOCAL BUILDING DEPARTMENTS AND THE CONTRACT DOCUMENTS SHALL BE PERFORMED BY AN INDEPENDENT TESTING AGENCY. SITE VISITS BY THE DESIGN ENGINEER DO NOT CONSTITUTE OR REPLACE INSPECTION

2. THE FOLLOWING ITEMS SHALL BE INSPECTED IN ACCORDANCE WITH MBC 2015 SEC. 1704 & 1705 BY A CERTIFIED SPECIAL INSPECTOR UNLESS NOTED OTHERWISE IN REMARKS COLUMN. ALL INSPECTION SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. ALL PRODUCTS WITH ICC APPROVALS SHALL BE INSTALLED PER THE APPROVAL AND PER MANUFACTURER'S RECOMMENDATIONS. FOR MATERIAL TESTING REQUIREMENTS, SEE SPECIFICATIONS AND/OR GENERAL NOTES. TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE ARCHITECT.

INSPECTION OF FABRICATOR'S (SEC. 1704.2.5) *

FABRICATION AND IMPLEMENTATION PROCEDURES 1704.2.5.1

*SPECIAL INSPECTION IS NOT REQUIRED FOR FABRICATOR SHOP IF CERTIFICATE OF APPROVAL SUBMITTED BY FABRICATOR'S INSPECTION AGENCY PER EXCEPTION 1704.2.5.1

TABLE 1705.2.2
REQUIRED VERIFICATION AND
INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	NOT APPLICABLE	REFERENCED STANDARD
1. MATERIAL VERIFICATION OF COLD-FORMED STEEL DECK:				
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X	-	APPLICABLE ASTM MATERIAL STANDARDS
b. MANUFACTURER'S CERTIFIED TEST REPORTS.	-	X	-	-
2. INSPECTION OF WELDING:				
a. COLD-FORMED STEEL DECK:				
1) FLOOR AND ROOF DECK WELDS.	-	X	-	AWS D1.3
b. REINFORCING STEEL:				
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	-	X	-	AWS D1.4 ACI 318: SECTION 3.5.2
2) REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	X	-	-	
3) SHEAR REINFORCEMENT.	X	-	-	
4) OTHER REINFORCING STEEL.	-	X	-	

TABLE 1705.2.3
REQUIRED SPECIAL INSPECTIONS OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]
1. INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS.			
a. END CONNECTIONS - WELDING OR BOLTED.	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1.
b. BRIDGING - HORIZONTAL OR DIAGONAL.	-		
1. STANDARD BRIDGING.	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1.
2. BRIDGING THAT DIFFERS FROM THE SJI SPECIFICATIONS LISTED IN SECTION 2207.1.		X	

FOR SI: 1 INCH = 25.4 MM.
a. WHERE APPLICABLE, SEE ALSO SECTION 1705.12, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.

O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding/Construction 06/13/2023

DRAWN BY
RC

CHECKED BY
MJ

APPROVED BY
TS

SHEET NAME

GENERAL NOTES

SHEET NO.

S4-00

SPECIAL INSPECTION(CONT.)

TABLE N5.4-1
INSPECTION TASKS PRIOR TO WELDING

INSPECTION TASKS PRIOR TO WELDING	QC	QA	NOT APPLICABLE
WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	P	P	-
MANUFACTURER CERTIFICATION FOR WELDING CONSUMABLES AVAILABLE	P	P	-
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O	-
WELDER IDENTIFICATION SYSTEM†	O	O	-
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) ● JOINT PREPARATION ● DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) ● CLEANLINESS (CONDITION OF STEEL SURFACES) ● TACKING (TACK WELD QUALITY AND LOCATION) ● BACKING TYPE AND FIT (IF APPLICABLE)	O	O	-
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O	-
FIT-UP OF FILLET WELDS ● DIMENSIONS (ALIGNMENT, GAPS AT ROOF) ● CLEANLINESS (CONDITION OF STEEL SURFACES) ● TACKING (TACK WELD QUALITY AND LOCATION)	O	O	-
CHECK WELDING EQUIPMENT	O	-	-

†THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.

TABLE N5.4-2
INSPECTION TASKS DURING WELDING

INSPECTION TASKS DURING TO WELDING	QC	QA	NOT APPLICABLE
USE OF QUALIFIED WELDERS	O	O	-
CONTROL AND HANDLING OF WELDING CONSUMABLES ● PACKAGING ● EXPOSURE CONTROL	O	O	-
NO WELDING OVER CRACKED TACK WELDS	O	O	-
ENVIRONMENTAL CONDITIONS ● WIND SPEED WITHIN LIMITS ● PRECIPITATION AND TEMPERATURE	O	O	-
WPS FOLLOWED ● SETTINGS ON WELDING EQUIPMENT ● TRAVEL SPEED ● SELECTED WELDING MATERIALS ● SHIELDING GAS TYPE/FLOW RATE ● PREHEAT APPLIED ● INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) ● PROPER POSITION (F, V, H, OH)	O	O	-
WELDING TECHNIQUES ● INTERPASS AND FINAL CLEANING ● EACH PASS WITHIN PROFILE LIMITATIONS ● EACH PASS MEETS QUALITY REQUIREMENTS	O	O	-

TABLE N5.4-3
INSPECTION TASKS AFTER WELDING

INSPECTION TASKS AFTER WELDING	QC	QA	NOT APPLICABLE
WELDS CLEANED	O	O	-
SIZE, LENGTH AND LOCATION OF WELDS	P	P	-
WELDS MEET VISUAL ACCEPTANCE CRITERIA ● CRACK PROHIBITION ● WELD/BASE-METAL FUSION ● CRATER CROSS SECTION ● WELD PROFILES ● WELD SIZE ● UNDERCUT ● POROSITY	P	P	-
ARC STRIKES	P	P	-
K-AREA†	P	P	-
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P	-
REPAIR ACTIVITIES	P	P	-
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P	-

†WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OF STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75MM) OF THE WELD.

TABLE N5.6-1
INSPECTION TASKS PRIOR TO BOLTING

INSPECTION TASKS PRIOR TO BOLTING	QC	QA	NOT APPLICABLE
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	P	-
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O	-
PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	O	O	-
PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	O	-
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	O	-
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	O	-
PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTNER COMPONENTS	O	O	-

TABLE N5.6-2
INSPECTION TASKS DURING BOLTING

INSPECTION TASKS DURING BOLTING	QC	QA	NOT APPLICABLE
FASTENERS ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	O	O	-
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O	-
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O	-
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	O	-

TABLE N5.6-3
INSPECTION TASKS AFTER BOLTING

INSPECTION TASKS AFTER BOLTING	QC	QA	NOT APPLICABLE
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O	-

O - OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

P - PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.

SPECIAL INSPECTION (CONT.)

REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
(LEVEL C QUALITY ASSURANCE)

MINIMUM TESTS
VERIFICATION OF f'_m AND f'_{AAC} IN ACCORDANCE WITH SPECIFICATION ARTICLE 1.4B PRIOR TO CONSTRUCTION AND FOR EVERY 5,000 SQ. FT (465 SQ. M) DURING CONSTRUCTION
VERIFICATION OF PROPORTIONS OF MATERIALS IN PREMIXED OR PREBLENDED MORTAR, PRESTRESSING GROUT, AND GROUT OTHER THAN SELF-CONSOLIDATING GROUT, AS DELIVERED TO HE PROJECT SITE
VERIFICATION OF SUMP FLOW AND VISUAL STABILITY INDEX (VSI) AS DELIVERED TO THE PROJECT SITE IN ACCORDANCE WITH SPECIFICATION ARTICLE 1.5 B.1 b.3 FOR SELF-CONSOLIDATING GROUT

MINIMUM INSPECTION					
INSPECTION TASK	FREQUENCY (a)			REFERENCE FOR CRITERIA	
	CONTINUOUS	PERIODIC	NOT APPLICABLE	TMS 402/ACI 530/ASCE 5	TMS 602/ACI 530.1/ASCE 6
1. VERIFY COMPLIANCE WITH THE APPROVED SUBMITTALS		X			ART. 1.5
2. VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
a. PROPORTIONS OF SITE-MIXED MORTAR, GROUT		X			ART. 2.1, 2.6A, 2.6B, 2.6C 2.4G 1.5
b. GRADE, TYPE, AND SIZE OF REINFORCEMENT AND ANCHOR BOLTS		X		SEC. 6.1	ART. 2.4, 3.4
c. PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS		X			ART. 3.3B
d. PLACEMENT OF REINFORCEMENT, CONNECTORS	X			SEC. 6.1 6.2.1, 6.2.6 6.2.7	ART. 3.2E, 3.4, 3.6A
e. GROUT SPACE PRIOR TO GROUTING	X				ART. 3.2D, 3.2F
f. PLACEMENT OF GROUT	X				ART. 3.5, 3.6C
g. SIZE AND LOCATION OF STRUCTURAL ELEMENTS		X			ART. 3.3F
h. TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	X			SEC. 1.2.1(d), 8.1.4.3, 6.2.1	
i. WELDING OF REINFORCEMENT			X	SEC. 8.1.6.7.2, 9.3.3.4(c), 11.2.3.4(b)	
j. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F (4.4°C) OR HOT WEATHER (TEMPERATURE ABOVE 90°F (32.2°C)		X			ART. 1.8C, 1.8D
k. APPLICATION OF MEASUREMENT OF PRESTRESSING FORCE			X		ART. 3.6B
l. PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION ON THIN-BED MORTAR JOINTS			X		ART. 3.3B 8G, 3.3F.1.b
m. PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY			X		ART. 2.1 C.1
3. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	X				ART. 1.4B.2.b.3, 1.4B.2.b.3, 1.4 B.2.c3, 1.4 B.3, 1.4 B.4

(a). FREQUENCY REFERS TO THE FREQUENCY OF INSPECTION, WHICH MAY BE CONTINUOUS DURING THE TASK LISTED OR PERIODICALLY DURING THE LISTED TASK, AS DEFINED IN THE TABLE.

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	NOT APPLICABLE	REFERENCED STANDARD ᵃ	IBC REFERENCE
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	-	X	-	ACI 318 CH. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. REINFORCING BAR WELDING:					
a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706;	-	X	-	AWS D1.4 ACI 318: 26.6.4	-
b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16" AND	-	X	-		
c. INSPECT ALL OTHER WELDS.	X	-	-		
3. INSPECT ANCHORS CAST IN CONCRETE	-	X	-	ACI 318: 17.8.2	-
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.ᵇ					
a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENTION LOADS.	X	-	-	ACI 318: 17.8.2.4	-
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.a.	-	X	-	ACI 318: 17.8.2	
5. VERIFY USE OF REQUIRED DESIGN MIX.	-	X	-	ACI 318: CH.19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	X	-	-	ASTM C172 ASTM C31 ACI 318: 26.4,26.12	1908.10
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-	-	ACI 318: 26.5	1908.6, 1908.7, 2908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	-	ACI 318: 26.5.3-26.5.5	1908.9
9. INSPECT PRESTRESSED CONCRETE FOR:					
a. APPLICATION OF PRESTRESSING FORCES; AND	X	-	-	ACI 318: 26.10	-
b. GROUTING OF BONDED PRESTRESSING TENDONS.	X	-	-		
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	-	ACI 318: CH. 26.8	-
11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	-	ACI 318: 26.11.2	-
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	-	ACI 318: 26.11.1.2(b)	-

FOR SI: 1 INCH = 25.4 MM

a. WHERE APPLICABLE, SEE ALSO SECTION 1705.12, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.

b. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 17.8.2 IN ACI 318, OR OTHER QUALIFICATION PROCEDURES. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.

TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	NOT APPLICABLE
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X	
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-	
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X	

SPECIAL INSPECTION(CONT.)

DESIGN CRITERIA		
CODE: MBC 2015 THE STRUCTURE IS DESIGNED FOR THE FOLLOWING LIVE LOADS, IN ADDITION TO THE LATERAL LOADS, SUPER-IMPOSED DEAD LOADS, & SELF WEIGHT OF THE STRUCTURE. WHERE APPLICABLE LIVE LOADS ARE REDUCED IN ACCORDANCE WITH THE PROVISIONS OF THE BUILDING CODE. A. AMERICAN CONCRETE INSTITUTE BUILDING CODE (ACI-318). B. MANUAL OF STEEL CONSTRUCTION BY AMERICAN INSTITUTE OF STEEL CONSTRUCTION (LATEST EDITION). C. LATEST MASONRY STANDARDS JOINT COMMITTEE (MSJC) BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (TMS 402/ACI 530/ASCE 5) AND SPECIFICATIONS FOR MASONRY STRUCTURES (TMS 602/ACI 530.1/ASCE 6) D. AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) STANDARDS AND SPECIFICATIONS. E. NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION (NDS) AS PUBLISHED BY AMERICAN FOREST AND PAPER ASSOCIATION.		
		CODE REFERENCE
BUILDING OCCUPANCY CATEGORY	IV	MBC-Table 1604.5 ASCE Table 1.5-1

FLOOR LIVE LOADS		
		CODE REFERENCE
STAIRS	100 PSF	ASCE Table 4-1
MEZZANINE	125 PSF STORAGE	ASCE Table 4-1

NOTE: HANDRAILS AND GUARDS TO BE DESIGNED TO RESIST A LINEAR LOAD OF 50 POUNDS PER LINEAR FOOT. PER SECTION 1607.8.1 OF THE MBC BUILDING CODE AND A CONCENTRATED LOAD OF 200 POUNDS CONCENTRATED LOAD PER SECTION 1607.8.1.1 OF THE MBC BUILDING CODE.

NOTE: GRAB BARS SHALL BE DESIGNED TO RESIST A SINGLE CONCENTRATED LOAD OF 250 POUNDS PER SECTION 1607.8.2 PER MBC BUILDING CODE

SNOW LOADS/ROOF LIVE LOADS		
SNOW CRITERIA		CODE REFERENCE
GROUND SNOW LOAD	Pg = 25 PSF	MBC FIG. 1608.2 ASCE Fig. 7-1
FLAT ROOF SNOW LOAD	Pf = 21 PSF (MINIMUM)	ASCE Sec. 7.3
EXPOSURE FACTOR	Ce = 1.0	ASCE Table 7-2
IMPORTANCE FACTOR	I = 1.2	ASCE Table 1.5-2
THERMAL FACTOR	Ct = 1.0	ASCE Table 7-3
ROOF LIVE LOADS	Lr = 20 PSF	ASCE Table 4-1
NOTE: SNOW LOADS ADJACENT VERTICAL PROJECTIONS, ON LOWER ROOFS, ADJACENT TO HIGH ROOFS, ON SLOPED ROOFS ARE INCREASED FOR THE EFFECT OR DRIFTING		

WIND LOADS		
WIND CRITERIA		CODE REFERENCE
BASIC WIND SPEED (3 SEC. GUST)	V = 120 MPH	ASCE FIG. 26.5-1A, 26.5-1B, 26.5-1C
RISK FACTOR	IV	ASCE Table 1.5-1
EXPOSURE CATEGORY	B	ASCE Sec. 26.7.3
INTERNAL PRESSURE COEFFICIENT	± 0.18 (ENCLOSED)	ASCE TABLE 26.11-1
MWFRS ANALYSIS PROCEDURE	DIRECTIONAL PROCEDURE	ASCE CHAP. 27
COMPONENTS AND CLADDING	± 33 PSF WINIMUM ULTIMATE AND PER CODE REQUIREMENTS BASED ON ABOVE INFORMATION	ASCE Sec. 30.2.2

SEISMIC LOADS		
SEISMIC CRITERIA		CODE REFERENCE
SEISMIC RISK CATEGORY	IV	ASCE Table 1.5-1
SEISMIC IMPORTANCE FACTOR	I = 1.5	ASCE Table 1.5-2
-0.2 SEC MAPPED SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING) Ss	Ss = .091	ASCE Sec. 11.4
-1.0 SEC MAPPED SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING) S1	S1 = .046	ASCE Sec. 11.4
SOIL SITE CLASS	D	ASCE Sec. 11.4.2
SEISMIC DESIGN CATEGORY	C	ASCE Sec. 11.6
SEISMIC FORCE RESISTING SYSTEM	BEARING WALL SYSTEM WITH INTERMEDIATE REINFORCED MASONRY SHEAR WALLS	ASCE Table 12.2-1
RESPONSE MODIFICATION FACTOR	R = 3.5	ASCE Table 12.2-1
DEFLECTION AMPLIFICATION FACTOR	Cd = 2.25	ASCE Table 12.2-1
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE	ASCE Sec. 12.8

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KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding/Construction 06/13/2023

DRAWN BY
RC

CHECKED BY
MJ

APPROVED BY
TS

SHEET NAME
GENERAL NOTES

SHEET NO.
S4-01

BEARING PLATE SCHEDULE

MARK	DESCRIPTION	REMARKS
BP1	7"x3/8"x0'-7"	
BP2	7"x3/8"x0'-15"	
BP3	11"x3/8"x0'-11"	

COLUMN SCHEDULE

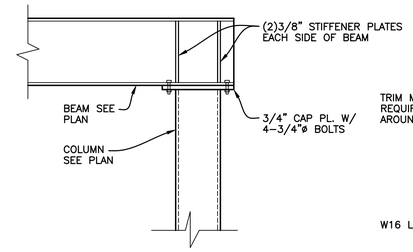
		C1	MARK
		HSS6x6x/4	SIZE
		12"x3/4"x1'-0"	BASE PLATE
		(4)3/4"ø x1'-4" HEADED ANCHOR	ANCHOR BOLTS
		CAP COLUMN WITH LINTEL SEE 13/S4-02	REMARKS

LINTEL SCHEDULE

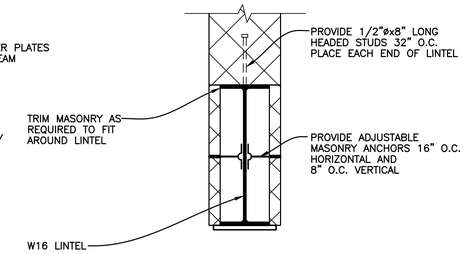
8" BEARING EACH END-U.N.O.

MARK	DESCRIPTION	
L1	W8x10 + 3/8" PLATE + L4x3 1/2x5/16" LLV	SEE 9 & 10/S4-02
L2	W8x18 + 3/8" PLATE + L5x3 1/2x5/16" LLV	SEE 9 & 10/S4-02
L3	W8x18 + 5/16" PLATE	
L4	W16x36	
L5	W16x36 + 5/16 PLATE	PROVIDE BP1 EACH END
L6	W16x36 + 5/16 PLATE	PROVIDE BP1 EACH END
L7	W16x36 + 5/16 PLATE	PROVIDE BP1 EACH END
L8	(3)L4x3 1/2x5/16 LLV	
L9	W8x24 + 5/16" PLATE	PROVIDE BP1 EACH END
L10	W8x28 + 5/16" PLATE	
L11	(2)L4x3 1/4x5/16" LLV	
L12	(4)L4x3 1/4x5/16" LLV	
L13	(4)L6x3 1/2x5/16" LLV	
L14	W8x18 + 3/8" PLATE + L7x4x3/8" LLV	SEE DETAILS 9 & 10/S4-02 PROVIDE BP1 EACH END
L15	W16x40 + 3/8" PLATE	BP3 EACH END
L16	CONTINUOUS W16x36 + 5/16" PLATE	BP3 TYPICALLY AT EACH SUPPORT

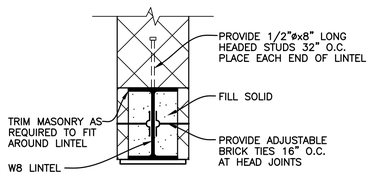
LINTEL NOTES:
1. PLATES ON LINTELS EXTEND WIDTH OF MASONRY OPENINGS ONLY. (SEE ARCH. DRAWINGS)
2. HOLD EDGE OF PLATE ON LINTEL BACK FROM EACH FACE OF MASONRY 1/4"
3. WELD 1/2"ø x8" HEADED STUDS 32" O.C. TO TOP FLANGE OF ALL WIDE FLANGE LINTELS
4. ALL EXTERIOR LINTELS TO BE GALVANIZED G90 PER ASTM 123
5. SEE MASONRY NOTE 15 ON SHEET S4-00 FOR MISC. LINTELS.



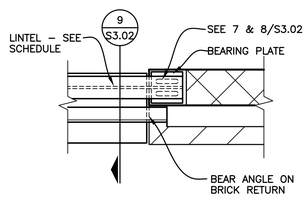
13 / S4-02 TYPICAL CAPPED COLUMN DETAIL
SCALE : 3/4" = 1'-0"



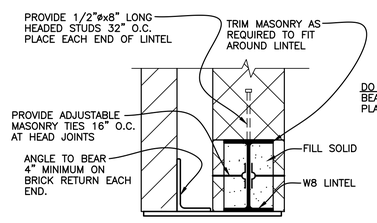
12 / S-402 TYPICAL LINTEL DETAIL AT W16 BEAM
SCALE : 1 1/2" = 1'-0"



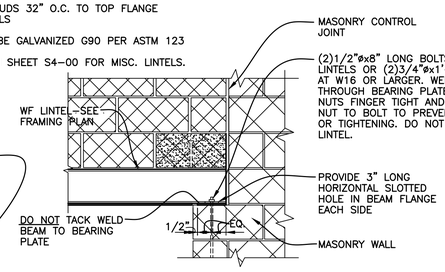
11 / S4-02 TYPICAL LINTEL DETAIL AT W8 BEAM
SCALE : 1 1/2" = 1'-0"



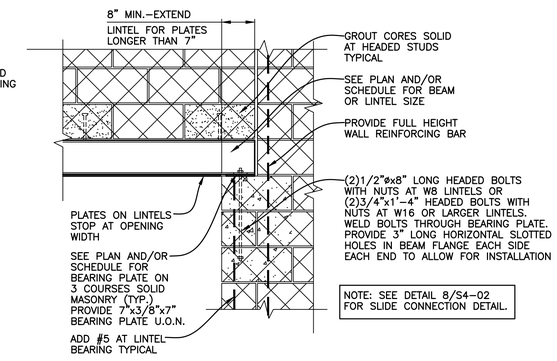
10 / S4-02 TYPICAL PLAN DETAIL AT LINTEL BEARING WITH BRICK VENEER
SCALE : 3/4" = 1'-0"



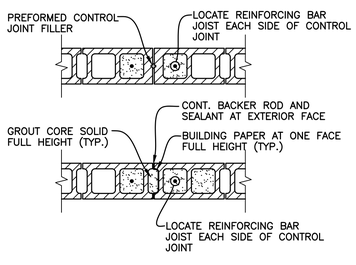
9 / S4-02 TYPICAL LINTEL DETAIL AT L1 & L2 BEAM
SCALE : 1 1/2" = 1'-0" WITH BRICK VENEER



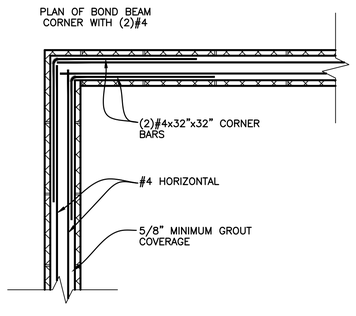
8 / S4-02 TYPICAL SLIDE CONNECTION LINTEL DETAIL
SCALE : 3/4" = 1'-0"
PROVIDE ON ONE END OF LINTEL FOR LINTEL SPANS GREATER THAN 8'-0"



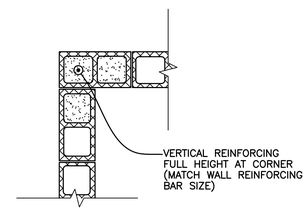
7 / S4-02 TYPICAL LINTEL BEARING ON MASONRY DETAIL
SCALE : 3/4" = 1'-0" (LINTEL PARALLEL TO WALL)
NOTE: PLACE LINTEL BEAMS CENTERED IN CMU WALLS UNLESS NOTED OTHERWISE



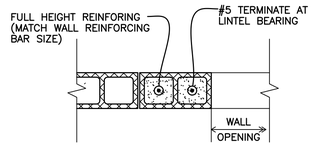
6 / S4-02 TYPICAL MASONRY WALL CONTROL JOINTS
SCALE : 3/4" = 1'-0"



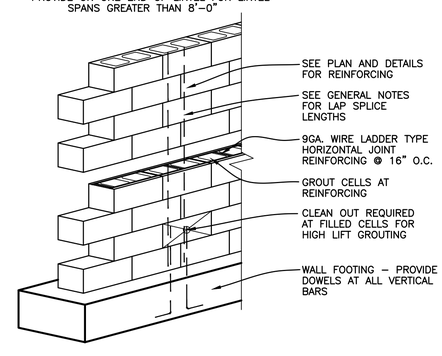
5 / S4-02 TYPICAL BOND BEAM CORNER DETAIL
SCALE : 3/4" = 1'-0"



4 / S4-02 TYPICAL REINFORCING AT CORNERS
SCALE : 3/4" = 1'-0"

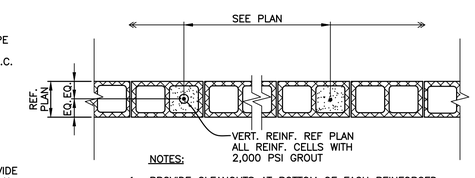


3 / S4-02 TYPICAL REINFORCING ALONG SIDE OPENING
SCALE : 3/4" = 1'-0"



GROUT INSTRUCTIONS :
1. CONSTRUCT WALL TO HEIGHT OF 4'-0" - ALLOW MORTAR TO SET SUFFICIENTLY TO WITHSTAND GROUT PRESSURE.
2. INSPECT UNITS FOR ALIGNMENT, CLEAN OUT CELLS TO BE FILLED.
3. FILL CELLS TO 8" BELOW TOP COURSE WITH 2,000 PSI CONCRETE GROUT.
4. DELAY 3 - 5 MINUTES PRIOR TO CONSOLIDATING TO ALLOW WATER TO BE ABSORBED BY MASONRY.

2 / S4-02 REINFORCED MASONRY CONSTRUCTION DETAIL
SCALE : NONE



NOTES:
1. PROVIDE CLEANOUTS AT BOTTOM OF EACH REINFORCED CELL IN ACCORDANCE WITH THE SPECIFICATIONS
2. PROVIDE HORIZONTAL JOINT REINF. PER GENERAL NOTES @ 16" O.C. MAX. U.N.O.

MASONRY REINF. LAP LENGTH		
BAR SIZE	8" WALL	12" WALL
4	24"	24"
5	30"	30"
6	38"	36"
7		42"

1 / S4-02 TYPICAL WALL REINFORCING DETAIL
SCALE : 3/4" = 1'-0"

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KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding/Construction 06/13/2023

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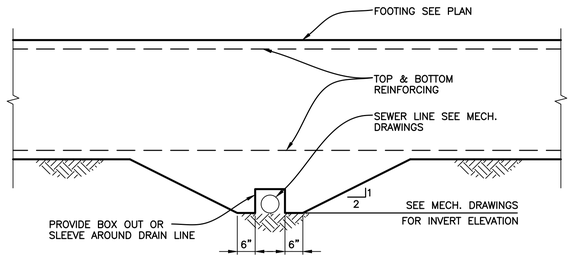
RC

CHECKED BY
MJ

APPROVED BY
TS

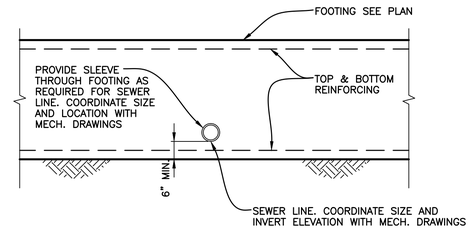
SHEET NAME
GENERAL NOTES

SHEET NO.
S4-02



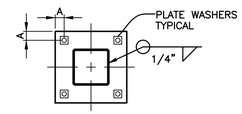
14 S4-03 TYPICAL ELEVATION OF SEWER LINE BELOW BOTTOM OF FOOTING

SCALE : NONE COORDINATE LOCATION WITH MECH. DRAWINGS



13 S4-03 TYPICAL ELEVATION OF SEWER LINE AT BOTTOM OF FOOTING

SCALE : NONE COORDINATE LOCATION WITH MECH. DRAWINGS



A = 1 1/2" @ 3/4"ø BOLTS
= 2" @ 1"ø BOLTS

10A S4-03 TYPICAL BASE PLATE DETAIL WITH OVER SIZED HOLES FOR ANCHOR BOLTS

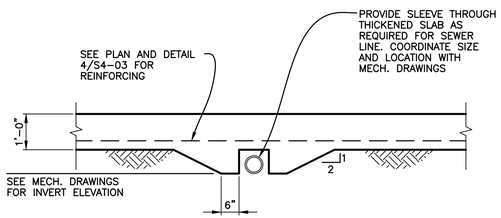
SCALE : NONE

1. PROVIDE PLATE WASHERS PER TABLE 14–2 OF THE FOURTEENTH EDITION OF STEEL CONSTRUCTION MANUAL IF USING OVER SIZED HOLES ON THE BASE PLATES FOR ANCHOR RODS.
2. IF USING OVER SIZED HOLES AT MOMENT FRAMES OR BRACED BAYS, WELD THE PLATE WASHERS TO TOP OF BASE PLATE WITH 1/4" FILLET WELD ALL AROUND.

TABLE 14-2
RECOMMENDED MAXIMUM SIZES FOR ANCHOR-ROD HOLES IN BASE PLATES

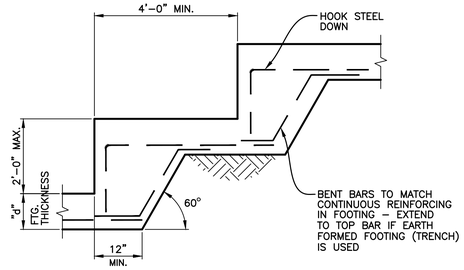
ANCHOR ROD DIAMETER, in.	MAX. HOLE DIAMETER, in.	MIN. WASHER SIZE, in.	MIN. WASHER THICKNESS
3/4	1 5/16	2	1/4
7/8	1 9/16	2 1/2	5/16
1	1 13/16	3	3/8
1 1/4	2 1/16	3	1/2

NOTES:
1. CIRCULAR OR SQUARE WASHERS MEETING THE SIZE ARE ACCEPTIBLE.
2. CLEARANCE MUST BE CONSIDERED WHEN CHOOSING AN APPROPRIATE ANCHOR ROD HOLE LOCATION, NOTING EFFECTS SUCH AS THE POSITION OF THE ROD IN THE HOLE WITH RESPECT TO THE COLUMN, WELD SIZE, AND OTHER INTERFERENCES.
3. WHEN BASE PLATES ARE LESS THAN 1 1/4 in. THICK, PUNCHING OF HOLES MAY BE AN ECONOMICAL OPTION. IN THIS CASE, 3/4–in. ANCHOR RODS AND 1 1/16–in. – DIAMETER PUNCHED HOLES MAY BE USED WITH ASTM F844 (USS STANDARD) WASHERS IN PLACE OF FABRICATED PLATE WASHERS.



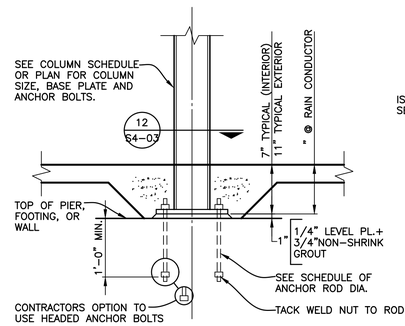
12 S4-03 TYPICAL ELEVATION OF SEWER LINE THROUGH INTERIOR FOOTING

SCALE : NONE COORDINATE LOCATION WITH MECH. DRAWINGS



11 S4-03 TYPICAL STEP FOOTING DETAIL

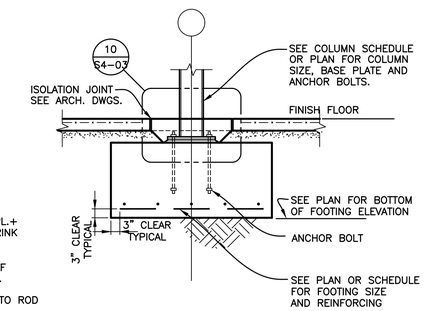
SCALE : NONE (IF REQUIRED)



NOTE: ANCHOR RODS MUST BE INSTALLED WITHIN AISC TOLERANCES BEFORE PLACEMENT OF CONCRETE.

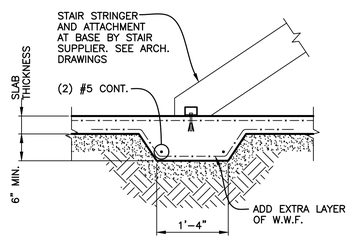
10 S4-03 TYPICAL COLUMN BASE DETAIL

SCALE : 3/4" = 1'-0"



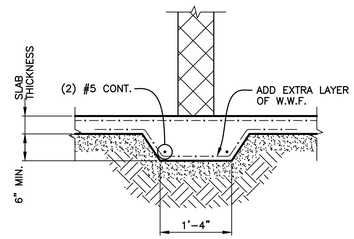
9 S4-03 TYPICAL COLUMN FOOTING

SCALE : 1/2" = 1'-0"



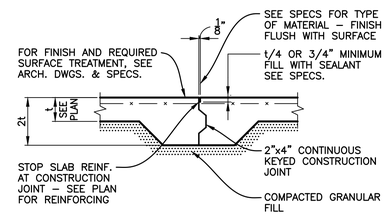
8 S4-03 TYPICAL THICKENED SLAB DETAIL

SCALE : 3/4" = 1'-0"



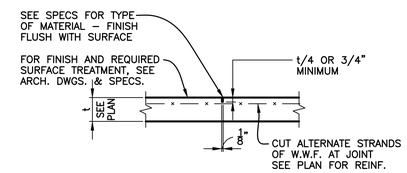
7 S4-03 TYPICAL THICKENED SLAB DETAIL

SCALE : 3/4" = 1'-0"



6 S4-03 TYPICAL FLOOR CONSTRUCTION JOINT

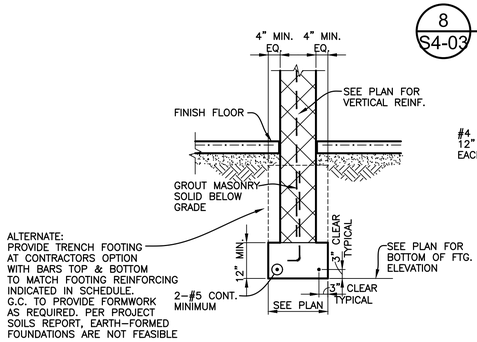
SCALE : 1" = 1'-0"



(15'-0" O.C. EACH WAY MAXIMUM)

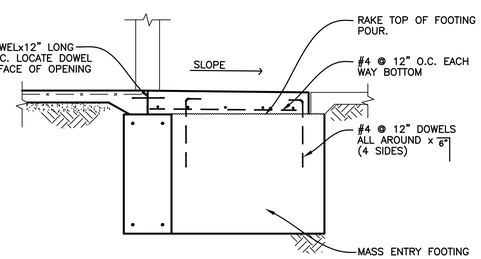
5 S4-03 TYPICAL FLOOR CONTROL JOINT

SCALE : 1" = 1'-0"



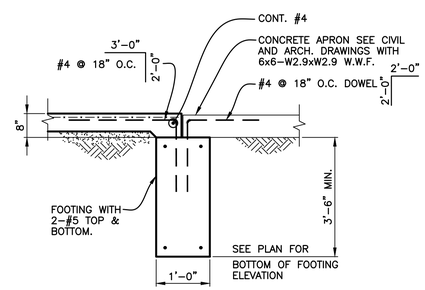
4 S4-03 TYPICAL INTERIOR MASONRY WALL FOOTING

SCALE : 1/2" = 1'-0"



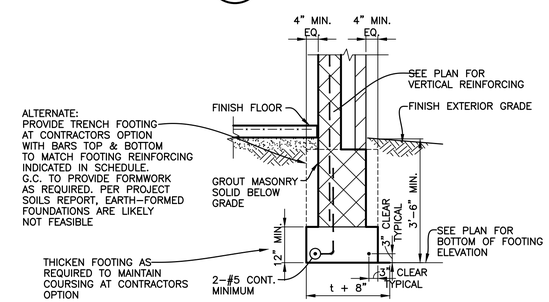
3 S4-03 TYPICAL MASS ENTRANCE SLAB

SCALE : 1/2" = 1'-0"



2 S4-03 TYPICAL FOUNDATION DETAIL AT OVERHEAD DOORS

SCALE : 1/2" = 1'-0"



1 S4-03 TYPICAL EXTERIOR MASONRY WALL FOOTING

SCALE : 1/2" = 1'-0"

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding/Construction 06/13/2023

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MJ

APPROVED BY

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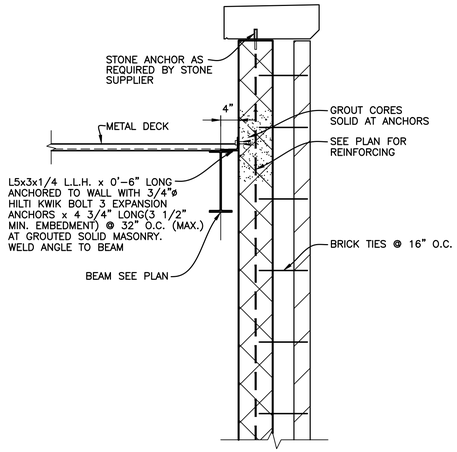
SHEET NAME

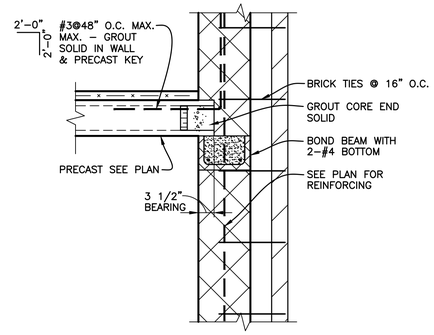
DETAILS

SHEET NO.

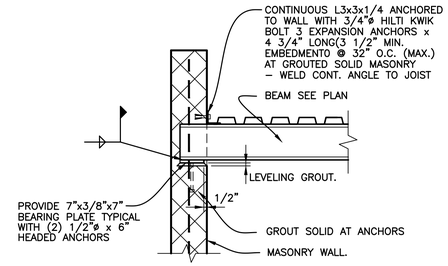
S4-03



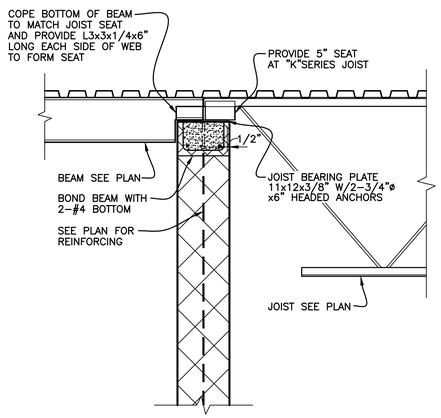
11 S5-00 TYPICAL JOIST PARALLEL TO MASONRY WALL
SCALE : 3/4" = 1'-0"



10 S5-00 SECTION
SCALE : 3/4" = 1'-0"



9 S5-00 TYPICAL ROOF BEAM BEARING ON MASONRY WALL
SCALE : 3/4" = 1'-0"



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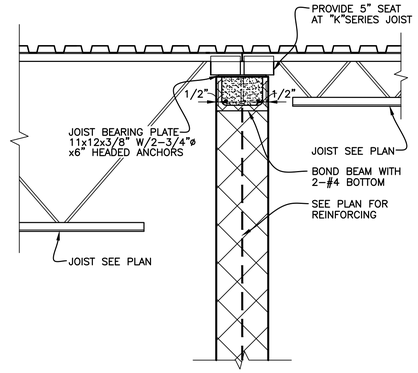
SCALE : 3/4" = 1'-0"



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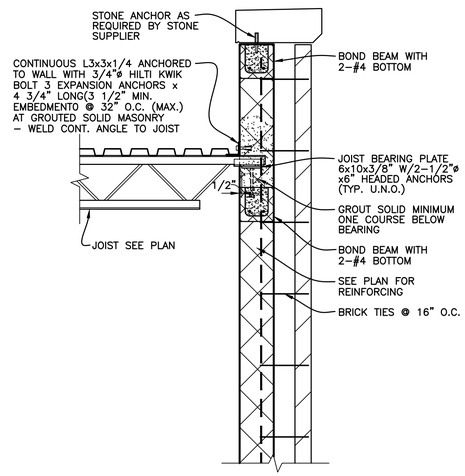
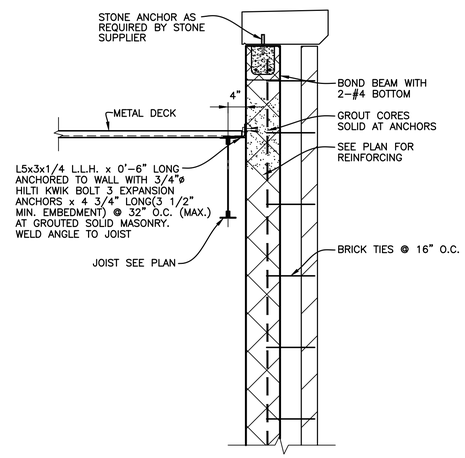
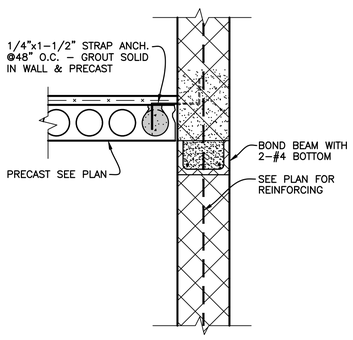
SCALE : 3/4" = 1'-0"



6 S5-00 TYPICAL JOIST BEARING ON MASONRY WALL
SCALE : 3/4" = 1'-0"



5 S5-00 TYPICAL JOIST PARALLEL TO MASONRY WALL
SCALE : 3/4" = 1'-0"



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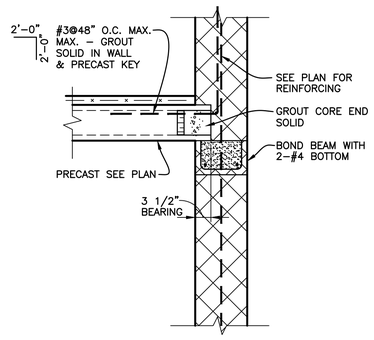

3 S5-00 SECTION
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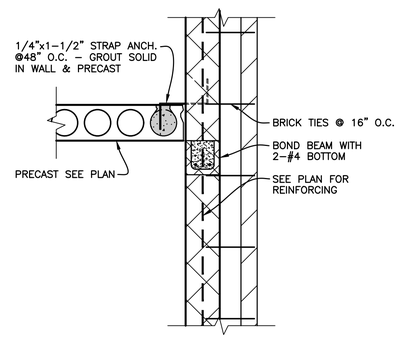

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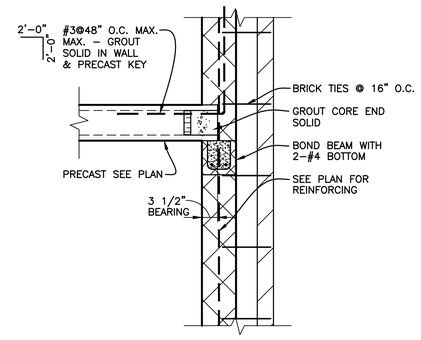

1 S5-00 SECTION
SCALE : 3/4" = 1'-0"

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding/Construction 06/13/2023

DRAWN BY
RC

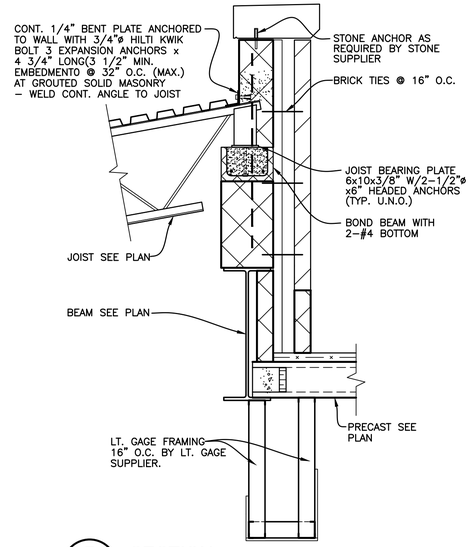
CHECKED BY
MJ

APPROVED BY
TS

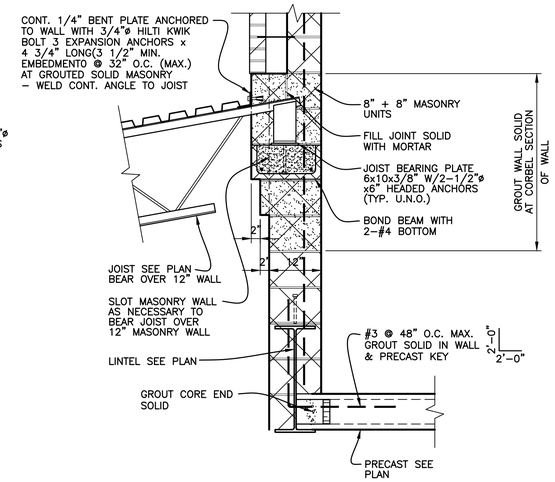
SHEET NAME

DETAILS

SHEET NO.
S5-00



7 S5-01 SECTION
SCALE : 3/4" = 1'–0"



6 S5-01 SECTION
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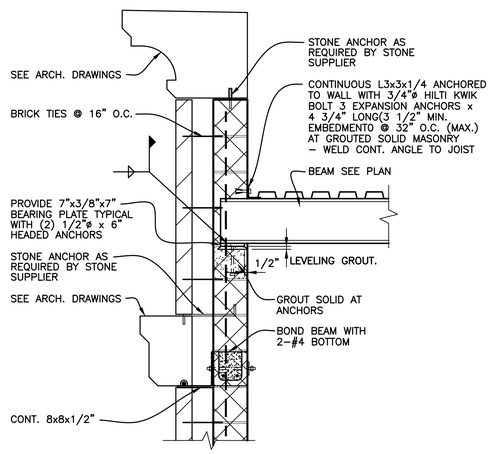

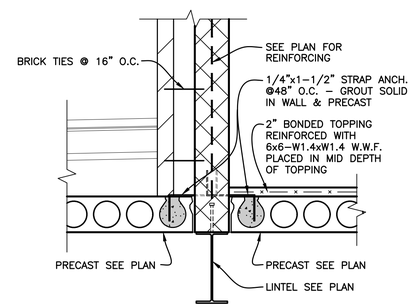

4 S5-01 SECTION
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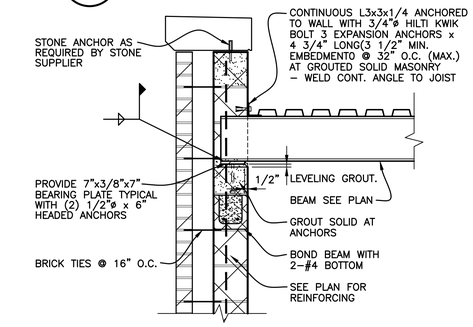

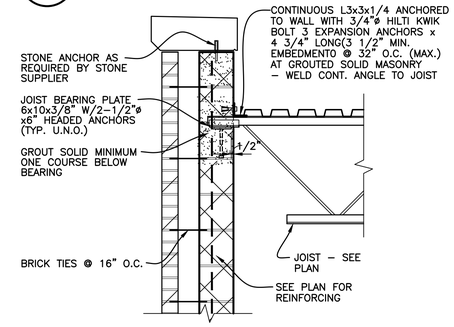

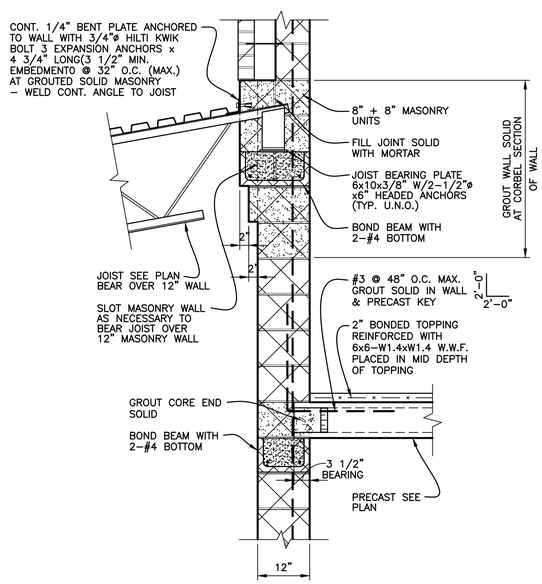

2 S5-01 SECTION
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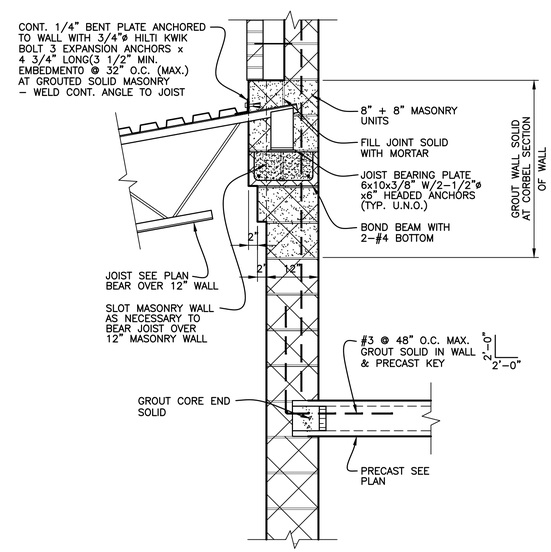

1 S5-01 SECTION
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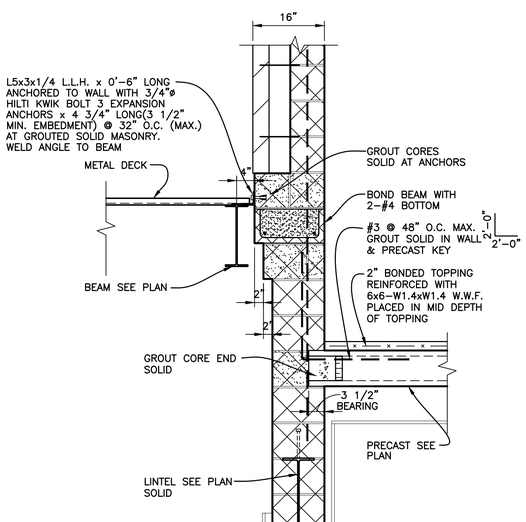

5 S5-01 SECTION
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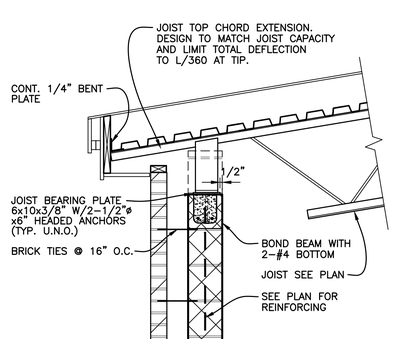

3 S5-01 SECTION
SCALE : 3/4" = 1'–0"

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding/Construction 06/13/2023

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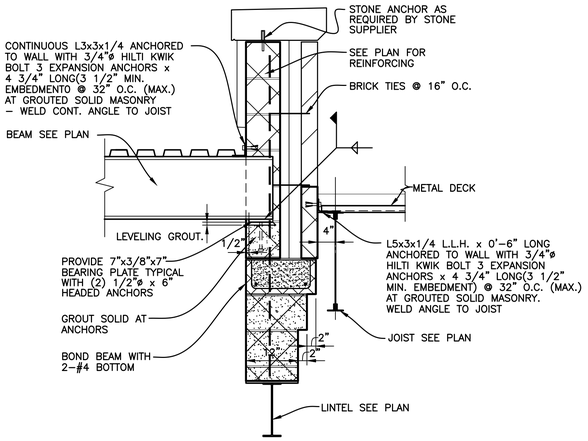
CHECKED BY
MJ

APPROVED BY
TS

SHEET NAME

DETAILS

SHEET NO.
S5-01



7 S5-02 SECTION
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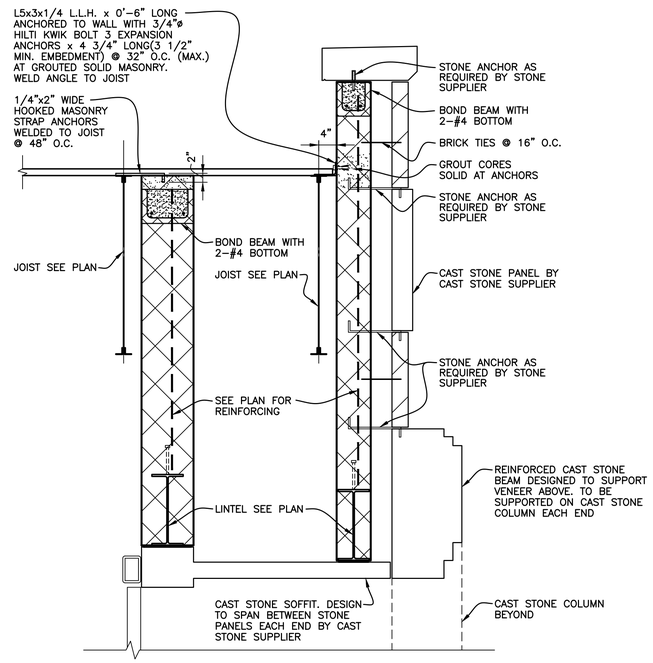

6 S5-02 SECTION
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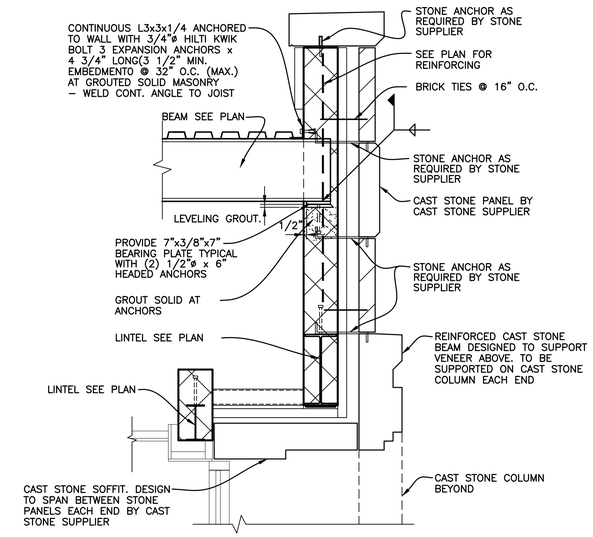

8 S5-02 SECTION
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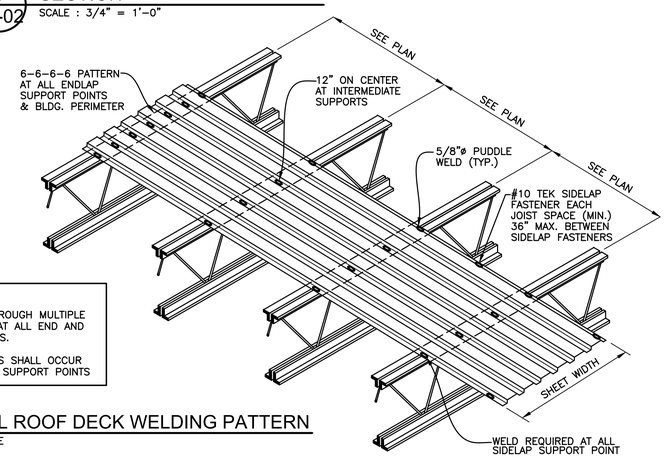
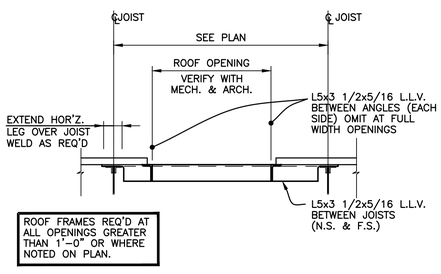


NOTES:

WELD THROUGH MULTIPLE SHEETS AT ALL END AND SIDE LAPS.

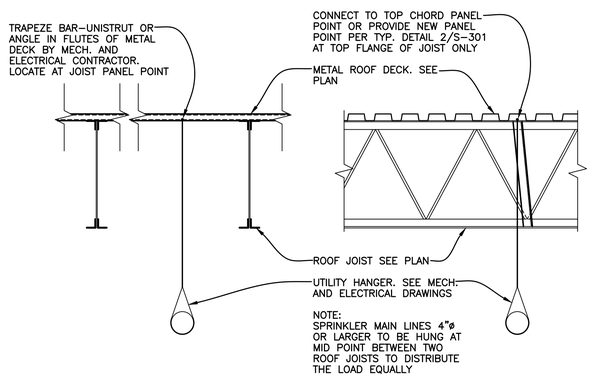
END LAPS SHALL OCCUR ONLY AT SUPPORT POINTS

5 S5-02 TYPICAL ROOF DECK WELDING PATTERN
SCALE : NONE



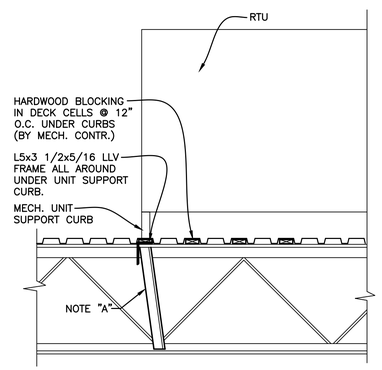
ROOF FRAMES REQ'D AT ALL OPENINGS GREATER THAN 1'–0" OR WHERE NOTED ON PLAN.

4 S5-02 TYPICAL ROOF OPENING DETAIL
SCALE : 3/4" = 1'–0"



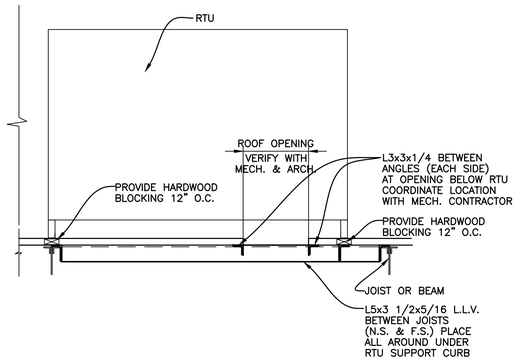
NOTE:
SPRINKLER MAIN LINES 4"ø OR LARGER TO BE HUNG AT MID POINT BETWEEN TWO ROOF JOISTS TO DISTRIBUTE THE LOAD EQUALLY

3 S5-02 MECHANICAL/ELECTRICAL PIPE HANGER SUPPORT DETAIL
SCALE : 3/4" = 1'–0"



NOTE "A"
REINF. TOP CHORD OF JOIST W/ (2)L2x2x3/16" WELDED TO TOP CHORD OF JOIST AT LOAD AND TO BOTTOM CHORD AT PANEL POINT WHEN LOAD IS FARTHER THAN 6" FROM TOP CHORD PANEL POINT

2 S5-02 TYPICAL JOIST REINFORCING DETAIL AT NEW MECHANICAL UNIT
SCALE : NONE FOR ADDED LOADS



1 S5-02 TYPICAL DETAIL AT MECHANICAL UNIT SUPPORT
SCALE : 3/4" = 1'–0"

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd.
Warren MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding/Construction 06/13/2023

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CHECKED BY

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APPROVED BY

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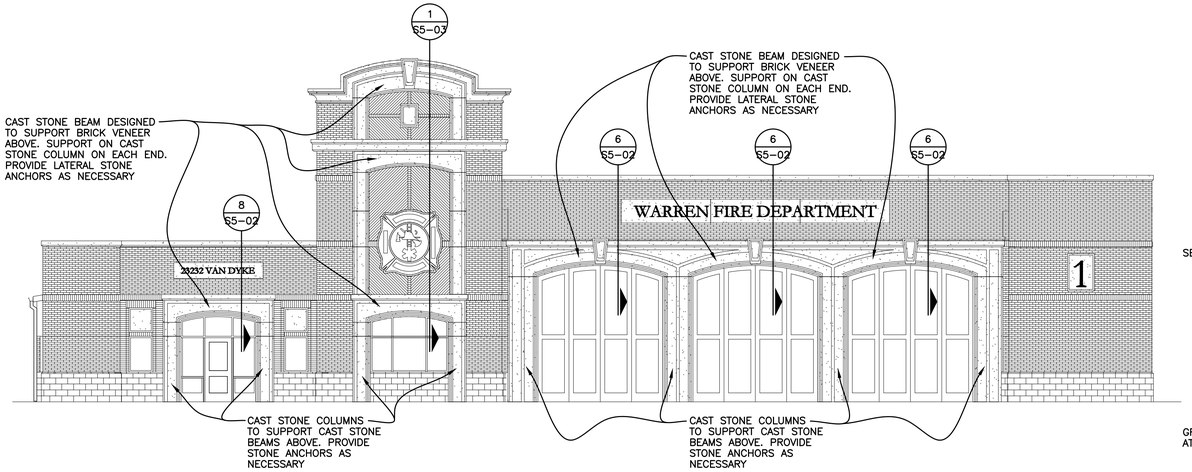
SHEET NAME

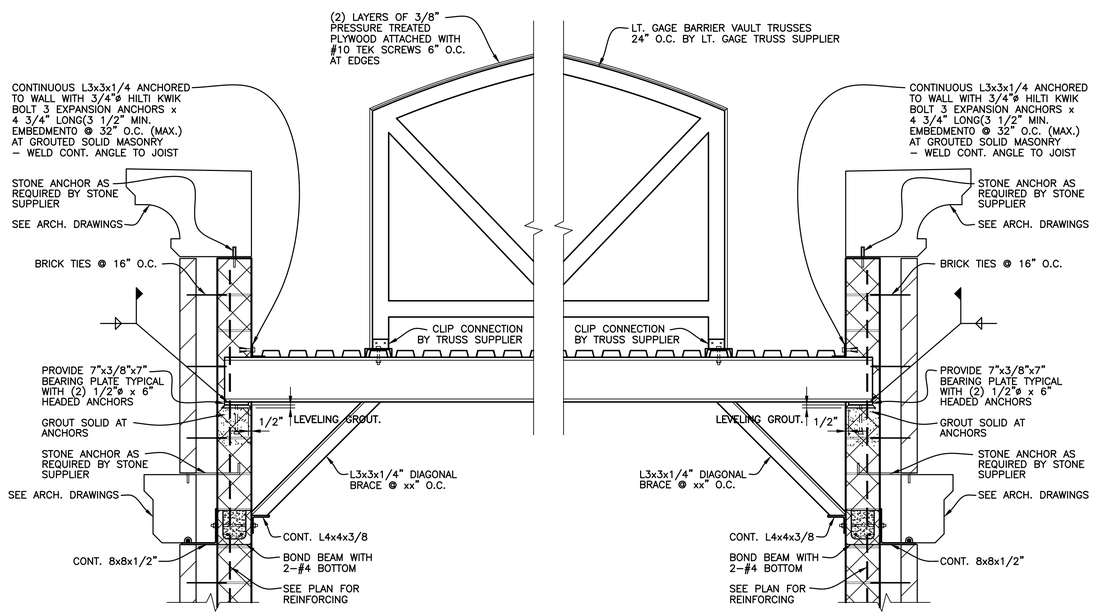
DETAILS

SHEET NO.

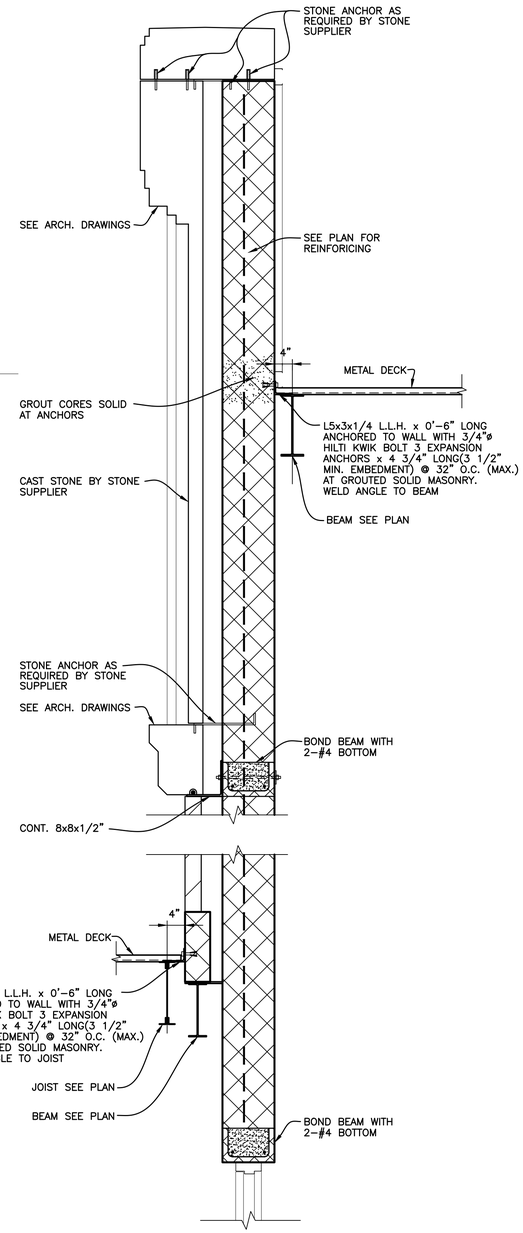
S5-02



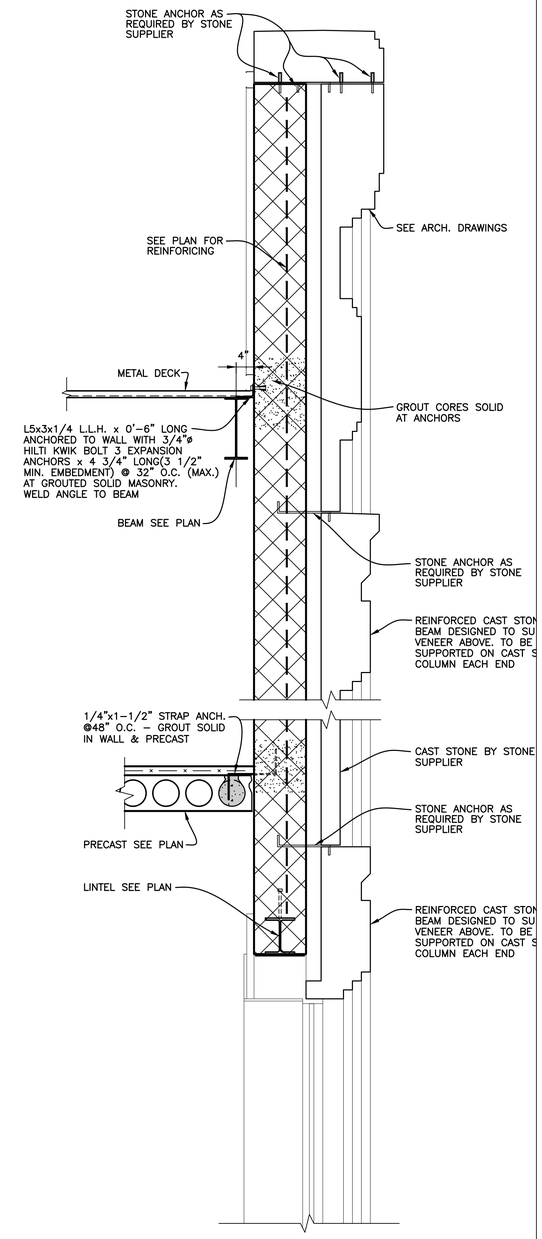
4 S5-03 EAST ELEVATION
SCALE : NO SCALE



3 S5-04 SECTION
SCALE : 3/4" = 1'–0"



2 S5-03 SECTION
SCALE : 3/4" = 1'–0"



1 S5-03 SECTION
SCALE : 3/4" = 1'–0"

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APPROVED BY
TS

SHEET NAME

DETAILS

SHEET NO.

S5-03

MECHANICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A	COMPRESSED AIR
A(__#)	COMPRESSED AIR (SPECIFIC PSIG)
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSER UNIT
AD	ACCESS DOOR
AD	AREA DRAIN
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMP	AMPERE
APD	AIR PRESSURE DROP
AR	ARGON
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASR	AUTOMATIC SPRINKLER RISER
ATD	AIR TRANSFER DUCT
AUX	AUXILIARY
AV	ACID VENT
AVTR	ACID VENT THROUGH ROOF
AW	ACID WASTE
BAS	BUILDING AUTOMATION SYSTEM
BCU	BLOWER COIL UNIT
BDD	BACK DRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BVC	BEVERAGE CONDUIT
BWV	BACKWATER VALVE
C	COMMON
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CB	CATCH BASIN
CC	COOLING COIL
CD	COLD DECK
CD	CONDENSATE DRAIN
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHW	CHILLED WATER
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	COOLING
CNDS	CONDENSATE
CNDS (__#)	CONDENSATE (SPECIFIC PSIG)
CO	CLEAN OUT
CO2	CARBON DIOXIDE
CONT	CONTINUATION OR CONTINUED
CONTR	CONTRACTOR
CONV	CONVECTOR
COP	COEFFICIENT OF PERFORMANCE
CP	CIRCULATING PUMP
CRU	CONDENSATE RETURN UNIT
CSS	CLINICAL SERVICE SINK
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CW	DOMESTIC COLD WATER
CWF	DOMESTIC COLD WATER - FILTERED
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
D&T	DRIP AND TRAP
DA	DISCHARGE AIR
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DMPR	DAMPER
D/N	DAY/NIGHT
DN	DOWN
DNZ	DOWNSPOUT NOZZLE
DS	DUCT SILENCER
DT	DRAIN TILE
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
DWG	DRAWING
(E)	EXISTING
E	EXHAUST GRILLE OR REGISTER
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EXPANSION COMPENSATOR
ECUH	ELECTRIC CABINET UNIT HEATER
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EES	EMERGENCY EYE WASH / SHOWER
EEW	EMERGENCY EYE WASH
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ERL	ENERGY RECOVERY LOOP
ERLR	ENERGY RECOVERY LOOP RETURN
ERLS	ENERGY RECOVERY LOOP SUPPLY
ERU	ENERGY RECOVERY UNIT
ESH	EMERGENCY SHOWER
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F	FIRE PROTECTION
°F	DEGREES FAHRENHEIT
F&B	FACE AND BYPASS
F&T	FLOAT AND THERMOSTATIC
FA	FACE AREA
FCU	FAN COIL UNIT

ABBREVIATION	DESCRIPTION
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FMS	FLOW MEASURING STATION
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FP	FIRE PUMP
FPTU	FAN POWERED (AIR) TERMINAL UNIT
FS	FLOOR SINK
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FT	FEET
FTR	FINNED TUBE RADIATION
FV	FACE VELOCITY
G	NATURAL GAS
GA	GAUGE
GAL	GALLON
GRH	GRAVITY RELIEF HOOD
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSAN	GREASE SANITARY WASTE
H	HYDROGEN
HB	HOSE BIBB
HC	HEATING COIL
HD	HOT DECK
HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE
HL	HIGH LIMIT
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HP	HORSEPOWER
HPCW	HIGH PRESSURE DOMESTIC COLD WATER
HPHW	HIGH PRESSURE DOMESTIC HOT WATER
HPHWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN
HPL	HEAT PUMP LOOP
HPLR	HEAT PUMP LOOP RETURN
HPLS	HEAT PUMP LOOP SUPPLY
HR	HOUR
HTG	HEATING
HV	HEATING VENTILATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HWH	HOT WATER HEATING
HWHR	HOT WATER HEATING RETURN
HWHS	HOT WATER HEATING SUPPLY
HW	DOMESTIC HOT WATER
HW(_)	DOMESTIC HOT WATER (SPECIFIC TEMP °F)
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
HZ	HERTZ
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INTAKE HOOD
IN	INCHES
IR	INFRARED HEATER
IW	INDIRECT WASTE
JC	JANITOR'S CLOSET
JP	JOCKEY PUMP
KA	THOUSAND AMP
KW	KILOWATT
KWH	KILOWATT-HOUR
LAT	LEAVING AIR TEMPERATURE
LAB	LABORATORY
LAV	LAVATORY
LBS	POUNDS
LDB	LEAVING DRY BULB
LL	LOW LIMIT
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MEDICAL COMPRESSED AIR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MIL	1/1000th INCH
MIN	MINIMUM
MISC	MISCELLANEOUS
MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
MOP	MAXIMUM OVERCURRENT PROTECTION
M/S	MOTOR STARTER
MTD	MOUNTED
MTR	MOTOR
MV	MANUAL AIR VENT
MVAC	MEDICAL VACUUM
N	NITROGEN
N2O	NITROUS OXIDE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NCTC	NORMALLY CLOSED TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NFPA	NATIONAL FIRE PROTECTION AGENCY
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPCW	NON POTABLE COLD WATER

ABBREVIATION	DESCRIPTION
O	OXYGEN
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OB	OUTLET BOX
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER/CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OL	OVERLOAD
ORC	OVERFLOW RAIN CONDUCTOR
ORD	OVERFLOW ROOF DRAIN
OS&Y	OUTSIDE SCREW AND YOKE
OV	OUTLET VELOCITY
OWS	OPERATOR WORKSTATION
PACU	PACKAGED AIR CONDITIONING UNIT
PBD	PARALLEL BLADE DAMPER
PC	PUMPED CONDENSATE
PCW	PROCESS COOLING WATER
PCWR	PROCESS COOLING WATER RETURN
PCWS	PROCESS COOLING WATER SUPPLY
PD	PRESSURE DROP (FEET OF WATER)
PH	PERIMETER HEAT
PHR	PERIMETER HEAT RETURN
PHS	PERIMETER HEAT SUPPLY
PNL	PANEL
PPM	PARTS PER MILLION
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSAN	PUMPED SANITARY
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PST	PUMPED STORM
PW	PURIFIED WATER
PWR	PURIFIED WATER RETURN
PWS	PURIFIED WATER SUPPLY
(R)	RELOCATED
R	RETURN GRILLE OR REGISTER
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RC	RAIN CONDUCTOR
RCP	RADIANT CEILING PANEL
RD	ROOF DRAIN
REQD	REQUIRED
REF	ROOF EXHAUST FAN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RLFA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPDA	REDUCED PRESSURE BACKFLOW DETECTION ASSY
RPZA	REDUCED PRESSURE BACKFLOW ZONE ASSY
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
S	SUPPLY AIR DIFFUSER OR GRILLE
SA	SOUND ATTENUATOR
SA	SUPPLY AIR
SAN	SANITARY WASTE
SAT	SUPPLY AIR TEMPERATURE
SCCR	SHORT CIRCUIT CURRENT RATING
SECT	SECTION
SF	SUPPLY FAN
SH	SHOWER
SK	SINK
SMR	SNOW MELT RETURN
SMS	SNOW MELT SUPPLY
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SQFT	SQUARE FOOT/SQUARE FEET
S/S	START/STOP
SS	SERVICE SINK
ST	STORM
STD	STANDARD
STK	STACK
STM	STEAM
STM(__#)	STEAM (SPECIFIC PSIG)
S/W	SUMMER/WINTER
SW	SWITCH
T	TRANSFER GRILLE
TC	TEMPERATURE CONTROL
TC	TEMPERING COIL
TCP	TEMPERATURE CONTROL PANEL
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TEMP	TEMPORARY
TH	TERMINAL HEATING
THA	TOTAL HEAT ABSORBED
THR	TERMINAL HEATING RETURN
THR	TOTAL HEAT REJECTED
THS	TERMINAL HEATING SUPPLY
TMR	TIMER SWITCH
TPD	TEPID WATER
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TV	TURNING VANES
TW	TEMPERED WATER
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UON	UNLESS OTHERWISE NOTED
UR	URINAL
UV	UNIT VENTILATOR
V	VALVE
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VOL	VOLUME
VFC	VARIABLE FREQUENCY CONTROLLER
VTR	VENT THROUGH ROOF
VTU	VENTURI TERMINAL UNIT
VUV	VERTICAL UNIT VENTILATOR
W	WASTE
W&V	WASTE AND VENT
WAGD	WASTE ANESTHETIC GAS DISPOSAL
WB	WET BULB
WC	WATER CLOSET
WC	WATER COLUMN
WG	WATER GAUGE
WH	WALL HYDRANT
WMSD	WASHING MACHINE SUPPLY AND DRAIN BOX
WPD	WATER PRESSURE DROP
WT	WEIGHT
XFMR	TRANSFORMER
ZVB	ZONE VALVE BOX

TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST

SYMBOL	DESCRIPTION
CO2	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FM	FLOW METER
	GUARD FOR STAT OR SENSOR
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)

SYMBOL	DESCRIPTION
OS	OCCUPANCY SENSOR
PT	PRESSURE TRANSMITTER
SP	STATIC PRESSURE SENSOR OR PROBE
	VALVE - 2 WAY CONTROL VALVE
	VALVE - 3 WAY CONTROL VALVE
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)

NOTE: LIST OF ADDITIONAL SYMBOLS & ABBREVIATIONS ASSOCIATED WITH TEMPERATURE CONTROLS ARE IDENTIFIED ON TC DRAWINGS.

MECHANICAL SYMBOL LIST

PIPING SYMBOLS

SYMBOL	DESCRIPTION
AV	AIR VENT - AUTOMATIC
MV	AIR VENT - MANUAL
BFP	BACKFLOW PREVENTER
	CATCH BASIN
	CIRCULATING PUMP
CO	CLEAN OUT - IN FLOOR
CO	CLEAN OUT - FLANGE
	DIRECTION OF FLOW
	DIRECTION OF PITCH - DOWN
	FINNED TUBE RADIATION
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL
	FLOOR DRAIN
	FLOOR DRAIN - ELEVATION
	FLOOR DRAIN - FUNNEL
	FLOOR DRAIN - FUNNEL, ELEVATION
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)
FS	FLOW SWITCH
FM	FLOW METER
HB	HOSE BIBB
	PIPE - ANCHOR
	PIPE - CAP OR PLUG
	PIPE - ELBOW DOWN
	PIPE - ELBOW UP
	PIPE - EXPANSION JOINT OR COMPENSATOR
	PIPE - FLANGE
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION
	PIPE - RUBBER FLEXIBLE CONNECTION
	PIPE - GUIDE
	PIPE - TEE DOWN
	PIPE - TEE UP
	PIPE - UNION
P/T	PRESSURE AND TEMPERATURE TEST PLUG
	PRESSURE GAUGE AND COCK
	REDUCER - CONCENTRIC
	REDUCER - ECCENTRIC
	ROOF/OVERFLOW DRAIN
	STRAINER
	STRAINER WITH VALVE AND BLOW-OFF
	THERMOMETER
	TRAP
	VALVE - ANGLE
	VALVE - BALL
0.5	VALVE - BALANCE (i.e. BALANCE VALVE TO 0.5 GPM)
0.5	VALVE - COMBINATION BALANCE & FLOW MEASURING STEAM (i.e. BALANCE VALVE TO 0.5 GPM)
	VALVE - BUTTERFLY
	VALVE - CHECK
	VALVE - SPRING CHECK
	VALVE - GAS (MANUAL)
	VALVE - GLOBE
	VALVE - ISOLATION
	VALVE - NEEDLE
	VALVE - OS&Y
	VALVE - PLUG
	VALVE - PRESSURE REGULATING
	VALVE - PRESSURE REDUCING
	VALVE - PRESSURE RELIEF
	VALVE - PRESSURE & TEMPERATURE RELIEF
VTR	VENT THROUGH ROOF
WH	WALL HYDRANT
WM	WATER METER
GM	GAS METER

DOUBLE LINE PIPING SYMBOLS

SYMBOL	DESCRIPTION
	FLANGE
	FLEX CONNECTION
	STRAINER - BASKET
	STRAINER - Y TYPE
	VALVE - 2 WAY CONTROL
	VALVE - 3 WAY CONTROL
	VALVE - BUTTERFLY
	VALVE - CHECK
	VALVE - DETECTOR CHECK
	VALVE - OS&Y HORIZONTAL STEM
	VALVE - OS&Y VERTICAL STEM

DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
TU-101	AIR TERMINAL UNIT
TU-101	AIR TERMINAL UNIT WITH HEATING COIL
	DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	DAMPER - SMOKE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)
BDD	DAMPER - BACK DRAFT
M	DAMPER - MOTORIZED
	DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	DIFFUSER - BLANK OFF
	DIFFUSER - LINEAR SLOT
	DIFFUSER - SQUARE OR RECTANGULAR
	DUCT CROSS SECTION - SUPPLY
	DUCT CROSS SECTION - RETURN
	DUCT CROSS SECTION - EXHAUST
	DUCT - FLEXIBLE CONNECTION
	DUCT - FLEXIBLE DUCT
	DUCT TAKE-OFF - ROUND CONICAL
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - RECTANGULAR/ ROUND SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	FAN - AXIAL
	FAN - CENTRIFUGAL (ELEVATION)
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	INTAKE OR RELIEF HOOD
	REGISTER - RETURN OR EXHAUST
	REGISTER - RETURN WITH BOOT
	REGISTER - TRANSFER GRILLE
	ROOF EXHAUST FAN
	TRANSITION - CONCENTRIC
	TRANSITION - ECCENTRIC
	UNIT HEATER - HORIZONTAL THROW
	UNIT HEATER - VERTICAL THROW

DOUBLE LINE DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
	DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	DUCT TAKE-OFF - ROUND CONICAL
	ELBOW - RECTANGULAR WITH TURNING VANES
	ELBOW - ROUND
	ELBOW - RECTANGULAR SMOOTH RADIUS
	ELBOW DOWN - RECTANGULAR
	ELBOW DOWN - ROUND
	ELBOW UP - RECTANGULAR
	ELBOW UP - ROUND
	HEATING COIL
D	INCLINED DROP IN DIRECTION OF AIRFLOW
R	INCLINED RISE IN DIRECTION OF AIRFLOW
	TRANSITION - CONCENTRIC
	TRANSITION -ECCENTRIC

MECHANICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
M0-01	MECHANICAL STANDARDS AND DRAWING INDEX
M1-01	GROUND FLOOR FIRE PROTECTION PLAN
M1-02	MEZZANINE FIRE PROTECTION PLAN
M2-00	UNDERGROUND PLUMBING PLAN
M2-01	GROUND FLOOR PLUMBING PLAN
M2-02	MEZZANINE AND HOSE TOWER PLUMBING PLANS
M3-01	GROUND FLOOR HVAC PIPING PLAN
M3-02	MEZZANINE HVAC PIPING PLAN
M4-01	GROUND FLOOR SHEET METAL PLAN
M4-02	MEZZANINE AND HOSE TOWER SHEET METAL PLANS
M5-31	ROOF MECHANICAL PLAN
M6-01	MECHANICAL DETAILS
M6-02	MECHANICAL DETAILS
M6-03	MECHANICAL DETAILS
M6-04	MECHANICAL DETAILS
M6-05	MECHANICAL DETAILS
M6-06	MECHANICAL DETAILS
M7-01	MECHANICAL SCHEDULES
M7-02	MECHANICAL SCHEDULES
M7-03	MECHANICAL SCHEDULES
M7-04	MECHANICAL SCHEDULES
M7-05	MECHANICAL SCHEDULES
M7-06	MECHANICAL SCHEDULES
M7-07	SNOWMELT DETAILS AND SCHEDULES
M8-01	TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES
M8-02	TEMPERATURE CONTROLS
M8-03	TEMPERATURE CONTROLS
M8-04	TEMPERATURE CONTROLS
M8-05	TEMPERATURE CONTROLS
M8-06	TEMPERATURE CONTROLS
M8-07	TEMPERATURE CONTROLS
M8-08	TEMPERATURE CONTROLS
M8-09	TEMPERATURE CONTROLS
M8-10	TEMPERATURE CONTROLS

STANDARD METHODS OF NOTATION

S-1 10ø 350-4	SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4
R-1 22x22 640-2	RETURN REGISTER WITH SCHEDULE TAG "1", 22"x 22" NECK SIZE 640 CFM TYPICAL FOR 2 EXHAUST REGISTER E DESIGNATION SIMILAR.
TU-101	AIR TERMINAL UNIT WITH HEATING COIL NO. 101 WITH SERVICE CLEARANCE SHOWN
(2)WC-1 FD-1	PLUMBING FIXTURE UNIT IDENTIFICATION TAG WATER CLOSET TYPE "1" TYPICAL FOR 2
8	PIPE DIAMETER NOTATION ALL SIZES IN INCHES
8ø 22x10 18x14ø	DUCT SIZE NOTATION ALL SIZES IN INCHES
	OVAL DUCT RECTANGULAR DUCT
1	CONSTRUCTION KEY NOTE (NUMBER) OR DEMOLITION KEY NOTE (LETTER)
EF 1	EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)
	NEW SYSTEM COMPONENT EXISTING SYSTEM COMPONENT TO REMAIN
	POINT OF NEW CONNECTION SYMBOL
1 M5.1	SECTION OR PLAN NUMBER SHEET WHERE SECTION IS DRAWN
	AREA OF ENLARGEMENT
1 M5.1	PLAN NUMBER SHEET WHERE ENLARGED PLAN IS DRAWN
1 M5.1	SECTION OR PLAN NUMBER SHEET WHERE SECTION IS CUT OR ENLARGED PLAN IS REFERENCED
SHEET M1.0 SHEET M1.1	MATCHLINE
	HEAVY LINE WEIGHT INDICATES NEW WORK
	LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION
	GRAY LINE INDICATES BACKGROUND INFORMATION
	DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE
	HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

SECTION OR ENLARGED PLAN
SCALE: 1/8" = 1' - 0"

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

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PBA Project No.: 2021.0370.01

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY
JTH

CHECKED BY
DAC

APPROVED BY
DAC

SHEET NAME

MECHANICAL STANDARDS AND DRAWING INDEX

SHEET NO.

M0-01

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

GROUND FLOOR FIRE PROTECTION PLAN

SCALE: 1/8" = 1'-0"

FIRE PROTECTION GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.

4 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

5 MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".

6 PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13 LIGHT HAZARD CLASSIFICATION. HYDRAULIC CALCULATIONS SHALL BE BASED ON DENSITY OF 0.10 GPM/SQ FT. OVER THE MOST REMOTE 1500 SQ. FT.

7 CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.

8 FIRE PROTECTION WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 PROVIDE FULLY FUNCTIONING WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, THE AUTHORITY HAVING JURISDICTION AND THE OWNERS INSURING AGENCY IN THE AREAS INDICATED.

2 EXTEND FIRE PROTECTION LINE TO KITCHEN HOOD, COORDINATE REQUIREMENTS WITH HOOD MANUFACTURER.

3 FINAL LOCATION OF FDC TO BE COORDINATED WITH THE AHJ.

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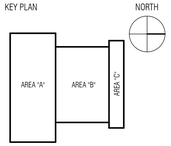
KEY PLAN

NORTH



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SHEET NAME

GROUND FLOOR FIRE PROTECTION PLAN

SHEET NO.

M1-01

6/12/2023 8:17:26 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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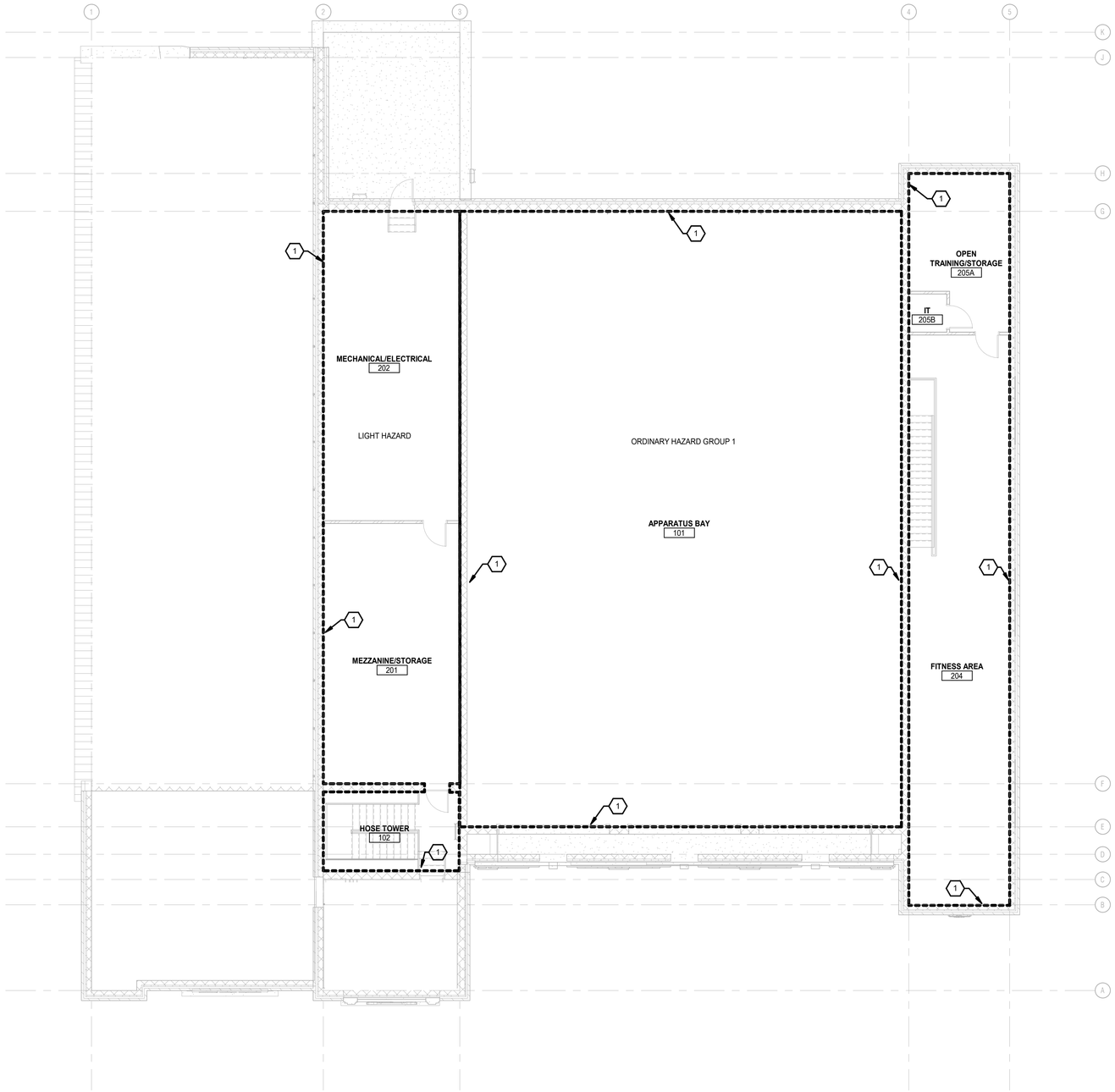

MEZZANINE FIRE PROTECTION PLAN

SCALE: 1/8" = 1'-0"

FIRE PROTECTION GENERAL NOTES:

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CONSTRUCTION KEY NOTES:

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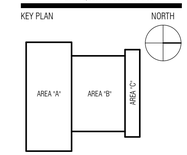
NORTH



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SHEET NAME

MEZZANINE FIRE PROTECTION PLAN

SHEET NO.

M1-02

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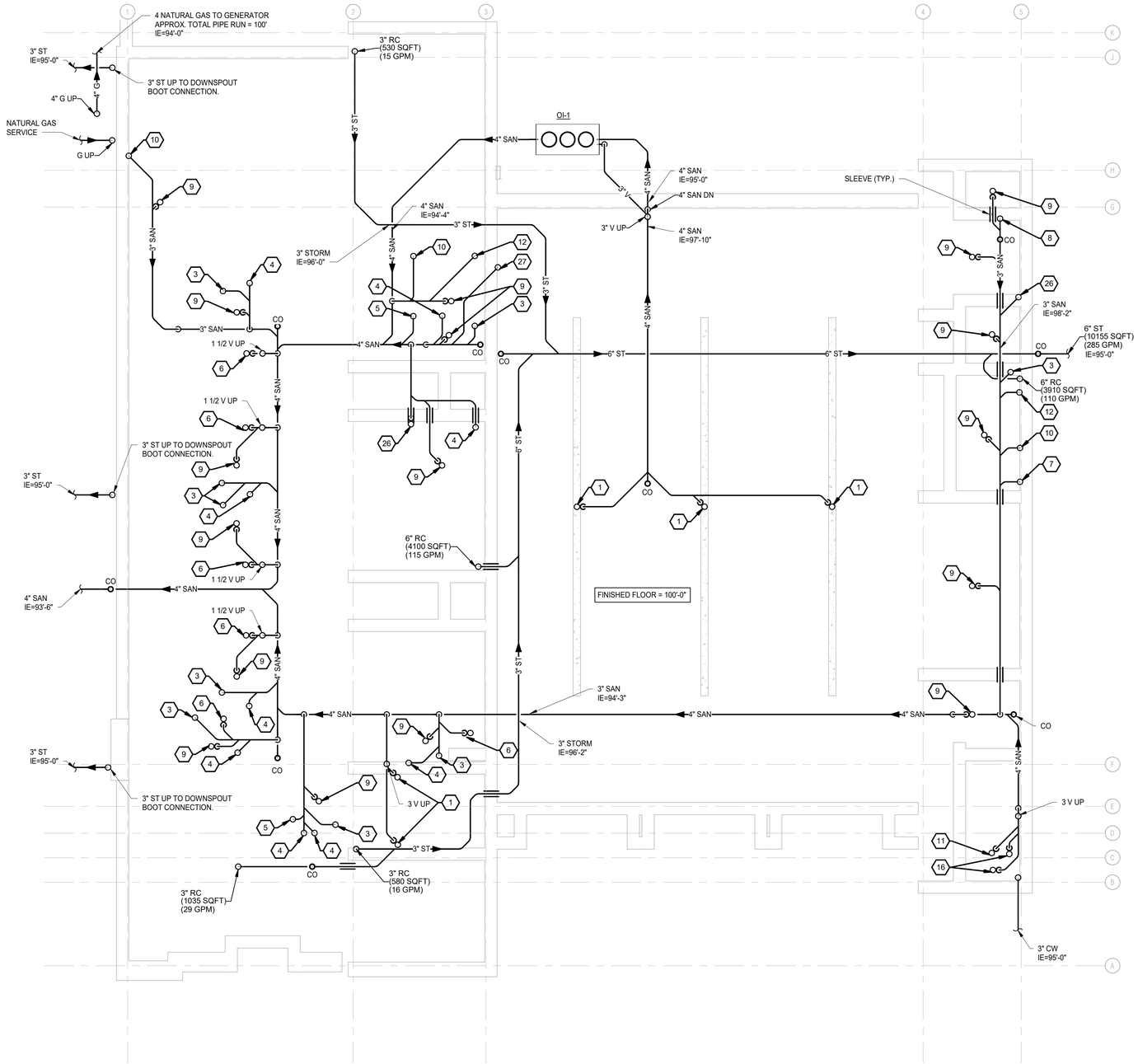

UNDERGROUND PLUMBING PLAN

SCALE: 1/8" = 1'-0"

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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
11. WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1. 4 SAN TO TRENCH DRAIN.
2. 1 1/4 GAS TO WATER HEATER.
3. 4 SAN TO WATER CLOSET.
4. 3 SAN TO LAV(S).
5. 3 SAN TO ELECTRIC WATER COOLER.
6. 3 SAN TO SHOWER.
7. 3 SAN TO WASHER EXTRACTOR.
8. 3 SAN TO 3-COMPARTMENT SINK.
9. 3 SAN TO FLOOR SINK/DRAIN.
10. 3 SAN TO SINK.
11. 4 SAN TO FLOOR DRAIN.
12. 3 SAN TO WASHING MACHINE SUPPLY AND DRAIN BOX.
13. 2 NPCW CAPPED FOR LAWN IRRIGATION.
14. ROUTE 1 1/4 NATURAL GAS TO RANGE (PROVIDED BY OWNER).
15. ROUTE 1 1/4 NATURAL GAS TO BOILER.
16. 4 SAN TO HUB OUTLET.
17. ROUTE 1/2 CW TO ELECTRIC WATER COOLER.
18. 1 1/4 GAS CAPPED FOR FUTURE GRILL.
19. ROUTE 3/4 NATURAL GAS TO DRYER, INCLUDE NATURAL GAS REGULATOR IN VERTICAL PIPING. REFER TO NATURAL GAS PIPING DIAGRAM ON SHEET M6-06.
20. ROUT 1/2 CW TO COFFE MAKER/REFRIGERATOR.
21. ROUTE 1/2 CW, HW, & HWR TO LAV(S).
22. ROUTE 1 1/4 NATURAL GAS TO RANGE, INCLUDE ELECTRONIC SOLENOID WIRED TO EMERGENCY GAS SHUT OFF BUTTON. REFER TO NATURAL GAS PIPING DIAGRAM ON SHEET M6-06.
23. ROUTE 1 1/4 NATURAL GAS TO INFRA-RED HEATER.
24. 3 V UP TO 3 VTR.
25. ROUTE 1 1/4 NATURAL GAS TO SNOWMELT SYSTEM.
26. 3 SAN TO SERVICE SINK.
27. 4 SAN TO MEZZANINE LEVEL.
28. ROUTE VENT, CW, & HW IN CABINETRY TO SINK TO AVOID WINDOW.

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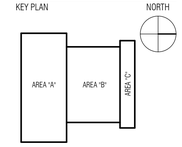
KEY PLAN

NORTH



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SHEET NAME

UNDERGROUND PLUMBING PLAN

SHEET NO.

M2-00

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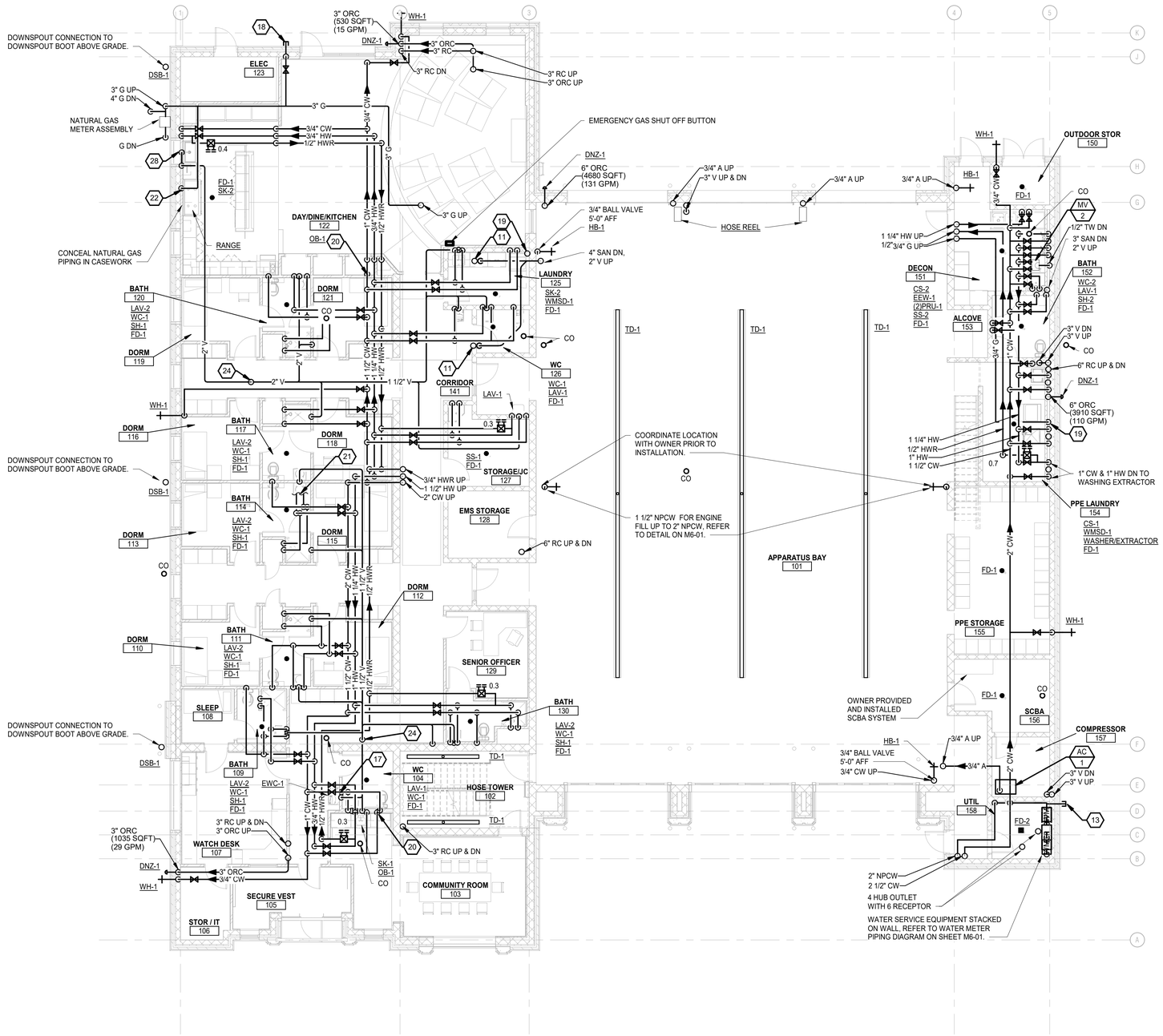

GROUND FLOOR PLUMBING PLAN

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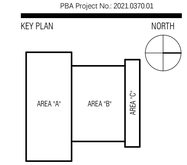
PBA Project No.: 2021.0370.01

KEY PLAN



OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY JTH

CHECKED BY DAC

APPROVED BY DAC

SHEET NAME

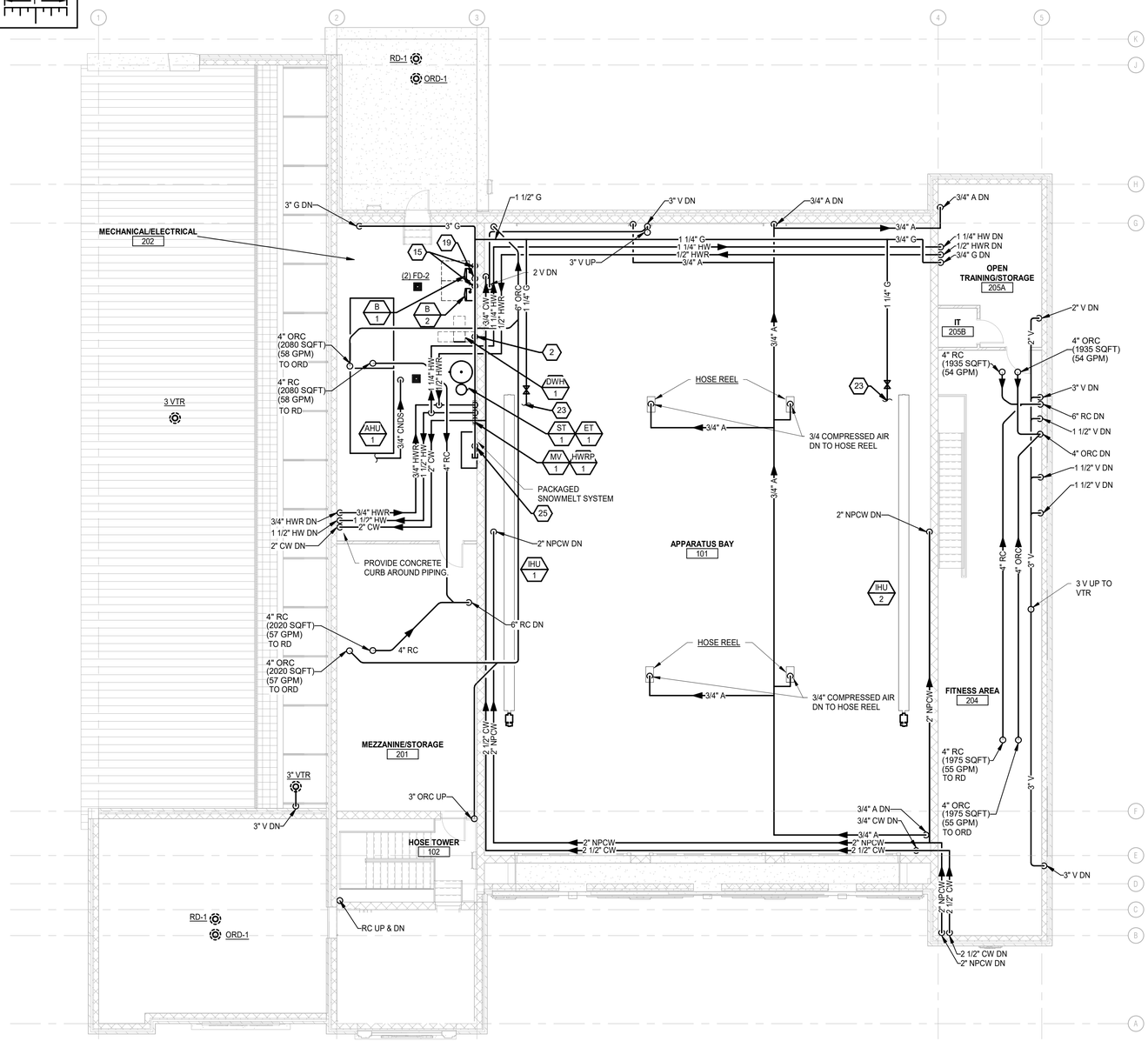
GROUND FLOOR PLUMBING PLAN

SHEET NO.

M2-01

6/12/2023 8:17:44 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



MEZZANINE PLUMBING PLAN

SCALE: 1/8" = 1'-0"

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

CONSTRUCTION KEY NOTES:

1 4 SAN TO TRENCH DRAIN.

2 1 1/4 GAS TO WATER HEATER.

3 4 SAN TO WATER CLOSET.

4 3 SAN TO LAV(S).

5 3 SAN TO ELECTRIC WATER COOLER.

6 3 SAN TO SHOWER.

7 3 SAN TO WASHER EXTRACTOR.

8 3 SAN TO 3-COMPARTMENT SINK.

9 3 SAN TO FLOOR SINK/DRAIN.

10 3 SAN TO SINK.

11 4 SAN TO FLOOR DRAIN.

12 3 SAN TO WASHING MACHINE SUPPLY AND DRAIN BOX.

13 2 NPCW CAPPED FOR LAWN IRRIGATION.

14 ROUTE 1 1/4 NATURAL GAS TO RANGE (PROVIDED BY OWNER).

15 ROUTE 1 1/4 NATURAL GAS TO BOILER.

16 4 SAN TO HUB OUTLET.

17 ROUTE 1/2 CW TO ELECTRIC WATER COOLER.

18 1 1/4 GAS CAPPED FOR FUTURE GRILL.

19 ROUTE 3/4 NATURAL GAS TO DRYER, INCLUDE NATURAL GAS REGULATOR IN VERTICAL PIPING. REFER TO NATURAL GAS PIPING DIAGRAM ON SHEET M6-06.

20 ROUT 1/2 CW TO COFFE MAKER/REFRIGERATOR.

21 ROUTE 1/2 CW, HW, & HWR TO LAV(S).

22 ROUTE 1 1/4 NATURAL GAS TO RANGE, INCLUDE ELECTRONIC SOLENOID WIRED TO EMERGENCY GAS SHUT OFF BUTTON. REFER TO NATURAL GAS PIPING DIAGRAM ON SHEET M6-06.

23 ROUTE 1 1/4 NATURAL GAS TO INFRA-RED HEATER.

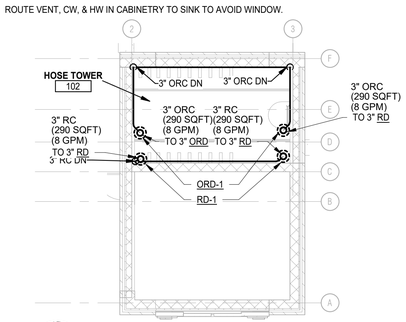
24 3 V UP TO 3 VTR.

25 ROUTE 1 1/4 NATURAL GAS TO SNOWMELT SYSTEM.

26 3 SAN TO SERVICE SINK.

27 4 SAN TO MEZZANINE LEVEL.

28 ROUTE VENT, CW, & HW IN CABINETRY TO SINK TO AVOID WINDOW.



HOSE TOWER PLUMBING PLAN

SCALE: 1/8" = 1'-0"

PARTNERS

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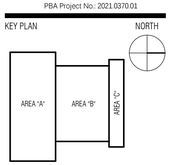

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Bidding / Construction	06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

MEZZANINE AND HOSE TOWER PLUMBING PLANS

SHEET NO.

M2-02

6/12/2023 8:17:51 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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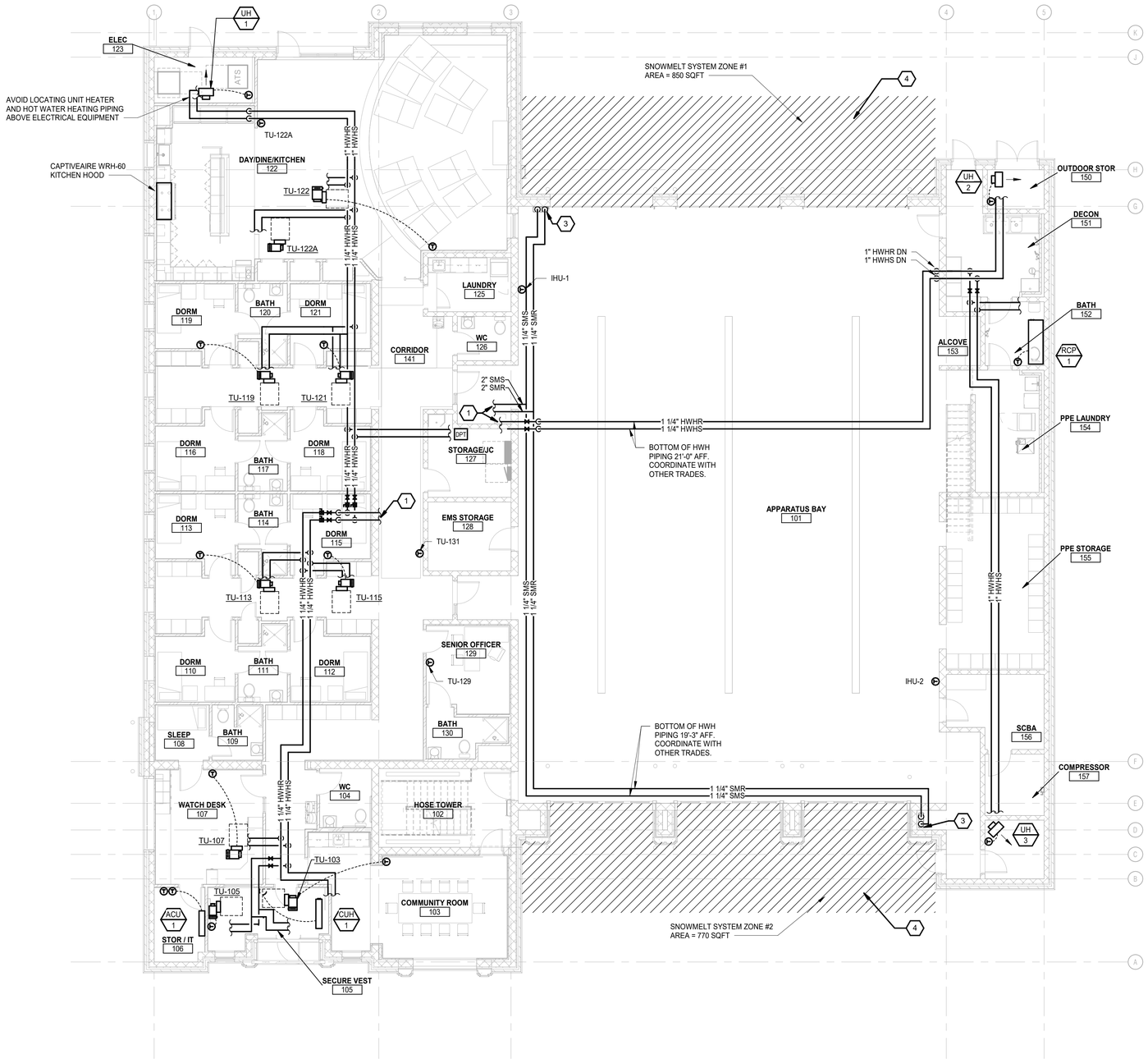

GROUND FLOOR HVAC PIPING PLAN

SCALE: 1/8" = 1'-0"

HVAC PIPING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.
8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. REFER TO SHEET M3-02 FOR CONTINUATION.
2. REFER TO SHEET M3-01 FOR CONTINUATION.
3. SNOWMELT ZONE MANIFOLD. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION.
4. SNOW/ICE SENSOR AND SLAB TEMPERATURE SENSOR. COORDINATE WITH TEMPERATURE CONTROLS CONTRACTOR.
5. REFER TO PIPING DIAGRAM FOR HOT WATER HEATING SYSTEM.

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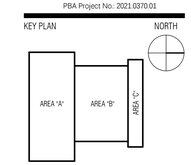

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City of Warren

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PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

GROUND FLOOR HVAC PIPING PLAN

SHEET NO.

M3-01

6/12/2023 8:17:57 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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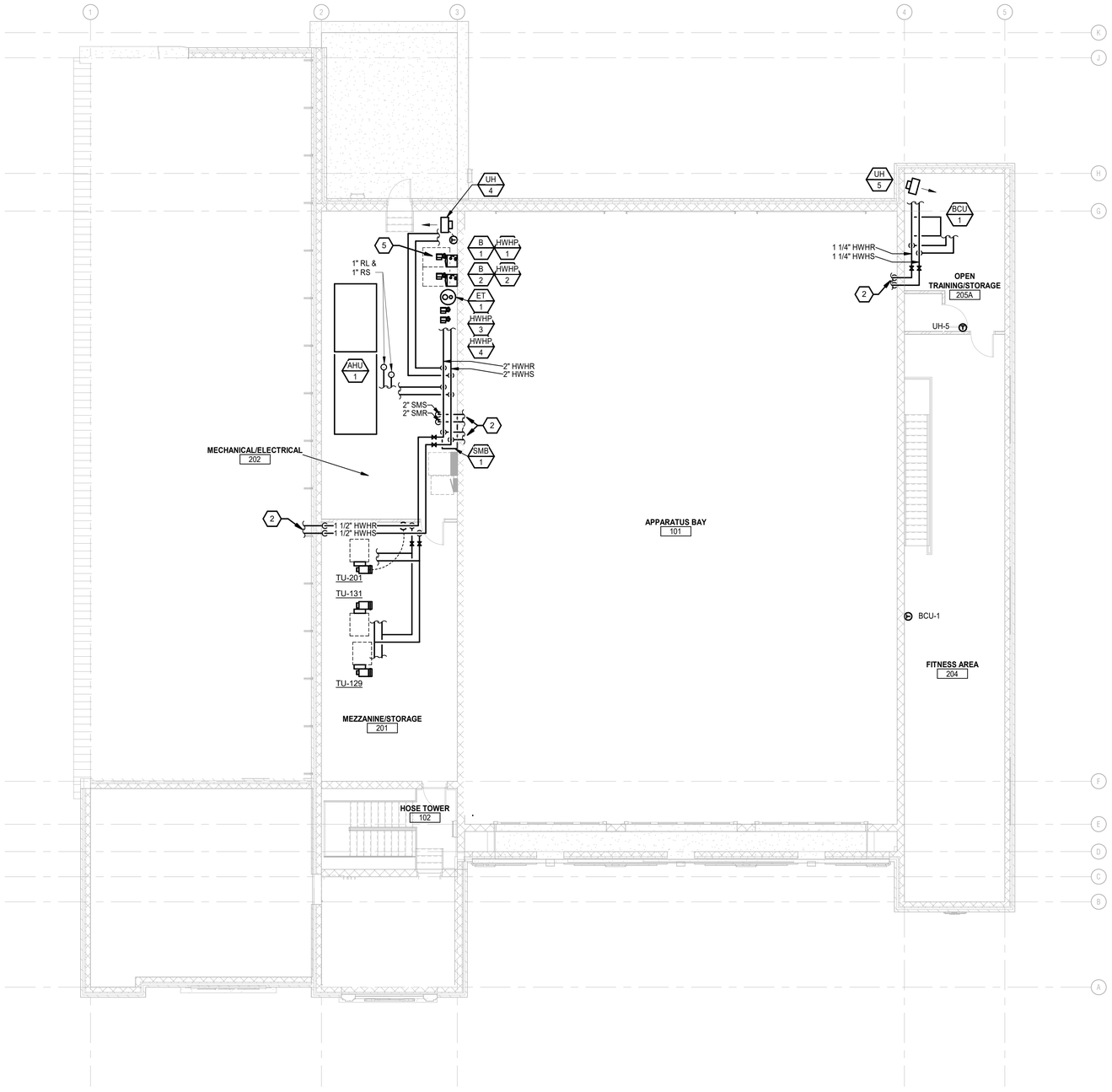

MEZZANINE HVAC PIPING PLAN

SCALE: 1/8" = 1'-0"

HVAC PIPING GENERAL NOTES:

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9 REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1 REFER TO SHEET M3-02 FOR CONTINUATION.

2 REFER TO SHEET M3-01 FOR CONTINUATION.

3 SNOWMELT ZONE MANIFOLD. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION.

4 SNOW/ICE SENSOR AND SLAB TEMPERATURE SENSOR. COORDINATE WITH TEMPERATURE CONTROLS CONTRACTOR.

5 REFER TO PIPING DIAGRAM FOR HOT WATER HEATING SYSTEM.

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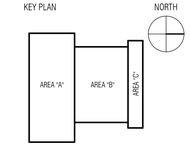
KEY PLAN

NORTH



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ISSUES / REVISIONS

Bidding / Construction	06/13/2023

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DAC

APPROVED BY

DAC

SHEET NAME

MEZZANINE HVAC PIPING PLAN

SHEET NO.

M3-02

6/12/2023 8:18:00 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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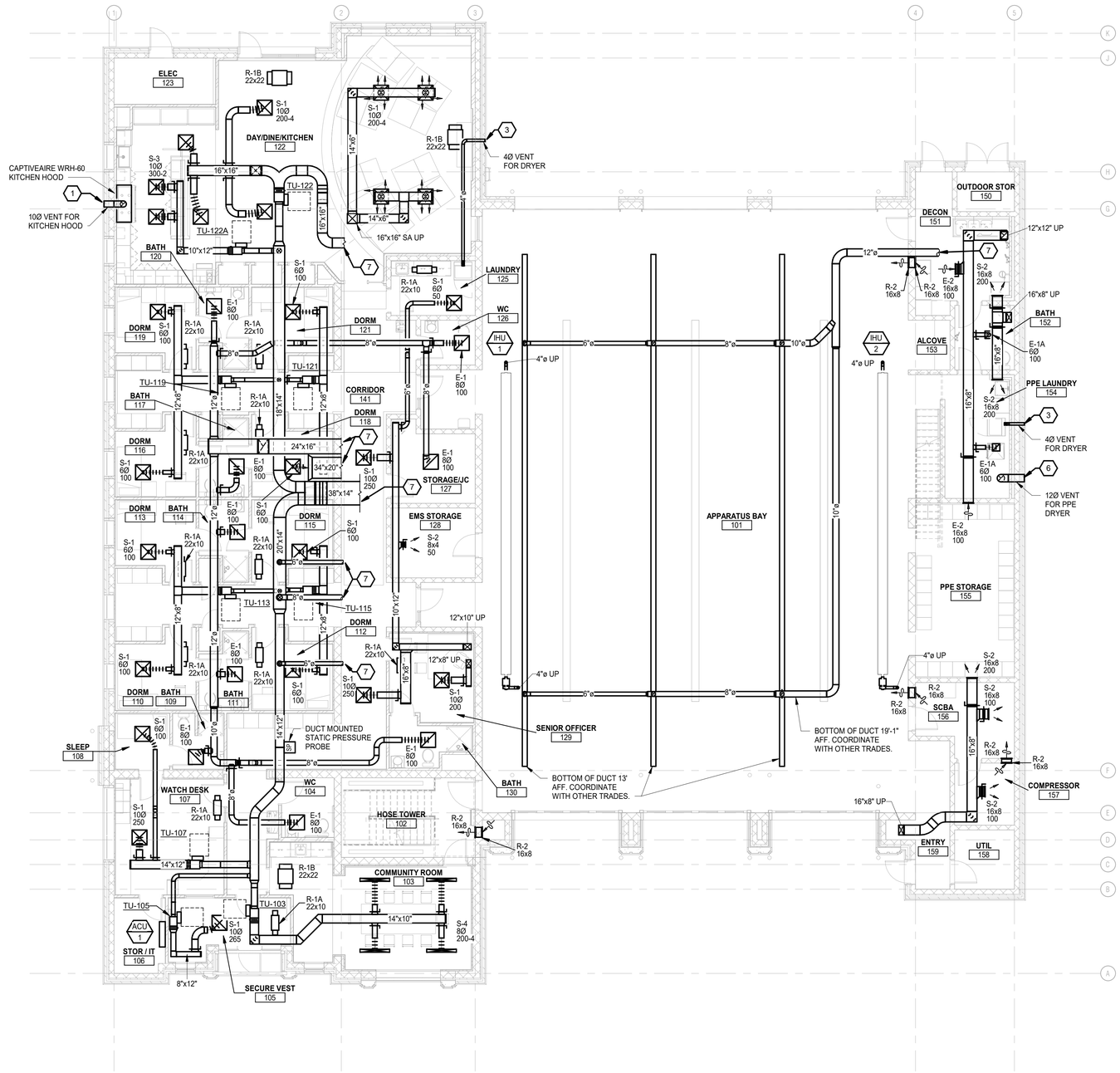

GROUND FLOOR SHEET METAL PLAN

SCALE: 1/8" = 1'-0"

SHEET METAL GENERAL NOTES:

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6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.
7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. 10" VENT CAP.
2. B-1 AND B-2 HAVE 3" INTAKE AND 3" FLUE UP THROUGH ROOF.
3. 4" VENT CAP.
4. SMB-1 HAS 4" INTAKE AND 4" FLUE UP THROUGH ROOF.
5. DWH-1 HAS 3" INTAKE AND 3" FLUE UP THROUGH ROOF.
6. 12" VENT CAP.
7. REFER TO SHEET M4-02 FOR CONTINUATION.
8. REFER TO SHEET M4-01 FOR CONTINUATION.

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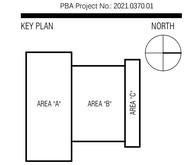

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DAC

APPROVED BY

DAC

SHEET NAME

GROUND FLOOR SHEET METAL PLAN

SHEET NO.

M4-01

6/12/2023 8:18:07 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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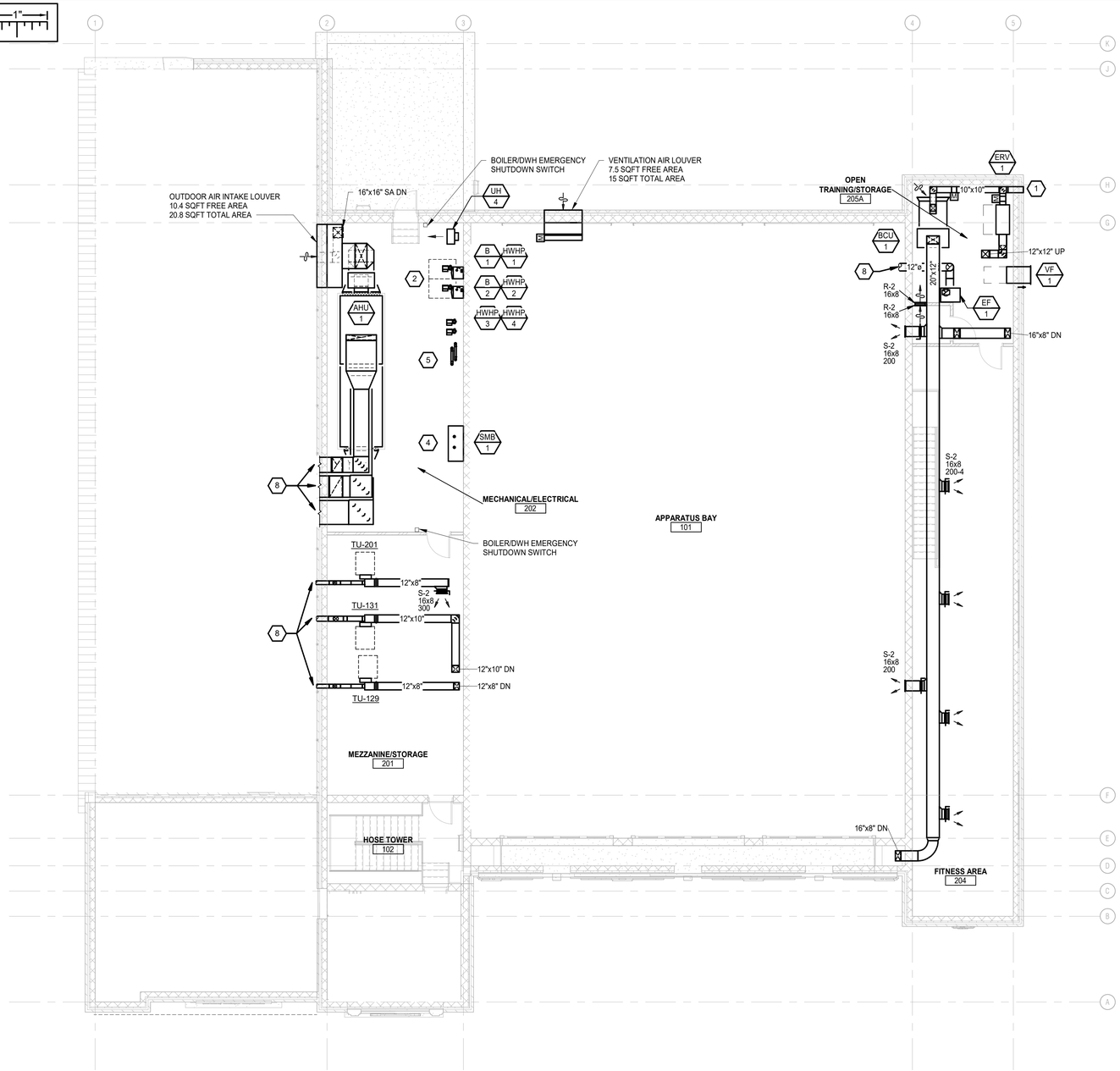

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7 REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1 10" VENT CAP.

2 B-1 AND B-2 HAVE 3" INTAKE AND 3" FLUE UP THROUGH ROOF.

3 4" VENT CAP.

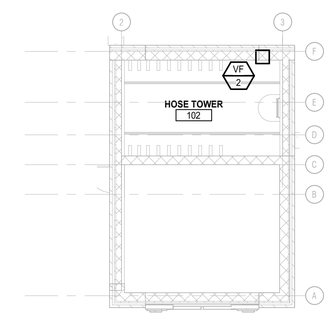
4 SMB-1 HAS 4" INTAKE AND 4" FLUE UP THROUGH ROOF.

5 DWH-1 HAS 3" INTAKE AND 3" FLUE UP THROUGH ROOF.

6 12" VENT CAP.

7 REFER TO SHEET M4-02 FOR CONTINUATION.

8 REFER TO SHEET M4-01 FOR CONTINUATION.



HOSE TOWER SHEET METAL PLAN

SCALE: 1/8" = 1'-0"

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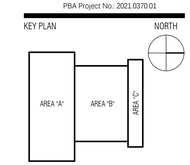
PBA Project No.: 2021.0370.01

KEY PLAN



OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

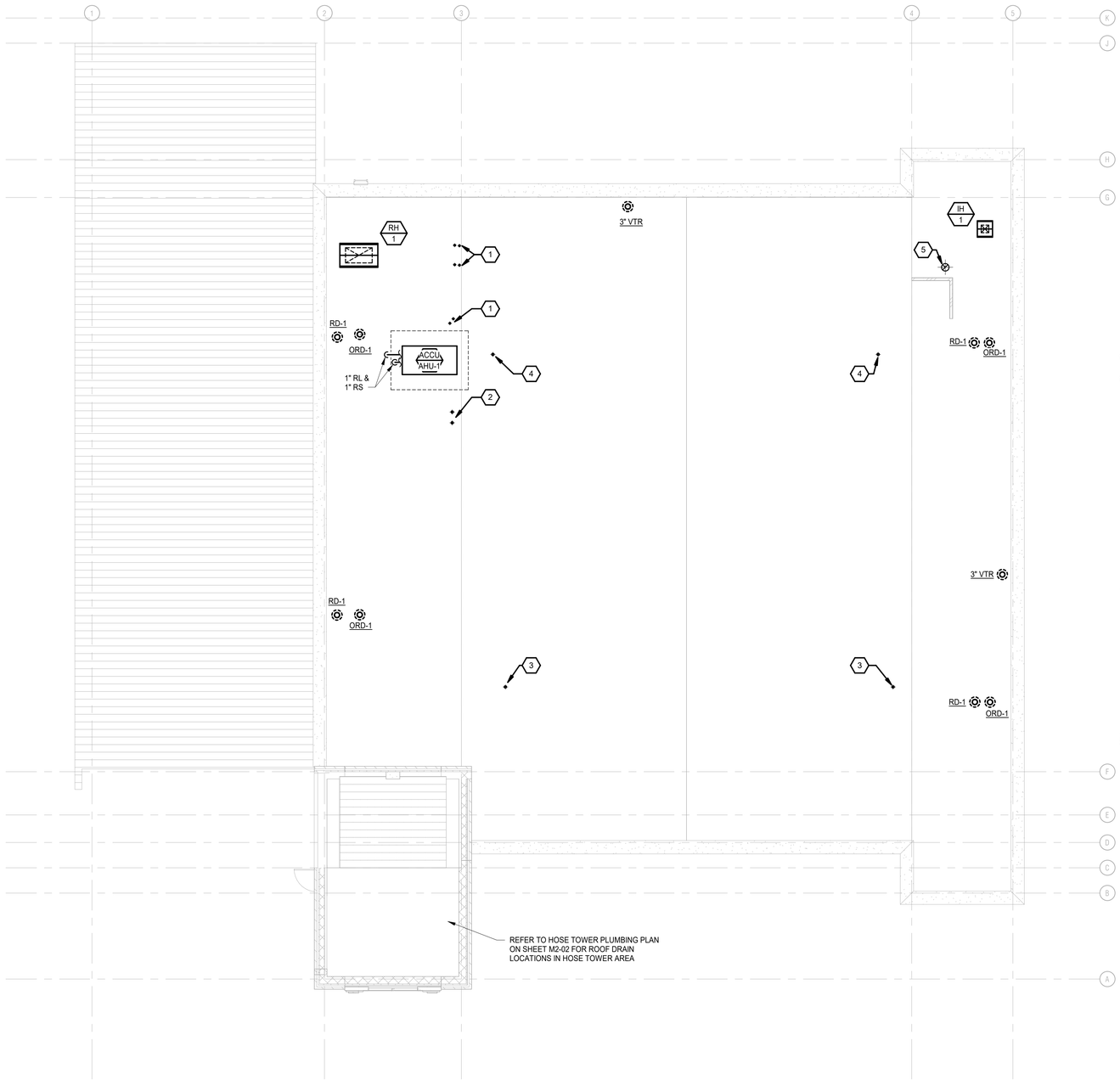
MEZZANINE AND HOSE TOWER SHEET METAL PLANS

SHEET NO.

M4-02

6/12/2023 8:18:10 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



ROOF MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

PLUMBING GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.

7 HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.

8 PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.

9 PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.

10 MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

11 WATER SERVICE ENTRANCE PIPING SHALL BE BURIED WITH DEPTH OF COVER OVER TOP OF PIPE OF AT LEAST 72", OR WITH TOP OF PIPE AT LEAST 12" BELOW LEVEL OF MAXIMUM FROST PENETRATION, OR AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, WHICHEVER IS DEEPEST.

SHEET METAL GENERAL NOTES:

1 THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.

4 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

5 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

6 REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.

7 REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1 3" INTAKE AND 3" FLUE.
2 4" INTAKE AND 4" FLUE.
3 4" INTAKE.
4 4" FLUE.
5 12" TAILPIPE EXHAUST REMOVAL VENT.

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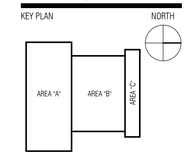
KEY PLAN

NORTH



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Bidding / Construction	06/13/2023

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SHEET NAME

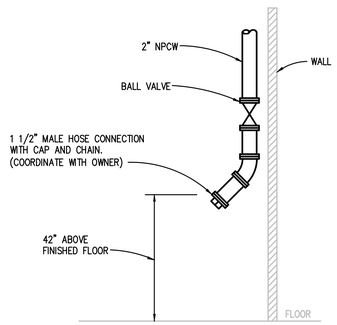
ROOF MECHANICAL PLAN

SHEET NO.

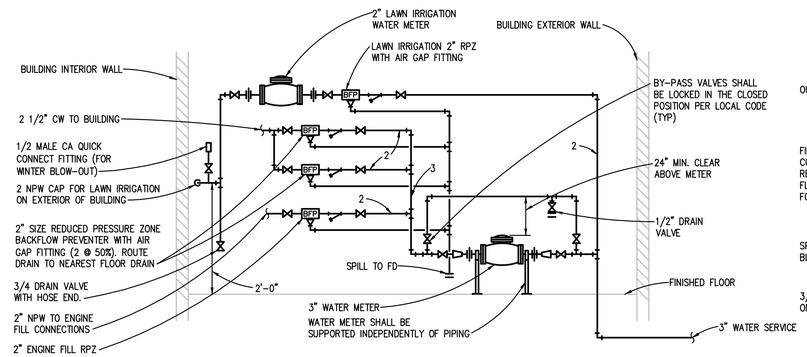
M5-31

6/12/2023 8:18:12 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

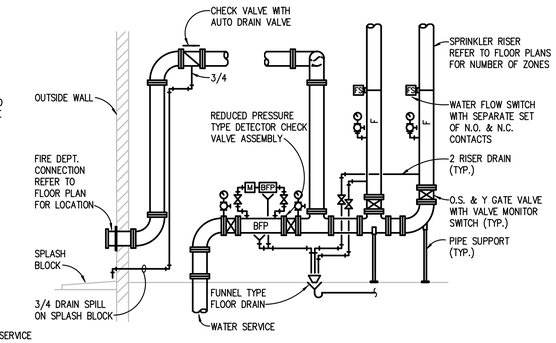
NOTES:
1. FOR 4" AND LARGER WATER SERVICES SHALL BE ROLLED OFF AT A 45° ANGLE FROM CENTERLINE OF WATER METER.
2. ALL PIPING SHALL BE SUPPORTED INDEPENDENTLY FROM WATER METER.



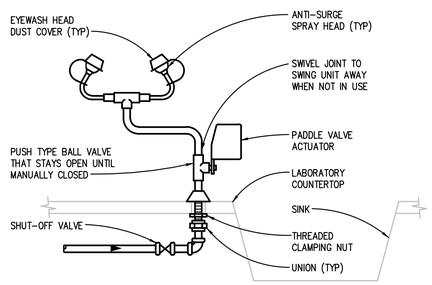
ENGINE FILL PIPING DIAGRAM
NO SCALE



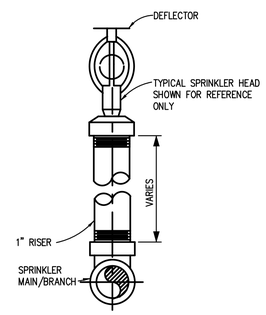
DOMESTIC WATER METER PIPING DIAGRAM
NO SCALE



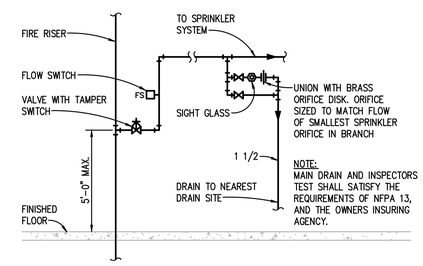
AUTOMATIC SPRINKLER RISER PIPING DIAGRAM
NO SCALE



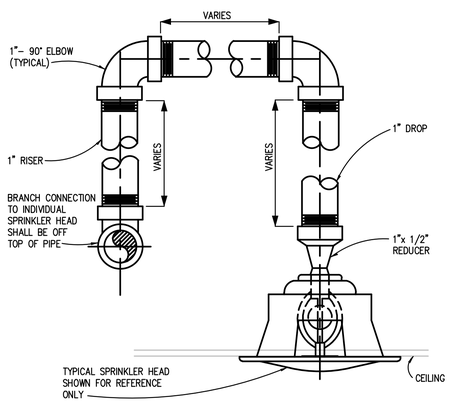
EMERGENCY EYEWASH PIPING DIAGRAM
NO SCALE



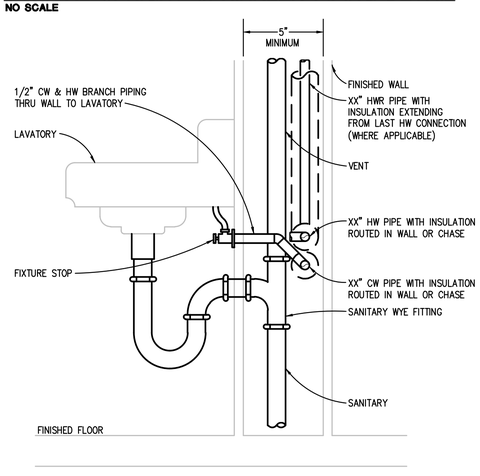
TYPICAL UPRIGHT SPRINKLER PIPING DETAIL
NO SCALE



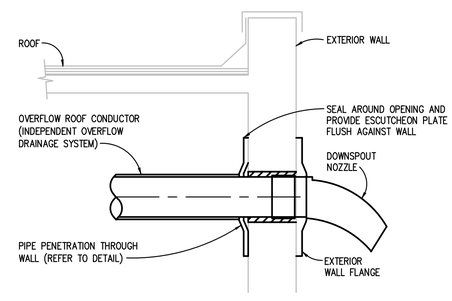
DRAIN/INSPECTORS TEST DETAIL
NO SCALE



TYPICAL SPRINKLER PIPING DETAIL
NO SCALE



TYPICAL LAVATORY DETAIL
NO SCALE



OVERFLOW DISCHARGE NOZZLE DETAIL
NO SCALE

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KEY PLAN

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City Of Warren

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PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
JTH

CHECKED BY
DAC

APPROVED BY
DAC

SHEET NAME
MECHANICAL DETAILS

SHEET NO.
M6-01

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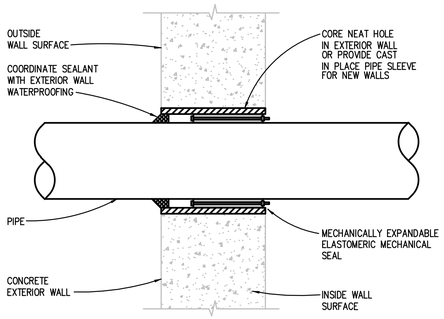
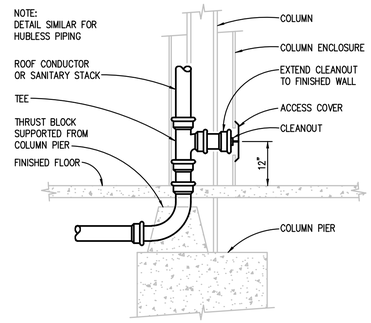


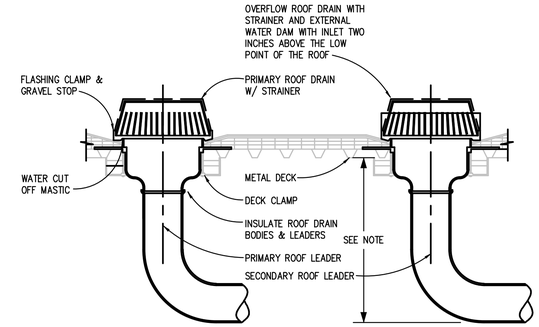
EXTERIOR BELOW GRADE WALL PIPE PENETRATION DETAIL

NO SCALE



ROOF CONDUCTOR AND SANITARY STACK BASE CONNECTION DETAIL

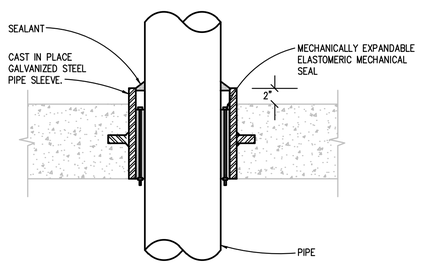
NO SCALE



NOTE:
DIMENSION FOR 6" ROOF DRAIN FROM BOTTOM OF DECK TO BOTTOM OF PIPE SHALL BE MAXIMUM OF 20". DIMENSION FOR 8" ROOF DRAIN SHALL BE A MAXIMUM OF 22". DIMENSION FOR 10" ROOF DRAIN SHALL BE A MAXIMUM OF 26".

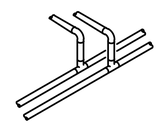
DOUBLE ROOF SUMP DETAIL

NO SCALE



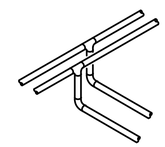
NEW SLAB ON GRADE FLOOR PIPE PENETRATION DETAIL

NO SCALE



BRANCH CONNECTION OFF TOP

APPLIES TO THE FOLLOWING SYSTEMS:
DOMESTIC WATER
COMPRESSED AIR
NATURAL GAS



BRANCH CONNECTION OFF BOTTOM

APPLIES TO THE FOLLOWING SYSTEMS:
HOT WATER HEATING

NOTE: BOTTOM AS INDICATED OR SIDE CONNECTION IS ACCEPTABLE. CONNECTION ABOVE CENTERLINE OF MAINS IS NOT ACCEPTABLE.

TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL

NO SCALE

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MECHANICAL DETAILS

SHEET NO.

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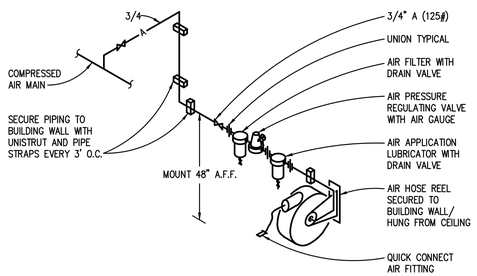
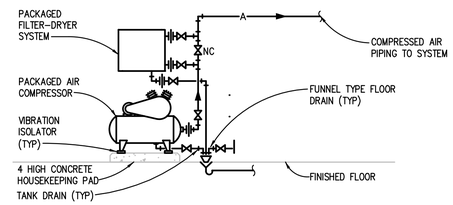


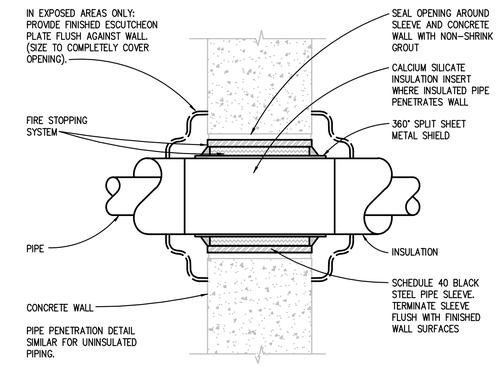
AIR OUTLET DETAIL WITH HOSE REEL

NO SCALE



AIR COMPRESSOR PIPING DIAGRAM

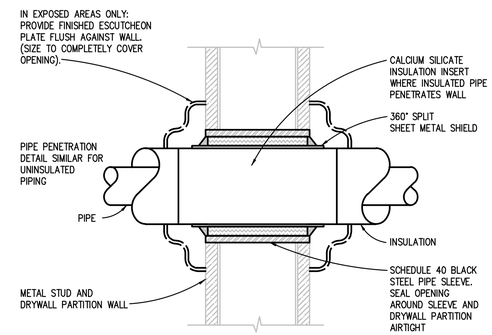
NO SCALE



DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL

NO SCALE



DETAIL INDICATES THE INSTALLATION REQUIREMENTS FOR A FIRE RATED ASSEMBLY. FOR A NON-FIRE RATED ASSEMBLY PACK SLEEVED OPENING WITH INSULATION MATERIAL AND CAULK WITH NON-HARDENING SEALANT.

FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL

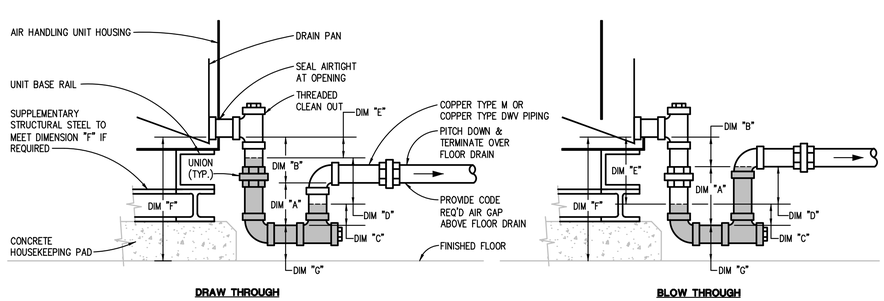
NO SCALE

TRAP DIMENSION TABLE

TYPE OF SYSTEM	S.P. AT DRAIN PAN (IN.) (NOTE A)	DIMENSION "A" (INCHES) MIN.	DIMENSION "B" (INCHES)	DIMENSION "C" (INCHES) (TRAP SEAL)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)	DIMENSION "F" (INCHES) DRAIN PIPE SIZE (INCHES)			
							1 1/2	2	2 1/2, 3	4
DRAW THROUGH	-5.1 TO -6	5.0	5.0	2	6	2	13.0	14.0	15.0	16.0
	-4.1 TO -5	4.5	4.5	2	5	2	12.0	13.0	14.0	15.0
	-3.1 TO -4	4.0	4.0	2	4	2	11.0	12.0	13.0	14.0
	-2.1 TO -3	3.5	3.5	2	3	2	10.0	11.0	12.0	13.0
	UP TO -2	3.0	3.0	2	2	2	9.0	10.0	11.0	12.0
BLOW THROUGH	UP TO +2	4.0	2.0	2	2	4	9.0	10.0	11.0	12.0
	+2.1 TO +3	5.0	2.0	2	3	5	10.0	11.0	12.0	13.0
	+3.1 TO +4	6.0	2.0	2	4	6	11.0	12.0	13.0	14.0
	+4.1 TO +5	7.0	2.0	2	5	7	12.0	13.0	14.0	15.0
	+5.1 TO +6	8.0	2.0	2	6	8	13.0	14.0	15.0	16.0

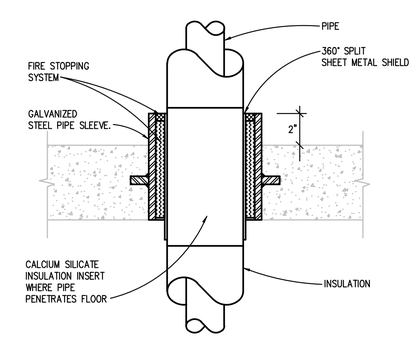
NOTES: A. REFER TO AIR HANDLING UNIT SCHEDULE FOR (-) OR (+) STATIC PRESSURE AT DRAIN PAN.

B. DIMENSION "G" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
4" FOR 2" DRAIN PIPE
5" FOR 2 1/2" OR 3" DRAIN PIPE
6" FOR 4" DRAIN PIPE



INDOOR AIR HANDLING UNIT CONDENSATE DRAIN PAN TRAP DETAIL

NO SCALE



NEW FLOOR PIPE PENETRATION DETAIL

NO SCALE

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City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
JTH

CHECKED BY
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SHEET NAME
MECHANICAL DETAILS

SHEET NO.
M6-03

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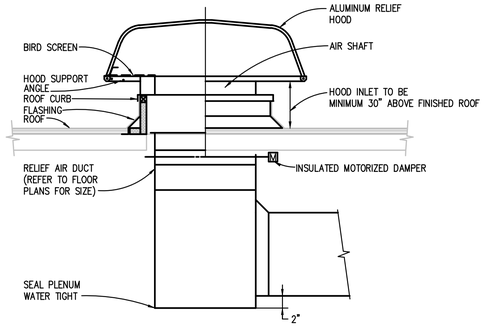
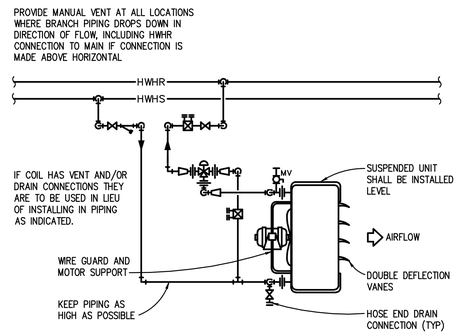


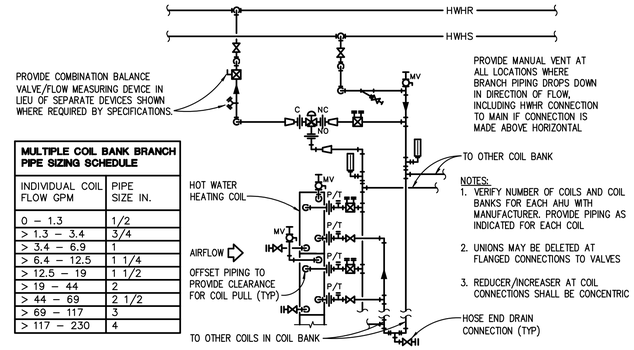
DUCTED INTAKE OR RELIEF HOOD INSTALLATION DETAIL

NO SCALE



HOT WATER UNIT HEATER WITH THREE-WAY CONTROL VALVE PIPING DIAGRAM

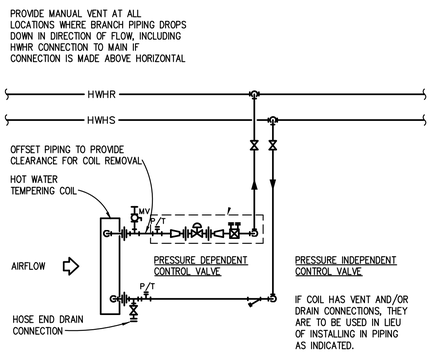
NO SCALE



MULTIPLE COIL BANK BRANCH PIPE SIZING SCHEDULE	
INDIVIDUAL COIL FLOW GPM	PIPE SIZE IN.
0 – 1.3	1/2
> 1.3 – 3.4	3/4
> 3.4 – 6.9	1
> 6.4 – 12.5	1 1/4
> 12.5 – 19	1 1/2
> 19 – 44	2
> 44 – 69	2 1/2
> 69 – 117	3
> 117 – 230	4

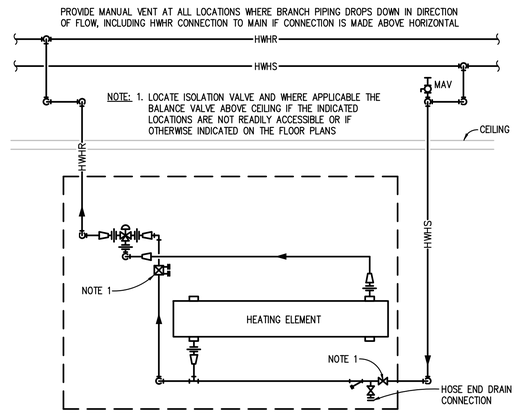
AHU HOT WATER HEATING COIL PIPING DIAGRAM #2

NO SCALE



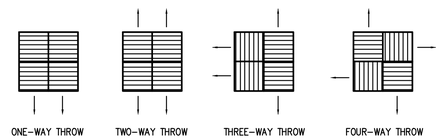
HOT WATER TEMPERING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



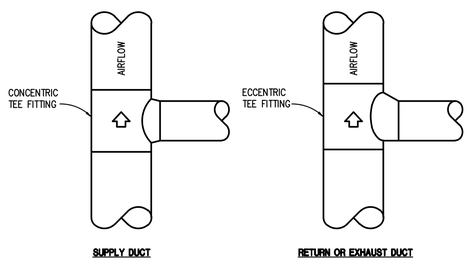
DOWNFEED CONV. OR CUH WITH THREE WAY CONTROL VALVE PIPING DIAGRAM

NO SCALE



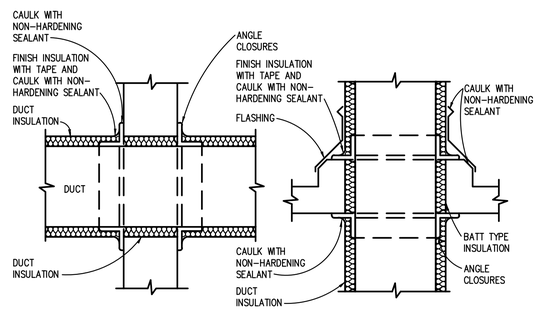
MODULAR CORE DIFFUSER ARRANGEMENT DETAIL

NO SCALE



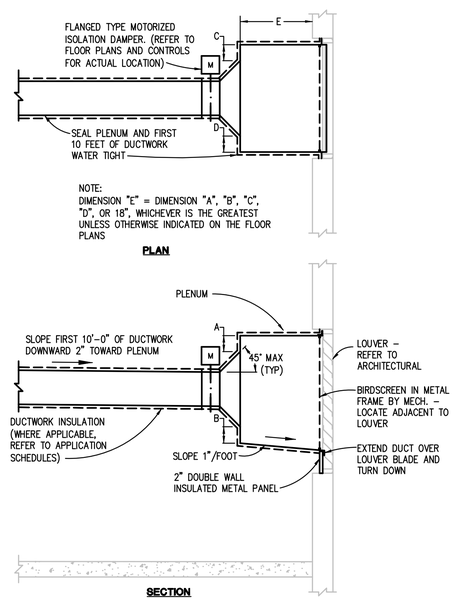
SPIRAL DUCT BRANCH TAKE-OFF DETAILS

NO SCALE (ROUND AND FLAT OVAL SIMILAR)



VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL

NO SCALE



OUTDOOR AIR INTAKE OR EXHAUST/RELIEF PLENUM DETAIL

NO SCALE

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PBA Project No.: 2021-0370-01

KEY PLAN

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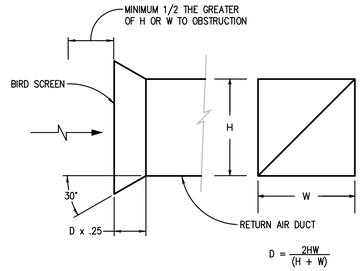
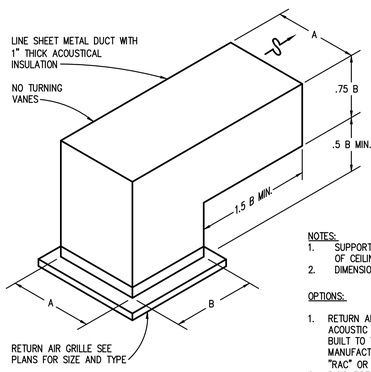


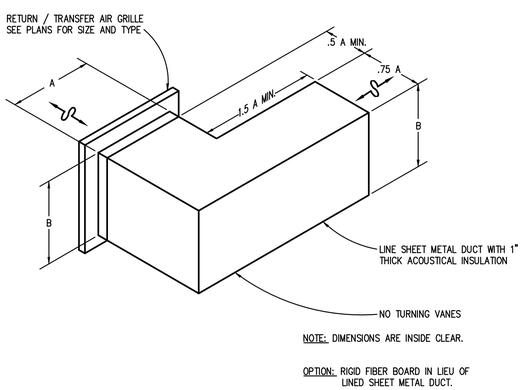
BELLMOUTH DETAIL
NO SCALE



NOTES:
1. SUPPORT ELBOW INDEPENDENT OF CEILING GRID
2. DIMENSIONS ARE INSIDE CLEAR

OPTIONS:
1. RETURN AIR CANOPY. GALVANIZED STEEL WITH ACOUSTIC FIBERGLASS LINER. UNIT SHALL BE BUILT TO THE RETURN GRILLE SIZE. AS MANUFACTURED BY PRICE INDUSTRIES–MODEL "RAC" OR OTHER APPROVED.
2. RIGID FIBER BOARD IN LIEU OF LINED SHEET METAL DUCT.

CEILING GRILLE TO/FROM PLENUM

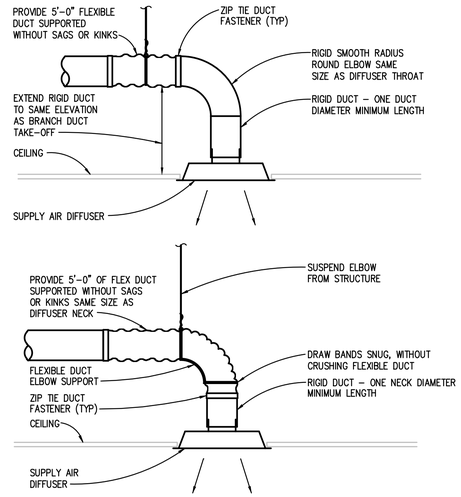


NOTE: DIMENSIONS ARE INSIDE CLEAR.

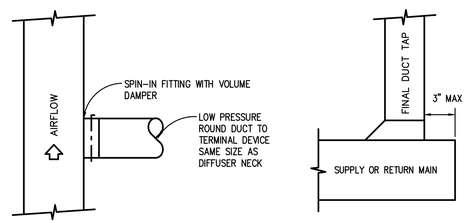
OPTION: RIGID FIBER BOARD IN LIEU OF LINED SHEET METAL DUCT.

PLENUM TO / FROM WALL GRILLE

PLENUM RETURN AIR GRILLE DETAILS
NO SCALE

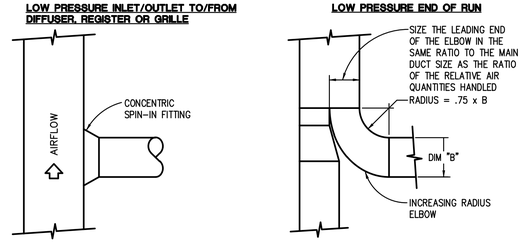


ROUND NECK SUPPLY AIR DIFFUSER DETAIL
NO SCALE



LOW PRESSURE INLET/OUTLET TO/FROM DIFFUSER, REGISTER OR GRILLE

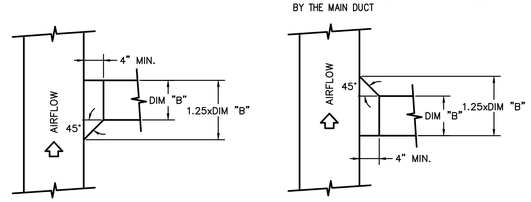
LOW PRESSURE END OF RUN



RECTANGULAR TO ROUND DUCT

SUPPLY, RETURN OR EXHAUST DUCT

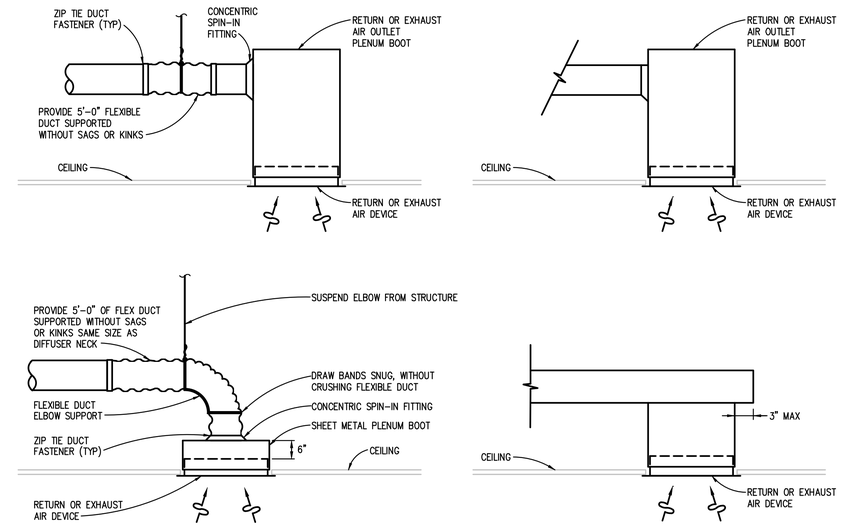
FOR USE WHEN A BRANCH TAKE–OFF IS TO HANDLE MORE THAN 25% OF THE AIR HANDLED BY THE MAIN DUCT



SUPPLY DUCT

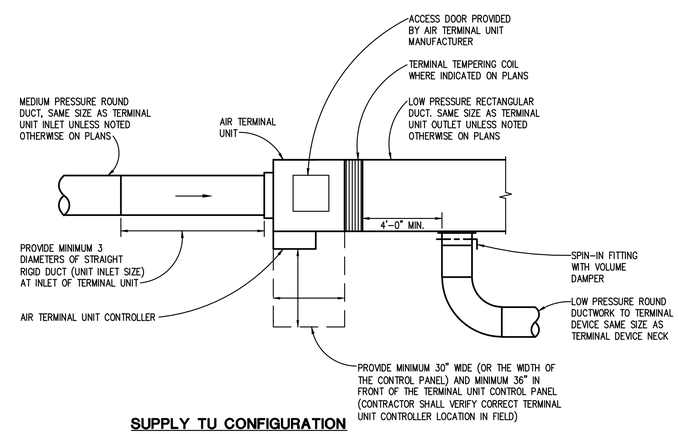
RETURN OR EXHAUST DUCT

RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS
NO SCALE

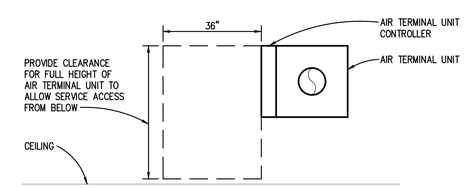


RETURN OR EXHAUST AIR DEVICE INSTALLATION DETAIL
NO SCALE

NOTE: PAINT INTERIOR SURFACE OF PLENUM BOX FLAT BLACK.



SUPPLY TU CONFIGURATION



TERMINAL UNIT SECTION

AIR TERMINAL UNIT (TU) DETAIL
NO SCALE

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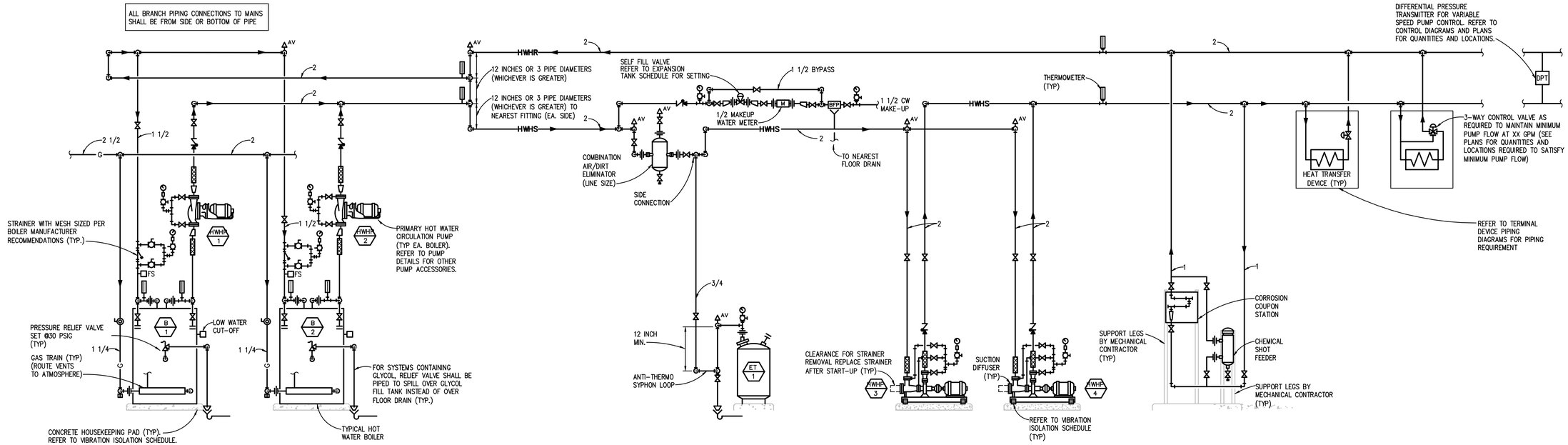


HOT WATER HEATING SYSTEM PIPING DIAGRAM

NO SCALE

NOTES:

THIS DIAGRAM IS REPRESENTATIONAL ONLY. REFER TO TEMPERATURE CONTROL DIAGRAMS FOR ADDITIONAL CONTROL DEVICES. COORDINATE LOCATIONS OF CONTROL DEVICES WITH TEMPERATURE CONTROL CONTRACTOR.

GAS LOAD SCHEDULE

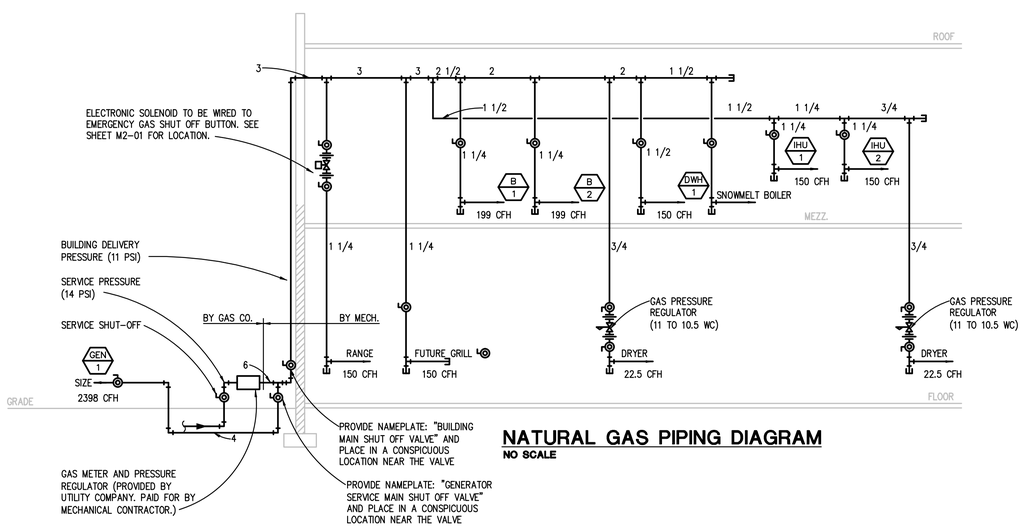
ITEM	TOTAL CFH
EMERGENCY GAS GENERATOR	2398
BOILER 1	199
BOILER 2	199
DOMESTIC WATER HEATER	150
DRYER	22.5
DRYER	22.5
RANGE	150
GRILL	150
INFRA-RED HEATING UNIT 1	150
INFRA-RED HEATING UNIT 2	150
SNOWMELT BOILER	300
CONNECTED GAS LOAD =	3,891 @ "B"

*GAS TRAIN PROVIDED BY EQUIPMENT MANUFACTURER – SEE SPECIFICATIONS

**GAS PRESSURE REGULATOR PROVIDED BY FOOD SERVICE MANUFACTURER

***THE GAS SERVICE COMPONENTS SHALL BE RATED IN ACCORDANCE WITH THE FOLLOWING CHART

METER OUTLET PRESSURE (psig)	MINIMUM SYSTEM PRESSURE RATING (psig)
0.4	0.5
1 OR 2	10
3 OR 30	DELIVERY +10
31 TO 100	DELIVERY +20
101 TO 200	DELIVERY +30



NATURAL GAS PIPING DIAGRAM

NO SCALE

HOT WATER TEMPERATURE SET-UP

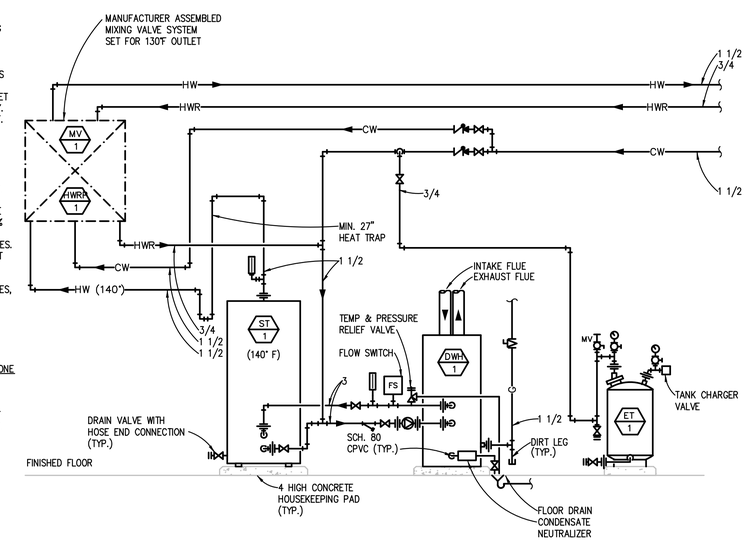
1. CREATE DEMAND GREATER THAN MIXING VALVE'S MINIMUM FLOW RATING USING HOSE CONNECTION ON HW LINE WITHIN ASSEMBLY. IF FLOW CAN NOT BE ACHIEVED THIS WAY, TURN ON FIXTURES WITHIN THE BUILDING.
2. ADJUST TEMPERATURE TO 130°F AND LET STABILIZE. RE-ADJUST AS NECESSARRY.
3. SET HIGH LIMIT ON AQUASTAT TO 132°F.

HOT WATER RETURN SET-UP (TO BE DONE AFTER HOT WATER TEMPERATURE SET-UP)

1. ENSURE THERE IS NO FLOW IN THE SYSTEM.
2. SET LOW LIMIT ON AQUASTAT TO 127°F.
3. START RETURN PUMP.
4. OPEN BALANCE VALVE ON RETURN LINE GOING BACK TO WATER HEATER TO 10% OF RETURN FLOW.
5. LET PUMP RUN FOR MINIMUM 30 MINUTES. IF TEMPERATURE INCREASES ON OUTLET OF MIXING VALVE CLOSE THE BALANCE VALVE UNTIL TEMPERATURE IS MAINTAINED. IF TEMPERATURE DECREASES, OPEN THE BALANCE VALVE UNTIL TEMPERATURE IS MAINTAINED.
6. ALLOW PUMP TO CYCLE TO ENSURE IT STARTS AND STOPS AT AQUASTAT SETTINGS.

140°F HOT WATER RETURN SET-UP (TO BE DONE AFTER HOT WATER TEMPERATURE SET-UP)

1. ENSURE THERE IS NO FLOW IN THE SYSTEM.
2. SET HIGH LIMIT ON AQUASTAT TO 142°F
3. SET LOW LIMIT ON AQUASTAT TO 137°F.
4. START RETURN PUMP.
5. ALLOW PUMP TO CYCLE TO ENSURE IT STARTS AND STOPS AT AQUASTAT SETTINGS.



SINGLE CONDENSING WATER HEATER WITH SINGLE STORAGE TANK AND MIXING VALVE PIPING DIAGRAM

NO SCALE

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DUCT SYSTEM APPLICATION SCHEDULE

AIR SYSTEMS	G90 GALV. SHEET METAL	DOUBLE-WALL LINED G90 GALV. SHEET METAL (SOLID INNER WALL)	DOUBLE-WALL LINED G90 GALV. SHEET METAL (PERF. INNER WALL)	G90 GALV. SHEET METAL WITH 1-INCH LINING	GALVANNEALED SHEET METAL	ALUMINUM	TYPE 304 STAINLESS STEEL	TYPE 316 STAINLESS STEEL	PVC COATED GALV. SHEET METAL (4X1)	PVC COATED GALV. SHEET METAL (1X4)	PVC COATED GALV. SHEET METAL (4X4)	16 GA. CARBON STEEL	ZERO-CLEARANCE PREFABRICATED RANGE HOOD EXHAUST DUCT	FABRIC	DESIGN PRESSURE CLASS (INCHES WG)	SEAL CLASS	MAX. ALLOWABLE LEAKAGE RATE (PERCENT)	KEYED NOTES
	DUCT MATERIAL																	
SUPPLY AIR WITHOUT TERMINAL UNITS	X														+2	A	5	
SUPPLY AIR UPSTREAM OF TERMINAL UNITS	X														+6	A	5	
SUPPLY AIR DOWNSTREAM OF TERMINAL UNITS	X														+2	A	5	
RETURN AIR WITHOUT TERMINAL UNITS	X														−2	A	5	
EXHAUST AIR WITHOUT TERMINAL UNITS	X														−2	A	5	
KITCHEN EXHAUST (TYPE I HOOD)												X			N/A	N/A	N/A	B
LAUNDRY EXHAUST (DRYER VENT)	X														+/−2	A	5	A
AIR TRANSFER DUCT				X											+2	A	5	
RELIEF AIR DOWNSTREAM OF FANS	X														+6	A	5	
OUTSIDE AIR AND MIXED AIR DUCT	X														−6	A	5	
OUTSIDE AIR, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS		X													+/−6	A	5	

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. 4 X 1 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON EXTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON INTERIOR SURFACES.
3. 1 X 4 (4 X 1 REVERSE COATED) PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON INTERIOR SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND MINIMUM 1 MIL (0.025 MM) THICK ON EXTERIOR SURFACES.
4. 4 X 4 PVC-COATED GALVANIZED STEEL: FACTORY-APPLIED PVC COATINGS SHALL BE 4 MILS (0.10 MM) THICK ON SHEET METAL SURFACES OF DUCTS AND FITTINGS EXPOSED TO CORROSIVE CONDITIONS AND 4 MILS (0.10 MM) THICK ON OPPOSITE SURFACES.

KEYED NOTES

A. SCREWS, DAMPERS, OR PROJECTIONS OF ANY TYPE ON INTERIOR OF DUCT SURFACE ARE PROHIBITED.
B. ALL WELDED CONSTRUCTION.

DUCT SYSTEM INSULATION APPLICATION SCHEDULE

	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	FIELD APPLIED JACKET MATERIAL: ALUMINUM	FIELD APPLIED JACKET MATERIAL: SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	KEYED NOTES
	INSULATION MATERIAL & THICKNESS (INCHES)									
DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW		1.5								A, D
RECTANGULAR SUPPLY AIR IN MECHANICAL ROOMS			1.5							
RECTANGULAR RETURN AIR IN MECHANICAL EQUIPMENT ROOMS			1.5							
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR OUTSIDE AIR AND MIXED AIR IN MECHANICAL ROOMS			1.5							
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW		1.5								
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS			1.5							
KITCHEN EXHAUST (TYPE I HOOD)						X				B, C

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:
FIBROUS-GLASS DUCTS
DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 – 2013
METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1 – 2013
FABRIC SUPPLY DUCTS
FACTORY-INSULATED FLEXIBLE DUCTS
FACTORY-INSULATED PLENUMS AND CASINGS
FLEXIBLE CONNECTORS
VIBRATION-CONTROL DEVICES
FACTORY-INSULATED ACCESS PANELS AND DOORS

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. REFER TO METAL DUCT SECTION OF SPECIFICATIONS FOR DUCT LINING AND DOUBLE-WALL INSULATED DUCT.
3. REFER TO HVAC CASINGS SECTION OF SPECIFICATIONS FOR DOUBLE-WALL INSULATED PLENUMS.

KEYED NOTES

A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
B. NUMBER OF LAYERS AND TOTAL INSULATION THICKNESS AS RECOMMENDED BY SELECTED MANUFACTURER.
C. DOES NOT APPLY TO PREFABRICATED, ZERO-CLEARANCE GREASE DUCT.
D. EXPOSED SUPPLY DUCTWORK LOCATED IN A CONDITIONED SPACE SERVED BY THE SAME AIR HANDLING SYSTEM IS NOT REQUIRED TO BE INSULATED.

SCHEDULES GENERAL NOTES:

TYPICAL FOR ALL SCHEDULE SHEETS:

1. REFER TO ELECTRICAL STANDARD SCHEDULES, ONE LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL ELECTRICAL INFORMATION
2. PROVIDE THE FOLLOWING FACTORY-WIRED ELECTRICAL OPTIONS/ACCESSORIES WHERE INDICATED IN SCHEDULE:
   - A – NON-FUSED DISCONNECT SWITCH
   - B – UNIT SHALL BE SINGLE POINT ELECTRICAL CONNECTION WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS
   - C – SERVICE RECEPTACLE
   - D – FUSED DISCONNECT SWITCH
   - E – COMBINATION STARTER
   - F – UNIT SHALL HAVE (2) SINGLE POINT CONNECTIONS WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS. (1) CONNECTION SHALL BE FOR CONDENSING SECTION AND (1) CONNECTION SHALL BE FOR THE REMAINDER OF THE UNIT.
3. FOR MODULATION/CONTROL TYPE COLUMN, "VFC" INDICATES VARIABLE FREQUENCY CONTROLLERS, "AUTO" INDICATES AUTOMATIC OPERATION (CONTROLLED BY TEMPERATURE CONTROLS OR SELF CONTAINED CONTROLS), "MANUAL" INDICATES HAND OPERATION.
4. IF VARIABLE FREQUENCY CONTROLLERS ARE INDICATED TO BE PROVIDED AND ARE NOT INSTALLED INTEGRAL TO THE UNIT, VARIABLE FREQUENCY CONTROLLERS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR (UNLESS OTHERWISE NOTED) AND INSTALLED BY THE ELECTRICAL CONTRACTOR INCLUDING THE LINE SIDE AND LOAD SIDE WIRING TO THE MOTOR AND INCLUDING MISCELLANEOUS STEEL REQUIRED FOR THE SUPPORT AND MOUNTING OF THE VFC. REFER TO FLOOR PLANS FOR LOCATION.
5. WHERE EQUIPMENT IS INDICATED TO HAVE A SINGLE POINT ELECTRICAL CONNECTION, THAT EQUIPMENT SHALL COME COMPLETE WITH FACTORY INSTALLED STARTERS, MOTOR OVERLOAD PROTECTION, CONTACTORS, FUSING AND ALL NECESSARY INTERNAL WIRING AND CONTROLS. PROVIDE A FACTORY MOUNTED UNIT DISCONNECTING MEANS WHERE THE ELECTRICAL CONTRACTOR SHALL MAKE SINGLE POINT CONNECTION. INSTALL PACKAGED EQUIPMENT SUCH THAT THE ELECTRICAL CONNECTION AND CONTROLS ARE ACCESSIBLE AND HAVE CLEARANCES MEETING THE NATIONAL ELECTRICAL CODE.
6. WHERE PACKAGED EQUIPMENT IS PROVIDED, NAMEPLATE MUST INDICATE MAXIMUM OVERCURRENT PROTECTION BY HACR RATED CIRCUIT BREAKERS OR FUSES. IF FUSE PROTECTION ONLY IS INDICATED, PROVIDE A FUSIBLE DISCONNECT AND FUSES WITH THE UNIT.
7. WHERE EQUIPMENT IS DESIGNATED BY MANUFACTURER AND MODEL NUMBER, THIS IS THE BASIS OF DESIGN. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT BY OTHER SPECIFIED MANUFACTURERS OR PROPOSED ALTERNATE EQUIPMENT BY THE BASIS OF DESIGN MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS TO ELECTRICAL REQUIREMENTS, STRUCTURAL LOADING, OR ARCHITECTURAL APPURTENANCES AND SHALL INCLUDE THE COST OF SUCH REVISIONS IN HIS BID.
8. WHERE EQUIPMENT IS SCHEDULED TO INCLUDE A SERVICE RECEPTACLE, PROVIDE A FACTORY MOUNTED SERVICE RECEPTACLE WITH APPROPRIATE FUSES AND TRANSFORMERS CONNECTED ON THE LINE SIDE OF THE UNIT DISCONNECT. PROVIDE A NAMEPLATE ON THE DISCONNECT SWITCH INDICATING THE PRESENCE OF LIVE POWER TO THE SERVICE RECEPTACLE WHEN THE UNIT DISCONNECT IS IN THE OFF POSITION.
9. SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.

ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE

PIPE SIZE (INCHES)	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	KEYED NOTES
	MATERIAL							CONNECTION								ISOLATION VALVES				
HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP. 125 PSIG AT 200 DEG F																				
UP TO 2				X							X					X				
UP TO 2		X						X	X							X				
2-1/2 TO 4				X						X		X	X				X			A
2-1/2 TO 4		X							X				X				X			A

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
   a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS FOR THIS PIPING SYSTEM ONLY. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS.
B. BALL VALVE WITH 250 PSIG STEAM TRIM.
C. BALL VALVE WITH 150 PSIG STEAM TRIM.

ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 201 TO 250 DEG F														
NPS 3-1/2 AND SMALLER		2.5	2.5					X		X				A
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)														
NPS 6 AND SMALLER	1	1		1	1	1		X		X				
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	1							X		X				
OUTDOOR (ABOVEGROUND) AND TUNNEL PIPE SYSTEM AND SIZE (INCHES)														
REFRIGERANT SUCTION & HOT GAS (RIGID COPPER)	2.5	2.5						X			X			B
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)	2													B

UNLESS OTHERWISE INDICATED OR SCHEDULED, THE FOLLOWING DO NOT REQUIRE INSULATION:
DIRECT BURIED COOLING SYSTEM PIPING
PIPING THAT CONVEYS FLUIDS HAVING DESIGN OPERATING TEMPERATURE RANGE BETWEEN 60 DEG F. AND 105 DEG F., INCLUSIVE.

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.
3. FOR PIPING NPS 1-1/4 AND SMALLER WITHIN PARTITIONS IN CONDITIONED SPACES INSULATION MAY BE REDUCED BY ONE-INCH THICKNESS, BUT NOT TO LESS THAN ONE-INCH THICKNESS.
4. FOR PIPING NPS 1 AND SMALLER, INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVES, AND BALANCING VALVES.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
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SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-01

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PLUMBING PIPING & VALVE APPLICATION SCHEDULE

	MATERIAL																PRESSURE CONNECTIONS												GRAVITY DWV CONNECTIONS					ISOLATION VALVES					
PIPE SIZE (INCHES)	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (STD.)	GALV. STEEL (SCHED. 40)	STAINLESS STEEL (SCHED. 10)	PEX	PE PIPE	PE SHEATHED CARBON STEEL PIPE	CSST	NO-HUB CISP	PVC TYPE DWV	PP DRAINAGE PIPE	COPPER TYPE DWV	DUCTILE IRON PIPE	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	INSERT & CRIMP	FUSION	PRESSURE-SEAL	MECHANICALLY-FORMED TEE	MECHANICAL JOINT	PUSH-ON-JOINT	SOLVENT WELDED	SOLDERED	FUSION	CISP HUBLESS	HEAVY-DUTY HUBLESS	BALL	AGA BALL	GENERAL SERVICE BUTTERFLY	LUBRICATED PLUG	GATE	KEYED NOTES
ABOVEGROUND DOMESTIC WATER (POTABLE AND NON-POTABLE) ON DISTRIBUTION SIDE OF METER - MIN. WORKING PRESS. & TEMP. 125 PSIG AT 200 DEG F																																							
UP TO 4		X															X	X			X	X			X	X								X		X			A
ABOVEGROUND SANITARY WASTE & VENT - MIN. WORKING PRESS. 10-FOOT HEAD OF WATER																																							
1-1/2 TO 15												X																				X							
UNDERGROUND SANITARY WASTE & VENT - MIN. WORKING PRESS. 10-FOOT HEAD OF WATER																																							
3 TO 12												X																					X						
3 TO 12													X																X										
ABOVEGROUND COLD CONDENSATE DRAIN - MIN. WORKING PRESSURE 10 FT. HEAD OF WATER																																							
ALL SIZES			X												X		X	X																					
ABOVEGROUND STORM DRAINAGE - MIN. WORKING PRESS. 10-FOOT HEAD OF WATER																																							
2												X																				X							
3 TO 15												X																				X							
UNDERGROUND STORM DRAINAGE - MIN. WORKING PRESS. 10-FOOT HEAD OF WATER																																							
3 TO 12												X																					X						
3 TO 12													X																X										
ABOVEGROUND FUEL GAS - MIN. WORKING PRESS. 100 PSIG																																							
UP TO 2				X															X	X															X				B
2-1/2 TO 3				X															X		X														X				B
4 TO 10				X															X		X																X		B
UNDERGROUND FUEL GAS - MIN. WORKING PRESS. 100 PSIG																																							
1/2 TO 12									X															X															C

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS.

   a. NPS 2 AND SMALLER: USE DIELECTRIC NIPPLE/WATERWAY.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.

3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. PLUMBING EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
5. GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.

KEYED NOTES

A. GROOVED AND FLANGED FITTINGS, JOINTS, AND COUPLINGS, IF INDICATED AS AN ACCEPTABLE SELECTION, MAY BE USED IN ACCESSIBLE LOCATIONS ONLY FOR THIS PIPING SYSTEM. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS.
B. VALVES, UNIONS, AND FLANGED JOINTS MAY BE USED IN ACCESSIBLE LOCATIONS ONLY, EXCLUDING CEILINGS USED AS AIR PLENUMS. ACCESSIBLE LOCATIONS ARE DEFINED AS EXPOSED CONSTRUCTION OR ABOVE LAY-IN CEILINGS. USE ONLY STEEL WELDED FITTINGS AND WELDED JOINTS IN CEILING USED AS AIR PLENUMS.
C. NO JOINTS ALLOWED UNDERGROUND.

ROOF MOUNTED PIPING SUPPORT APPLICATION SCHEDULE

	SUPPORT TYPE							SHIELD TYPE			
PIPE TYPE & SIZE	LOW FIXED-HEIGHT SINGLE-BASE STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE STAND	HIGH ADJUSTABLE-HEIGHT SINGLE-BASE STAND	LOW FIXED HEIGHT SINGLE-BASE ROLLER STAND	LOW ADJUSTABLE-HEIGHT SINGLE-BASE ROLLER STAND	HIGH MULTIPLE-BASE PIPE STAND	CUSTOM MULTIPLE BASE PIPE STAND	CURB-MOUNTING PIPE STAND	MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	KEYED NOTES
SINGLE PIPES												
REFRIGERANT PIPE NPS 4 AND SMALLER				X	X			X				

GENERAL NOTES

1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION.
2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS.
3. SUPPORT ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC OR PLASTIC COATED, FELT LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS

ABOVEGROUND PLUMBING PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)							FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)														
DOMESTIC COLD WATER	1	1						X		X				A
DOMESTIC HOT WATER SUPPLY & RETURN 140 DEG F AND LESS:														
NPS 1-1/4 AND SMALLER	1	1						X		X				A
NPS 1-1/2 AND LARGER	1.5	1.5						X		X				A
STORM WATER & OVERFLOW	1	1						X		X				A
ROOF DRAIN AND OVERFLOW DRAIN BODIES	1	1												
CONDENSATE AND EQUIPMENT DRAIN PIPING BELOW 60 DEG F	0.75	1												
FLOOR DRAINS, TRAPS AND SANITARY DRAIN PIPING WITHIN 10 FEET OF DRAIN RECEIVING CONDENSATE AND EQUIPMENT DRAIN WATER BELOW 60 DEG F	0.75	1						X		X				A

UNLESS OTHERWISE INDICATED OR SCHEDULED, DO NOT INSULATE THE FOLLOWING:
FIRE SUPPRESSION PIPING
UNDERGROUND PIPING
LABORATORY GAS AND VACUUM PIPING
MEDICAL GAS AND VACUUM PIPING
FUEL GAS PIPING
FUEL OIL PIPING

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE, WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.

HORIZONTAL PIPING AND SUPPORT APPLICATION SCHEDULE

	HANGER OR SUPPORT TYPE						SHIELD TYPE			
METAL PIPE TYPE & SIZE	MSS TYPE 1 CLEVIS HANGER	MSS TYPE 10 SWIVEL RING BAND HANGER	MSS TYPE 41 DOUBLE ROD PIPE ROLLER	MSS TYPE 43 SINGLE ROD ROLLER HANGER	MSS TYPE 44 PIPE ROLLER & STAND	MSS TYPE 46 ADJUSTABLE PIPE ROLL STAND	MSS TYPE 39 PROTECTION SADDLE	MSS TYPE 40 INSULATION PROTECTION SHIELD	THERMAL-HANGER SHIELD	KEYED NOTES
UNINSULATED SINGLE PIPE										
UP TO 2 INCH	X	X								
2-1/2 INCH TO 4 INCH	X	X								
INSULATED SINGLE COLD PIPES										
UP TO 2 INCH	X	X						X	X	A
2-1/2 INCH TO 4 INCH	X								X	
6 INCH TO 8 INCH	X								X	
INSULATED SINGLE HOT PIPES										
UP TO 2 INCH	X	X					X	X	X	A, C
2-1/2 INCH TO 4 INCH			X	X	X	X	X		X	B, C

GENERAL NOTES

1. "X" INDICATES APPROVED HANGER OR SUPPORT ELEMENTS. IF MORE THAN ONE HANGER OR SUPPORT ELEMENT IS INDICATED, SELECTION FROM APPROVED ELEMENTS IS CONTRACTOR'S OPTION.
2. REFER TO HANGER AND SUPPORT SECTION FOR APPROVED MANUFACTURERS.
3. HANGERS AND SUPPORTS USED FOR FIRE PROTECTION SERVICES SHALL BE UL LISTED OR FMG APPROVED.
4. HANGER ELEMENTS IN CONTACT WITH BARE COPPER PIPE SHALL BE COPPER PLATED, PLASTIC COATED, FELT LINED, OR USE MANUFACTURED COPPER TUBE ISOLATORS.
5. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR HANGER SPACING.
6. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING U-BOLTS OR STRUT CLAMPS AND THERMAL HANGER SHIELDS. REFER TO KEYED NOTE A.
7. MULTIPLE PARALLEL COLD PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD HANGER ELEMENTS INDICATED FOR SINGLE COLD PIPES.
8. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM BELOW USING ROLLER ELEMENTS AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEYED NOTES B AND C.
9. MULTIPLE PARALLEL HOT PIPES MAY BE TRAPEZE SUPPORTED FROM ABOVE USING STANDARD ROLLER HANGERS INDICATED AND THERMAL HANGER SHIELD OR INSULATION PROTECTION SADDLE. REFER TO KEY NOTES B AND C.
10. REFER TO INDIVIDUAL PIPING SPECIFICATION SECTIONS FOR ADDITIONAL SYSTEM SPECIFIC HANGER APPLICATIONS.

KEYED NOTES

A. USE THERMAL HANGER SHIELD ON TRAPEZE SUPPORTED INSULATED PIPE TO PREVENT CRUSHING OF INSULATION.
B. USE THERMAL HANGER SHIELD DESIGNED FOR USE ON ROLLER SUPPORTS FOR INSULATED HOT PIPE .
C. USE TYPE 39 PROTECTION SADDLES IF INSULATION WITHOUT VAPOR BARRIER IS INDICATED. FILL INTERIOR VOIDS WITH INSULATION MATCHING ADJOINING INSULATION.

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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SHEET NAME
MECHANICAL SCHEDULES

SHEET NO.
M7-02

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FAN SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	MINIMUM WHEEL DIAMETER INCHES	RPM	CLASS	ARRANGEMENT	OUTLET VELOCITY FPM	MOTOR				MODULATION/ CONTROL TYPE	ELECTRICAL				MAXIMUM SOUND POWER LEVELS														MODEL NUMBER	KEYED NOTES
										BHP	HP	RPM	DRIVE TYPE		VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ ACCESSORIES	UNIT DISCHARGE Lw BY OCTAVE BAND								UNIT INLET Lw BY OCTAVE BAND									
																			63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
SF-AHU-1	AHU-1	PLENUM	5,500	0.92	18.2	2,682	II	HORIZONTAL	---	7.8	10.0	1,800	DIRECT	VFC	208	3	14	B	95	91	91	95	85	83	81	79	95	87	87	89	82	74	73	71	39M	
EF-AHU-1	AHU-1	AIRFOIL	5,500	0.57	13	2,145	II	HORIZONTAL	---		10.0	1,800	BELT	VFC	208	3	14	B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39M	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

VIBRATION ISOLATOR APPLICATION SCHEDULE

EQUIPMENT TYPE	EQUIPMENT CATEGORY	HORSEPOWER AND OTHER	RPM	EQUIPMENT LOCATION						KEYED NOTES
				SLAB ON GRADE			UP TO 40 FT (12 M) FLOOR SPAN			
				BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	
AIR COMPRESSORS AND VACUUM PUMPS	TANK-MOUNTED HORIZ.	≤10 ≥15	ALL ALL	A C	3 3	0.75 (19) 0.75 (19)	A C	3 3	1.50 (38) 1.50 (38)	NOTE 3
	TANK-MOUNTED VERT. BASE-MOUNTED LARGE RECIPROCATING	ALL ALL ALL	ALL ALL ALL	C C C	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	1.50 (38) 1.50 (38) 1.50 (38)	
BASE MOUNTED HEAT PUMPS, FAN COILS, COMPUTER ROOM UNITS	ALL	ALL	ALL	A	3	0.75 (19)	A	3	1.50 (38)	NOTES 1, 3, 4
SUSPENDED HEAT PUMPS, FAN COILS, CONDENSING UNITS, COMPUTER ROOM UNITS, LOCATED INDOORS.	ALL	ALL	ALL				A OR B	8a OR 8b	1.50 (38)	NOTES 1, 3, 4
BASE MOUNTED CONDENSING UNITS	ALL ALL	≤1HP >1HP	ALL ALL	A OR B A OR B	2 2	0.25 (6) 0.25 (6)	A OR B A OR B	2 4	0.25 (64) 2.50 (64)	NOTE 3
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING, AND HEATING AND VENTILATING UNITS	ALL	≤10	ALL	A	3	0.75 (19)	A	3	0.75 (19)	NOTES 1, 3, 4
	ALL	≤15 AND ≤4 IN. SP	UP TO 300 301 TO 500 500 AND UP	A A A	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C A A	3 3 3	3.50 (89) 2.50 (64) 1.50 (38)	
		≥15 AND/OR >4 IN. SP	UP TO 300 301 TO 500 500 AND UP	B B B	3 3 3	0.75 (19) 0.75 (19) 0.75 (19)	C C C	3 3 3	3.50 (89) 2.50 (64) 2.50 (64)	
PACKAGED AND MODULAR AIR HANDLING, AIR CONDITIONING AND HEATING AND VENTILATING UNITS WITH INTERNAL SPRING ISOLATORS	ALL	ALL	ALL	A	1a	0.25 (6)	A	1a	0.25 (6)	NOTES 1, 3, 4
AIR HANDLING EQUIPMENT WITH NON-INTERNALLY ISOLATED FAN ARRAYS (AIR HANDLING UNITS, CABINET FANS, FAN UNITS, ETC.)	ALL	ALL	ALL	A	3	0.75 (19)	A	3	2.50 (64)	NOTES 1, 3, 4

GENERAL NOTES:

KEYED NOTES:
1. THRUST RESTRAINTS: PROVIDE THRUST RESTRAINTS BETWEEN FAN DISCHARGE AND DUCT (IN PAIRS, LOCATED ON THE CENTERLINE OF THE DISCHARGE OUTLET OF THE FAN, BRIDGING THE FLEXIBLE DUCT CONNECTOR) FOR ALL FAN HEADS, FOR AXIAL AND CENTRIFUGAL FANS UNITS OPERATING AT 2 INCHES OR GREATER TOTAL STATIC PRESSURE AND AS SHOWN ON DRAWINGS. SPRING DEFLECTION SHALL BE SAME AS THE SUPPORT ISOLATORS.
2. PIPING RISER ISOLATION: PROVIDE PIPE RISER RESILIENT ANCHORS, SPRING MOUNTS AND RESILIENT PIPE GUIDES CAPABLE OF DISTRIBUTING THE LOADS WITHIN THE BUILDING DESIGN LIMITS AT THE SUPPORT POINTS.
3. HORIZONTAL PIPING VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR PIPING CONNECTED TO VIBRATION ISOLATED EQUIPMENT FOR ALL PIPING IN MECHANICAL ROOMS OR THE FOLLOWING MINIMUM HORIZONTAL DISTANCES FROM THE ISOLATED EQUIPMENT: UP TO 6" – 50 FEET (1 1/2" MINIMUM DEFLECTION), 8" AND LARGER – 100 FEET (2 1/2" MINIMUM DEFLECTION), WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS. THE FIRST 4 HANGERS FROM THE ISOLATED EQUIPMENT SHALL BE TYPE 8b.
4. DUCTWORK VIBRATION ISOLATION: PROVIDE TYPE 8a OR 8b SPRING HANGERS FOR DUCTWORK WITH A CROSS SECTION OF 2 SQUARE FEET OR GREATER CONNECTED TO AIR HANDLING UNITS, RETURN OR RELIEF FANS, AND VIBRATION ISOLATED EQUIPMENT FOR ALL SUCH DUCTWORK IN MECHANICAL ROOMS OR FOR A MINIMUM HORIZONTAL DISTANCE OF 100 FEET FROM THE ISOLATED EQUIPMENT, WHICHEVER IS GREATER, AND AS SHOWN ON DRAWINGS (3/4" MINIMUM DEFLECTION).
5. IF SPAN DOES NOT EXCEED 20 FT, SPRING DEFLECTION MAY BE 1.0 IN AND TYPE D BASE MAY BE USED. FOR SPANS GREATER THAN 20 FT, USE SPRING DEFLECTION INDICATED AND TYPE E BASE.

BASE TYPES:

BASE TYPE A – NO BASE, ISOLATORS ATTACHED DIRECTLY TO EQUIPMENT.
BASE TYPE B – STRUCTURAL, STEEL RAILS OR BASE.
BASE TYPE C – CONCRETE INERTIA BASE.
BASE TYPE D – CURB – MOUNTED ALUMINUM BASE WITH 1" DEFL. SPRING ISOLATORS
BASE TYPE E – CURB – MOUNTED STEEL BASE WITH ADJUSTABLE 1", 2" OR 3" DEFL. SPRING ISOLATORS

ISOLATOR TYPES:

ISOLATOR TYPE 1a – ELASTOMERIC ISOLATION PAD.
ISOLATOR TYPE 1b – ELASTOMERIC ISOLATION PAD WITH STEEL LOAD BEARING PLATE.
ISOLATOR TYPE 2 – ELASTOMERIC FLOOR ISOLATOR.
ISOLATOR TYPE 3 – FREE STANDING SPRING FLOOR ISOLATOR.
ISOLATOR TYPE 4 – RESTRAINED SPRING ISOLATOR.
ISOLATOR TYPE 5 – THRUST RESTRAINT.
ISOLATOR TYPE 6 – AIR SPRING.
ISOLATOR TYPE 7 – ELASTOMERIC HANGERS.
ISOLATOR TYPE 8a – SPRING HANGERS.
ISOLATOR TYPE 8b – SPRING HANGERS WITH VERTICAL-LIMIT STOP.

MODULAR AIR HANDLING UNIT COMPONENT SCHEDULE

UNIT IDENTIFICATION	POSITION NUMBER 1	POSITION NUMBER 2	POSITION NUMBER 3	POSITION NUMBER 4	POSITION NUMBER 5	POSITION NUMBER 6	POSITION NUMBER 7	POSITION NUMBER 8	MAXIMUM UNIT LENGTH	KEYED NOTES
AHU-1	EXHAUST FAN	PRE FILTER	ENERGY RECOVERY WHEEL	RETURN FILTER	FINAL FILTER	COOLING COIL	HEATING COIL	SUPPLY FAN	20'-9/16"	

GENERAL NOTES:
1. MODULES SELECTED BASED ON CARRIER INDOOR MODULAR AIR HANDLING UNIT.
2. POSITION NUMBERS ARE INDICATED IN THE DIRECTION OF AIRFLOW FROM RETURN AIR INLET TO SUPPLY AIR DISCHARGE.

AIR HANDLING UNIT FILTER SCHEDULE

UNIT I.D.	SYSTEM SERVED	TYPE	AIRFLOW CFM	AIR PRESS. DROP		MERV	FILTER MEDIA					MODEL NO.	KEYED NOTES
				INITIAL IN. W.G.	DIRTY IN. W.G.		QUAN.	WIDTH IN.	HEIGHT IN.	DEPTH IN.	MIN. MEDIA FACE AREA SQ. FT.		
AF-1	AHU-1 OA FILTER	PLEATED	5500	0.15	0.55	8	6	20	20	2	16.66	31K2B0000000620204	
AF-2	AHU-1 RA FILTER	PLEATED	5500	0.15	0.55	8	6	20	20	2	16.66	31K2B0000000620204	
AF-3	AHU-1 SA FILTER	PLEATED	5500	0.25	0.85	13	6	20	16	4	13.33	31K4F0000000616204	

GENERAL NOTES:
1. MODEL NUMBERS ARE FARR UNLESS OTHERWISE NOTED.
2. PROVIDE 25% TO 30% EFFICIENT 2 INCH THROW AWAY PREFILTERS
3. MERV DESIGNATES THE "MINIMUM EFFICIENCY REPORTING VALUE" AS EVALUATED UNDER ASHRAE STANDARD 52.2 1999.
4. AIR HANDLING UNIT TOTAL STATIC PRESSURE FOR VARIABLE AIR VOLUME SYSTEMS IS BASED ON THE FILTER DIRTY AIR PRESSURE DROP AND AVERAGE/MIDLIFE FILTER AIR PRESSURE DROP FOR CONSTANT VOLUME SYSTEMS UNLESS NOTED OTHERWISE.

ENERGY RECOVERY WHEEL SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	SUPPLY AIR SIDE – SUMMER/WINTER						EXHAUST AIR SIDE				ELECTRICAL				MODEL NO.	KEYED NOTES
		AIRFLOW CFM	E.D.B ° F	E.W.B. ° F	L.D.B. ° F	L.W.B. ° F	MAX A.P.D. IN. W.G.	AIRFLOW CFM	E.D.B ° F	E.W.B. ° F	MAX A.P.D. IN. W.G.	VOLTS	PHASE	SCCR KA	OPTIONS/ ACCESSORIES		
ERW-1	AHU-1	1,525	90.9/-10	73.8/-10	77.6/56.1	64.8/44.8	0.59	1,525	75/70	62.5/53	0.59	208	3	14	B	ERC4128C	1

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CARRIER UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. PROVIDE WHEEL VARIABLE FREQUENCY CONTROLLER.

DIRECT EXPANSION COOLING COIL SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ASSOCIATED CONDENSING UNIT	REFRIGERANT TYPE	MINIMUM NUMBER ROWS	TOTAL CAPACITY MBH	AIR						MINIMUM FACE AREA SQ. FT.	FACE VELOCITY FPM	FINS PER INCH	COIL SUCTION TEMPERATURE °F	NUMBER OF CIRCUITS	MODEL NUMBER	KEYED NOTES
						AIRFLOW CFM	E.D.B. °F	E.W.B. °F	L.D.B. °F	L.W.B. °F	MAXIMUM A.P.D. IN. W.G.							
CC-1	AHU-1	ACCU-1	R-410A	6	145.0	5,500	75.7	63.1	53.2	52.1	0.64	12.64	435	8	43.7	1	28ME	

GENERAL NOTES:
1. MODEL NUMBERS ARE BASED ON CARRIER UNLESS OTHERWISE NOTED.

HOT WATER HEATING COIL SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	MAXIMUM NUMBER ROWS	MAXIMUM FIN DENSITY FINS/INCH	CAPACITY MBH	AIR				MINIMUM FACE AREA SQ. FT.	WATER					CONTROL VALVE W.P.D. FT. HD.	MODEL NUMBER	KEYED NOTES
					AIRFLOW CFM	E.D.B. °F	L.D.B. °F	MAXIMUM A.P.D. IN. W.G.		FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD			
HC-1	AHU-1	1	8	56.8	3,300	44.2	60.0	0.15	12.64	3.9	W	150	120	5	15	28MH	

GENERAL NOTES:
1. MODEL NUMBERS ARE TRANE UNLESS OTHERWISE NOTED.
2. COIL SELECTION BASED ON .00025 FOULING FACTOR.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

AIR COOLED CONDENSING UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TOTAL CAPACITY MBH	MINIMUM EER	REFRIGERATION TYPE	NUMBER OF CIRCUITS	NUMBER OF CONTROL STAGES	CONDENSER		SUCTION TEMPERATURE °F	CONDENSER FAN		COMPRESSOR		MODULATION / CONTROL TYPE	ELECTRICAL						MODEL NUMBER	KEYED NOTES
							DESIGN AMBIENT TEMPERATURE °F	MINIMUM AMBIENT TEMPERATURE °F		QUANTITY	HP EACH	NUMBER OF COMPRESSORS	TYPE OF COMPRESSOR		VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
ACCU-AHU-1	CC-1	145.0	13.0	R-410A	2	2	95.0	45.0	43.6	2	---	2	SCROLL	AUTO	208	3	60.8	80.0	14	B	38AUD	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CARRIER UNLESS OTHERWISE NOTED.
3. REFER TO AIR HANDLING UNIT DIRECT EXPANSION COOLING COIL SCHEDULE FOR ASSOCIATED COOLING COIL.
4. EFFICIENCY RATING SHALL BE IN ACCORDANCE WITH ARI-STANDARD 340/360-2004.

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KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

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SHEET NAME

MECHANICAL SCHEDULES

SHEET NO.

M7-03

POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	MOTOR				CURB HEIGHT INCHES	MODULATION/ CONTROL TYPE	ELECTRICAL				MAXIMUM SOUND POWER LEVELS														MODEL NUMBER	KEYED NOTES
																	UNIT DISCHARGE Lw BY OCTAVE BAND								UNIT INLET Lw BY OCTAVE BAND									
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ ACCESSORIES	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)	63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)	1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)		
VF-1	APPARATUS BAY PURGE	SIDEWALL	3,700	0.25	6,112	1,160	0.42	1/2	1,160	DIRECT	---	AUTO	208	3	14	---	---	---	---	---	---	---	---	---	75	85	84	82	74	69	65	59	AER-20	
VF-2	HOSE TOWER	SIDEWALL	350	0.25	---	1,050	0.06	1/20	1,050	DIRECT	---	AUTO	120	1	14	---	---	---	---	---	---	---	---	---	80	68	40	41	45	44	39	32	SE1-12-432-E	
EF-1	TAILPIPE EXHAUST	CENTRIFUGAL	3,000	5.0	---	3,500	---	7-1/2	3,500	DIRECT	---	AUTO	208	3	14	---	---	---	---	---	---	---	---	---	103	106	106	103	94	89	85	80	PLYMOVENT TEV-585-60	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

ENERGY RECOVERY UNIT SCHEDULE

UNIT IDENT-IFICATION	AREA/ SYSTEM SERVED	SUPPLY FAN							EXHAUST FAN						HEAT EXCHANGER (SUMMER)							HEAT EXCHANGER (WINTER)							OUTSIDE AIR FILTERS			RETURN FILTERS			ELECTRICAL						CURB			UNIT WEIGHT W/ CURB (LBS.)	SA/RA CONFIG.	EA/OA CONFIG.	KEYED NOTES
		CFM	MIN. OA CFM/ %	ESP"	TSP"	CONTROL TYPE	MOTOR		CFM	ESP"	TSP"	CONTROL TYPE	MOTOR		SUPPLY SIDE			EXHAUST SIDE			EFFIC. (%)	SUPPLY SIDE			EXHAUST SIDE			EFFIC. (%)	EFF. %	AREA SQ. FT.	SP" TOTAL	EFF. %	AREA SQ. FT.	SP" TOTAL	VOLTS	PHASE	MCA	MOP	SCCR KA	OPTIONS/ ACCESS-ORIES	TYPE		HEIGHT				
							BHP	HP					BHP	HP	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.		E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.	E.A.T. °F	L.A.T. °F	A.P.D. IN. WG.														STANDARD	VIBRATION ISOLATION SPRING CURB					
ERV-1	APPARATUS BAY	400	400	0.5	0.6	AUTO	0.13	0.5	400	0.5	0.6	AUTO	0.14	0.5	90.3	90.3	0.1	90.3	90.3	0.1	---	-10.0	41.9	0.1	65.0	13.4	0.1	---	MERV 8	---	---	MERV 8	---	---	208	1	8.6	15.0	14	B	---	---	---	450	END	END	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE CARRIER UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. FOR UNITS LOCATED OUTDOORS, INSULATE AND PROVIDE ELECTRIC HEAT TRACE FOR HEAT EXCHANGER CABINET DRAIN PIPING.

BLOWER COIL UNIT SCHEDULE

UNIT IDENTIFICATION	FAN						HEATING COIL								ARRANGEMENT	MAXIMUM UNIT DIMENSIONS			FILTER	MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
	AIRFLOW CFM	ESP IN. W.G.	TSP IN. W.G.	BHP	HP	FAN RPM	MINIMUM TOTAL CAPACITY MBH	AIR		WATER						LENGTH INCHES	WIDTH INCHES	HEIGHT INCHES	TYPE		VOLTS	PHASE	SCCR KA	OPTIONS/ ACCESSORIES		
								E.D.B. °F	L.D.B. °F	FLOW GPM	E.W.T. °F	L.W.T. °F	FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD												
BC-1	2,000	0.5	0.85	---	1.0	1,800	48.7	50.0	72.5	3.3	150.0	120.0	2.8	15.0	VERTICAL	30	50	50	DISP.	AUTO	208	1	14	B	HDD20	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE ENVIRE-TEC UNLESS OTHERWISE NOTED

INTAKE HOOD SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	HOOD INTAKE VELOCITY FPM	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE			CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
							WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES				
IH-1	ERV-1	400	12x12	---	400	0.021	22	24	14	18	STEEL	FGI	

GENERAL NOTES:
1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
2. PROVIDE WITH BIRD SCREEN.

RELIEF HOOD SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE			CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
						WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES				
RH-1	AHU-1	5500	42x24	786	0.085	34	60	19	18	STEEL	FGR	

GENERAL NOTES:
1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
2. PROVIDE WITH BIRD SCREEN.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S-1	DIFFUSER	24x24	SEE PLAN	LAY IN	---	ALUMINUM	WHITE	AMCD	
S-2	GRILLE	D+1 3/4	SEE PLAN	DUCT MOUNTED	---	STEEL	WHITE	520	
S-3	DIFFUSER	24x24	SEE PLAN	LAY IN	---	ALUMINUM	WHITE	PDS	
S-4	DIFFUSER	48x2 SLOTS	SEE PLAN	LAY IN	INSULATED PLENUM WITH REMOTE BALANCING DAMPER	ALUMINUM	WHITE	SDS100	1
R-1A	DIFFUSER	24x12	22x10	LAY IN	---	STEEL	WHITE	PDDR	
R-1B	DIFFUSER	24x24	22x22	LAY IN	---	STEEL	WHITE	PDDR	
R-2	GRILLE	D+1 3/4	SEE PLAN	DUCT MOUNTED	---	STEEL	WHITE	530	
E-1	DIFFUSER	24x24	SEE PLAN	LAY IN	---	STEEL	WHITE	PDDR	

GENERAL NOTES:
1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. PROVIDE PLASTER FRAME WHERE INSTALLED IN HARD LID CEILING.

HOT WATER CABINET UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	AIR			FAN		WATER					CONTROL VALVE W.P.D. FT. HEAD	DIMENSIONS			RECESS DEPTH INCHES	FILTER		MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
		AIRFLOW CFM	E.D.B. °F	L.D.B. °F	HP	RPM	FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD		LENGTH INCHES	HEIGHT INCHES	DEPTH INCHES		TYPE	AREA SQ. FT.		VOLTS	PHASE	SCCR KA	OPTIONS/ ACCESSORIES		
CUH-1	19.2	430	60.0	101.1	2 @ 1/10	1,050	1.3	W	150.0	120.0	5.0	15.0	47.0	33.0	9.0	---	DISP.	1.9	AUTO	120	1	14	B	WI-04	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE STERLING UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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FINNED WATER TUBE BOILER SCHEDULE

UNIT IDENTIFICATION	FUEL			OUTPUT MBH	PRESSURE RATING PSIG	NUMBER OF CONTROL STAGES	DIMENSIONS			FLUID					MODULATION/ CONTROL TYPE	ELECTRICAL						MODEL NUMBER	KEYED NOTES
	TYPE	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	INPUT MBH				WIDTH	LENGTH	HEIGHT	E.W.T. °F	L.W.T. °F	FLOW GPM	FLUID TYPE	W.P.D. FT		VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
B-1	NAT. GAS	4-14	199.0	180.0	80	10:1	18-3/4	19-1/8	31-1/8	120	150	12.0	W	5	AUTO	120	1	3.3	15.0	14	B	WHB199	1
B-2	NAT. GAS	4-14	199.0	180.0	80	10:1	18-3/4	19-1/8	31-1/8	120	150	12.0	W	5	AUTO	120	1	3.3	15.0	14	B	WHB199	1

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE LOCHINVAR UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

KEYED NOTES:
1. BOILERS ARE SIZED AT 2/3 OF THE ANTICIPATED BUILDING LOAD.

PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	COLDEST SYSTEM OPERATING TEMP. °F FOR PUMP SELECTION	PUMP HEAD FT.	OVERLOAD GPM	MINIMUM EFFICIENCY %	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
											BHP	HP	RPM		VOLTS	PHASE	SCCR KA (NOTE 4)	OPTIONS/ ACCESSORIES		
HWHP-1	B-1	MECHANICAL 202	INLINE	CLOSE	20.0	W	60.0	12.0	NON-OVERLOADING	---	---	120W	---	ECM	120	1	14	---	GRUNDFOS UPMXL 25-124	1
HWHP-2	B-2	MECHANICAL 202	INLINE	CLOSE	20.0	W	60.0	12.0	NON-OVERLOADING	---	---	120W	---	ECM	120	1	14	---	GRUNDFOS UPMXL 25-124	1
HWHP-3	HWH	MECHANICAL 202	INLINE	CLOSE	18.0	W	60.0	22.0	NON-OVERLOADING	35.1	0.43	1.0	4,200	ECM	208	1	14	B	ECOCIRC XL 65-130	
HWHP-4	HWH	MECHANICAL 202	INLINE	CLOSE	18.0	W	60.0	22.0	NON-OVERLOADING	35.1	0.43	1.0	4,200	ECM	208	1	14	B	ECOCIRC XL 65-130	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

KEYED NOTES:
1. PUMP POWER FED FROM ASSOCIATED BOILER.

HOT WATER PROPELLER FAN UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	AIRFLOW CFM	LEAVING AIR TEMPERATURE °F	FAN		WATER					CONTROL VALVE W.P.D. FT. HEAD	MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
				HP	RPM	FLOW GPM	FLUID TYPE	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D. FT. HEAD			VOLTS	PHASE	SCCR KA	OPTIONS/ ACCESSORIES		
UH-1	3.1	245	91.0	16 W	1,550	0.5	W	150.0	120.0	5.0	15.0	AUTO	120	1	14	B	HS-108A	
UH-2	3.1	245	91.0	16 W	1,550	0.5	W	150.0	120.0	5.0	15.0	AUTO	120	1	14	B	HS-108A	
UH-3	3.1	245	91.0	16 W	1,550	0.5	W	150.0	120.0	5.0	15.0	AUTO	120	1	14	B	HS-108A	
UH-4	3.1	245	91.0	16 W	1,550	0.5	W	150.0	120.0	5.0	15.0	AUTO	120	1	14	B	HS-108A	
UH-5	3.1	245	91.0	16 W	1,550	0.5	W	150.0	120.0	5.0	15.0	AUTO	120	1	14	B	HS-108A	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE STERLING UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

HOT WATER RADIANT CEILING PANEL SCHEDULE

UNIT IDENTIFICATION	CAPACITY BTUH/ LINEAR FT.	FLUID TYPE	WATER TEMP		DIMENSIONS		FINISH	CONSTRUCTION	CONTROL VALVE W.P.D. FT. HEAD	MODEL NUMBER	KEYED NOTES
			E.W.T. °F	L.W.T. °F	LENGTH INCHES	WIDTH INCHES					
RCP-1	238	W	150.0	120.0	SEE PLANS	24	WHITE	ALUMINUM	15.0	LRP	

GENERAL NOTES:
1. MODEL NUMBERS ARE STERLING UNLESS OTHERWISE NOTED.
2. EXTRUDED ARCHITECTURAL SPACE MASTERY SERIES HEF-2 FLUTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

HVAC SYSTEM EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLONS	TYPE	FLUID TYPE	SYSTEM FILL VALVE OR GLYCOL PUMP PRESSURE SETTING PSIG	OPERATING PRESSURES AT EXPANSION TANK		SYSTEM OPERATING TEMPERATURES		EXPANSION VOLUME GALLONS	ACCEPTANCE FACTOR	MINIMUM TANK VOLUME GALLONS	DIMENSIONS		MODEL NUMBER	KEYED NOTES
						PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F				DIAMETER INCHES	HEIGHT INCHES		
ET-1	HWH SYSTEM		DIAPHRAGM	W									8	12 5/8	PT-5	

GENERAL NOTES:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL PRE-CHARGE THE TANK TO THE VALUE INDICATED IN THE SCHEDULE. FOR TANKS THAT ARE SUPPLIED PRE-CHARGED BY THE MANUFACTURER, THE CONTRACTOR SHALL CONFIRM THE PRESSURE AND MAKE ADJUSTMENTS AS REQUIRED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.

AIR TERMINAL UNIT WITH HOT WATER COIL SCHEDULE

UNIT IDENTIFICATION	INLET SIZE	AREA SERVED	UNIT SERVED FROM	AIR FLOW					HEATING COIL (NOTE 3)										CONTROL DIAGRAM	KEYED NOTES
											AIR		WATER							
				COOLING MAX CFM	COOLING MIN. CFM	HEATING MIN. CFM	HEATING MAX CFM	MAXIMUM A.P.D. W/ COIL IN. W.G.	CAPACITY MBH	MAXIMUM NUMBER ROWS	E.D.B. °F	L.D.B. °F	FLOW GPM	E.W.T. °F	L.W.T. °F	MAXIMUM W.P.D FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD	CONTROL VALVE TYPE		
TU-103	10	COMMUNITY ROOM	AHU-1	790	230	230	475	0.25	18.0	2	55.0	89.9	1.2	150.0	120.0	5.00	15	2-WAY		
TU-105	6	LOBBY	AHU-1	265	80	80	265	0.25	11.3	2	55.0	94.5	0.8	150.0	120.0	5.00	15	2-WAY		
TU-107	8	WATCH DESK	AHU-1	350	145	145	285	0.25	10.8	2	55.0	89.9	0.7	150.0	120.0	5.00	15	2-WAY		
TU-113	6	DORM	AHU-1	200	100	100	190	0.25	7.2	2	55.0	89.9	0.5	150.0	120.0	5.00	15	2-WAY		
TU-115	6	DORM	AHU-1	200	100	100	150	0.25	4.2	2	55.0	80.7	0.5	150.0	120.0	5.00	15	2-WAY		
TU-119	6	DORM	AHU-1	200	100	100	190	0.25	7.2	2	55.0	89.9	0.5	150.0	120.0	5.00	15	2-WAY		
TU-121	6	DORM	AHU-1	200	100	100	150	0.25	4.2	2	55.0	80.7	0.5	150.0	120.0	5.00	15	2-WAY		
TU-122	12	DAYROOM	AHU-1	1600	325	325	740	0.25	28.1	2	55.0	89.9	1.9	150.0	120.0	5.00	15	2-WAY		
TU-122A	8	KITCHEN HOOD	AHU-1	600	0	0	600	0.25	6.5	2	55.0	65.0	0.5	150.0	120.0	5.00	15	2-WAY		
TU-129	6	SENIOR OFFICER	AHU-1	200	100	100	150	0.25	4.8	2	55.0	84.3	0.5	150.0	120.0	5.00	15	2-WAY		
TU-131	8	CORRIDOR	AHU-1	600	400	400	530	0.25	21.8	2	55.0	65.0	0.5	150.0	120.0	5.00	15	2-WAY		
TU-201	6	MEZZANINE	AHU-1	300	100	100	300	0.25	11.3	2	55.0	89.9	0.8	150.0	120.0	5.00	15	2-WAY		

GENERAL NOTES:
1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.
2. MAXIMUM PRESSURE DROP SCHEDULED SHALL BE THE MAXIMUM ALLOWABLE STATIC PRESSURE FOR BOX AND COIL AT THE MAXIMUM CFM.
3. HEATING COIL SELECTION BASED ON HEATING MAXIMUM AIR FLOW.

KEYED NOTES:

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KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

JTH

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DAC

APPROVED BY

DAC

SHEET NAME

MECHANICAL SCHEDULES

SHEET NO.

M7-05

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THERMOSTATIC MIXING VALVE SCHEDULE

UNIT IDENTIFICATION	MINIMUM FLOW GPM	MAXIMUM FLOW GPM	PRESSURE DROP AT MAXIMUM FLOW PSIG	MODEL NUMBER	KEYED NOTES
MV-1	1	165	50	MECATRON 5NB-LF	
MV-2	1.5	5	15	S19-2000	1

GENERAL NOTES:
1. MODEL NUMBERS ARE LEONARD UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. MODEL NUMBER IS BRADLEY.

FUEL FIRED DOMESTIC WATER HEATER SCHEDULE

UNIT IDENTIFICATION	STORAGE CAPACITY GALLONS	FUEL			RECOVERY GPH	E.W.T. °F	L.W.T. °F	MODULATION/ CONTROL TYPE	ELECTRICAL						MODEL NUMBER	KEYED NOTES
		TYPE	MIN/MAX MANUFACTURER REQUIRED INLET PRESSURE AT GAS TRAIN	INPUT MBH					VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
DWH-1	–	NATURAL GAS	4–14	150	125	40	140	AUTO	120	1	4.5	–	–		AWN151PM	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE LOCHINVAR UNLESS OTHERWISE NOTED.

DOMESTIC HOT WATER STORAGE TANK SCHEDULE

UNIT IDENTIFICATION	STORAGE CAPACITY GALLONS	DIMENSIONS		MODEL NUMBER	REMARKS
		DIAMETER (INCHES)	HEIGHT (INCHES)		
ST-1	257	34	91	RGA257	

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE LOCHINVAR UNLESS OTHERWISE NOTED.

DOMESTIC HOT WATER SYSTEM EXPANSION TANK SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	ESTIMATED TOTAL SYSTEM VOLUME GALLONS	TYPE	OPERATING PRESSURES AT EXPANSION TANK			SYSTEM OPERATING TEMPERATURES		EXPANSION VOLUME GALLONS	ACCEPTANCE FACTOR	MINIMUM TANK VOLUME GALLONS	DIMENSIONS		MODEL NUMBER	KEYED NOTES
				INITIAL PSIG	PRE-CHARGE PSIG	MAX (OPERATING) PSIG	MINIMUM °F	MAXIMUM °F				DIAMETER INCHES	HEIGHT INCHES		
ET-1	DWH-1	26	DIAPHRAGM	38	38	150	40	200	1	0.39	1	8	13	PT-5	

GENERAL NOTES:
1. MODEL NUMBERS ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL PRE-CHARGE THE TANK TO THE VALUE INDICATED IN THE SCHEDULE. FOR TANKS THAT ARE SUPPLIED PRE-CHARGED BY THE MANUFACTURER, THE CONTRACTOR SHALL CONFIRM THE PRESSURE AND MAKE ADJUSTMENTS AS REQUIRED.

DOMESTIC WATER PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	COLDEST SYSTEM OPERATING TEMP. °F FOR PUMP SELECTION	PUMP HEAD FT.	OVERLOAD GPM	MINIMUM EFFICIENCY %	MOTOR			MODULATION/ CONTROL TYPE	ELECTRICAL				MODEL NUMBER	KEYED NOTES
											BHP	HP	RPM		VOLTS	PHASE	SCCR KA (NOTE 4)	OPTIONS/ ACCESSORIES		
HWRP-1	DWH-1	MECHANICAL/ ELECTRICAL 202	INLINE	CLOSE	2.3	W	40	4	0	0	0	1/6	3,300	AUTO	120	1	14		PL-36	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
3. FLUID TYPE: W = WATER, PGXX = PROPYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL, EGXX = ETHYLENE GLYCOL SOLUTION XX PERCENTAGE OF GLYCOL.
4. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

AIR COMPRESSOR SCHEDULE

UNIT NUMBER	SIMPLEX OR DUPLEX	TYPE	DELIVERY PRESSURE PSIG	CAPACITY S.C.F.M.	COMPRESSOR(S)			RECEIVER				MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	KEYED NOTES
					S.C.F.M. EACH	HP EACH	RPM	TYPE	LENGTH INCHES	DIAMETER INCHES	GALLONS		VOLTS	PHASE	SCCR KA		
AC-1	SIMPLEX	RECIPROCATING	175	17.3	–	5	845	TANK	74	34	80	AUTO	208	3	–	PSB-5-75-80VT	

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE PNEUTECH UNLESS OTHERWISE NOTED.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

INDOOR UNIT																OUTDOOR UNIT												KEYED NOTES
UNIT IDENTIFICATION	TOTAL CAPACITY MBH	EVAPORATOR FAN			COOLING COIL			FILTER		ELECTRICAL					MODEL NUMBER	UNIT IDENTIFICATION	CONDENSING SECTION					MODULATION/ CONTROL TYPE	ELECTRICAL					MODEL NUMBER	
		AIRFLOW CFM	NUMBER FANS	WATTS EACH	E.D.B. °F	E.W.B. °F	MINIMUM FACE AREA SQ. FT.	EFF. %	AREA SQ. FT.	VOLTS	PHASE	MCA	MOP	SCCR KA			NUMBER OF COMPRESSORS	NUMBER OF CONTROL STAGES	AMBIENT TEMPERTURE °F	AIRFLOW CFM	FAN WATTS		VOLTS	PHASE	MCA	MOP	SCCR KA		
ACU-1	18.0	500	1	---	80.0	67.0	---	MERV 4	---	208	1	0.5	15.0	14	FAQ18TAVJURZQ18TAVJUA	ACCU-1	1	MODULATING	95.0	2682	---	AUTO	208	1	16.5	20.0	14	FAQ18TAVJURZQ18TAVJUA	1,2

GENERAL NOTES:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS DAIKIN UNLESS OTHERWISE NOTED.

KEYED NOTES:
1. INDOOR UNIT POWER FEED THROUGH OUTDOOR UNIT.
2. UNITS SHALL BE CAPABLE OF OPERATING DOWN TO 0 DEG. F.

GAS FIRED INFRA-RED HEATER SCHEDULE

UNIT IDENTIFICATION	HEATER LENGTH	NAT GAS INPUT MBH	INLET PRESSURE AT GAS TRAIN	MODULATION/ CONTROL TYPE	ELECTRICAL			MODEL NUMBER	REMARKS
					VOLTS	PHASE	OPTIONS/ ACCESSORIES		
IHU-1	41'-3 1/4"	150	7"-14"	AUTO	120	1	B	MTSA150/100L40	
IHU-2	41'-3 1/4"	150	7"-14"	AUTO	120	1	B	MTSA150/100L40	

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE SOLARONICS UNLESS OTHERWISE NOTED.

PLUMBING CONNECTION SCHEDULE

UNIT IDENTIFICATION	CW INCHES	HW INCHES	SAN INCHES	VENT INCHES	KEYED NOTES
WC-1	1 1/2	–	4	2	
WC-2	1 1/2	–	4	2	
LAV-1	1/2	1/2	1 1/2	1 1/2	
LAV-2	1/2	1/2	1 1/2	1 1/2	
SK-1	3/4	3/4	1 1/2	1 1/2	
SK-2	3/4	3/4	1 1/2	1 1/2	
SK-3	3/4	3/4	1 1/2	1 1/2	
CS-1	3/4	3/4	–	–	
SS-1	3/4	3/4	3	–	
EWC-1	1/2	–	1 1/2	1 1/2	
SH-1	3/4	3/4	–	–	1
SH-2	3/4	3/4	–	–	1
FD-1	–	–	3	–	
FD-2	–	–	4	–	
FS-1	–	–	3	–	

GENERAL NOTES:
1. INDIVIDUAL WATER LINE BRANCHES, WASTE LINES, VENTS, AND TRAPS FOR CONNECTION TO INDIVIDUAL FIXTURES, FIXTURE FITTINGS, AND SPECIALTIES SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE OR AS INDICATED ON DRAWINGS, WHICHEVER IS GREATER.

KEYED NOTES:
1. PROVIDE MIXING VALVE.

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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SHEET NO.
M7-06

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PACKAGED SNOWMELT BOILER SCHEDULE

UNIT IDENTIFICATION	BOILER						PUMPS								SNOWMELT FLUID	AIR SEPERATOR	EXPANSION TANK			GLYCOL MAKEUP UNIT (GALLONS)	ELECTRICAL						MODEL NUMBER	REMARKS
	MIN SNOW MELT LOAD (MBH)	INPUT (MBH)	OUTPUT (MBH)	SNOW MELT FLUID E.W.T. °F	SNOW MELT FLUID L.W.T. °F	RELIEF VALVE SETTING (PSI)	PRIMARY				SECONDARY						TANK TYPE	VOLUME (GALLONS)	ACCEPTANCE (GALLONS)		VOLTS	PHASE	FLA	MOP	SCCR KA	OPTIONS/ ACCESSORIES		
							PUMP TYPE	GPM	HEAD (FEET)	HP	PUMP TYPE	GPM	HEAD (FEET)	HP														
SMB-1	267.3	300	278	100	130	30	INLINE	19.2	15	1/6	INLINE	19.2	30	2/5	40% PG	INLINE	DIAPHRAGM	25	20.2	6	120	1	26	30	14	B	SMP-B-1-1/4-120-1PH	

NOTE:
1. REFER TO SCHEDULES GENERAL NOTES.
2. MODEL NUMBERS ARE PROPAK SOLUTIONS BOILERS UNLESS OTHERWISE NOTED.
3. ENTIRE PACKAGE PIPED, WIRED, AND INSTALLED ON RIGID STEEL BASE.

VIBRATION ISOLATOR APPLICATION SCHEDULE

EQUIPMENT TYPE	EQUIPMENT CATEGORY	EQUIPMENT LOCATION						KEYED NOTES
		SLAB ON GRADE			UP TO 40 FT (12 M) FLOOR SPAN			
		BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	BASE TYPE	ISOLATOR TYPE	MIN. DEFL., IN. (MM)	
PACKAGED SNOWMELT SYSTEM	ALL	A OR B	3	0.25 (6)	A OR B	3	0.25 (64)	NOTE 3

BASE TYPES:

BASE TYPE A – NO BASE, ISOLATORS ATTACHED DIRECTLY TO EQUIPMENT.

ISOLATOR TYPES:

ISOLATOR TYPE 1a – ELASTOMERIC ISOLATION PAD.
ISOLATOR TYPE 1b – ELASTOMERIC ISOLATION PAD WITH STEEL LOAD BEARING PLATE.
ISOLATOR TYPE 3 – FREE STANDING SPRING FLOOR ISOLATOR.

SNOWMELT ZONING SCHEDULE

MANIFOLD	AREA SERVED (SQFT)	NUMBER OF CIRCUITS	CAPACITY (BTUH)	WATERFLOW (GPM)	WATER TEMPERATURE		TUBING					REMARKS
					E.W.T °F	L.W.T °F	TUBE DIAMETER INCHES	TUBE SPACING INCHES	MAX. CIRCUIT LENGTH FT.	TUBING HEAD LOSS (FT.)	CONTROL VALVE W.P.D. FT HD.	
ZONE #1-EAST APPARATUS BAY	850	4	139200	10	130	100	3/4	9	350	15	15	
ZONE #2-WEST APPARATUS BAY	770	4	128100	9.2	130	100	3/4	9	350	15	15	

ABOVEGROUND SNOWMELT PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE

	INSULATION MATERIAL & THICKNESS (INCHES)						FIELD-APPLIED JACKET MATERIAL						
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)	PVDC (OUTDOOR)	KEYED NOTES
INDOOR PIPE SYSTEM AND SIZE (INCHES)													
SNOWMELT SUPPLY & RETURN 200 DEG F AND LOWER													
3 AND SMALLER		1					X		X				A

GENERAL NOTES

1. 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.

KEYED NOTES

A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.
C. STEAM AND CONDENSATE PIPING JACKET SHALL BE STUCCO EMBOSSED.

SNOWMELT PIPING & VALVE APPLICATION SCHEDULE

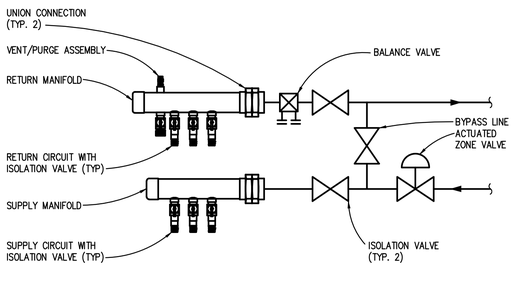
PIPE SIZE (INCHES)	MATERIAL							CONNECTION								ISOLATION VALVES				KEYED NOTES
	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	PEX	SOLDERED	BRAZED	WELDED	THREADED	FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY	HI-PERF BUTTERFLY	GATE	
INDOOR, ABOVEGROUND SNOWMELT SYSTEM SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																				
UP TO 2		X						X								X				
BELOW GROUND SNOWMELT SYSTEM UNDERSLAB SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP.: 125 PSIG AT 200 DEG F																				
UP TO 1							X													

GENERAL NOTES

1. 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
2. DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.

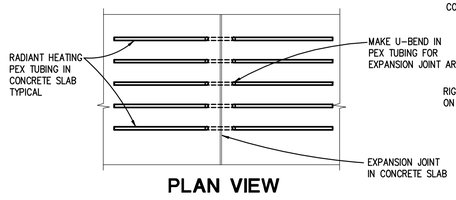
   a. NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
   b. NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.

3. USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
4. HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.

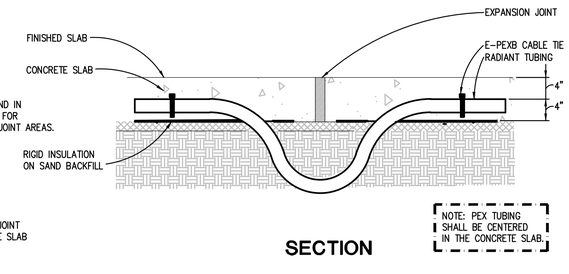


MANIFOLD PIPING DIAGRAM

NO SCALE



PLAN VIEW

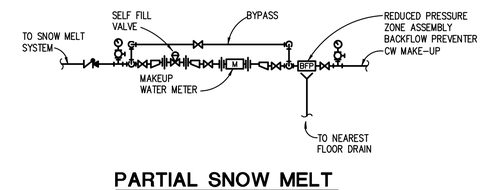


SECTION

PEX TUBING EXPANSION JOINT DETAIL

NO SCALE

NOTE:
ALL EQUIPMENT ASSOCIATED WITH SNOW-MELT SYSTEM TO BE INCLUDED AS ALTERNATE #3.



PARTIAL SNOW MELT SYSTEM PIPING DIAGRAM

NO SCALE

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PBA Project No.: 2021-0370-01

KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
JTH

CHECKED BY
DAC

APPROVED BY
DAC

SHEET NAME
SNOWMELT DETAILS AND SCHEDULES

SHEET NO.
M7-07

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TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
AFC	AIR FLOW CONTROLLER
AQ	AQUASTAT, STRAP ON BULB
CO2	CARBON DIOXIDE SENSOR – WALL MOUNTED
CO2	CARBON DIOXIDE SENSOR – DUCT MOUNTED
CS	CURRENT SWITCH
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
CM	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
FMS	FLOW MEASURING STATION
FM	FLOW METER
FS	FLOW SWITCH
FZ	FREEZESTAT
F/	GAUGE – FLOW
P/	GAUGE – PRESSURE
T/	GAUGE – TEMPERATURE
	GUARD FOR STAT OR SENSOR
	HUMIDIFIER
H	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)
H	HUMIDITY SENSOR, DUCT MOUNTED
LVL	LEVEL SWITCH OR TRANSMITTER
LS	LIMIT SWITCH
	LINE – ELECTRIC
	LINE – INSTRUMENT AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
R	PILOT LIGHT OR BEACON R – RED LENS A – AMBER LENS B – BLUE LENS G – GREEN LENS
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
R	RELAY, ELECTRIC
N	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
AI	SIGNAL – DDC/BAS, ANALOG INPUT
AO	SIGNAL – DDC/BAS, ANALOG OUTPUT
DI	SIGNAL – DDC/BAS, DIGITAL INPUT
DO	SIGNAL – DDC/BAS, DIGITAL OUTPUT
AI	SIGNAL – PACKAGED EQUIPMENT, ANALOG INPUT
AO	SIGNAL – PACKAGED EQUIPMENT, ANALOG OUTPUT
DI	SIGNAL – PACKAGED EQUIPMENT, DIGITAL INPUT
DO	SIGNAL – PACKAGED EQUIPMENT, DIGITAL OUTPUT

NOTES:

1. SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.
2. REFER TO MECHANICAL STANDARDS ON DRAWING M0-01 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
DD	SMOKE DETECTOR – DUCT MOUNTED
S/S	START/STOP RELAY
SPT	STATIC PRESSURE TRANSMITTER
SP	STATIC PRESSURE SENSOR OR PROBE
SW	SWITCH
T	TEMPERATURE SENSOR – RIGID ELEMENT IN WELL
T	TEMPERATURE SENSOR – STRAP ON BULB
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
XF	TRANSFORMER
	VALVE – 2 WAY CONTROL VALVE
	VALVE – 3 WAY CONTROL VALVE
VFC	VARIABLE FREQUENCY CONTROLLER
VS	VELOCITY SENSOR
VIB	VIBRATION SWITCH
V	VOLTAGE SENSOR

WIRING SYMBOLS

SYMBOL	DESCRIPTION
	AUDIBLE DEVICE (AS DEFINED ON TC DRAWINGS)
M/S	COIL – MOTOR STARTER CONTACTOR
R	COIL – RELAY
TDR	COIL – TIME DELAY RELAY
VFC	COIL – VARIABLE SPEED DRIVE CONTACTOR
	COIL – EP OR SOLENOID VALVE
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NOTC
	CONTACT – TIMED AFTER COIL IS ENERGIZED, NCTO
	CONTACT – TIMED AFTER COIL IS DE-ENERGIZED, NOTO
	CONTACT – TIMED AFTER COIL IS DE-ENERGIZED, NCTC
	GROUND
	MOTOR, SINGLE PHASE
R	PILOT LIGHT OR BEACON R – RED LENSE A – AMBER LENS B – BLUE LENSE G – GREEN LENS
R	PILOT LIGHT, WITH PUSH-TO-TEST
	PUSH BUTTON – MOMENTARY CONTACT, NO
	PUSH BUTTON – MOMENTARY CONTACT, NC
	PUSH BUTTON – MOMENTARY CONTACT, NO & NC
	PUSH BUTTON – MOMENTARY, NO (MUSHROOM HEAD)
	PUSH BUTTON – MOMENTARY, NC (MUSHROOM HEAD)

WIRING SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
1 2	SWITCH – 2 POSITION SELECTOR
H O A	SWITCH – 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH – FLOW (AIR, WATER, ETC.), NO
	SWITCH – FLOW (AIR, WATER, ETC.), NC
	SWITCH – LIMIT, NO
	SWITCH – LIMIT, NO, HELD CLOSED
	SWITCH – LIMIT, NC
	SWITCH – LIMIT, NC, HELD OPEN
	SWITCH – LIQUID LEVEL, NO
	SWITCH – LIQUID LEVEL, NC
	SWITCH – MANUAL SPST, NO
	SWITCH – MANUAL DPST, NO
	SWITCH – MANUAL SPST, NC
	SWITCH – MANUAL DPST, NC
	SWITCH – MANUAL SPDT
	SWITCH – MANUAL DPDT
	SWITCH – PRESSURE & VACUUM, NO
	SWITCH – PRESSURE & VACUUM, NC
	SWITCH – TEMPERATURE ACTUATED, NO
	SWITCH – TEMPERATURE ACTUATED, NC
	THERMAL OVERLOAD, SINGLE PHASE
OLs	THERMAL OVERLOAD CONTACTS – 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION
	WIRING NOT CONNECTED

ABBREVIATIONS

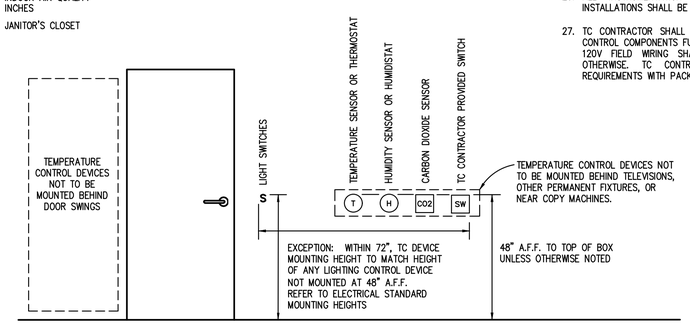
ABBREVIATION	DESCRIPTION
BAS	BUILDING AUTOMATION SYSTEM
DDC	DIRECT DIGITAL CONTROL
TC	TEMPERATURE CONTROLS
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NCTC	NORMALLY CLOSED TIMED CLOSED
SPST	SINGLE POLE SINGLE THROW
SPDT	SINGLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW

ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMP	AMPERE
APD	AIR PRESSURE DROP
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS
AUX	AUXILIARY
BAS	BUILDING AUTOMATION SYSTEM
C	COMMON
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHWP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CLG	COOLING
CLP	COMPUTER LOOP PUMP
CLR	COMPUTER LOOP RETURN
CLS	COMPUTER LOOP SUPPLY
CO2	CARBON DIOXIDE
COND	CONDENSATE
CONT	CONTINUATION OR CONTINUED
CONTR	CONTRACTOR
CONV	CONVECTOR
COS	CENTRAL OPERATOR STATION
CP	CIRCULATING PUMP
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
CW	DOMESTIC COLD WATER
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DA	DISCHARGE AIR
DAT	DISCHARGE AIR TEMPERATURE
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREES
DMPR	DAMPER
D/N	DAY/NIGHT
DN	DOWN
DPR	DAMPER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EACH
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ECUH	ELECTRIC CABINET UNIT HEATER
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRICAL
ERCP	ELECTRIC RADIANT CEILING PANEL
ERU	ENERGY RECOVERY UNIT
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
°F	DEGREES FAHRENHEIT
F&B	FACE AND BYPASS DAMPER
FAS	FIRE ALARM SYSTEM
FCU	FAN COIL UNIT
FLR	FLOOR
FM	FLOW MEASURING DEVICE
FT	FEET
FTR	FINNED TUBE RADIATION
GPM	GALLONS PER MINUTE
GRH	GRAVITY RELIEF HOOD
HOA	HAND/OFF/AUTO
HP	HEAT PUMP
HP	HORSEPOWER
HPLP	HEAT PUMP LOOP PUMP
HPLR	HEAT PUMP LOOP RETURN
HPLS	HEAT PUMP LOOP SUPPLY
HR	HOUR
HTG	HEATING
HV	HEATING VENTILATING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HWH	HOT WATER HEATING
HWHR	HOT WATER HEATING RETURN
HWHS	HOT WATER HEATING SUPPLY
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
HX	HEAT EXCHANGER
IAQ	INDOOR AIR QUALITY
IN	INCHES
JC	JANITOR'S CLOSET
KW	KILOWATT
KWH	KILOWATT-HOUR
LBS/HR	POUNDS PER HOUR
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
M/S	MOTOR STARTER
MTD	MOUNTED
MTR	MOTOR
MV	MANUAL AIR VENT
MZ	MULTI-ZONE
NC	NORMALLY CLOSED
NCTC	NORMALLY CLOSED TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NIC	NOT IN CONTRACT
NFPA	NATIONAL FIRE PROTECTION AGENCY
NO	NORMALLY OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NSB	NIGHT SETBACK
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
PACU	PACKAGED AIR CONDITIONING UNIT
PD	PRESSURE DROP (FEET OF WATER)
PHR	PERIMETER HEAT RETURN
PHS	PERIMETER HEAT SUPPLY
PNL	PANEL
PPM	PARTS PER MILLION
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
R	RETURN
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RCP	RADIANT CEILING PANEL
RELA	RELIEF AIR
REQD	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SF	SUPPLY FAN
SP	STATIC PRESSURE
S/S	START/STOP
STD	STANDARD
STEAM	STEAM
SZ	SINGLE-ZONE
S/W	SUMMER/WINTER
SW	SWITCH
TC	TEMPERATURE CONTROL
TCP	TEMPERATURE CONTROL PANEL
TEMP	TEMPERATURE
THR	TERMINAL HEATING RETURN
THS	TERMINAL HEATING SUPPLY
TSP	TOTAL STATIC PRESSURE
TU	(AIR) TERMINAL UNIT
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITER'S LABORATORY
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME
VFC	VARIABLE FREQUENCY CONTROLLER
VUV	VERTICAL UNIT VENTILATOR
VS	VELOCITY SENSOR (AIRFLOW)
WC	WATER COLUMN
XFMR	TRANSFORMER

TC GENERAL NOTES

1. THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL TEMPERATURE CONTROL (TC) DRAWINGS.
2. "PROVIDE" IS DEFINED AS 'FURNISH AND INSTALL".
3. TEMPERATURE CONTROLS CONTRACTOR (TC CONTRACTOR) SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
4. FOR TEMPERATURE CONTROL DRAWINGS ONLY: ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE PROVIDED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT SHALL BE PROVIDED BY OTHER TRADES.
5. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
6. TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
7. ALL TC PROVIDED COMPONENTS AND ALL TC CONTRACTOR INSTALLED WIRING SHALL BE LABELED PER SPECIFICATIONS.
8. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
9. FAN AND PUMP MOTOR STARTERS, STARTER WIRING, CONTROL VOLTAGE TRANSFORMERS AND ASSOCIATED POWER WIRING SHALL BE PROVIDED BY OTHER TRADES.
10. FAN AND PUMP MOTOR VARIABLE FREQUENCY CONTROLLERS SHALL BE PROVIDED BY THE TC CONTRACTOR INCLUDING CONTROL WIRING AND CONTROL VOLTAGE TRANSFORMERS.
11. DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL SHALL PROVIDE FIRE ALARM SYSTEM CONTROL MODULES FOR REQUIRED SAFETIES TO MOTOR STARTERS OR VFC'S AS INDICATED. CONTROL MODULES SHALL BE LOCATED NEAR RESPECTIVE MOTOR STARTERS OR VFCs. TC CONTRACTOR SHALL PROVIDE INTERLOCK WIRING FROM CONTROL MODULES TO MOTOR STARTERS OR VFCs.
12. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VFC AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WIRING REQUIREMENTS AND TERMINATION POINTS.
13. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
14. ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. WHERE RACEWAY IS REQUIRED, TWO SEPARATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR 120V WIRING AND THE OTHER FOR 24V WIRING.
15. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
16. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
17. THERMOSTATS AND SPACE TEMPERATURE SENSORS SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. PROVIDE GUARDS FOR SPACE TEMP SENSORS LOCATED IN PUBLIC AREA.
18. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL. DEPENDING ON WIRE QUANTITY OR COMPLEXITY, PROVIDE CONDUITS BETWEEN PANELS OR WIRING THROUGH WITH CONDUIT STUBS ABOVE ALL ASSOCIATED PANELS.
19. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
20. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
21. FREEZESTATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT OF CROSS SECTIONAL AREA.
22. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
23. ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL FLOOR PLAN DRAWINGS.
24. ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
25. DAMPER ACTUATORS SHALL BE INSTALLED BY TC CONTRACTOR WHEN FURNISHED BY TC CONTRACTOR.
26. ALL INSTRUMENTATION TUBING REQUIRED FOR DPS AND DPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
27. TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED "SHIPPED LOOSE" PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS. ALL REQUIRED 24V AND 120V FIELD WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING REQUIREMENTS WITH PACKAGED EQUIPMENT SUPPLIERS.



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE

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PBA Project No. 2021070.01

KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

TEMPERATURE CONTROL STANDARDS AND GENERAL NOTES

SHEET NO.

M8-01

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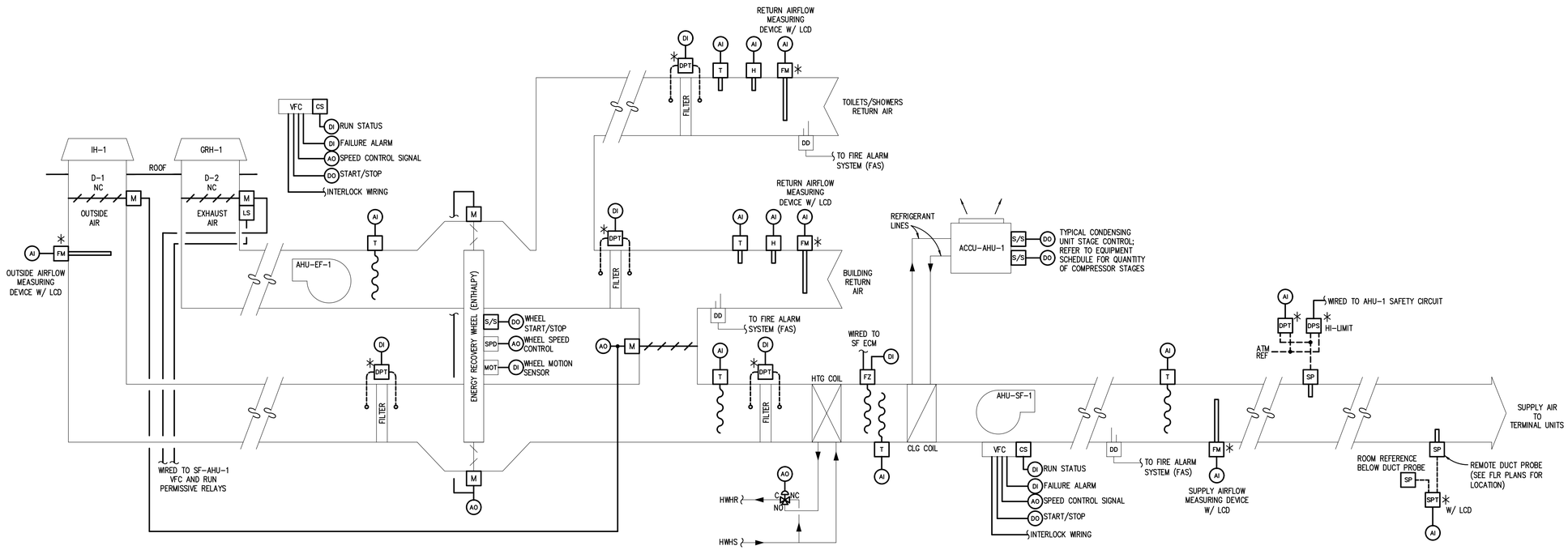
GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.



AHU-1 CONTROL

NOTES:

1. * INDICATES PANEL MOUNTED COMPONENT.
2. SUPPLY AIR AND RETURN AIR AIRFLOW MEASURING DEVICE RANGES SHALL BE 50% GREATER THAT EXPECTED CFM. REFER TO MECHANICAL EQUIPMENT SCHEDULES.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO VFC SAFETY CIRCUIT.

AHU-1 SEQUENCE OF OPERATION

NOTES:

1. MAIN BUILDING AIR HANDLER (AHU-1) SHALL BE SUPPLIED FOR PROJECT WITH COMPLETE INCLUDING FANS, FILTERS, DAMPERS, ENERGY WHEEL, ETC. AS SHOWN IN LIGHT LINE WEIGHT.
2. TC CONTRACTOR SHALL PROVIDE FIELD-WIRED, BACNET, DDC CONTROLLER INCLUDING ALL SENSORS & DEVICES FOR CONTROLS, RELAYS, AIRFLOW MEASURING DEVICES, ETC. AS SHOWN IN HEAVY LINE WEIGHT.
3. TC CONTRACTOR SHALL INSTALL THE MANUFACTURER'S FIELD-WIRED (SHIPPED LOOSE) SENSORS AND DEVICES, PLUS PROVIDE FIELD CONTROL WIRING FOR UNIT AS INDICATED, PLUS ANY MISCELLANEOUS FIELD CONTROL WIRING THAT MAY BE REQUIRED FOR THE UNIT THAT IS NOT SHOWN.
4. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE. TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO SAFETY CUTOUT RELAY.
5. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.

AHU-1 SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

1. AHU-1 SHALL RUN 24X7 YEAR-ROUND. UNOCCUPIED MODE REFERS ONLY TO TERMINAL UNITS.
2. WHEN COMMANDED OFF THRU DDC OR THE BAS, OR OFF ON A SAFETY DEVICE TRIP, SUPPLY FAN, EXHAUST FAN, AND ENERGY WHEEL SHALL BE OFF, OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE, DX COOLING CONTROL SHALL BE DISABLED. WHEN OA TEMP IS LESS THAN 40°F (ADJ.), DDC SHALL MODULATE THE HWH COIL VALVE TO MAINTAIN 50°F PLENUM SETPOINT AS MEASURED LEAVING AIR TEMP SENSOR, OTHERWISE HWH COIL VALVE SHALL CLOSE TO THE COIL. DDC SHALL SHUTDOWN THE ENTIRE AHU SYSTEM IN AN ORDERLY AND CONTROLLED MANNER.
3. ALL CONTROL DEVICES SHALL FAIL TO THE INDICATED "NORMAL FAIL-SAFE POSITION".

SYSTEM ACTIVATED:

4. AHU SHALL RUN CONTINUOUSLY WITH BAS TIME OF DAY PROGRAMMING. OA AND EA DAMPERS SHALL OPEN WHEN SF VFC IS COMMANDED ON. DAMPER LIMIT SWITCHES SHALL PROVIDE RUN PERMISSIVE SIGNALS TO SF AND EF VFCs.
5. UPON ANY SAFETY ACTIVATING, SF AND EF VFCs SHALL STOP THE RESPECTIVE FANS, OA & EA DAMPERS SHALL CLOSE. DDC SHALL PROVIDE AN AHU SAFETY ALARM TO THE BAS.
6. UPON INITIAL START, DDC SHALL START BOTH SF AND EF VFCs AT MINIMUM OUTPUT SIGNAL. VFCs SHALL SLOWLY RAMP UP TO SETPOINT OVER A 180 SECOND INTERVAL.
7. SF AND EF STATUSES SHALL BE MONITORED THRU RESPECTIVE CURRENT SWITCHES. ABNORMAL STATUS CONDITION SHALL ACTIVATE AN ALARM TO THE BAS. DDC SHALL TOTALIZE EACH FAN'S MOTOR RUNTIME HOURS OF OPERATION VIA THE CURRENT SWITCH FOR BAS DISPLAY.
8. DDC SHALL MONITOR OUTSIDE AIR (OA) AIRFLOW AND MAINTAIN 1525 CFM AS MINIMUM OA SETPOINT. FREE COOLING ECONOMIZER OVERRIDES MINIMUM OA CONTROL.
9. MIXED AIR DAMPERS (OA AND RA DAMPERS) ARE REFERRED TO AS DAMPERS HEREIN.
10. WHEN DISCHARGE AIR TEMPERATURE (DAT) IS BELOW DAT SETPOINT, DDC SHALL MODULATE DAMPERS TO MINIMUM OA POSITION AND MODULATE THE HWH COIL VALVE TO MAINTAIN DAT SETPOINT.
11. WHEN DAT IS ABOVE DAT SETPOINT AND OA ENTHALPY IS LESS THAN RA ENTHALPY, DDC SHALL MODULATE DAMPERS ABOVE MINIMUM OA POSITION TO MAINTAIN DAT SETPOINT. WHEN DAMPERS REACH 100% OA POSITION, IF DAT IS STIL ABOVE DAT SETPOINT, DDC SHALL STAGE DX COOLING MAINTAIN DAT SETPOINT.
12. WHEN SPACE TEMP IS ABOVE DAT SETPOINT AND OA ENTHALPY IS GREATER THAN RA ENTHALPY, DDC SHALL MODULATE DAMPERS TO MINIMUM OA POSITION AND STAGE DX COOLING MAINTAIN DAT SETPOINT.
13. DDC SHALL PROVIDE DISCHARGE AIR TEMP SETPOINT THAT SHALL BE RESET BASED ON THE FOLLOWING SCHEDULE:

OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

14. DDC SHALL MODULATE SF VFC TO MAINTAIN DOWN-THE-DUCT SUPPLY AIR STATIC PRESSURE SETPOINT THAT SHALL BE RESET BASED ON DAMPER POSITION FEEDBACK FROM ASSOCIATED SUPPLY AIR TERMINAL UNIT CONTROLLERS (VIA BACNET) AS FOLLOWS: SETPOINT SHALL BE ADJUSTED TO ALLOW 2 SA TERMINAL UNITS TO OPERATE AT 90% OPEN DAMPER POSITION. BELOW 2 SA TERMINAL UNITS AT 90%, SETPOINT SHALL BE SLOWLY DECREASED. ABOVE 2 SA TERMINAL UNITS AT 90%, SETPOINT SHALL BE SLOWLY INCREASED. LOW/HIGH SETPOINT RANGE SHALL BE 0.5" W.G. TO 1.5" W.G. LOW/HIGH SETPOINTS SHALL BE REVISED BASED ON TAB CONTRACTOR'S FINAL AIR BALANCE. INITIAL SETPOINT SHALL BE +1.5" W.G.
15. DDC SHALL MONITOR TWO RETURN AIR AIRFLOW DEVICES AND PROVIDE A SUMMATION OF THE TWO AIRFLOWS FOR CONTROL PURPOSES.
16. DDC SHALL MODULATE EF VFC TO MAINTAIN "TOILETS/SHOWERS/LOCKER ROOMS" CONSTANT VOLUME AIRFLOW SETPOINT. SETPOINT SHALL BE BASED ON TAB CONTRACTOR'S FINAL AIR BALANCE.
17. DDC SHALL PROVIDE DISCHARGE AIR STATIC PRESSURE HIGH LIMIT CONTROL WITH SETPOINT OF 3.5 INCHES W.G. DDC SHALL OVERRIDE CONTROL OF SF VFCs TO PREVENT STATIC PRESSURE FORM EXCEEDING SETPOINT. DDC SHALL ACTIVATE A BAS DISPLAY MESSAGE IF OPERATING IN OVERRIDE CONDITION.
18. DDC SHALL MONITOR THE ENERGY WHEEL EXHAUST AIR TEMPERATURE. WHEN THE EA TEMP REDUCES BETWEEN 40°F AND 37°F SETPOINTS, DDC SHALL SLOW THE ENERGY WHEEL PROPORTIONALLY TO AS LOW AS MINIMUM ROTATIONAL SPEED BASED ON THE MFR'S DATA. WHEN EA TEMP IS LESS THAN 36°F, DDC SHALL STOP THE ENERGY WHEEL. WHEN EA TEMP IS GREATER THAN 39°F, DDC SHALL RESTART THE ENERGY WHEEL.
19. DDC SHALL MONITOR THE ENERGY WHEEL MOTION SENSOR FOR BAS DISPLAY AND DIAGNOSTIC PURPOSES.
20. DDC SHALL MONITOR THE AHU SAFETY RELAY AND RUN PERMISSIVE RELAY STATUSES.
21. WHEN DDC REQUIRES THE ENERGY WHEEL TO ROTATE AND THE MOTION SENSOR INDICATES MOTION IS STOPPED, DDC SHALL PROVIDE AN ALARM.
22. SUPPLY AIR HIGH STATIC LIMIT DIFFERENTIAL PRESSURE SWITCH (DPS) WITH DP SETPOINT OF 4.0 INCHES W.G. SHALL PROVIDE HARDWIRED SAFETY CONTROL.
23. FILTER STATUSES SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE TRANSMITTERS (DPT). WHEN DPTs REACH INDIVIDUAL DP SETPOINT MINUS 0.2 IN. W.G. BASED ON FILTER MANUFACTURER'S LOADED FILTER DATA, DDC SHALL ACTIVATE A DIRTY FILTER WARNING. WHEN DPTs REACH INDIVIDUAL DP SETPOINT BASED ON FILTER MANUFACTURER'S LOADED FILTER DATA, DDC SHALL ACTIVATE DIRTY FILTER ALARM.
24. FREEZESTAT(S) SHALL DEACTIVATE SF & EF WHEN TEMPERATURE IS 35°F OR BELOW. FREEZESTAT STATUS SHALL ACTIVATE ALARM IF CONDITION OCCURS TO THE BAS.
25. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF & EF THRU FIRE ALARM SYSTEM CONTROL MODULES WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
26. WHEN AHU-1 IS DEACTIVATED, DDC SHALL SHUTDOWN THE SYSTEM IN AN ORDERLY MANNER.

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KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

TEMPERATURE CONTROLS

SHEET NO.

M8-02

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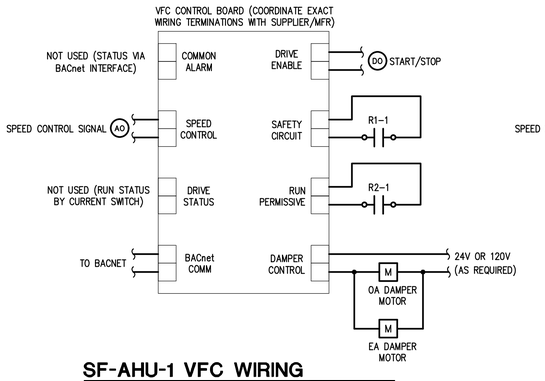
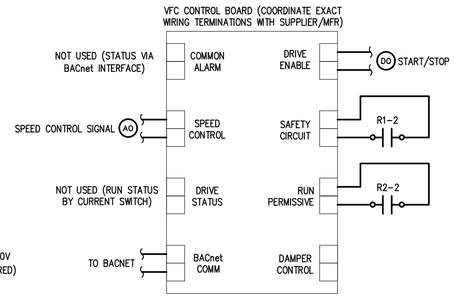


SF-AHU-1 VFC WIRING

NOTE:

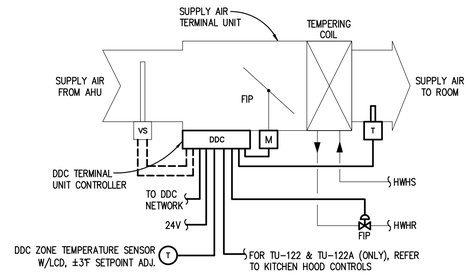
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



EF-AHU-1 VFC WIRING

NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH VFC SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

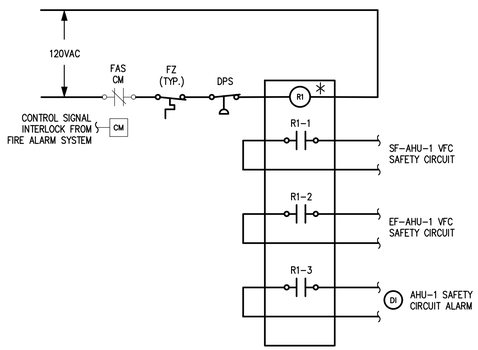


AIR TERMINAL UNIT W/REHEAT CONTROL

REFER TO AIR TERMINAL UNIT SCHEDULE FOR APPLICATION.

NOTES:

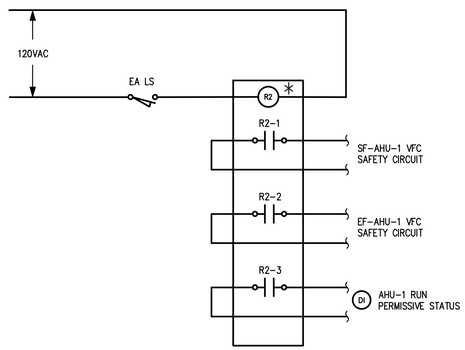
1. REFER TO PIPING & SHEET METAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS AND LOCATIONS OF ROOM TEMP SENSORS.
2. WHERE INDICATED ON FLOOR PLANS, ZONE TEMPERATURE SHALL BE REFERENCED TO MULTIPLE AIR TERMINAL UNIT CONTROLLERS VIA DDC NETWORK.
3. TC CONTRACTOR SHALL PROVIDE 24V POWER SUPPLY TO TERMINAL UNIT CONTROLLER.
4. TERMINAL UNIT MANUFACTURER SHALL PROVIDE DAMPER AND TC CONTRACTOR SHALL PROVIDE DAMPER ACTUATOR.
5. TERMINAL UNIT MANUFACTURER SHALL PROVIDE VELOCITY SENSOR FOR SYSTEM CONTROL. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR TO DETERMINE DAMPER CONTROL SETTINGS TO ACHIEVE SCHEDULED MINIMUM AND MAXIMUM CFMs.
6. TC CONTRACTOR SHALL FURNISH CONTROL VALVES FOR HEATING ELEMENTS PER THE MECHANICAL DETAILS. SELECT CONTROL VALVES TO ACHIEVE THE SCHEDULED FLOW RATES.



AHU-1 SF/EF VFC SAFETY WIRING

NOTES:

1. RELAY SHALL BE MOUNTED IN AN AUXILIARY CONTROL PANEL NEAR RESPECTIVE DDC CONTROL PANEL. COORDINATE LOCATION WITH ARCHITECT AND ELECTRICAL CONTRACTOR.
2. CONTROL DEVICES AND FIELD WIRING SHOWN WITH HEAVY LINEWEIGHT ARE BY TC CONTRACTOR.
3. PROVIDE 120VAC CONTROL POWER FROM A DEDICATED CIRCUIT BREAKER. COORDINATE WITH THE ELECTRICAL CONTRACTOR. PROVIDE A CIRCUIT BREAKER "LOCK-ON" DEVICE TO PREVENT INADVERTENT SWITCHING OFF OF BREAKER.



AHU-1 SF/EF RUN PERMISSIVE WIRING

NOTES:

1. RELAY SHALL BE MOUNTED IN AN AUXILIARY CONTROL PANEL NEAR RESPECTIVE DDC CONTROL PANEL. COORDINATE LOCATION WITH ARCHITECT AND ELECTRICAL CONTRACTOR.
2. CONTROL DEVICES AND FIELD WIRING SHOWN WITH HEAVY LINEWEIGHT ARE BY TC CONTRACTOR.
3. PROVIDE 120VAC CONTROL POWER FROM A DEDICATED CIRCUIT BREAKER. COORDINATE WITH THE ELECTRICAL CONTRACTOR. PROVIDE A CIRCUIT BREAKER "LOCK-ON" DEVICE TO PREVENT INADVERTENT SWITCHING OFF OF BREAKER.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

1. ALL TU'S ASSOCIATED WITH A SINGLE ZONE TEMP SENSOR SHALL CONTROL IN UNISON.
2. SUPPLY AIR TERMINAL UNIT'S (TU) VAV COOLING AND HEATING MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE MECHANICAL SCHEDULES. WHERE MINIMUM AND MAXIMUM AIRFLOW SETTINGS ARE THE SAME, THE TU CONTROLLER SHALL PERFORM CONSTANT AIR VOLUME CONTROL.
3. IN ALL MODES OF HEATING, TU DISCHARGE AIR TEMP (DAT) SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT.
4. WHEN ZONE TEMP RISES ABOVE THE COOLING SETPOINT, TU CONTROLLER SHALL KEEP THE TEMPERING COIL VALVE CLOSED AND MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM COOLING AIRFLOW SETTINGS TO MAINTAIN ZONE COOLING TEMPERATURE SETPOINT.
5. WHEN ZONE TEMP FALLS BELOW HEATING SETPOINT, TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MINIMUM HEATING AIRFLOW SETTING. WHEN AIRFLOW IS AT MINIMUM HEATING AIRFLOW, CONTROLLER SHALL MODULATE TEMPERING COIL VALVE TOWARDS OPEN. IF THE ZONE TEMP IS BELOW SETPOINT WITH TEMPERING COIL DAT AT HIGH LIMIT SETPOINT, TU CONTROLLER SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM HEATING AIRFLOW SETTINGS TO MAINTAIN ZONE HEATING TEMPERATURE SETPOINT.
6. ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 70°F

   COOLING OCCUPIED SETPOINT = 75°F

   COOLING UNOCCUPIED SETPOINT = 80°F
7. DURING BUILDING UNOCCUPANCY, RELATED AHU SHALL CYCLE AS REQUIRED TO MAINTAIN BUILDING SETBACK AND SETUP TEMP SETPOINTS.
8. WHEN RESPECTIVE AHU IS DEACTIVATED, THE TERMINAL UNIT TEMPERING COIL VALVE SHALL REMAIN CLOSED.
9. WHEN RESPECTIVE AHU IS OPERATING IN WARM-UP OR PURGE MODES, THE TERMINAL UNIT SHALL MAINTAIN ITS MAXIMUM AIRFLOW SETTING UNTIL ZONE OCCUPIED TEMPERATURE SETPOINT IS ACHIEVED.
10. TU CONTROLLER SHALL RECALIBRATE THE AIRFLOW SENSOR AND RESET FLOATING CONTROL DAMPER AND VALVE ACTUATORS ONCE A WEEK MINIMUM. THE RECALIBRATION AND RESET PROCESS SHALL OCCUR WHEN RESPECTIVE AHU IS DEACTIVATED. IF RELATED AHU OPERATES CONTINUOUSLY, THE RECALIBRATION AND RESET PROCESS SHALL BE STAGGERED AMONGST THE TERMINAL UNITS SO THE DUCT STATIC PRESSURE DOES NOT EXCEED LIMITS.
11. CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER AND HEATING CONTROL OUTPUTS SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.
12. DISCHARGE AIR TEMP SHALL BE MONITORED FOR SYSTEM DIAGNOSTICS.

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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SHEET NAME
TEMPERATURE CONTROLS

SHEET NO.
M8-03

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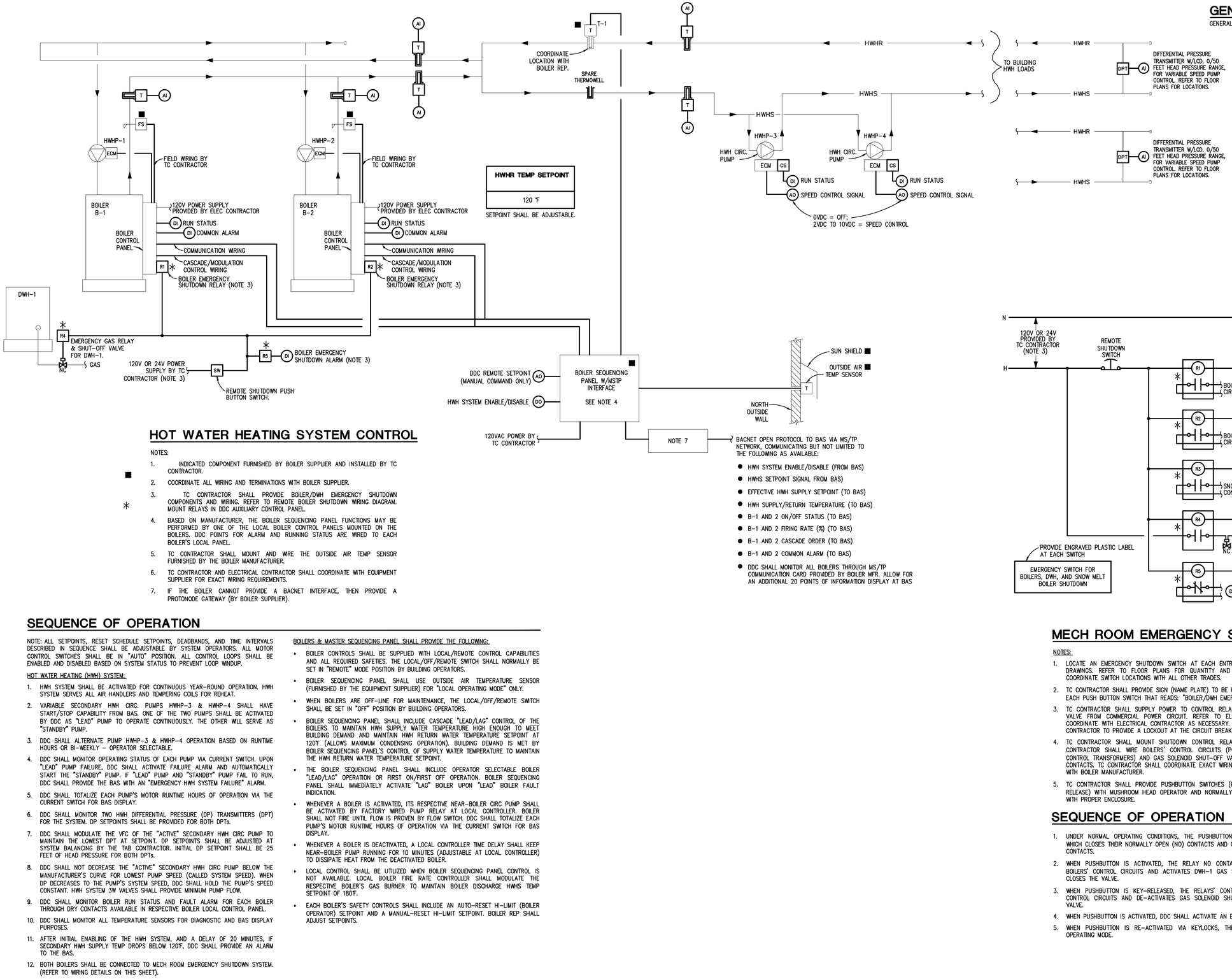


HWHR TEMP SETPOINT
120 °F

SETPOINT SHALL BE ADJUSTABLE.

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.

HOT WATER HEATING SYSTEM CONTROL

NOTES:

1. INDICATED COMPONENT FURNISHED BY BOILER SUPPLIER AND INSTALLED BY TC CONTRACTOR.
2. COORDINATE ALL WIRING AND TERMINATIONS WITH BOILER SUPPLIER.
3. TC CONTRACTOR SHALL PROVIDE BOILER/DWH EMERGENCY SHUTDOWN COMPONENTS AND WIRING. REFER TO REMOTE BOILER SHUTDOWN WIRING DIAGRAM. MOUNT RELAYS IN DDC AUXILIARY CONTROL PANEL.
4. BASED ON MANUFACTURER, THE BOILER SEQUENCING PANEL FUNCTIONS MAY BE PERFORMED BY ONE OF THE LOCAL BOILER CONTROL PANELS MOUNTED ON THE BOILERS. DDC POINTS FOR ALARM AND RUNNING STATUS ARE WIRED TO EACH BOILER'S LOCAL PANEL.
5. TC CONTRACTOR SHALL MOUNT AND WIRE THE OUTSIDE AIR TEMP SENSOR FURNISHED BY THE BOILER MANUFACTURER.
6. TC CONTRACTOR AND ELECTRICAL CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT WIRING REQUIREMENTS.
7. IF THE BOILER CANNOT PROVIDE A BACNET INTERFACE, THEN PROVIDE A PROTONODE GATEWAY (BY BOILER SUPPLIER).

SEQUENCE OF OPERATION

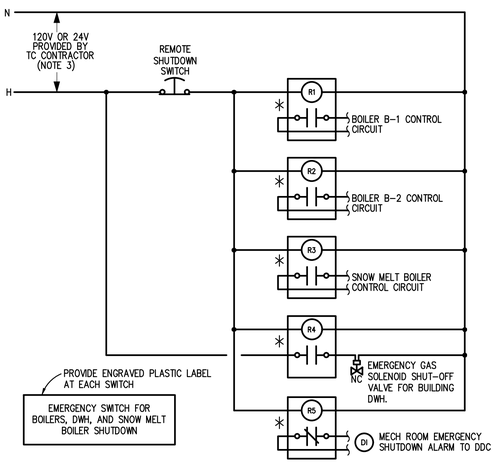
NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

HOT WATER HEATING (HWH) SYSTEM:

1. HWH SYSTEM SHALL BE ACTIVATED FOR CONTINUOUS YEAR-ROUND OPERATION. HWH SYSTEM SERVES ALL AIR HANDLERS AND TEMPERING COILS FOR REHEAT.
2. VARIABLE SECONDARY HWH CIRC. PUMPS HWHP-3 & HWHP-4 SHALL HAVE START/STOP CAPABILITY FROM BAS. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC AS "LEAD" PUMP TO OPERATE CONTINUOUSLY. THE OTHER WILL SERVE AS "STANDBY" PUMP.
3. DDC SHALL ALTERNATE PUMP HWHP-3 & HWHP-4 OPERATION BASED ON RUNTIME HOURS OR BI-WEEKLY – OPERATOR SELECTABLE.
4. DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP VIA CURRENT SWITCH. UPON "LEAD" PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE "STANDBY" PUMP. IF "LEAD" PUMP AND "STANDBY" PUMP FAIL TO RUN, DDC SHALL PROVIDE THE BAS WITH AN "EMERGENCY HWH SYSTEM FAILURE" ALARM.
5. DDC SHALL TOTALIZE EACH PUMP'S MOTOR RUNTIME HOURS OF OPERATION VIA THE CURRENT SWITCH FOR BAS DISPLAY.
6. DDC SHALL MONITOR TWO HWH DIFFERENTIAL PRESSURE (DP) TRANSMITTERS (DPT) FOR THE SYSTEM. DP SETPOINTS SHALL BE PROVIDED FOR BOTH DPTs.
7. DDC SHALL MODULATE THE VFC OF THE "ACTIVE" SECONDARY HWH CIRC PUMP TO MAINTAIN THE LOWEST DPT AT SETPOINT. DP SETPOINTS SHALL BE ADJUSTED AT SYSTEM BALANCING BY THE TAB CONTRACTOR. INITIAL DP SETPOINT SHALL BE 25 FEET OF HEAD PRESSURE FOR BOTH DPTs.
8. DDC SHALL NOT DECREASE THE "ACTIVE" SECONDARY HWH CIRC PUMP BELOW THE MANUFACTURER'S CURVE FOR LOWEST PUMP SPEED (CALLED SYSTEM SPEED). WHEN DP DECREASES TO THE PUMP'S SYSTEM SPEED, DDC SHALL HOLD THE PUMP'S SPEED CONSTANT. HWH SYSTEM 3W VALVES SHALL PROVIDE MINIMUM PUMP FLOW.
9. DDC SHALL MONITOR BOILER RUN STATUS AND FAULT ALARM FOR EACH BOILER THROUGH DRY CONTACTS AVAILABLE IN RESPECTIVE BOILER LOCAL CONTROL PANEL.
10. DDC SHALL MONITOR ALL TEMPERATURE SENSORS FOR DIAGNOSTIC AND BAS DISPLAY PURPOSES.
11. AFTER INITIAL ENABLING OF THE HWH SYSTEM, AND A DELAY OF 20 MINUTES, IF SECONDARY HWH SUPPLY TEMP DROPS BELOW 120°F, DDC SHALL PROVIDE AN ALARM TO THE BAS.
12. BOTH BOILERS SHALL BE CONNECTED TO MECH ROOM EMERGENCY SHUTDOWN SYSTEM. (REFER TO WIRING DETAILS ON THIS SHEET).

BOILERS & MASTER SEQUENCING PANEL SHALL PROVIDE THE FOLLOWING:

- BOILER CONTROLS SHALL BE SUPPLIED WITH LOCAL/REMOTE CONTROL CAPABILITIES AND ALL REQUIRED SAFETIES. THE LOCAL/OFF/REMOTE SWITCH SHALL NORMALLY BE SET IN "REMOTE" MODE POSITION BY BUILDING OPERATORS.
- BOILER SEQUENCING PANEL SHALL USE OUTSIDE AIR TEMPERATURE SENSOR (FURNISHED BY THE EQUIPMENT SUPPLIER) FOR "LOCAL OPERATING MODE" ONLY.
- WHEN BOILERS ARE OFF-LINE FOR MAINTENANCE, THE LOCAL/OFF/REMOTE SWITCH SHALL BE SET IN "OFF" POSITION BY BUILDING OPERATORS.
- BOILER SEQUENCING PANEL SHALL INCLUDE CASCADE "LEAD/LAG" CONTROL OF THE BOILERS TO MAINTAIN HWH SUPPLY WATER TEMPERATURE HIGH ENOUGH TO MEET BUILDING DEMAND AND MAINTAIN HWH RETURN WATER TEMPERATURE SETPOINT AT 120°F (ALLOWS MAXIMUM CONDENSING OPERATION). BUILDING DEMAND IS MET BY BOILER SEQUENCING PANEL'S CONTROL OF SUPPLY WATER TEMPERATURE TO MAINTAIN THE HWH RETURN WATER TEMPERATURE SETPOINT.
- THE BOILER SEQUENCING PANEL SHALL INCLUDE OPERATOR SELECTABLE BOILER "LEAD/LAG" OPERATION OR FIRST ON/FIRST OFF OPERATION. BOILER SEQUENCING PANEL SHALL IMMEDIATELY ACTIVATE "LAG" BOILER UPON "LEAD" BOILER FAULT INDICATION.
- WHENEVER A BOILER IS ACTIVATED, ITS RESPECTIVE NEAR-BOILER CIRC PUMP SHALL BE ACTIVATED BY FACTORY WIRED PUMP RELAY AT LOCAL CONTROLLER. BOILER SHALL NOT FIRE UNTIL FLOW IS PROVEN BY FLOW SWITCH. DDC SHALL TOTALIZE EACH PUMP'S MOTOR RUNTIME HOURS OF OPERATION VIA THE CURRENT SWITCH FOR BAS DISPLAY.
- WHENEVER A BOILER IS DEACTIVATED, A LOCAL CONTROLLER TIME DELAY SHALL KEEP NEAR-BOILER PUMP RUNNING FOR 10 MINUTES (ADJUSTABLE AT LOCAL CONTROLLER) TO DISSIPATE HEAT FROM THE DEACTIVATED BOILER.
- LOCAL CONTROL SHALL BE UTILIZED WHEN BOILER SEQUENCING PANEL CONTROL IS NOT AVAILABLE. LOCAL BOILER FIRE RATE CONTROLLER SHALL MODULATE THE RESPECTIVE BOILER'S GAS BURNER TO MAINTAIN BOILER DISCHARGE HWHS TEMP SETPOINT OF 180°F.
- EACH BOILER'S SAFETY CONTROLS SHALL INCLUDE AN AUTO-RESET HI-LIMIT (BOILER OPERATOR) SETPOINT AND A MANUAL-RESET HI-LIMIT SETPOINT. BOILER REP SHALL ADJUST SETPOINTS.



MECH ROOM EMERGENCY SHUTDOWN WIRING

NOTES:

1. LOCATE AN EMERGENCY SHUTDOWN SWITCH AT EACH ENTRANCE AS SHOWN ON MECHANICAL DRAWINGS. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF ROOM ENTRANCES. COORDINATE SWITCH LOCATIONS WITH ALL OTHER TRADES.
2. TC CONTRACTOR SHALL PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSH BUTTON SWITCH THAT READS: "BOILER/DWH EMERGENCY SHUTDOWN SWITCH".
3. TC CONTRACTOR SHALL SUPPLY POWER TO CONTROL RELAYS AND GAS SOLENOID SHUT-OFF VALVE FROM COMMERCIAL POWER CIRCUIT. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY. COORDINATE WITH THE ELECTRICAL CONTRACTOR TO PROVIDE A LOCKOUT AT THE CIRCUIT BREAKER.
4. TC CONTRACTOR SHALL MOUNT SHUTDOWN CONTROL RELAYS IN AUX. CONTROL PANEL. TC CONTRACTOR SHALL WIRE BOILERS' CONTROL CIRCUITS (POWER FROM SECONDARY SIDE OF CONTROL TRANSFORMERS) AND GAS SOLENOID SHUT-OFF VALVE THRU NORMALLY OPEN RELAY CONTACTS. TC CONTRACTOR SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH BOILER MANUFACTURER.
5. TC CONTRACTOR SHALL PROVIDE PUSHBUTTON SWITCHES (PUSH TO LATCH – TURN KEY TO RELEASE) WITH MUSHROOM HEAD OPERATOR AND NORMALLY CLOSED (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.

SEQUENCE OF OPERATION

1. UNDER NORMAL OPERATING CONDITIONS, THE PUSHBUTTON CIRCUIT ENERGIZES THE RELAYS WHICH CLOSES THEIR NORMALLY OPEN (NO) CONTACTS AND OPENS THE NORMALLY CLOSED (NC) CONTACTS.
2. WHEN PUSHBUTTON IS ACTIVATED, THE RELAY NO CONTACTS SHALL OPEN/INTERRUPT ALL BOILERS' CONTROL CIRCUITS AND ACTIVATES DWH-1 GAS SOLENOID SHUT-OFF VALVE WHICH CLOSES THE VALVE.
3. WHEN PUSHBUTTON IS KEY-RELEASED, THE RELAYS' CONTACTS RE-ENERGIZE THE BOILERS' CONTROL CIRCUITS AND DE-ACTIVATES GAS SOLENOID SHUT-OFF VALVE WHICH OPENS THE VALVE.
4. WHEN PUSHBUTTON IS ACTIVATED, DDC SHALL ACTIVATE AN EMERGENCY ALARM AT THE BAS.
5. WHEN PUSHBUTTON IS RE-ACTIVATED VIA KEYLOCKS, THE SYSTEM IS RESET TO NORMAL OPERATING MODE.

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PBA Project No. 2021070.01

KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

JTH

CHECKED BY

DAC

APPROVED BY

DAC

SHEET NAME

TEMPERATURE CONTROLS

SHEET NO.

M8-04

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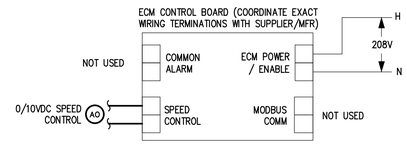
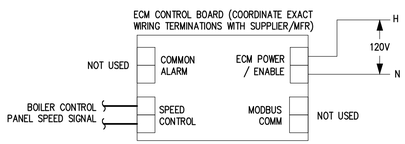


HWH PUMPS HWHP-3 & -4 ECM WIRING

NOTES:

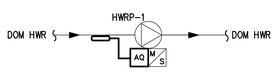
1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.



HWH PUMPS HWHP-1 & -2 ECM WIRING

NOTES:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. CONSULT WITH ECM SUPPLIER FOR THE ACTUAL WIRING REQUIREMENTS.
2. MOUNT CURRENT SWITCH ON MOTOR LEADS.

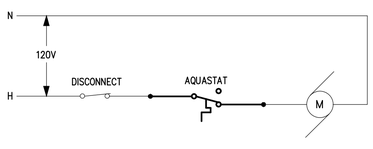


DOMESTIC HW CIRC PUMP CONTROL

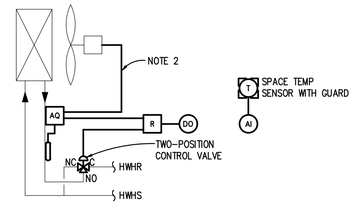
TYPICAL – REFER TO SCHEDULES & FLOOR PLANS FOR QUANTITY & LOCATION OF UNITS

SEQUENCE OF OPERATION:

1. AQUASTAT SHALL START PUMP WHEN WATER TEMPERATURE FALLS BELOW SETPOINT. SET AQUASTAT AT 2°F BELOW SYSTEM HW SETPOINT.



DOM HW CP WIRING



HWH UH/CUH CONTROL

TYPICAL

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. AQUASTAT SHALL BE WIRED IN SERIES WITH FAN CONTROL WIRING CIRCUIT.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS.

1. ASHRAE 90.1-2013 FOR VESTIBULES ONLY:

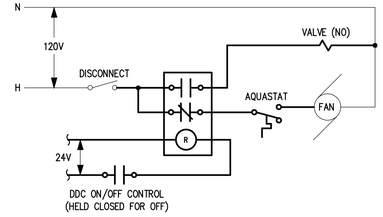
1.1. DDC SHALL ENABLE/DISABLE UH/CUH FAN CIRCUIT AND OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 60°F. FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL. DDC SHALL PROVIDE 2°F DEADBAND FOR CONTROL.

1.2. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 45°F, DDC SHALL DISABLE CONTROL OF THE UH/CUH.

2. FOR ALL OTHER AREAS/ROOMS:

2.1. DDC SHALL ENABLE/DISABLE UH/CUH FAN CIRCUIT AND OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 68°F DURING BUILDING OCCUPIED MODE AND 50°F DURING BUILDING UNOCCUPIED MODE. UH/CUH FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL. DDC SHALL PROVIDE 2°F DEADBAND CONTROL AROUND SETPOINTS.

2.2. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 60°F, DDC SHALL DISABLE CONTROL OF THE UH/CUH.

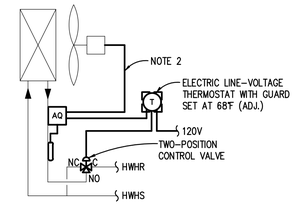


HWH UH & CUH WIRING

TYPICAL

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.

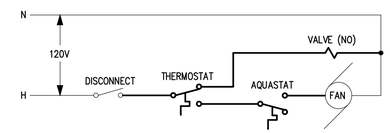


HWH UH & CUH CONTROL

TYPICAL

SEQUENCE OF OPERATION:

1. LINE VOLTAGE THERMOSTAT SHALL ENABLE/DISABLE UH/CUH FAN CIRCUIT AND OPEN/CLOSE HWH VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 68°F DURING BUILDING OCCUPIED MODE AND 50°F DURING BUILDING UNOCCUPIED MODE.
2. UH/CUH FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT.
3. AQUASTAT SHALL PROVIDE 4°F DEADBAND FOR CONTROL.



HWH UH & CUH WIRING

TYPICAL

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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SHEET NO.
M8-05

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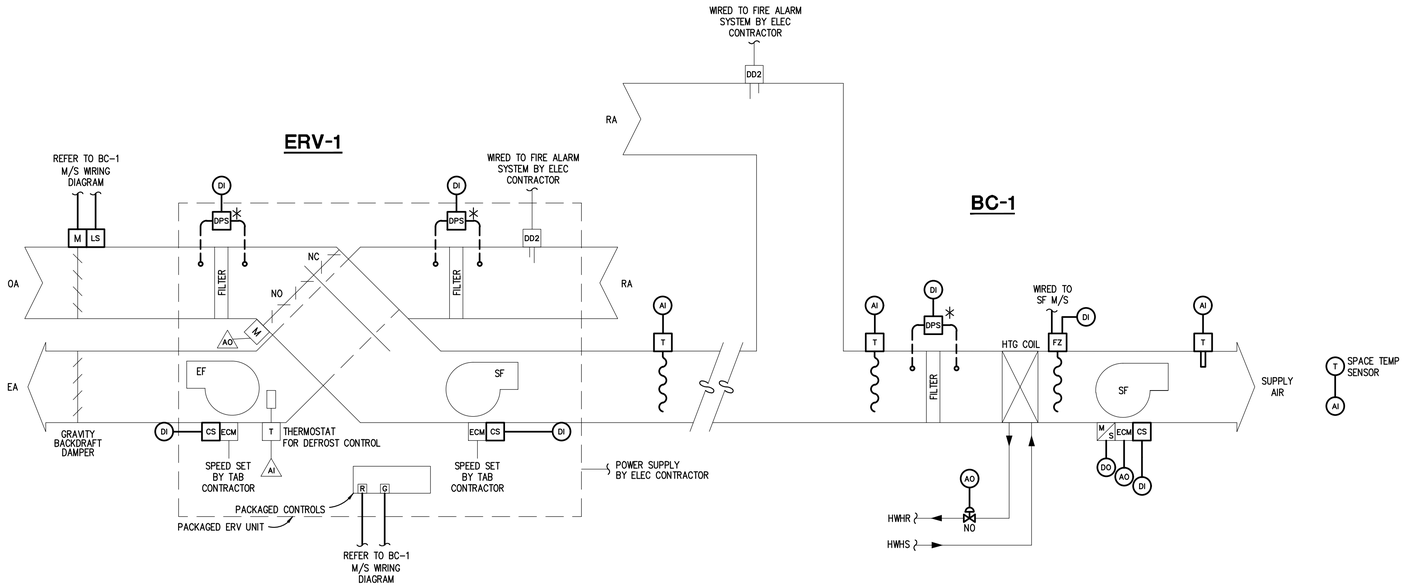
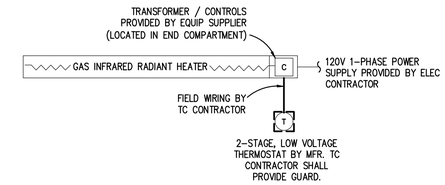


GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.



GAS INFRARED RADIANT HEATER CONTROL

TYPICAL

SEQUENCE OF OPERATION

NOTES:

1. REFER TO FLOOR PLANS FOR LOCATION OF UNITS AND THERMOSTATS.
2. COORDINATE THERMOSTAT WIRING DETAILS AND TERMINATIONS REQUIREMENTS WITH EQUIPMENT SUPPLIER.
3. TC CONTRACTOR SHALL PROVIDE THERMOSTAT GUARD.

SEQUENCE OF OPERATION:

1. MFR'S 2-STAGE SPACE THERMOSTAT SHALL ENABLE/DISABLE GAS-FIRED INFRARED HEATING UNIT BASED ON THERMOSTAT SETPOINT TO MAINTAIN DESIRED SPACE TEMPERATURE.
2. SPACE TEMPERATURE SETPOINT IS ADJUSTABLE AT THE THERMOSTAT.

ERV-1/BC-1 CONTROLS

NOTES:

1. ✳ INDICATES PANEL MOUNTED COMPONENT.
2. DAMPERS SHALL BE FURNISHED AND FACTORY INSTALLED BY ERV MANUFACTURER. TC CONTRACTOR SHALL PROVIDE DAMPER ACTUATORS.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE FIRE ALARM SYSTEM COMPONENTS AND WIRING FROM FIRE ALARM PANEL TO CONTROL MODULE (CM). TC CONTRACTOR SHALL PROVIDE WIRING FROM CONTROL MODULE TO SAFETY CIRCUIT.
4. COORDINATE WIRING, TERMINATION, CONTROL, AND I/O REQUIREMENTS WITH EQUIPMENT MANUFACTURER. SPECIFIC CONTROL REQUIREMENTS MAY DIFFER SLIGHTLY DEPENDING ON EQUIPMENT MANUFACTURER.
5. TC CONTRACTOR SHALL ADJUST DPSs BASED ON THE FILTER MANUFACTURER'S LOADED FILTER DATA.

SEQUENCE OF OPERATION

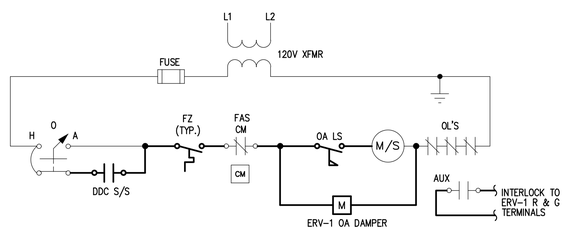
ENERGY RECOVERY UNIT CONTROL:

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

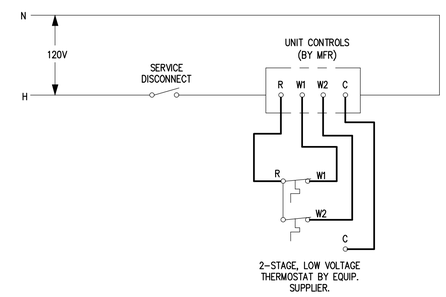
1. ERV-1 SUPPLY FAN (SF), ERV-1 EXHAUST FAN (EF), AND BC-1 SF SHALL HAVE START/STOP CAPABILITY FROM THE DDC/BAS SYSTEM.
2. ERV-1/BC-1 (THE SYSTEM) SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE COMPENSATED BY OPTIMUM START PROGRAM AND UNOCCUPIED CYCLE MODE.
3. SFs AND EF STATUSES SHALL BE MONITORED BY DDC SYSTEM THRU RESPECTIVE CURRENT SWITCHES. ALL CURRENT SWITCHES SHALL PROVIDE FEEDBACK TO ENABLE TEMPERATURE CONTROLS. ABNORMAL STATUS CONDITION FOR ANY FAN SHALL ACTIVATE AN ALARM AT THE BAS.
4. WHEN THE SYSTEM IS ACTIVATED DURING OCCUPIED MODE, ERV-1 OA DAMPER SHALL OPEN, ERV-1 SF & EF SHALL RUN, AND BC-1 SF SHALL RUN. ERV-1 PROVIDE DISCHARGE AIR BASED ON OA TEMPERATURE AND RA TEMPERATURE FROM THE SPACE. DDC MODULATE BC-1 HWH COIL VALVE TO MAINTAIN SPACE TEMPERATURE SETPOINT.
5. ERV-1 PACKAGED DEFROST CYCLE SHALL BE ACTIVATED WHEN ERV-1 PLATE EXHAUST AIR TEMPERATURE DROPS BELOW FACTORY SETPOINT.
6. DDC SHALL MONITOR ALL SENSORS AND DEVICES FOR BAS DISPLAY.
7. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 70°F
8. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF AND EF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
9. ERV-1 FREEZESTAT SHALL DEACTIVATE ERV-1 AND BC-1 FANS. DDC SHALL CLOSE BC-1 HWH COIL VALVE TO THE COIL.
10. ERV-1 OA AND EA, AND BC-1 FILTER STATUSES SHALL BE MONITORED BY DDC SYSTEM THRU DIFFERENTIAL PRESSURE SWITCHES. FILTER STATUS ALARMS SHALL BE MONITORED BY DDC SYSTEM.
11. WHEN ERU IS DEACTIVATED, OA DAMPER SHALL CLOSE, AND ALL FANS SHALL TURN OFF.
12. IN UNOCCUPIED MODE, DDC SHALL NIGHT CYCLE THE SYSTEM TO MAINTAIN UNOCCUPIED HEATING SETPOINT WITH A 4°F DEADBAND.

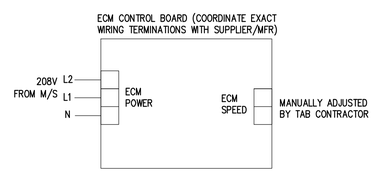


BC-1 SF M/S WIRING

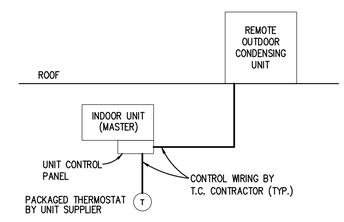


GAS INFRARED RADIANT HEATER CONTROL WIRING

TYPICAL



BC-1 SF ECM WIRING



PACKAGED ACU FIELD WIRING & CONTROL

TYPICAL

NOTES:

1. INSTALLATION CONTRACTOR SHALL PROVIDE FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE REMOTE CONDENSER.
2. INSTALLATION CONTRACTOR SHALL INSTALL THERMOSTAT PROVIDED BY ACU SUPPLIER AND PROVIDE REQUIRED FIELD WIRING.
3. INSTALLATION CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.

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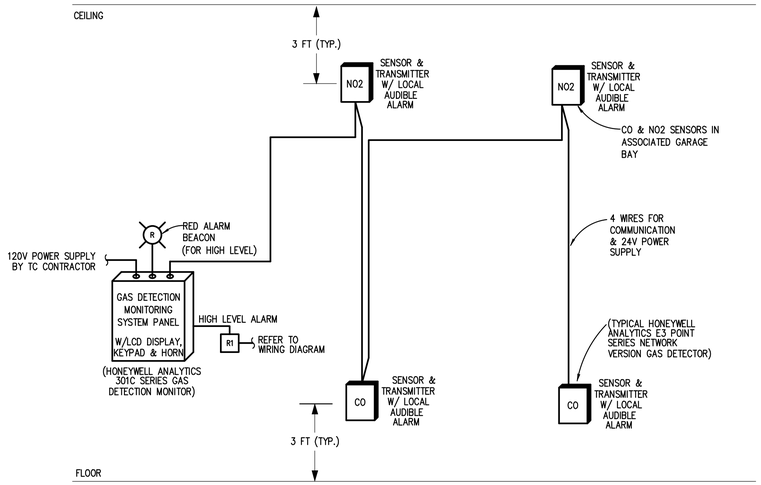


GAS DETECTION MONITORING SYSTEM CONTROLS

ASSOCIATED WITH GARAGE AREA

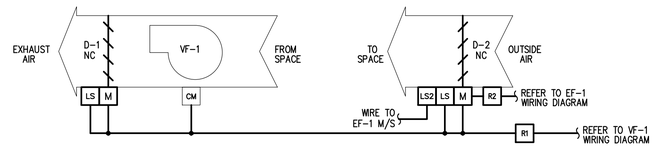
NOTES:

1. REFER TO MECHANICAL FLOOR PLANS FOR SENSORS AND DEVICE QUANTITIES & LOCATIONS.
2. TC CONTRACTOR SHALL PROVIDE GAS DETECTION MONITORING SYSTEM & SENSORS AS SPECIFIED.
3. THE REPRESENTATIVE OF THE GAS DETECTION SYSTEM MANUFACTURER SHALL PROVIDE RESPECTIVE CO AND NO2 ALARM LIMITS FOR THE OPERATION AND PROGRAMMING OF THE CONTROLLER.
4. PER MMC-2015, CO SHALL NOT EXCEED 25PPM AND NO2 SHALL NOT EXCEED 3PPM.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

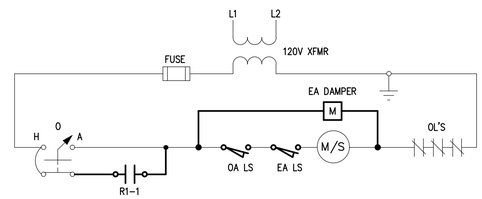
1. WHEN THE GAS DETECTION SYSTEM IS IN "NORMAL" MODE (NO GAS DETECTED), VF-1 SHALL REMAIN OFF.
2. WHEN GAS IS DETECTED, PURGE MODE SHALL BE ACTIVATED BY GAS DETECTION SYSTEM'S DRY CONTACT CLOSURE FOR HIGH LIMIT ALARM. CONTROL RELAY R1 IS ENERGIZED, INTERLOCK WIRING OPENS THE DAMPERS, WHEN LIMIT SWITCHES MAKE, VF-1 SHALL BE ENERGIZED.
3. WHEN GAS DETECTION SYSTEM'S CONTACT CLOSES, RELAY R1'S CONTACTS OPEN, VF-1 IS DE-ENERGIZED AND DAMPERS SHALL CLOSE.
4. IN PURGE MODE, VF-1 SHALL RUN UNTIL THE GAS DETECTION SYSTEM IS RESET BACK TO NORMAL OPERATION.



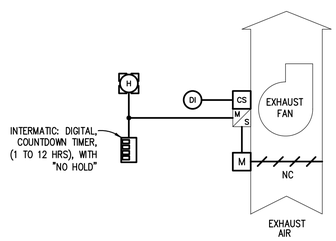
PURGE VENT FAN VF-1 CONTROL WIRING

SERVES THE APPARATUS BAY

SEQUENCE OF OPERATION: REFER TO GAS DETECTION MONITORING SEQUENCE OF OPERATION.

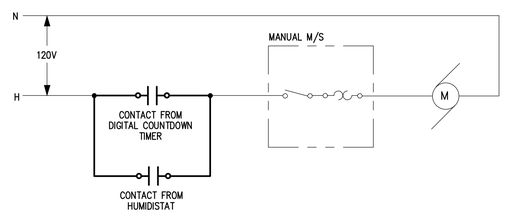


VF-1 M/S WIRING



SEQUENCE OF OPERATION

1. HOSE TOWER USER SHALL MANUALLY SELECT A RUN TIME FOR VF-2 USING THE DIGITAL TIMER. VF-2 SHALL RUN FOR THE PERIOD OF TIME SELECTED AND THEN SHUTOFF.
2. HUMIDISTAT SHALL OVERRIDE THE DIGITAL TIMER (IF OFF) AND RUN VF-2 UNTIL THE HUMIDITY DECREASES BELOW THE HUMIDISTAT'S SETPOINT. INITIAL SETPOINT SHALL BE 60% RH.



VF-2 M/S WIRING

GENERAL NOTES

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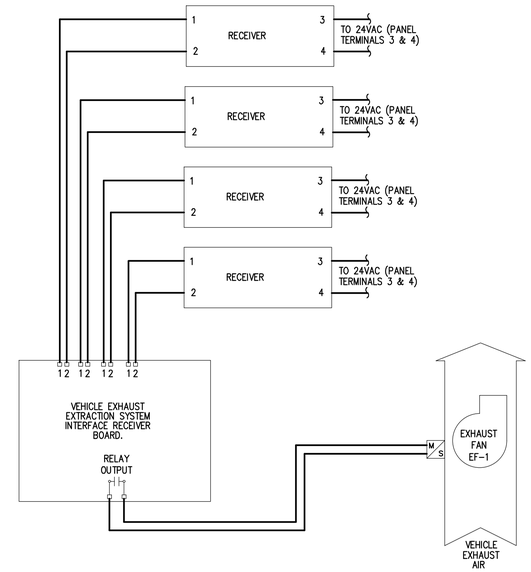


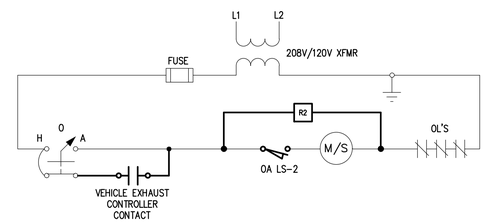
VEHICLE EXHAUST EF-1 SYSTEM WIRING

NOTE:

1. CONTRACTOR SHALL PROVIDE INTERLOCK WIRING AS INDICATED. COORDINATE WIRING REQUIREMENTS WITH EQUIPMENT SUPPLIER.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY VEHICLE EXHAUST SYSTEM CONTROLLER WHENEVER AN EXHAUST HOSE IS PLACED INTO USE.
2. WIRING INTERLOCK SHALL OPEN VENTILATION OUTSIDE AIR DAMPER ASSOCIATED WITH EF-1.



EF-1 M/S WIRING

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PROJECT NO.

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TEMPERATURE CONTROLS

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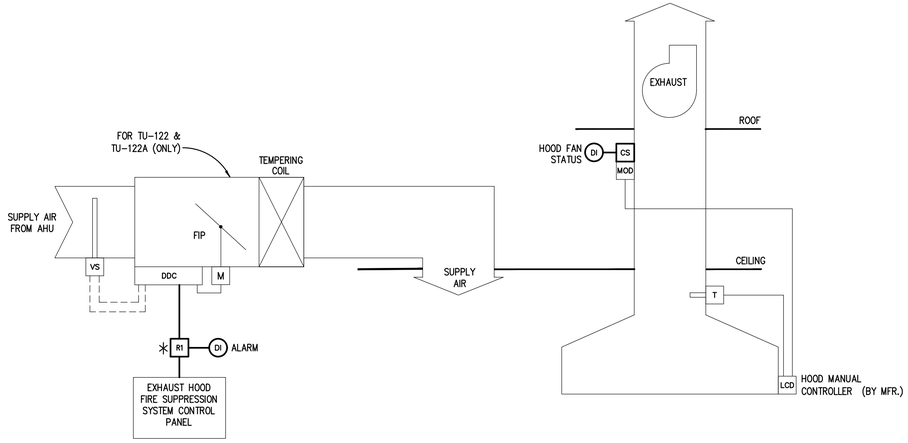


KITCHEN EXHAUST HOOD CONTROL

NOTES:

1. * INDICATES INDOOR PANEL MOUNTED COMPONENT. COORDINATE PANEL LOCATION WITH ARCHITECT.
2. TC CONTRACTOR SHALL COORDINATE WITH THE AUTHORITY HAVING JURISDICTION WHETHER EXHAUST WILL RUN AFTER FIRE SUPPRESSION SYSTEM ACTIVATION
3. TC CONTRACTOR SHALL COORDINATE WIRING AND TERMINATION REQUIREMENTS WITH SUPPLIERS.
4. TC CONTRACTOR SHALL PROVIDE WIRING FROM FIRE SUPPRESSION SYSTEM FOR INTERLOCK WIRING AND SIGNAL TO THE FSE CONTROLLER. COORDINATE WIRING AND TERMINATION REQUIREMENTS WITH SUPPLIER.

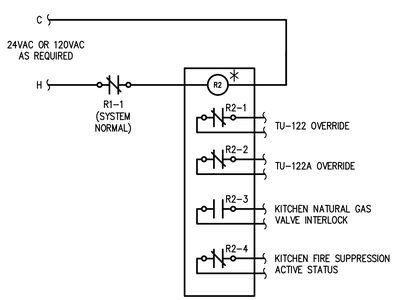
SEQUENCE OF OPERATION

NOTES:

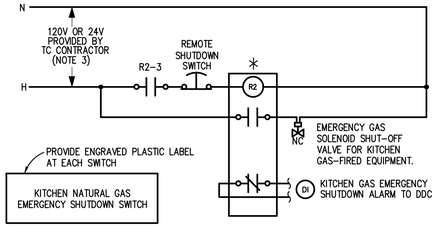
1. ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

SEQUENCE OF OPERATION:

1. KITCHEN HOOD IS MANUALLY ACTIVATED BY KITCHEN USER THROUGH MFR'S HUMAN MACHINE INTERFACE (HMI) OR HOOD THERMOSTAT(S).
2. WHEN DDC CURRENT SWITCH SENSES THAT THE HOOD FAN IS ENERGIZED, DDC SHALL COMMAND TU-120 AND TU-122A TO HIGHER CFM TO PROVIDE MAKEUP AIR.
3. WHEN DDC CURRENT SWITCH SENSES THAT THE HOOD FAN IS DE-ENERGIZED, DDC SHALL COMMAND TU-120 AND TU-122A TO NORMAL CONTROL.
4. IF FIRE SUPPRESSION SYSTEM ACTIVATES, INTERLOCK RELAY SHALL SIGNAL TU-122 AND TU-122A TO CLOSE THEIR RESPECTIVE FLOW CONTROL DAMPERS (0 CFM) REGARDLESS OF WHETHER THE KITCHEN EXHAUST FAN IS RUNNING OR NOT. INTERLOCK RELAY SHALL SIGNAL THE KITCHEN NATURAL GAS SHUTOFF VALVE TO CLOSE.



KITCHEN FIRE SUPPRESSION SYSTEM INTERLOCK WIRING



KITCHEN GAS SHUTDOWN WIRING

NOTES:

1. LOCATE AN EMERGENCY SHUTDOWN SWITCH SHOWN ON MECHANICAL DRAWINGS. COORDINATE SWITCH LOCATION WITH ALL OTHER TRADES.
2. TC CONTRACTOR SHALL PROVIDE SIGN (NAME PLATE) TO BE PLACED DIRECTLY ABOVE OR BELOW EACH PUSH BUTTON SWITCH THAT READS: "KITCHEN NATURAL GAS EMERGENCY SHUTDOWN SWITCH".
3. TC CONTRACTOR SHALL SUPPLY POWER TO CONTROL RELAY AND NATURAL GAS SOLENOID SHUT-OFF VALVE FROM COMMERCIAL POWER CIRCUIT. REFER TO ELECTRICAL PANEL SCHEDULES AND COORDINATE WITH ELECTRICAL CONTRACTOR AS NECESSARY. COORDINATE WITH THE ELECTRICAL CONTRACTOR TO PROVIDE A LOCKOUT AT THE CIRCUIT BREAKER.
4. TC CONTRACTOR SHALL MOUNT SHUTDOWN CONTROL RELAY IN AUX. CONTROL PANEL. TC CONTRACTOR SHALL WIRE NATURAL GAS SOLENOID SHUT-OFF VALVE THRU NORMALLY OPEN RELAY CONTACTS. TC CONTRACTOR SHALL COORDINATE EXACT WIRING AND TERMINATION REQUIREMENTS WITH BOILER MANUFACTURER.
5. TC CONTRACTOR SHALL PROVIDE PUSHBUTTON SWITCH (PUSH TO LATCH – TURN KEY TO RELEASE) WITH MUSHROOM HEAD OPERATOR AND NORMALLY CLOSED (NC) CONTACTS. PROVIDE WITH PROPER ENCLOSURE.

SEQUENCE OF OPERATION

1. THE FOLLOWING OCCURS WHEN FIRE SUPPRESSION SYSTEM INTERLOCK RELAY R1 IS NORMAL:

1.1. UNDER NORMAL OPERATING CONDITIONS, THE PUSHBUTTON CIRCUIT ENERGIZES RELAY R2 WHICH CLOSES THE NORMALLY OPEN (NO) CONTACTS AND OPENS THE NORMALLY CLOSED (NC) CONTACTS.

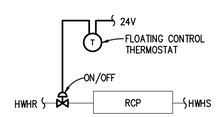
1.2. WHEN PUSHBUTTON IS ACTIVATED, RELAY R2 NO CONTACTS SHALL OPEN/INTERRUPT THE KITCHEN NATURAL GAS SOLENOID SHUT-OFF VALVE WHICH CLOSES THE VALVE.

1.3. WHEN PUSHBUTTON IS KEY-RELEASED, THE RELAYS' CONTACTS RE-ENERGIZE AND DEACTIVATES THE KITCHEN NATURAL GAS SOLENOID SHUT-OFF VALVE WHICH OPENS THE VALVE.

1.4. WHEN PUSHBUTTON IS ACTIVATED, DDC SHALL ACTIVATE AN EMERGENCY ALARM AT THE BAS.

1.5. WHEN PUSHBUTTON IS RE-ACTIVATED VIA KEYLOCKS, AND INTERLOCK RELAY R1 IS NORMAL, THE SYSTEM IS RESET TO NORMAL OPERATING MODE.

2. INTERLOCK RELAY R1 SHALL SIGNAL THE KITCHEN NATURAL GAS SHUTOFF VALVE TO CLOSE WHEN THE FIRE SUPPRESSION SYSTEM ACTIVATES. DDC SHALL ACTIVATE AN EMERGENCY ALARM AT THE BAS.



RADIANT CEILING PANEL CONTROL

TYPICAL FOR EXISTING UNITS

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. EXISTING CONVECTOR CONTROL VALVES SHALL BE REPLACED.

SEQUENCE OF OPERATION:

1. THERMOSTAT SHALL OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 68°F.
2. THERMOSTAT SHALL PROVIDE A 2°F DEADBAND FOR CONTROL.

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.

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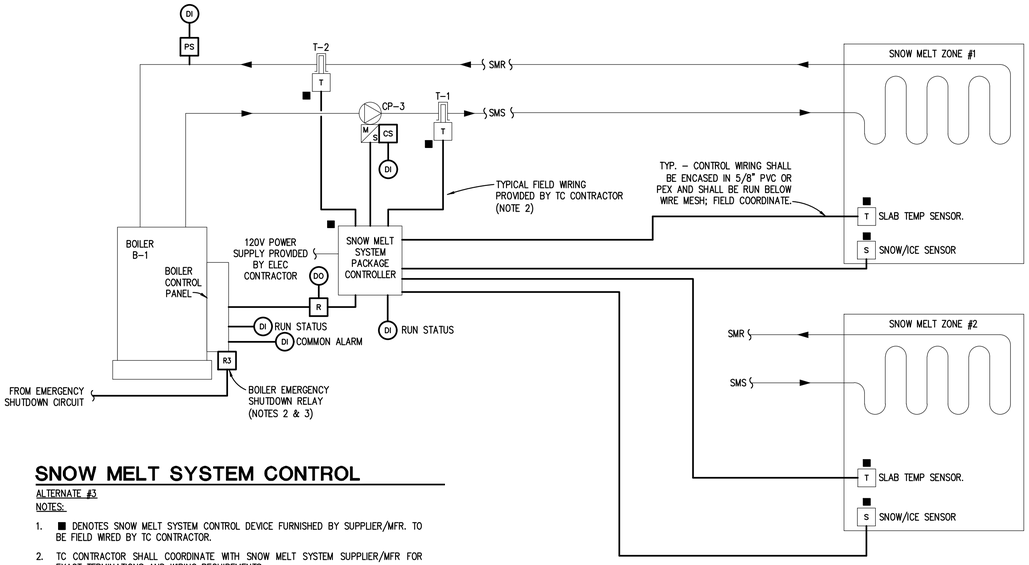


SNOW MELT SYSTEM CONTROL

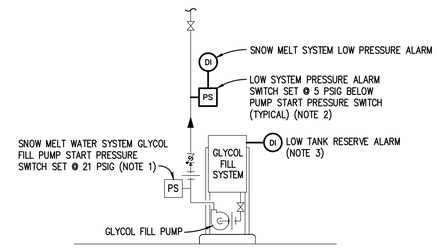
ALTERNATE #3

NOTES:

1. ■ DENOTES SNOW MELT SYSTEM CONTROL DEVICE FURNISHED BY SUPPLIER/MFR. TO BE FIELD WIRED BY TC CONTRACTOR.
2. TC CONTRACTOR SHALL COORDINATE WITH SNOW MELT SYSTEM SUPPLIER/MFR FOR EXACT TERMINATIONS AND WIRING REQUIREMENTS.
3. REFER TO MANUFACTURER'S MANUAL FOR A DETAILED DESCRIPTION OF OPERATION.

SEQUENCE OF OPERATION:

1. THE SNOW MELT SYSTEM SHALL BE OPERATED BY THE PACKAGED SNOW MELT CONTROL PANEL.
2. WHEN OUTDOOR AIR TEMP IS BELOW 37°F (ADJ.) THE SYSTEM IS ENABLED. DURING THIS TIME THE SYSTEM SHALL IDLE UNTIL MOISTURE IS SENSED. WHEN MOISTURE IS DETECTED, THE SYSTEM SHALL BECOME ACTIVE AND BE CONTROLLED TO MAINTAIN A SPECIFIC SLAB TEMPERATURE.
3. BOILER SHALL BE INTERLOCKED TO SNOW MELT SYSTEM CONTROL PANEL TO OPERATE ON DEMAND FOR HEAT. BOILER SHALL MAINTAIN A SUPPLY TEMPERATURE OF 120°F (ADJUSTABLE).
4. BOILER CONTROL PANEL SHALL OPERATE BOILER CIRC PUMP VIA INTERLOCK WIRING. DDC SHALL MONITOR SNOW MELT CIRC PUMP STATUS AND TOTALIZE RUN TIME HOURS OF OPERATION.
5. WHEN THE REMOTE MECH ROOM EMERGENCY SHUTDOWN SWITCH IS PUSHED, SNOW MELT BOILER BURNER CONTROLS SHALL BE DE-ENERGIZED THRU HARDWIRE INTERLOCK. REFER TO HWH SYSTEM TC DETAILS.
6. DDC SYSTEM SHALL MONITOR SMS PIPE PRESSURE AND GLYCOL FEED SYSTEM PRESSURE AND PROVIDE ALARMS TO THE BAS IF EITHER PRESSURES DROP BELOW INDIVIDUAL SETPOINTS.

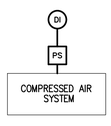


GLYCOL FILL STATION MONITORING

GLYCOL FILL STATION SERVES SNOW MELT SYSTEM

NOTES:

1. PUMP CONTROL PRESSURE SWITCH AND ASSOCIATED CONTROL WIRING ARE PROVIDED WITH GLYCOL FILL STATION.
2. PRESSURE SWITCH FOR ALARM MONITORING SHALL BE FURNISHED BY TC CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
3. DRY CONTACTS FOR REMOTE MONITORING OF LOW TANK RESERVE ALARM PROVIDED WITH GLYCOL FILL STATION.

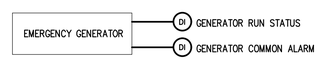


COMPRESSED AIR SYSTEM MONITORING

NOTE: TC CONTRACTOR SHALL PROVIDE PRESSURE SWITCH FOR AIR PRESSURE SENSING.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR PRESSURE SWITCH FOR LOW PRESSURE ALARM SYSTEM STATUS.



EMERGENCY GENERATOR MONITORING

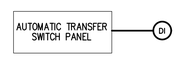
TYPICAL

NOTES:

1. DRY CONTACTS FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH GENERATOR SYSTEM. COORDINATE WIRING REQUIREMENTS WITH SYSTEM SUPPLIER.
2. REFER TO DRAWINGS FOR GENERATOR SYSTEM SYSTEM PANEL LOCATION.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR EACH GENERATOR SYSTEM FOR FOR BAS DISPLAY OF COMMON ALARM AND RUNNING STATUS.



AUTOMATIC TRANSFER SWITCH MONITORING

TYPICAL

NOTES:

1. DRY CONTACTS FOR REMOTE TRANSFER SWITCH MONITORING SHALL BE PROVIDED WITH SYSTEM. COORDINATE WIRING REQUIREMENTS WITH SYSTEM SUPPLIER.
2. REFER TO ELECTRICAL DRAWINGS FOR AUTOMATIC TRANSFER SWITCH (ATS) LOCATIONS.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR EACH ATS CONTACT FOR BAS DISPLAY INDICATING "ON COMMERCIAL POWER" AND "ON GENERATOR POWER."

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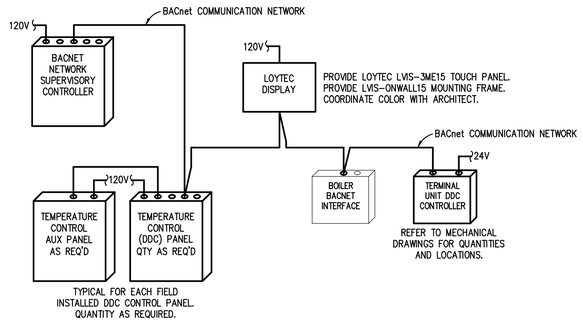


DDC SYSTEM ARCHITECTURE

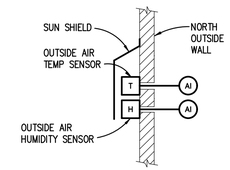
NO SCALE

NOTES:

1. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED DDC POINTS ASSOCIATED FOR EACH SYSTEM.
2. THE TC CONTRACTOR SHALL PROVIDE THE BUILDING AUTOMATION SYSTEM (BAS) FOR HVAC SYSTEMS AND ASSOCIATED AND/OR RELATED CONTROLS AND BACNET INTEGRATION OF HVAC AND RELATED SYSTEMS AND EQUIPMENT. THE TEMPERATURE CONTROLS (TC) CONTRACTOR SHALL PROVIDE THE ASSOCIATED COMPONENTS AS INDICATED.
3. TC CONTRACTOR SHALL DETERMINE DDC PANEL QUANTITY BASED ON POINT DENSITIES AND AVAILABLE MOUNTING SPACE, PANEL COMPONENTS, CONFIGURATION AND SIZE REQUIREMENTS WITH THE OWNER'S REPRESENTATIVE (OR ARCHITECT).
4. THE TC CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS FOR POWER SUPPLY TO HVAC SYSTEM CONTROLS AND COMMUNICATION WIRING FOR BAS INTEGRATION TO HVAC AND RELATED SYSTEMS AND EQUIPMENT. TC CONTRACTOR SHALL PROVIDE REQUIRED PROGRAMMING FOR HVAC SYSTEM CONTROLS. TC CONTRACTOR SHALL LOCATE DDC PANELS AND COORDINATE WITH OTHER TRADES.
5. TC CONTRACTOR SHALL PROVIDE REQUIRED 120V POWER SUPPLIES FROM SPARE CIRCUITS IDENTIFIED ON ELECTRICAL PANEL SCHEDULES. COORDINATE WITH ELECTRICAL CONTRACTOR. REFER TO ELECTRICAL DRAWINGS FOR PANEL SCHEDULES AND PANEL LOCATIONS.
6. TC CONTRACTOR SHALL PROVIDE 24V TRANSFORMERS AS REQUIRED FOR DDC CONTROLLERS LOCATED IN MECHANICAL OR ELECTRICAL ROOMS – COORDINATE LOCATIONS. MAXIMUM TRANSFORMER SIZE SHALL BE 100VA. PROVIDE ENCLOSURE(S) FOR TRANSFORMERS.
7. TC CONTRACTOR SHALL BE RESPONSIBLE TO INTEGRATE PROJECT RELATED HVAC CONTROLLERS PROVIDED BY EQUIPMENT MANUFACTURERS AS SHOWN ON M8 DRAWINGS FOR CONTROL BY BUILDING OPERATORS.
8. TC CONTRACTOR SHALL PROVIDE TIME OF DAY SCHEDULING FUNCTIONS, TRENDING, ALARM MONITORING, AND TREND DATA FOR CONTROLLERS THAT REQUIRE THEM.
9. BUILDING DDC NETWORK SHALL BE CONNECTED TO THE LOYTEC DISPLAY FOR OWNER'S USE TO MONITOR SYSTEMS/SUBSYSTEMS, TIME OF DAY SCHEDULES, ALARM REPORTS, CHANGE SETPOINTS, ETC. TC CONTRACTOR SHALL PROVIDE NETWORK COMMUNICATION CONTROLLER PANEL COMPATIBLE FOR THIS CONNECTION.
10. TC CONTRACTOR SHALL PROVIDE INTEGRATION OF 3RD PARTY HVAC EQUIPMENT CONTROLLERS PROVIDED BY HVAC EQUIPMENT MANUFACTURERS.
11. TC CONTRACTOR SHALL PROVIDE AUXILIARY PANEL FOR GAUGES, TRANSMITTERS, RELAYS, POWER TRANSFORMERS, ETC.
12. TC CONTRACTOR SHALL PROVIDE GRAPHICS ASSOCIATED WITH FIELD INSTALLED AND 3RD PARTY BACNET DDC CONTROLLERS FOR THE HVAC SYSTEM AND ASSOCIATED AND/OR RELATED CONTROLS.

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M8.1 APPLY TO THIS DRAWING.

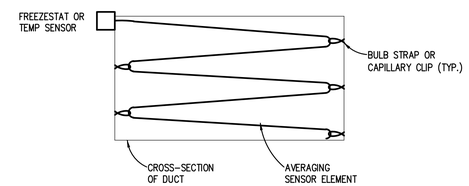


OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

1. TC CONTRACTOR SHALL PROVIDE THE OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR THE DDC/BAS.
2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE OF OPERATION REQUIREMENTS.
3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEW POINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.

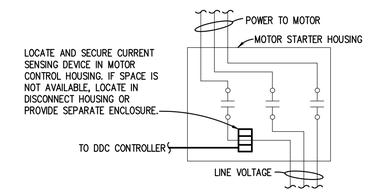


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

1. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS-SECTIONAL AREA.
2. AVERAGING DDC SENSOR QUANTITY SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS-SECTIONAL AREA.
3. PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT VIBRATION FROM AIR MOVEMENT.
4. PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO CAPILLARY.



CURRENT SWITCH INSTALLATION DETAIL

TYPICAL

NOTES:

1. WHERE INDICATED ON CONTROL DETAILS, CURRENT SWITCHES SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
2. AS APPLICABLE, CURRENT SWITCH SHALL BE ADJUSTED TO MEET THE CURRENT DRAW REQUIRED TO DETECT FAN BELT LOSS, PUMP COUPLING DETACHMENT, OR VFC LOSS.

SEQUENCE OF OPERATION:

1. WHEN FAN OR PUMP MOTOR IS ENERGIZED THROUGH ITS STARTER OR VFC, AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR BUILDING AUTOMATION SYSTEM GRAPHICS.

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ELECTRICAL SYMBOL LIST

(NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.)

SYMBOL	DESCRIPTION
FX (NL)	FIXTURE TYPE (NL INDICATES NIGHT LIGHT)
	LIGHTING FIXTURE
	DIRECT/INDIRECT LIGHTING FIXTURE
	EMERGENCY LIGHTING FIXTURE
	LIGHTING FIXTURE
	WALL MOUNTED LIGHTING FIXTURE
	LIGHTING FIXTURE
	RECESSED OR SURFACE MOUNTED DIRECTIONAL LIGHTING FIXTURE
	PENDANT LIGHTING FIXTURE
	WALL SCONCE
	LIGHTING TRACK
	TRACK LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE
	POLE MOUNTED LIGHTING FIXTURE - POST TOP
	BOLLARD LIGHTING FIXTURE
	EMERGENCY LIGHTING UNIT
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE WITH DIRECTIONAL ARROWS (SHADED AREA INDICATES FACE)
	EXIT LIGHTING FIXTURE - WALL MOUNTED
	EXIT/EMERGENCY LIGHTING COMBO
ALCR	AUTOMATIC LOAD CONTROL RELAY
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
LC	LIGHTING CONTROL DEVICE - REFER TO LIGHTING CONTROL SCHEDULE
XX	ROOM CONTROL DESIGNATION - REFER TO LIGHTING CONTROL SCHEDULE
S	SINGLE POLE TOGGLE SWITCH
S2	TWO POLE TOGGLE SWITCH
S3	3 WAY TOGGLE SWITCH
S4	4 WAY TOGGLE SWITCH
K	KEY OPERATED SWITCH
K3	3 WAY KEY OPERATED SWITCH
K4	4 WAY KEY OPERATED SWITCH
D	DIMMER SWITCH
DO	DIMMER OCCUPANCY SENSOR SWITCH
DL	LOW VOLTAGE DIMMER SWITCH
D3	3 WAY DIMMER SWITCH
SP	PILOT SWITCH
ST	DIGITAL TIME SWITCH
SI	ILLUMINATED TOGGLE SWITCH FOR CONTROL OF LIGHTING ON CRITICAL POWER-ILLUMINATED WHEN SWITCH IS IN "OFF" POSITION
SL	LOW VOLTAGE SWITCH
SO	OCCUPANCY SENSOR
SO2	OCCUPANCY SENSOR - REFER TO ELECTRICAL STANDARD SCHEDULE
OS X	OCCUPANCY SENSOR - REFER TO ELECTRICAL STANDARD SCHEDULES - "X" INDICATES TYPE
TWC	TWO-WAY COMMUNICATION SYSTEM CALL STATION
TWCD	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER
TWCA	TWO-WAY COMMUNICATION SYSTEM ANNUNCIATOR & COMMUNICATION PANEL
TWCP	TWO-WAY COMMUNICATION SYSTEM POWER SUPPLY WITH BATTERY BACK-UP
TWCDP	TWO-WAY COMMUNICATION SYSTEM AUTO DIALER POWER SUPPLY WITH BATTERY BACK-UP
RGP	REMOTE GENERATOR ANNUNCIATOR PANEL
ATS	AUTOMATIC TRANSFER SWITCH
UPS	UNINTERRUPTIBLE POWER SUPPLY
CSX	LOW VOLTAGE CONTROL STATION "X" INDICATES TYPE
	SINGLE / DUPLEX RECEPTACLE OUTLET "X" INDICATES TYPE
	SINGLE / DUPLEX RECEPTACLE OUTLET CONTROLLED BY AUTOMATIC CONTROL DEVICE / SYSTEM
	QUAD RECEPTACLE OUTLET
	ABOVE COUNTER DUPLEX RECEPTACLE (SIMILAR FOR TAMPER RESISTANT, QUADS, EMERGENCY AND GFCI RECEPTACLES)
	DUPLEX RECEPTACLE-GROUND FAULT CIRCUIT INTERRUPTER
	DEAD FRONT-GROUND FAULT CIRCUIT INTERRUPTER
	DUPLEX EMERGENCY RECEPTACLE OUTLET
	DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
	QUAD TAMPER RESISTANT RECEPTACLE OUTLET
	ABOVE COUNTER DUPLEX TAMPER RESISTANT RECEPTACLE OUTLET
	DUPLEX UPS RECEPTACLE
	DUPLEX RECEPTACLE WITH 2 USB PORTS OUTLET
	USB 4 PORT CHARGING STATION
	CEILING MOUNTED DUPLEX / QUAD RECEPTACLE
	POWER POLE
X	WALL / CEILING MOUNTED SPECIAL RECEPTACLE - REFER TO ELECTRICAL STANDARD SCHEDULES
	MULTI-OUTLET SURFACE RACEWAY
"X"	MULTI-SERVICE DROP SEE ELECTRICAL DETAILS AND DIAGRAMS SHEET "X" INDICATES TYPE
PTX	POKE-THROUGH ASSEMBLY "X" INDICATES TYPE
FBX	FLOOR SERVICE FITTING "X" INDICATES TYPE
AFX	ACCESS FLOOR SERVICE FITTING "X" INDICATES TYPE
RX	CORD REEL "X" INDICATES TYPE
S	DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S3	3-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
S4	4-WAY DUAL SWITCHING FOR INNER/OUTER LAMPS OF FLUORESCENT LIGHT FIXTURES
	TIME CLOCK
C	CONTACTOR
P	PHOTOCELL
TT	TWIST TIMER
CP	CONTROL PANEL
	MOTOR
VFC	VARIABLE FREQUENCY CONTROLLER
	MANUAL CONTROLLER
	MAGNETIC CONTROLLER
	COMBINATION MAGNETIC CONTROLLER
	NON-FUSIBLE DISCONNECT SWITCH
	FUSIBLE DISCONNECT SWITCH
CB	ENCLOSED CIRCUIT BREAKER
	PUSH BUTTON STATION
J	JUNCTION BOX
	HARD WIRE POWER CONNECTION
	GROUND ROD
	GROUND CONNECTION
X	CONDUIT SLEEVE WITH BUSHINGS LENGTH AS REQUIRED "X" INDICATES CONDUIT SIZE
HH	HANDHOLE
	CONDUIT UP
	CONDUIT DOWN
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET
	EMPTY BOX FOR FUTURE TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP
	EMPTY BOX FOR FUTURE CEILING MOUNTED TELECOMMUNICATION OUTLET
X	TELECOMMUNICATION OUTLET "X" INDICATES TYPE
X	TELECOMMUNICATION OUTLET MOUNTED 8" ABOVE COUNTERTOP "X" INDICATES TYPE
X	TELECOMMUNICATION CEILING MOUNTED OUTLET "X" INDICATES TYPE
	TELECOMMUNICATION BACKBOARD
TGB	TELECOMMUNICATION GROUNDING BUS BAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUS BAR
IC	INTERCOM OUTLET
S	SPEAKER
S	SPEAKER - WALL MOUNTED
MIC	MICROPHONE
VC	VOLUME CONTROL
B	SIGNALING BELL
	SINGLE FACE CLOCK - CEILING MOUNTED
	SINGLE FACE CLOCK - WALL MOUNTED
	DOUBLE FACE CLOCK - CEILING MOUNTED
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER CEILING MOUNTED
	DOUBLE FACE CLOCK - WALL MOUNTED
S	DOUBLE FACE COMBINATION CLOCK/SPEAKER WALL MOUNTED
	SECURITY CAMERA
MD	MOTION DETECTOR
K	SECURITY KEY SWITCH
DC	DOOR CONTACT
KP	KEY PAD
CR	CARD READER
DB	DURESS PUSH BUTTON STATION
DE	DELAYED EGRESS
REX	REQUEST TO EXIT STATION
PP	AUTOMATIC DOOR PUSH PAD OPERATOR
DO	DOOR OPERATOR
DA	DOOR ACTUATOR
AC	ACCESS CONTROL STATION
ACCP	ACCESS CONTROL CONTROL PANEL
ACPS	ACCESS CONTROL POWER SUPPLY
	CIRCUIT BREAKER
	DRAWOUT CIRCUIT BREAKER MANUALLY/ OPERATED
	DRAWOUT CIRCUIT BREAKER ELECTRICALLY/ OPERATED
	SWITCH
	AUTOMATIC OR MANUAL TRANSFER SWITCH
	FUSE
	TRANSFORMER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LIGHTNING ARRESTOR
X	PANELBOARD "X" INDICATES PANELBOARD NAME
	GROUND
	STRESS CONE TERMINATION
K	SECURITY KEY INTERLOCK
G	ENGINE GENERATOR
M	UTILITY METER
EMU	ELECTRONIC METERING UNIT
A	AMMETER
V	VOLTMETER
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
SPD	SURGE PROTECTIVE DEVICE
CR	CONTROL RELAY
PRM	PHASE ROTATION MONITOR
	CAMLOK - MALE
	CAMLOK - FEMALE
TDR	TIME DELAY RELAY

REFER TO ELECTRICAL STANDARD SCHEDULES

SYMBOL	DESCRIPTION
F	MANUAL FIRE ALARM BOX
SD	SMOKE DETECTOR
DD	DUCT SMOKE DETECTOR
CO	CARBON MONOXIDE DETECTOR
RT	REMOTE TEST STATION (FOR DUCT DETECTOR)
TD	THERMAL DETECTOR
BD	PROJECTED BEAM DETECTOR
F	FIRE ALARM BELL
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE
XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F XX	FIRE ALARM COMBINATION VISUAL/ AUDIBLE NOTIFICATION APPLIANCE - CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
XX	FIRE ALARM VISUAL NOTIFICATION APPLIANCE CEILING MOUNTED "XX" INDICATES CANDELA RATING IF NO RATING SHOWN, APPLIANCE IS 15cd
F	FIRE ALARM AUDIBLE NOTIFICATION APPLIANCE - CEILING MOUNTED
F	FIREFIGHTERS PHONE JACK
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANEL
IM	ADDRESSABLE MONITORING MODULE
CM	ADDRESSABLE CONTROL MODULE
TS	TAMPER SWITCH
FS	FLOW SWITCH
DR	MAGNETIC DOOR RELEASE
	BRANCH CIRCUIT PANEL BOARD
	LOAD CENTER
	MOTOR CONTROL CENTER
T	TRANSFORMER
	DISTRIBUTION PANEL
GB	GROUND BUS
PB	PLUG IN BUSWAY
FB	FEEDER BUSWAY
	THERMAL OVERLOAD RELAY
	NORMALLY OPEN CONTACTS
	NORMALLY CLOSED CONTACTS
	N.O. PUSH BUTTON SINGLE CIRCUIT
	N.C. PUSH BUTTON SINGLE CIRCUIT
X-X	CABLE VAULT "X-X" INDICATES TYPE

ELECTRICAL DRAWING INDEX

SHEET NO.	SHEET TITLE
E0-01	ELECTRICAL STANDARDS AND DRAWING INDEX
E0-02	ELECTRICAL STANDARD SCHEDULES
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E2-01	GROUND FLOOR LIGHTING PLAN
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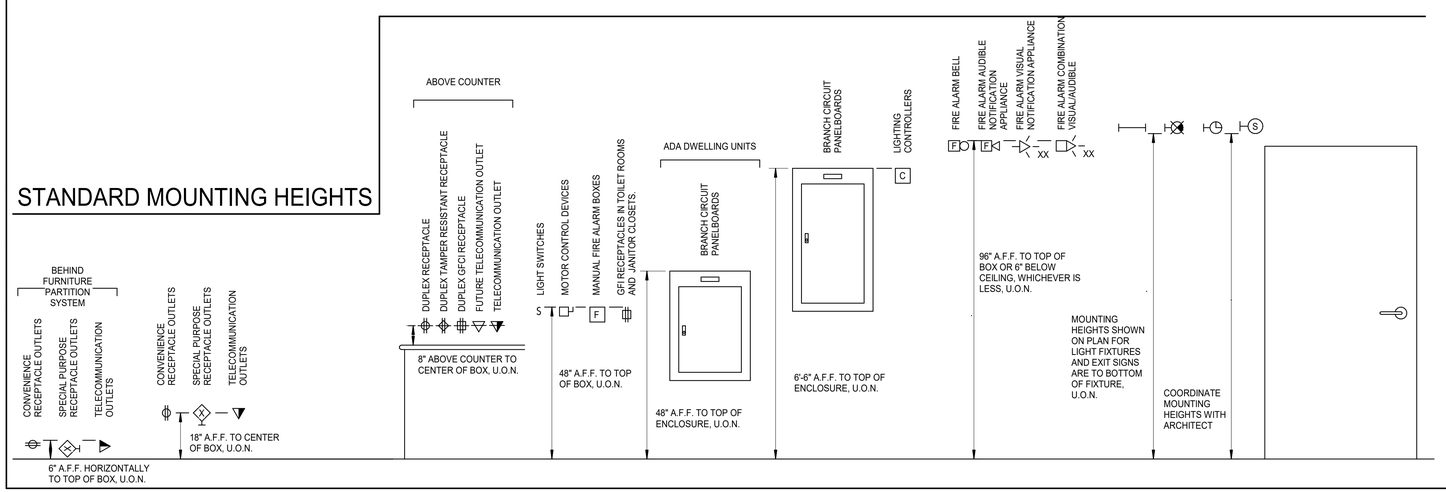
E7-01	ELECTRICAL DETAILS AND DIAGRAMS
E7-02	ELECTRICAL DETAILS AND DIAGRAMS
E7-03	ELECTRICAL DETAILS AND DIAGRAMS

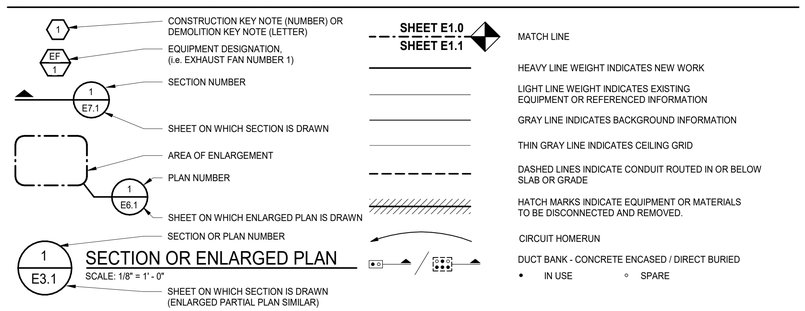
ELECTRICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
A	AMPERES
AER	ARC ENERGY REDUCTION
AF	AMPERES FRAME (BREAKER RATING)
AFCI	ARC FAULT CIRCUIT INTERRUPTER
A.F.F.	ABOVE FINISH FLOOR
AIC	AMPS INTERRUPTING CAPACITY
AL	AUDIENCE LEFT
ALCR	AUTOMATIC LOAD CONTROL RELAY
AR	AUDIENCE RIGHT
AT	AMPERES TRIP (BREAKER SETTING)
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BCELTS	BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH
BKR	BREAKER
BPS	BOLTED PRESSURE SWITCH
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DEMO	DEMOLITION
DIM	DIMENSION
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DS	DOWNSTAGE
DWG	DRAWING
EBU	EMERGENCY BATTERY UNIT
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRICAL
EM/ EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EO	ELECTRICALLY OPERATED
EPO	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
FA	FIRE ALARM
FLA	FULL LOAD AMPS
FLR	FLOOR
FOH	FRONT OF HOUSE
FSEC	FOOD SERVICE EQUIPMENT CONTRACTOR
FU	FUSE
G/GRD/EG	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND
JB	JUNCTION BOX
KA	THOUSAND AMP
KV	KILOVOLT
KVA	KILOVOLT - AMPERES
KW	KILOWATT
KWH	KILOWATT - HOURS
LA	LIGHTING ARRESTOR
LP	LIGHTING PANEL
LDP	LIGHTING DISTRIBUTION PANEL
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MIN	MINIMUM
MISC.	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MOP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
MTG	MOUNTING
MTR	MOTOR
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSIBLE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
P	POLE
PB	PUSHBUTTON STATION
PH	PHASE
PT	POTENTIAL TRANSFORMER
PDP	POWER DISTRIBUTION PANEL
RECEPT.	RECEPTACLE
RDP	RECEPTACLE DISTRIBUTION PANEL
RP	RECEPTACLE PANEL
RSC	RIGID STEEL CONDUIT
SCCR	SHORT CIRCUIT CURRENT RATING
SCHED	SCHEDULE
SPD	SURGE PROTECTION DEVICE
ST	SHUNT TRIP
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TERMINAL BOX
TELECOM	TELECOMMUNICATIONS
TR	TAMPER RESISTANT
TTP	TELEPHONE TERMINAL BACKBOARD
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
US	UPSTAGE
V	VOLTS
W	WIRE OR WATTS
WG	WIRE GUARD
WP	WEATHERPROOF
WR	WEATHER RESISTANT
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
(E)	EXISTING
(R)	RELOCATED

STANDARD MOUNTING HEIGHTS



STANDARD METHODS OF NOTATION



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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

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ELECTRICAL STANDARDS AND DRAWING INDEX

SHEET NO.

E0-01

6/12/2023 8:16:55 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

BRANCH CIRCUIT VOLTAGE DROP WIRING SCHEDULE FOR SINGLE PHASE CIRCUITS

BRANCH CIRCUIT RATING (A)	WIRE SIZE (AWG)	MAXIMUM BRANCH CIRCUIT LENGTH (IN FEET)				
		120V	208V	240V	277V	480V
20A	12	83	143	165	191	331
20A	10	128	222	256	295	511
20A	8	201	348	402	464	804
20A	6	313	542	625	721	1250
30A	10	85	148	170	197	341
30A	8	134	232	268	309	536
30A	6	208	361	417	481	833
30A	4	313	542	625	721	1250

GENERAL NOTES:
1. THE ABOVE TABLE VALUES ARE BASED ON COPPER CONDUCTORS, IN STEEL CONDUIT, WITH A LOAD POWER FACTOR OF 0.85 PER NEC CHAPTER 9, TABLE 9.
2. PROVIDE BRANCH CIRCUIT CONDUCTORS AS INDICATED IN THE TABLE ABOVE FOR ALL LIGHTING AND RECEPTACLE BRANCH CIRCUITS. WHERE BRANCH CIRCUITS SERVE DEDICATED EQUIPMENT, THE CONTRACTOR MAY PERFORM VOLTAGE DROP CALCULATIONS BASED ON ACTUAL EQUIPMENT CONNECTED LOAD AND PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO A MAXIMUM OF 3%.
3. CONDUCTOR SIZES ARE BASED ON MAXIMUM OF 9 CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT.
4. LIMITS FOR CONDUCTOR LENGTHS SHOWN ARE BASED ON A MAXIMUM BRANCH CIRCUIT LOADING OF 64% OF THE BRANCH BREAKER RATING AND A MAXIMUM OF 3 PERCENT VOLTAGE DROP TO COMPLY WITH ASHRAE 90.1 AND THE NEC. FOR CIRCUITS LOADED GREATER THAN 64% OF BRANCH BREAKER RATING, THE CONTRACTOR SHALL PROVIDE CONDUCTORS APPROPRIATELY SIZED TO LIMIT VOLTAGE DROP TO 3%.

NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT

OCCUPANCY SENSOR LEGEND

TYPE	DESCRIPTION
[OS]A	360° CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR

FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

OVERCURRENT DEVICE RATING (AMPERES)	COPPER CONDUCTORS						KEYED NOTES	ALUMINUM CONDUCTORS				
	WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE					WIRE SIZE (AWG OR KCMIL)		CONDUIT SIZE		
	PHASE & NEUTRAL	GROUND	SINGLE PHASE 2 WIRE+G (1PH, 1N, 1G; 2PH, 1G)	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)		PHASE & NEUTRAL	GROUND	SINGLE PHASE 3 WIRE+G (2PH, 1N, 1G)	THREE PHASE 3 WIRE+G (3PH, 1G)	THREE PHASE & NEUTRAL 4 WIRE+G (3PH, 1N, 1G)
15-20	12	12	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
25-30	10	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
35-40	8	10	3/4"	3/4"	3/4"	3/4"		N/A	N/A	N/A	N/A	N/A
45-50	8 (6)	10	3/4"	3/4"	3/4"	3/4"	1	N/A	N/A	N/A	N/A	N/A
60	6 (4)	10	3/4" (1")	3/4" (1")	3/4" (1")	1" (1 1/4")	1	N/A	N/A	N/A	N/A	N/A
70	4	8	1"	1 1/4"	1 1/4"	1 1/4"		N/A	N/A	N/A	N/A	N/A
80	4 (3)	8	1"	1 1/4"	1 1/4"	1 1/4"	1	N/A	N/A	N/A	N/A	N/A
90-100	3 (2)	8	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1	1	6	1 1/2"	1 1/2"	1 1/2"
110	2 (1)	6	-	1 1/4"	1 1/4"	1 1/4" (1 1/2")	1	1/0	4	1 1/2"	1 1/2"	2"
125	1 (1/0)	6	-	1 1/4" (1 1/2")	1 1/4" (1 1/2")	1 1/2"	1	2/0	4	1 1/2"	1 1/2"	2"
150	1/0	6	-	1 1/2"	1 1/2"	1 1/2"		3/0	4	2"	2"	2 1/2"
175	2/0	6	-	2"	2"	2"		4/0	4	2"	2"	2 1/2"
200	3/0	6	-	2"	2"	2 1/2"		250	4	2"	2"	3"
225	4/0	4	-	2"	2"	2 1/2"		300	2	2 1/2"	2 1/2"	3"
250	250	4	-	2 1/2"	2 1/2"	2 1/2"		350	2	2 1/2"	2 1/2"	3"
300	350	4	-	2 1/2"	2 1/2"	3"		500	2	3"	3"	3 1/2"
350	500	3	-	3"	3"	3"		2-4/0	2-1/0	2-2"	2-2"	2-2"
400	500	3	-	3"	3"	3"		2-250	2-1/0	2-2 1/2"	2-2 1/2"	2-2 1/2"
450	2-4/0	2-2	-	2-2"	2-2"	2-2 1/2"		2-300	2-1/0	2-2 1/2"	2-2 1/2"	2-3"
500	2-250	2-2	-	2-2 1/2"	2-2 1/2"	2-2 1/2"		2-350	2-1/0	2-2 1/2"	2-2 1/2"	2-3"
600	2-350	2-1	-	2-2 1/2"	2-2 1/2"	2-3"		2-500	2-2/0	2-3"	2-3"	2-3 1/2"
700	2-500	2-1/0	-	2-3"	2-3"	2-3"		2-600	2-3/0	2-3"	2-3"	2-3 1/2"
800	2-500	2-1/0	-	2-3"	2-3"	2-3 1/2"		3-400	3-3/0	3-3"	3-3"	3-3 1/2"
1000	3-400	3-2/0	-	3-3"	3-3"	3-3"		3-600	3-4/0	-	3-3 1/2"	3-3 1/2"
1200	3-600	3-3/0	-	3-3 1/2"	3-3 1/2"	3-3 1/2"		4-500	4-250	-	4-3"	4-3 1/2"
1600	4-600	4-4/0	-	4-3 1/2"	4-3 1/2"	4-3 1/2"		5-600	5-350	-	5-3 1/2"	5-4"
2000	5-600	5-250	-	5-3 1/2"	5-3 1/2"	5-3 1/2"		6-600	6-400	-	6-3 1/2"	6-4"

GENERAL NOTES:
1. CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.
2. CONTRACTOR MAY COMBINE 20A CIRCUITS AS NOTED IN SPECIFICATION.
3. COPPER CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. COPPER CONDUCTORS LARGER THAN #4/0 AND ALUMINUM CONDUCTORS ARE BASED ON XHHW-2.
4. CONDUIT SIZES ARE VALID FOR EMT OR RGS. CONDUIT SIZES SHALL BE ADJUSTED AS REQUIRED FOR OTHER TYPES OF CONDUIT.
5. ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE REQUIRED WIRE SIZES TO ACCOMMODATE MECHANICAL EQUIPMENT LUG SIZES.
6. SIZE OF DISCONNECT SWITCH LOCATED AT EQUIPMENT SHALL BE SIZED BASED UPON OVERCURRENT PROTECTION OF THAT DEVICE.
7. OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLING DIFFERENT SIZE/QUANTITY OF CONDUCTORS TO OBTAIN AN EQUIVALENT AMPACITY.
8. SPLICE FROM ALUMINUM TO COPPER PRIOR TO ENTERING EQUIPMENT LISTED FOR USE WITH COPPER CONDUCTORS ONLY OR USE COPPER CONDUCTORS FOR THE ENTIRE LENGTH OF FEEDER.
9. N/A = NOT ACCEPTABLE

KEYED NOTES:
1. CONDUCTORS ARE BASED ON 90°C, 600V. INSULATED WIRE APPLIED AT 75°C FOR TERMINATION RATED 60/75°C OR 75°C. FOR TERMINATION RATED AT 60°C, USE CONDUCTORS AND CONDUIT SIZES INDICATED IN PARENTHESES.

MOTOR CIRCUIT SIZING SCHEDULE (208V, 3 PHASE)

MOTOR HP	SWITCH/FUSE	CIRCUIT BREAKER	STARTER SIZE/TYPE	MOTOR DISCONNECT (NOTE 3)
1/2	30/6A	15A	1	30A
3/4	30/6A	15A	1	30A
1	30/10A	15A	1	30A
1 1/2	30/10A	15A	1	30A
2	30/10A	15A	1	30A
3	30/20A	20A	1	30A
5	30/25A	35A	1	30A
7 1/2	60/40A	50A	1	60A
10	60/50A	60A	2	60A
15	60/60A	90A	3	60A
20	100/90A	100A	3	100A
25	100/100A	110A	3	100A
30	200/125A	125A	4	200A
40	200/175A	175A	4	200A
50	200/200A	200A	5	200A
60	400/250A	250A	5	400A
75	400/300A	300A	5	400A
100	400/400A	400A	6	400A
125	600/500A	600A	6	600A
150	600/600A	600A	6	600A

MOTOR CIRCUIT SIZING SCHEDULE (120V, SINGLE PHASE)

MOTOR HP	CIRCUIT BREAKER	MANUAL MOTOR STARTER SIZE	COMBINATION STARTER SIZE	MOTOR DISCONNECT (NOTE 3)
1/6	15A	1 HP	0	20A
1/4	15A	1 HP	0	20A
1/3	15A	1 HP	0	20A
1/2	20A	1 HP	0	20A

RACEWAY / CONDUCTOR / CABLE APPLICATION SCHEDULE

	WIRE			RACEWAY												CABLE/CORD		
	COPPER, TYPE THHN/THWN-2	COPPER, TYPE XHHW-2	ALUMINUM, TYPE XHHW-2 (100A AND ABOVE ONLY)	ELECTRICAL METALLIC TUBING (EMT)	INTERMEDIATE METAL CONDUIT (IMC)	RIGID STEEL CONDUIT (RSC)	ALUMINUM RIGID CONDUIT	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-40	RIGID NON-METALLIC CONDUIT (RNC) TYPE EPC-80	HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 40	HIGH DENSITY POLYETHYLENE (HDPE) SCHEDULE 80	FLEXIBLE METAL CONDUIT (FMC)	LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC)	SURFACE RACEWAY	CABLE TRAY	METAL CLAD TYPE CABLE WITH INSULATED GROUND WIRE (TYPE MC)	VFC CABLE	CIRCUIT INTEGRITY CABLE (TYPE CI)
FEEDERS - EXTERIOR																		
EXPOSED, SURFACE MOUNTED TO STRUCTURE		X	X		X	X												
EXPOSED, WITH FREESTANDING SUPPORT		X	X		X	X												
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X	X			X		X	X									
BELOW PARKING LOTS AND ROADWAYS		X	X						X		X							
BELOW GREEN SPACE		X	X					X		X								
WITHIN 5' OF FOUNDATION WALL		X	X			X												
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X	X		X	X												
FEEDERS - INTERIOR																		
CONCEALED, ACCESSIBLE CEILINGS	X		X	X	X													
CONCEALED, INACCESSIBLE CEILINGS	X		X	X	X													
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X		X	X	X													
CONCEALED IN CMU WALLS	X		X	X	X													
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X		X		X	X												
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X		X	X	X													
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X		X	X	X													
EXPOSED, FINISHED SPACES	X		X	X	X									X				
BELOW SLAB ON GRADE	X		X			X		X	X									
DAMP AND WET LOCATIONS	X		X		X	X		X										
BRANCH CIRCUITS - EXTERIOR																		
EXPOSED, SURFACE MOUNTED TO STRUCTURE		X			X	X			X									
EXPOSED, WITH FREESTANDING SUPPORT		X			X	X												
CONCEALED IN RETAINING WALL OR SIMILAR ELEMENT		X				X		X										
BELOW PARKING LOTS AND ROADWAYS		X				X		X		X								
BELOW GREEN SPACE		X						X										
WITHIN 5' OF FOUNDATION WALL		X				X												
ROOFTOPS (WHEN APPROVED BY ENGINEER)		X			X	X												
BRANCH CIRCUITS - INTERIOR																		
CONCEALED, ACCESSIBLE CEILINGS	X			X	X											X		
CONCEALED, INACCESSIBLE CEILINGS	X			X	X													
CONCEALED IN GYPSUM BOARD PARTITION WALLS	X			X	X							X				X		
CONCEALED IN CMU WALLS	X			X	X													
EXPOSED, BELOW 10' AFF AND SUBJECT TO DAMAGE	X				X	X												
EXPOSED, BELOW 10' AFF AND NOT SUBJECT TO DAMAGE	X			X	X									X				
EXPOSED, ABOVE 10' AFF UNFINISHED SPACES	X			X	X													
EXPOSED, FINISHED SPACES	X													X				
BELOW SLAB ON GRADE	X						X											
EMBEDDED IN ELEVATED CONCRETE SLAB	X						X											
DAMP AND WET LOCATIONS	X				X	X		X					X					
SPECIAL APPLICATIONS																		
SERVICE ENTRANCE - UNDERGROUND		X	X					X	X	X	X							
SERVICE ENTRANCE - ABOVE GROUND		X	X	X	X	X												
CONNECTION BETWEEN VFC AND MOTORS (KEYED NOTE 1)																	X	
CLASS 1 CONTROL CIRCUITS	X			X	X	X												
CLASS 2 CONTROL CIRCUITS	X			X	X	X									X			
CLASS 3 CONTROL CIRCUITS	X			X	X	X									X			
CONNECTIONS TO TRANSFORMERS, MOTORS AND VIBRATING EQUIPMENT		X											X					

GENERAL NOTES:
1. TRANSITION FROM PVC/HDPE AND PROVIDE RIGID STEEL OR RTRC SWEEPS WHERE CONDUITS PENETRATE WALLS, CONCRETE SLABS, CONCRETE BASES, AND ASPHALT.
2. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON MC/AC CABLE INSTALLATION.
3. EMT SHALL NOT BE USED ON THE EXTERIOR OF A BUILDING OR IN AREAS SUBJECT TO DAMAGE BELOW 10' AFF.
4. INSTALL SURFACE RACEWAYS ONLY WHERE SHOWN ON DRAWINGS.

KEYED NOTES:
1. NON-ARMORED CABLE SHALL BE INSTALLED IN RACEWAY. ARMORED CABLE SHALL BE INSTALLED IN TRAY OR FREE-AIR AS APPLICABLE.
2. CONDUIT AND BUILDING WIRE ALLOWED WHEN ENCASED IN MINIMUM 2" CONCRETE.
3. EMERGENCY FEEDERS IN OCCUPANCIES THAT ARE UNDER 700.10(D) SHALL HAVE A TWO HOUR RATING. RATING SHALL BE OBTAINED BY ROUTING CONDUIT AND BUILDING WIRE IN SPRINKLERED SPACE, IN A TWO HOUR SHAFT, OUTSIDE OF THE BUILDING, IN A LISTED TWO HOUR RATED RACEWAY, OR UNDER A MINIMUM OF 2" OF CONCRETE; OR BY USING A LISTED TWO-HOUR RATED CABLE ASSEMBLY.
4. SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS BASED ON UL TESTING AND RATING.
5. FOR USE IN PATIENT CARE SPACES, SHALL NOT BE USED FOR LIFE SAFETY OR CRITICAL CIRCUITS EXCEPT WHERE PERMITTED BY NEC 517.
6. PULLING LUBRICANT SHALL NOT BE USED.
7. ALL CONDUIT, FITTINGS, AND OTHER ACCESSORIES SHALL BE NON-FERROUS.
8. ALL CONDUIT, FITTINGS, AND OTHER ACCESSORIES SHALL BE RATED FOR THE HAZARD CLASSIFICATION OF THE SPACE OR AREA.

FLOOR SERVICE FITTING SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER (SEE NOTE #2)	MODEL	DEVICE CONFIGURATION	FLANGE/COVER MATERIAL & COLOR	SERVICE PLATE TYPE	MINIMUM DEPTH	MAXIMUM CONDUIT
FB4D	MULTI FUNCTION FOUR GANG, MULTI SERVICE, STAMPED STEEL FOR SLAB ON GRADE APPLICATIONS, RECESSED FLOOR BOX. 2 DUPLEX RECEPTACLES AND 2 TELECOM OUTLETS, CARPET/TILE INSERT COVER.	WIREMOLD	RFB4E-OG	2D / 2T	BS,GY,BK,BZ,NK	F	3 1/2"	2"

PF = PARTITION FEED
D = DUPLEX RECEPTACLE
T = 2 TELECOM OPENINGS

BS = BRASS
AL = ALUMINUM
BK = BLACK
GY = GRAY (CONCRETE)
BZ = BRONZE
NK = NICKEL

FR = FLIP LID/RECTANGULAR
SL = SLIDES
F = FLIP COVER

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KEY PLAN

OWNER
City of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

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SHEET NAME
ELECTRICAL STANDARD SCHEDULES

SHEET NO.
E0-02

INTERIOR SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	REMARKS
L1	ARCHITECTURAL 2X2 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X2 – FLUL 22	48	UNV	2X2 RECESSED LED TROFFER, 3500K, 4000L, 80CRI	0–10V DIMMING, 10%	
L1A	ARCHITECTURAL 2X2 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X2 – FLUL 22	28	UNV	2X2 RECESSED LED TROFFER, 3500K, 2500L, 80CRI	0–10V DIMMING 10%	
L1B	ARCHITECTURAL 2X2 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X2 – FLUL 22	41	UNV	2X2 RECESSED LED TROFFER, 3500K, 3500L, 80CRI	0–10V DIMMING 10%	
L2	ARCHITECTURAL 2X4 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X4 FLUL 24	35	UNV	2X4 RECESSED LED TROFFER, 3500K, 3500L, 80CRI	0–10V DIMMING, 10%	
L2A	ARCHITECTURAL 2X4 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X4 FLUL 24	61	UNV	2X4 RECESSED LED TROFFER, 3500K, 5500L, 80CRI	0–10V DIMMING, 10%	
L2B	ARCHITECTURAL 2X4 RECESSED LED TROFFER WITH PERFORATED CENTER BASKET	FOCAL POINT LUNA 2X4 FLUL 24	48	UNV	2X4 RECESSED LED TROFFER, 3500K, 4500L, 80CRI	0–10V DIMMING, 10%	
L3	DOWNLIGHT	FOCAL POINT – FLC6D	17	120	6" DOWNLIGHT, LED, 3500K, 1500L, 80CRI	0–10V DIMMING, 10%	
L4	UTILITY LINEAR	LITHONIA LIGHTING – ZL1D	30	UNV	4' LINEAR, 3500K, 3000L, 80CRI	0–10V DIMMING, 10%	
L4A	UTILITY LINEAR	LITHONIA LIGHTING – ZL1D	59	UNV	4' LINEAR, 3500K, 7000L, 80CRI	0–10V DIMMING, 10%	
L4B	UTILITY LINEAR	LITHONIA LIGHTING – ZL1D	41	UNV	4' LINEAR, 3500K, 5000L, 80CRI	0–10V DIMMING, 10%	
L5	VANITY LIGHT	LITHONIA LIGHTING – FMVCSL SERIES	18	MULTI	2' WALL MOUNTED LINEAR, 1300L, 90CRI		
L6	SHOWER LIGHT 6" ROUND FLUSH LENS	FOCAL POINT ID+6" FLC6D	11	120	6" DOWNLIGHT, LED, 3500K, 1000L, 80CRI	0–10V DIMMING, 10%	
L7	LINEAR LED DIRECT/INDIRECT – CABLE HUNG PENDANT	FOCAL POINT SEEM 4	72	120/277	8' LINEAR, 625L DN/375L UP, 3500K, 8000L, 80CRI	0–10V DIMMING, 10%	
L7A	LINEAR LED DIRECT/INDIRECT – CABLE HUNG PENDANT	FOCAL POINT SEEM 4	75	120/277	12' LINEAR, 375L DN/275L UP, 3500K, 5200L, 80CRI	0–10V DIMMING, 10%	
L8	LINEAR ROUGH SERVICE 1X4 FROSTED LENS WET LOCATION	LITHONIA LIGHTING – VAP LED	67	UNV	1x4 LINEAR, LED, 3500K, 8000L, 80CRI	0–10V DIMMING 10%	
L8A	LINEAR ROUGH SERVICE 1X4 FROSTED LENS WET LOCATION	SAME AS TYPE L8 EXCEPT AS NOTED	33		4000L		
L9	LINEAR RECESSED FLUSH SATIN LENS	FOCAL POINT SEEM 4	104/8'	UNV	LINEAR, 375L/FT, 3500K, 80CRI	0–10V DIMMING, 10%	LENGTHS AS ON PLAN
L10	2X2 EDGE LIT LED FLAT PANEL	LITHONIA EPANL LED	30	MVOLT	2X2 RECESSED FLAT PANEL, LED, 3500K 3400L, 80CRI	0–10V DIMMING, 10%	
L11	BATHROOM OCCUPANCY INDICATING LIGHT	KENALL – MCSL	2	UNV	AMBER LED, VERTICAL RECTANGLE		
L12	1X4 LOW PROFILE ENCLOSED AND GASKETED WALL MOUNTED LED FROSTED LENS FIXTURE	LITHONIA LIGHTING – FEM LED	75	MVOLT	1X4 SURFACE WALL MOUNTED LED, 4000K, 12000L, 80CRI, WIDE DISTRIBUTION	0–10V DIMMING, 10%	
L13	LED COVE LIGHT FIXTURE	MARK ARCHITECTURAL LIGHTING, MARKCOVE SERIES 502	78	MVOLT	LED LINEAR COVE, ADJUSTABLE, 120 X 120 DISTRIBUTION 3500K, 80CRI MIN, 600L/FOOT	0–10V DIMMING, 1%	PROVIDE TOTAL LENGTH AS INDICATED.
L14	2' PANTRY LIGHT FIXTURE	DECO LIGHTING, DACH–LED ROUND ARCHITECTURAL CHANNEL	22	UNIV	2' LED SURFACE MOUNTED, 2350L, ROUND, 4000K	0–10V DIMMING, 10%	
X1	EXIT SIGN	LITHONIA LIGHTING – LRP	2	UNV	RED LETTERING, WHITE BACKGROUND, WHITE HOUSING, NICKEL CADMIUM BATTERY		MOUNTING & SIDES & ARROWS AS INDICATED

GENERAL NOTES:
1. REFER TO SPECIFICATIONS FOR DETAILED LIGHT FIXTURE CUT SHEETS.
2. WATTAGE LISTED IS FROM THE BASIS OF DESIGN MANUFACTURER.
3. FINISH TO BE APPROVED BY INTERIOR DESIGNER, ARCHITECT OR CLIENT.
4. ALL LUMINAIRES TO BE AS SPECIFIED OR EQUAL APPROVED BY PBA

INTERIOR LIGHTING CONTROL SCHEDULE

PLAN REFERENCE	ROOM TYPE	LOCAL CONTROL		CONTROL ON / OFF	SENSOR TYPE	TURN ON LIGHTING TO %	BI–LEVEL CONTROL	SENSOR PARTIAL OFF		SENSOR FULL OFF TIME	EMERGENCY LIGHTING CIRCUIT CONTROL	NOTES
		SWITCH TYPE	SWITCH CONTROL					TIME	%			
A	CORRIDOR (ALL OTHER CORRIDORS)	LOW VOLTAGE	ON–OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	NA	20 MIN	50%	15 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
B	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	NA	NA	20 MIN	BATTERY	
C	STORAGE ROOM (≥50 FT2 AND ≤ 1000 SQFT)	LOW VOLTAGE	ON–OFF	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	NA	NA	NA	15 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
D	ELECTRICAL/MECHANICAL ROOM	LOW VOLTAGE	ON–OFF	MANUAL ON / MANUAL OFF	NA	NA	NA	NA	NA	NA	BATTERY	
E	RESTROOM (ALL OTHER RESTROOMS)	LOW VOLTAGE	ON–OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	NA	NA	NA	20 MIN	BATTERY	
F	LOBBY (ALL OTHER LOBBIES)	LOW VOLTAGE	ON–OFF–DIM	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	20 MIN	50%	20 MIN	BATTERY	
H	GYMNASIUM/FITNESS CENTER (IN AN EXERCISE AREA)	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / MANUAL OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	NA	NA	20 MIN	BATTERY	
I	FIRE STATION – SLEEPING QUARTERS	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / MANUAL OFF	NA	FULL 100%	CONTINUOUS DIM	NA	NA	NA	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
J	EMERGENCY VEHICLE GARAGE	LOW VOLTAGE	ON–OFF	SENSOR ON / SENSOR OFF	NA	PARTIAL 75%	NA	NA	NA	20 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
K	LOUNGE/BREAKROOM (ALL OTHER LOUNGES/BREAKROOMS)	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	NA	NA	20 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
L	LAUNDRY/WASHING AREA	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	NA	NA	20 MIN	BATTERY	
M	ELECTRICAL/MECHANICAL ROOM	LOW VOLTAGE	ON–OFF	MANUAL ON / MANUAL OFF	NA	NA	NA	NA	NA	NA	BATTERY	
N	CONFERENCE/MEETING/MULTIPURPOSE ROOM	LOW VOLTAGE	ON–OFF	SENSOR ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	NA	20 MIN	50%	15 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
O	FOOD PREPARATION AREA	LOW VOLTAGE	ON–OFF	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	NA	20 MIN	NA	20 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
P	DINING AREA (ALL OTHER DINING AREAS)	LOW VOLTAGE	ON–OFF–DIM	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	20 MIN	NA	20 MIN	BATTERY	INTEGRATE LIGHTING CONTROL WITH BRIX STATION ALERTING SYSTEM WHERE INDICATED ON PLAN
Q	PARKING AREA, INTERIOR	LOW VOLTAGE	ON–OFF	MANUAL ON / MANUAL OFF	NA	FULL 100%	INTERMEDIATE STEP 50%	20 MIN	30%	NA	BATTERY	

NOTE:
1. REFER TO PLANS FOR LOCATION OF LOCAL CONTROL.
2. REFER TO PLANS FOR SCENE CONTROL.
3. NOT USED
4. NOT USED
5. CONTRACTOR SHALL PROVIDE FLOOR PLAN INDICATING SENSOR LOCATIONS OF CHOSEN CONTROL SYSTEM.
6. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE CHARACTERISTICS.

NA = NOT APPLICABLE

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EXTERIOR LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	REMARKS
OL1	LED PARKING LOT LIGHTING FIXTURE W/ 14'–0" POLE	LITHONIA LIGHTING – D SERIES SIZE 0	71	MVOLT	8447L, 4000K, 70CRI FORWARD THROW MEDIUM DISTRIBUTION, DARK BRONZE, WET LOCATION.		TIME CLOCK/ROOF PHOTOCELL PER OWNERS SCHEDULE
OL2	LED PARKING LOT LIGHTING FIXTURE W/ 12'–6" POLE	LITHONIA LIGHTING – D SERIES SIZE 0	71	MVOLT	8447L, 4000K, 70CRI FORWARD THROW MEDIUM DISTRIBUTION, DARK BRONZE, WET LOCATION.		TIME CLOCK/ROOF PHOTOCELL PER OWNERS SCHEDULE
OL3	FLAGPOLE LIGHTING	COOPER LUMIERE MONACO 3002A	25	UNV	INGROUND ADJUSTABLE LED 1307L, NARROW FLOOD, WITH DIFFUSED OPTICAL LENS, 4000K, 85CRI		TIME CLOCK/ROOF PHOTOCELL PER OWNERS SCHEDULE
OL4	EXTERIOR ARCHITECTURAL WALL SCONCE	LITHONIA LIGHTING – WST LED SERIES	25	MVOLT	3000L, 4000K, FORWARD THROW DISTRIBUTION		TIME CLOCK/ROOF PHOTOCELL PER OWNERS SCHEDULE
OL5	EXTERIOR WALL SCONCE	LITHONIA LIGHTING – WST LED SERIES	11	MVOLT	1500L, 4000K, FORWARD THROW DISTRIBUTION		PB PHOTOCONTROL
OL6	EXTERIOR DECORATIVE WALL SCONCE – 90"H X 7"W X 4"D	ALVA – TESSIE	58	120–277	1914L, 4000K, WET LOCATION	0–10V DIMMING. DIM FIXTURE TO 50% AT INSTALLATION	PB PHOTOCONTROL
OL7	EXTERIOR GOOSENECK	BARN LIGHT ELECTRIC CO – THE ORIGINAL INTEGRATED LED SERIES	16	120V	1250L, 4000K, WET LOCATION	0–10V DIMMING, 10%	PB PHOTOCONTROL
OL8	EXTERIOR WALL SCONCE	BEGA – 33590	3.8	120–277	89L, 4000K, WET LOCATION		PB PHOTOCONTROL
OL9	RECESSED DOWNLIGHT	LITHONIA LIGHTING – LDN3	14.3	MVOLT	1000L, 4000K, WET LOCATION	0–10V DIMMING, 10%	PB PHOTOCONTROL
OL10	EXTERIOR SMALL FLOODLIGHT, VANDAL SHEILD	EATON – STREETWORKS UFLD–S	26	MVOLT	2700L, 4000K, NEMA 3H X 3V SPOT, WET LOCATION	0–10V DIMMING, 10%	PB PHOTOCONTROL
OL11	30FT EXTERIOR SURFACE MOUNT LINEAR	MARK ARCHITECTURAL LIGHTING – S2LS	108	MVOLT	400L/FT, 4000K, WALL WASH DISTRIBUTION, WET LOCATION	0–10V DIMMING. DIM FIXTURE TO 50% AT INSTALLATION	PB PHOTOCONTROL

GENERAL NOTES:
1. REFER TO SPECIFICATIONS FOR DETAILED LIGHT FIXTURE CUT SHEETS.
2. WATTAGE LISTED IS FROM THE BASIS OF DESIGN MANUFACTURER.
3. FINISH TO BE APPROVED BY INTERIOR DESIGNER, ARCHITECT OR CLIENT.
4. ALL LUMINAIRES TO BE AS SPECIFIED OR EQUAL APPROVED BY PBA

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PBA Project No.: 2021J370.01

KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
SAM

CHECKED BY
EMG

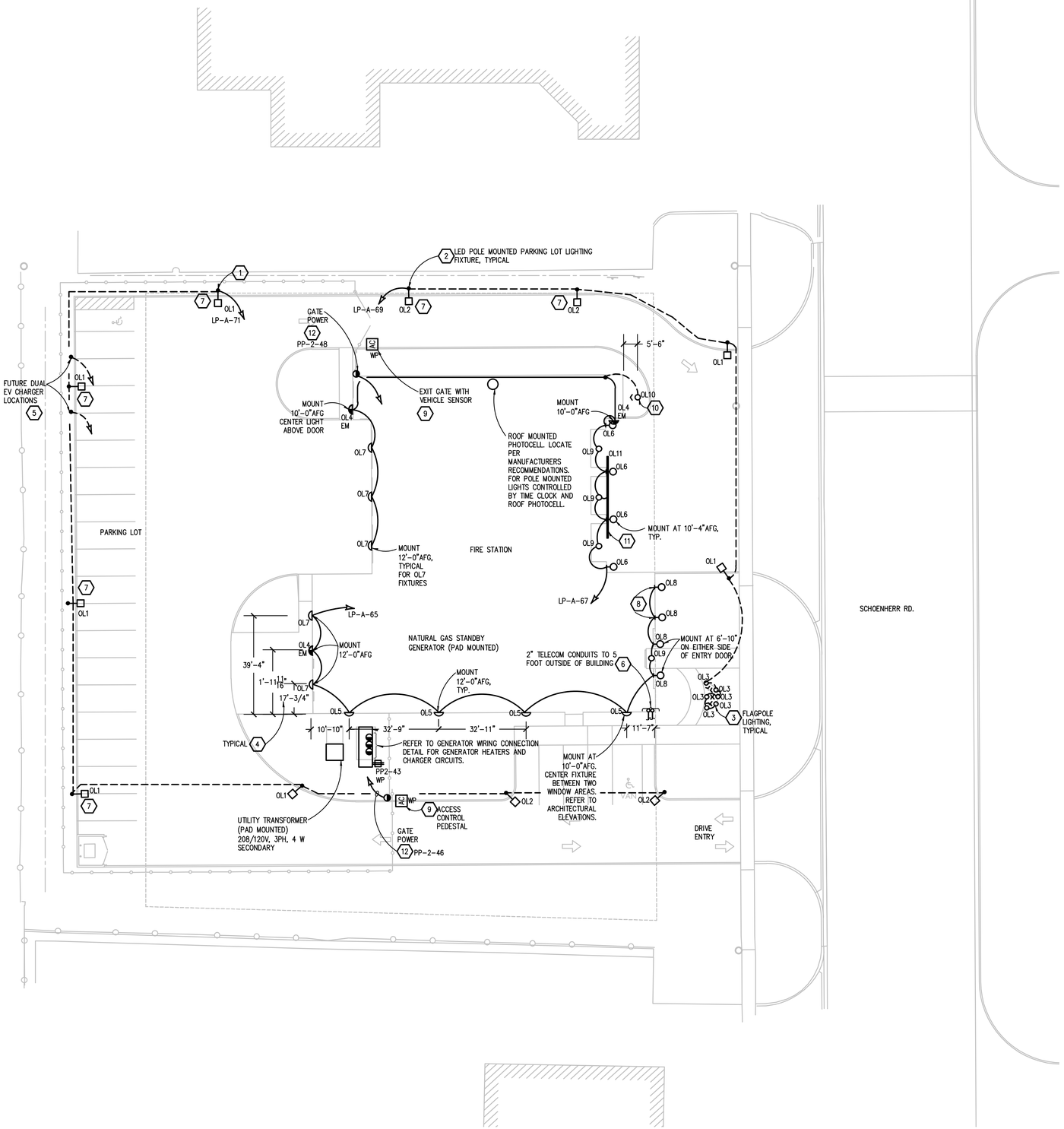
APPROVED BY
EMG

SHEET NAME
ELECTRICAL STANDARD SCHEDULES

SHEET NO.
E0-03

g:\2021\2021-0370-00\CAD\2021-0370-E0-SH.dwg, E0-03, 6/12/2023 8:08:45 AM, Nadeen F. Hamid, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



ELECTRICAL NEW WORK SITE PLAN

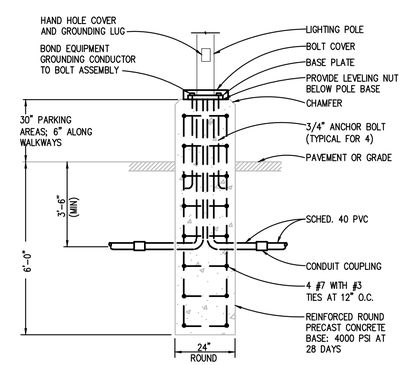
SCALE: 1" = 20'

SITE PLAN GENERAL NOTES:

1. THESE NOTES ARE GENERIC GUIDELINES ONLY. ELECTRICAL CONTRACTOR'S PERSONNEL ON SITE SHALL BE THOROUGHLY FAMILIAR WITH THE PUBLISHED SPECIFICATIONS FOR EXACT DESCRIPTIONS OF SCOPE, METHODS, AND MATERIAL.
2. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
3. CONDUCT A SURVEY TO IDENTIFY ALL UNDERGROUND UTILITIES. CALL 811 PRIOR TO EXCAVATION.
4. UTILITIES SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATION OF ALL EXISTING UTILITIES, AND ROUTING OF ALL NEW UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. DEWATER TRENCHES PRIOR TO INSTALLATION OF CONDUITS. PROVIDE WATER TIGHT FITTINGS ON ALL UNDERGROUND CONDUITS.
6. COORDINATE DEMOLITION WORK, AND ELECTRICAL AND TELEPHONE SERVICES TO THE SITE, WITH THE RESPECTIVE LOCAL UTILITY COMPANY REPRESENTATIVES PRIOR TO COMMENCEMENT OF WORK. INCLUDE ALL ASSOCIATED COST/FEES BY THE UTILITY COMPANIES IN THE BID PRICE.
7. INSTALL UNDERGROUND CONDUITS 42" BELOW FINISHED GRADE, MINIMUM, UNLESS NOTED OTHERWISE.
8. COORDINATE SERVICE SHUT-DOWNS WITH ALL TRADES INVOLVED ON SITE AND OBTAIN WRITTEN AUTHORIZATION FROM OWNER 72 HOURS PRIOR TO ANY ELECTRICAL AND/OR TELEPHONE SHUT-DOWN.
9. REMOVE ALL DE-ENERGIZED CONDUCTORS FROM SITE AT COMPLETION OF THE PROJECT.
10. OUTDOOR LIGHTING BRANCH CIRCUIT WIRING SHALL BE MINIMUM #8 AWG CONDUCTORS (XHHW-2), IN MINIMUM 1" DIA. CONDUIT, UNLESS NOTED OTHERWISE.
11. SPARE CONDUITS SHALL INCLUDE PULL STRING AND SHALL BE TERMINATED WITH A CAP.
12. EXCAVATE THE ENTIRE LENGTH OF TRENCH TO PROPERLY SET DUCT ELEVATIONS.

CONSTRUCTION KEY NOTES:

1. LIGHTING FIXTURE TYPE "OL1": OUTDOOR LIGHTING FIXTURE CONSISTING OF REINFORCED CONCRETE BASE, 14'-0" NOMINAL HEIGHT POLE SINGLE ARM MOUNTED LUMINAIRE. THE ENTIRE ASSEMBLY SHALL BE DESIGNED TO WITHSTAND A SUSTAINED WIND OF 80 MPH WITHOUT PERMANENT DAMAGE. LUMINAIRE SHALL BE 71 WATT LED WITH 120-277V DRIVER, 8447 LUMENS OUTPUT WITH 4000K COLOR, FORWARD THROW DISTRIBUTION. FUSES SHALL BE IN-LINE TYPE AND INSTALLED IN POLE BASE. DARK BRONZE FINISH. PROVIDE ALL ACCESSORIES AND HARDWARE FOR INSTALLATION INCLUDING POLE BASE BOT COVERS. POLE SHALL BE INTERNALLY COATED AT THE BASE WITH THERMO-PLASTIC RUS PREVENTING HYDRO-CARBON RESIN. PROVIDE WEATHERPROOF GFCI RECEPTACLE AT POLE WHERE INDICATED ON PLAN. LITHONIA #DSX0-LED-P3-40K-TFTM-MVOLT-DDBXD OR ENGINEEER-APPROVED EQUAL. LOCATE BASE APPROXIMATELY 3'-0" FROM EDGE OF PAVEMENT/SIDEWALK.
2. LIGHTING FIXTURE TYPE "OL2" SHALL BE SAME AS TYPE "OL1" EXCEPT WITH 12'6" POLE.
3. LIGHTING FIXTURE "OL3": IN-GROUND MOUNTED FLAGPOLE LIGHTING FIXTURES. POSITION PER MANUFACTURERS RECOMMENDATIONS. 2 FIXTURES PER POLE.
4. DIMENSIONS ARE APPROXIMATE. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT FIXTURE POSITIONS.
5. PROVIDE INDIVIDUAL 2" EMPTY CONDUIT ROUTED UNDERGROUND FROM MAIN ELECTRICAL ROOM TO INDICATED PARKING SPACES FOR FUTURE DUAL EV CHARGERS. STUB AND CAP CONDUIT 6 INCHES ABOVE GRADE, APPROXIMATELY 2' ABOVE AND BETWEEN HEAD OF PARKING SPACES. STUB AND CAP 6 INCHES ABOVE FIN FLOOR IN ELECTRICAL ROOM. PROVIDE LABEL "FOR FUTURE EV CHARGER WIRING AT PARKING LOT".
6. COORDINATE REQUIREMENTS WITH TELECOMMUNICATIONS UTILITIES.
7. PROVIDE HOUSE SIDE SHIELDS FOR INDICATED LIGHTING FIXTURES.
8. MOUNT (3) LEVELS OF OL8 FIXTURES (2 FIXTURES EACH LEVEL) CENTER ON WALL. MOUNT FIRST AT 6'-10"AFG, SECOND AT 17'-6"AFG, AND THIRD AT 31'-3"AFG. HEIGHTS ARE APPROXIMATE. COORDINATE WITH ARCHITECTURAL ELEVATIONS.
9. SECURITY/DOOR HARDWARE EQUIPMENT. REFER TO ARCHITECTURAL AND DOOR HARDWARE PLANS AND SPECIFICATIONS FOR EXT LOCATION AND DETAILED REQUIREMENTS. COORDINATE RACEWAY, BACKBOX, POWER, AND OTHER REQUIREMENTS.
10. AIM OL10 FIXTURE AT BUILDING SIGNAGE IN FIELD.
11. INSTALL OL11 FIXTURE BELOW TOP LEDGE CENTERED ABOVE SIGNAGE. COORDINATE EXACT LOCATION WITH ARCHITECTURAL ELEVATIONS.
12. PROVIDE GATE POWER. COORDINATE WITH ARCHITECTURAL SPECIFICATIONS AND SUPPLIER FOR FINAL REQUIREMENTS.



LIGHTING POLE BASE DETAIL

NO SCALE

NOTE:

1. PROVIDE PRECAST CONCRETE BASE AS MANUFACTURED BY NORTHERN CONCRETE PIPE, INC. OR APPROVED EQUAL.
2. CONCRETE REINFORCEMENTS SHALL BE BARE, ZINC GALVANIZED, OR ELECTRICALLY CONDUCTIVE COATED STEEL. BOND ALL CONCRETE REINFORCEMENTS AND ANCHOR BOLTS TOGETHER SO THAT SYSTEM IS ELECTRICALLY CONTINUOUS.

811 Know what's below. Call before you dig.

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PBA Project No.: 2021C070.01

KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

SHEET NAME

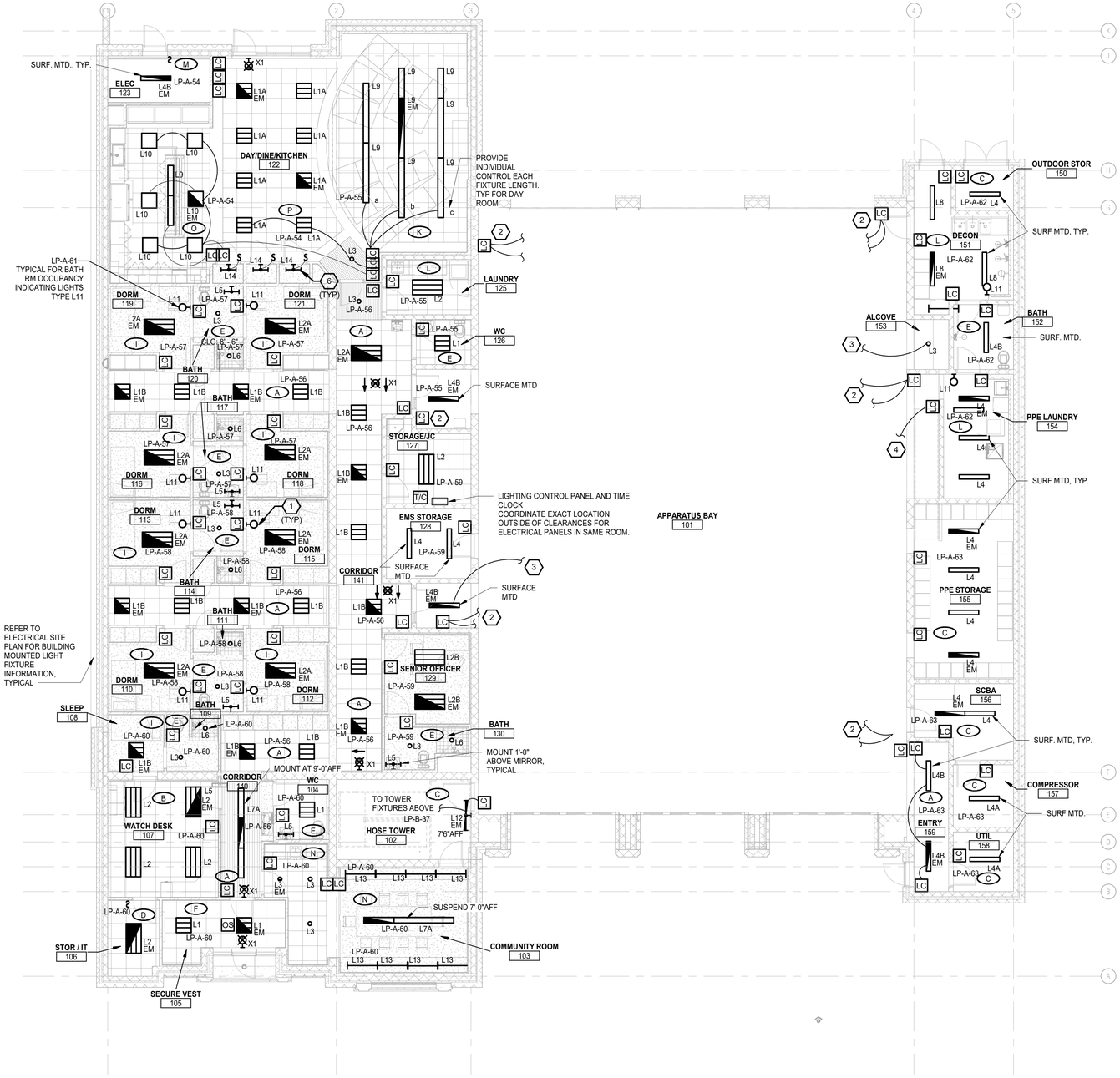
ELECTRICAL NEW WORK SITE PLAN

SHEET NO.

E0-04

g:\2021\2021-0370-00\CAD\01 station no. 5\2021-0370-01-E0-SP.dwg, E0-04, 6/12/2023 7:59:53 AM, Nadeen F. Hamid, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



GROUND FLOOR LIGHTING PLAN

SCALE: 1/8" = 1'-0"

ELECTRICAL GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
4. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
5. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
6. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
7. COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
8. COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
9. REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
10. REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
11. THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES, MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.
12. REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

CONSTRUCTION KEY NOTES:

1. WALL MOUNTED RECESSED INDICATOR LIGHT, WHITE FINISH, AMBER COLOR 2W LED LAMP, 120-277V DRIVER WIRED TO BATHROOM OCCUPANCY SENSOR. MOUNT AT 48 INCHES AFFF. ENALL #MCSL-VR-MW-2LAMB-DV OR APPROVED EQUAL.
2. LIGHTING CONTROL FOR APPARATUS BAY LIGHTS ABOVE.
3. CONNECT TO LIGHTING CIRCUIT FOR APPARATUS BAY LIGHTS ABOVE.
4. CONNECT TO MEZZANINE LIGHT FIXTURES AND LIGHTING CONTROL ABOVE.
5. REFER TO GROUND LEVEL PLAN FOR APPARATUS BAY LIGHTING CONTROL LOCATIONS
6. MOUNT PANTRY LIGHT ABOVE DOOR. LOCATE SWITCH IN DOOR FRAME. COORDINATE SWITCH TYPE AND EXACT LOCATION WITH ARCHITECT AND DOOR FRAME TYPE.

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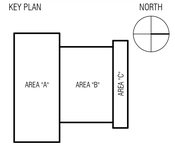
KEY PLAN



OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
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PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

SHEET NAME

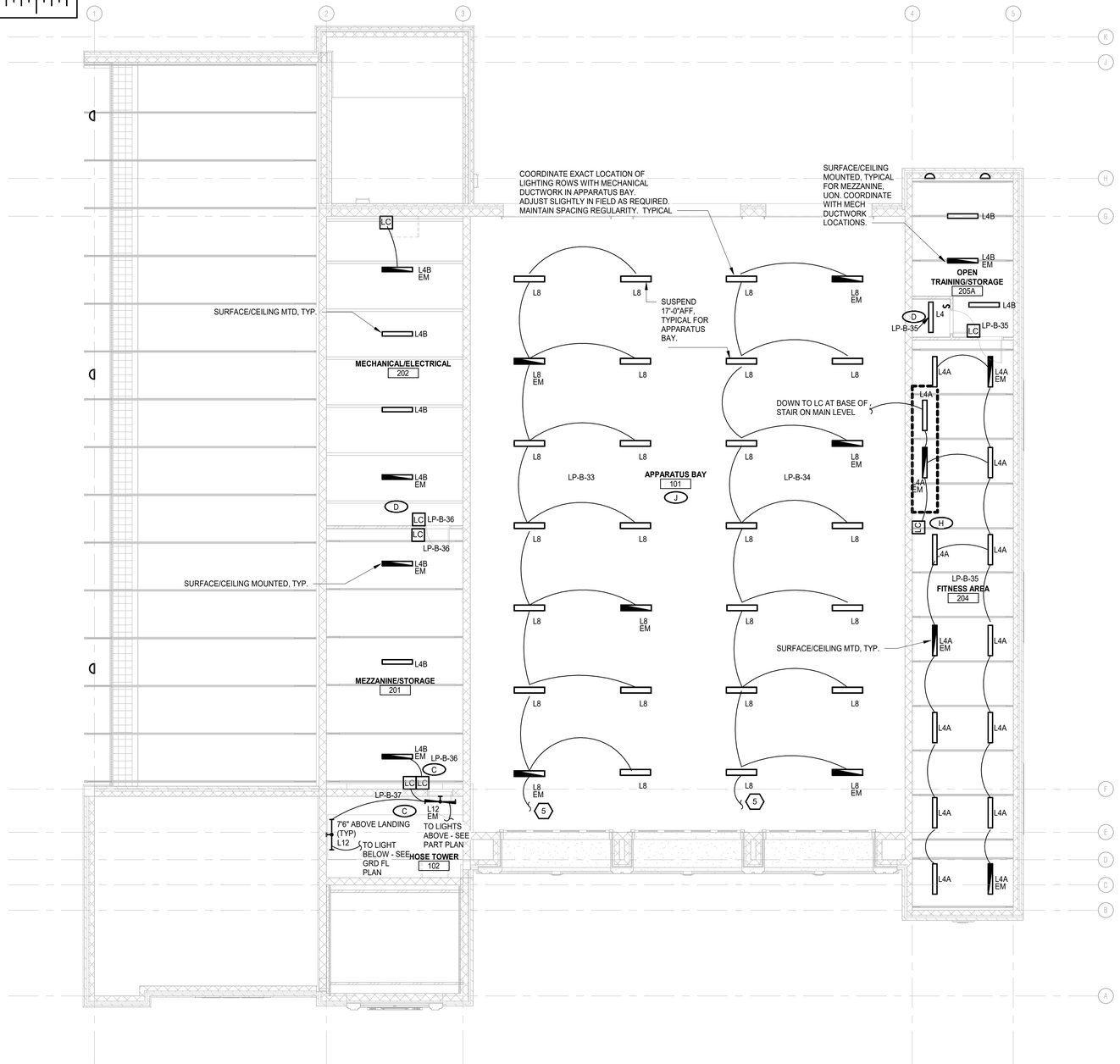
GROUND FLOOR LIGHTING PLAN

SHEET NO.

E2-01

6/12/2023 8:17:05 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



MEZZANINE LIGHTING PLAN

SCALE: 1/8" = 1'-0"

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7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

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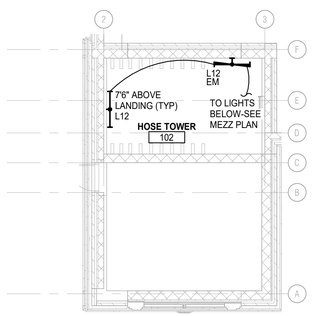

HOSE TOWER LIGHTING PLAN

SCALE: 1/8" = 1'-0"

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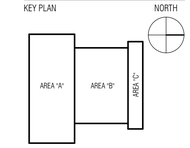
KEY PLAN



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21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

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APPROVED BY

EMG

SHEET NAME

MEZZANINE AND HOSE TOWER LIGHTING PLANS

SHEET NO.

E2-02

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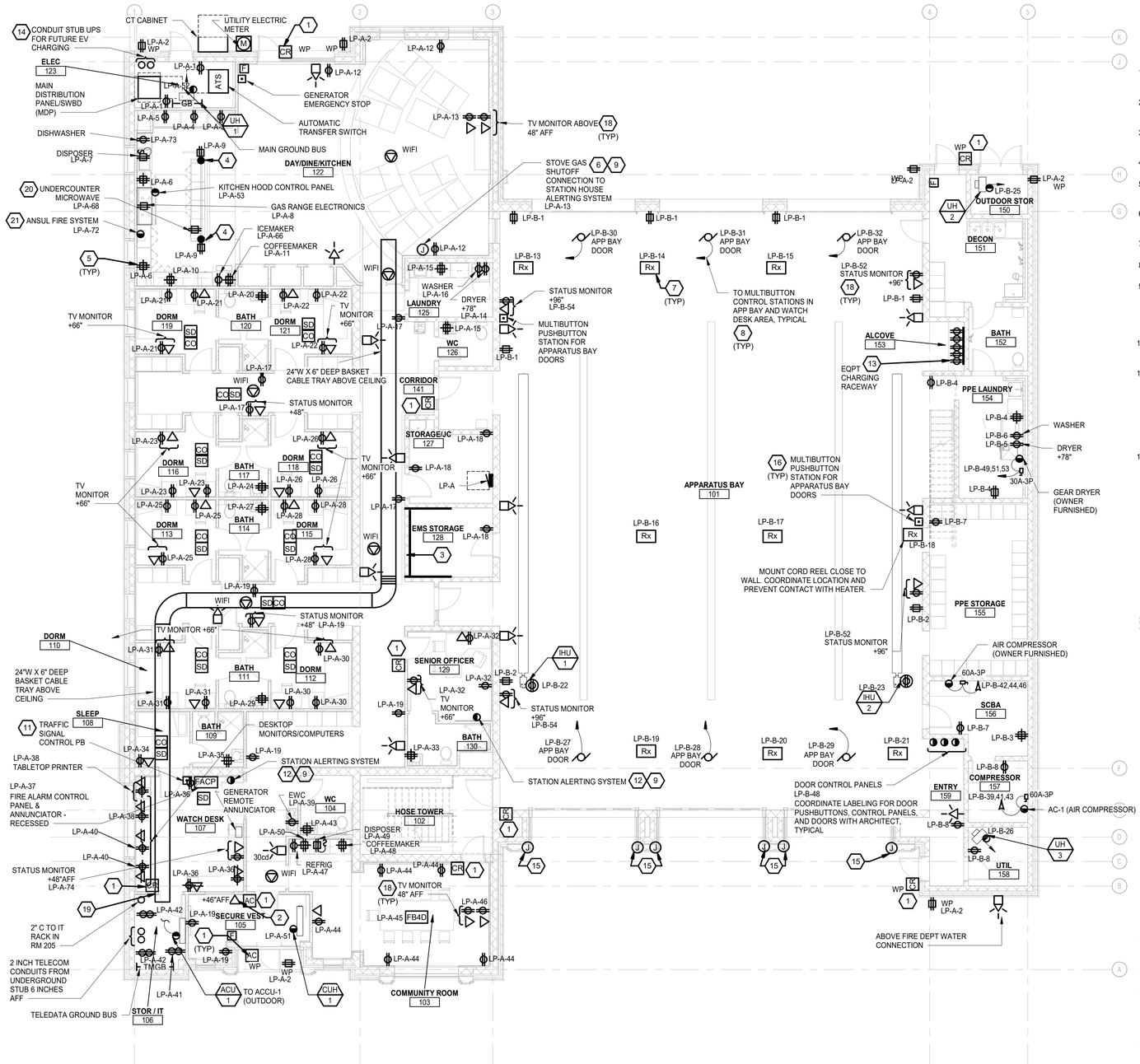

GROUND FLOOR POWER AND AUXILIARY SYSTEMS PLAN

SCALE: 1/8" = 1'-0"

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CONSTRUCTION KEY NOTES:

1. ACCESS CONTROL SYSTEM BY OTHERS. SECURITY/DOOR HARDWARE EQUIPMENT. REFER TO ARCHITECTURAL AND DOOR HARDWARE PLANS AND SPECIFICATIONS FOR EXACT LOCATIONS AND DETAILED REQUIREMENTS . COORDINATE RACEWAY, BACKBOX, AND OTHER REQUIREMENTS.
2. COORDINATE LOCATION AND OTHER REQUIREMENTS OF VISITOR NOTIFICATION DEVICE TYPE FOR SECURITY RACEWAY AND BOX REQUIREMENTS WITH SECURITY CONSULTANT/CONTRACTOR.
3. PROVIDE WALL MOUNTED STEEL SURFACE RACEWAY WITH RECEPTACLES (EVERY FOOT) AND ALTERNATING CIRCUITS AT APPROX. 3'-8"AFF SIMILAR TO WIREMOLD PLUGMODE MULTIOUTLET SYSTEM 2000. APPROXIMATE LENGTH IS ON 3 WALLS AND AS INDICATED ON PLAN.
4. MOUNT RECEPTACLE FLUSH TO COUNTER SIDE APPROX. 1 FOOT BELOW COUNTERTOP LIP. ROUTE CIRCUIT UP THROUGH FLOOR SLAB AND INSIDE COUNTER.
5. PROVIDE STAINLESS STEEL COVERPLATES FOR KITCHEN RECEPTACLES.
6. COORDINATE WITH MECHANICAL DRAWINGS FOR SYSTEM SHUTOFF AND STATION HOUSE ALERTING SYSTEM CONSULTANT AND SHOP DRAWINGS FOR EXACT REQUIREMENTS AND LOCATION.
7. MOUNT IN TRUSS. PROVIDE LENGTH SUITABLE TO REACH 2 FOOT AFF WITH 6 FOOT SLACK CABLE. CORD REEL SHALL HAVE NEMA 5-20R RECEPTACLE AT END WITH PULL AWAY CONNECTION FOR EASY RELEASE.
8. PROVIDE POWER AND CONTROL WIRING FOR APPARATUS BAY DOOR CONTROLLERS LOCATED OVERHEAD AND MULTIBUTTON PUSHBUTTON CONTROL STATIONS WHERE INDICATED. COORDINATE EXACT REQUIREMENTS WITH ARCHITECTURAL DOOR SPECIFICATIONS AND SHOP DRAWINGS.
9. FIRE STATION ALERTING SYSTEM COMPONENT. PROVIDE POWER AND DATA CABLES AS REQUIRED FOR SYSTEM. COORDINATE REQUIREMENTS WITH ARCHITECT, OWNER, AND SYSTEM SHOP DRAWINGS.
10. COORDINATE FINAL HOIST POWER AND CONTROL REQUIREMENTS WITH EQUIPMENT SUPPLIER AND SHOP DRAWINGS. VERIFY LOCATION OF HOIST AND CONNECTIONS.
11. PUSHBUTTON FOR TRAFFIC SIGNAL CONTROL. FINALIZE LOCATION WITH ARCHITECT AND OWNER. COORDINATE INSTALLATION REQUIREMENTS WITH SYSTEM SHOP DRAWINGS AND SUPPLIER.
12. PROVIDE POWER FOR STATION ALERTING SYSTEM AND COMPONENTS. COORDINATE REQUIREMENTS WITH OWNER AND SYSTEM SUPPLIER.
13. PROVIDE 2-CIRCUIT POWER SURFACE RACEWAY FOR EQUIPMENT CHARGING, MOUNTED 6 INCHES ABOVE COUNTER. ALTERNATE CIRCUITS TO DUPLEXES: LP-B-38 & LP-B-40. PROVIDE DUPLEX RECEPTACLES (5-20R) EVERY 1' (APPROX. 5).
14. REFER TO ELECTRICAL SITE PLAN FOR TERMINATION POINT AT PARKING AREA.
15. PROVIDE FLUSH MOUNTED BACK BOX AND CONCEALED RACEWAY FOR BIFOLD DOOR SAFETY SENSOR. COORDINATE REQUIREMENTS WITH SYSTEM SUPPLIER.
16. COORDINATE DOOR INDICATING LABELS FOR STATION WITH OWNER. COORDINATE WITH DOOR LABELS.
17. PROVIDE 2" EMPTY CONDUIT WITH PULL WIRE BETWEEN MAIN IT RACK AT RM 106 TO RM 205 IT RACK LOCATION. STUB 6 INCHES ABOVE FLOOR.
18. COORDINATE EXACT LOCATION WITH LOCATIONS ON ARCHITECTURAL PLANS. EXACT MOUNTING HEIGHT TO BE DETERMINED IN FIELD. COORDINATE OUTLET HEIGHT SO THAT THEY AND CORDS ARE COVERED BY MONITOR. VERIFY REQUIREMENTS WITH ARCHITECT.
19. TERMINATE BASKET TRAY APPROX. 1 FOOT INTO ROOM. COORDINATE EXACT LENGTH AND LOCATION WITH IT CONSULTANT.
20. COORDINATE EXACT LOCATION FOR MICROWAVE OUTLET WITH ARCHITECTURAL ELEVATION/CASEWORK.
21. COORDINATE EQUIPMENT BELOW HOOD SHUNT TRIPS AND ANSUL SYSTEM REQUIREMENTS.

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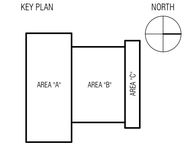
PBA Project No.: 2021.0370.01

KEY PLAN



OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY
SAM

CHECKED BY
EMG

APPROVED BY
EMG

SHEET NAME

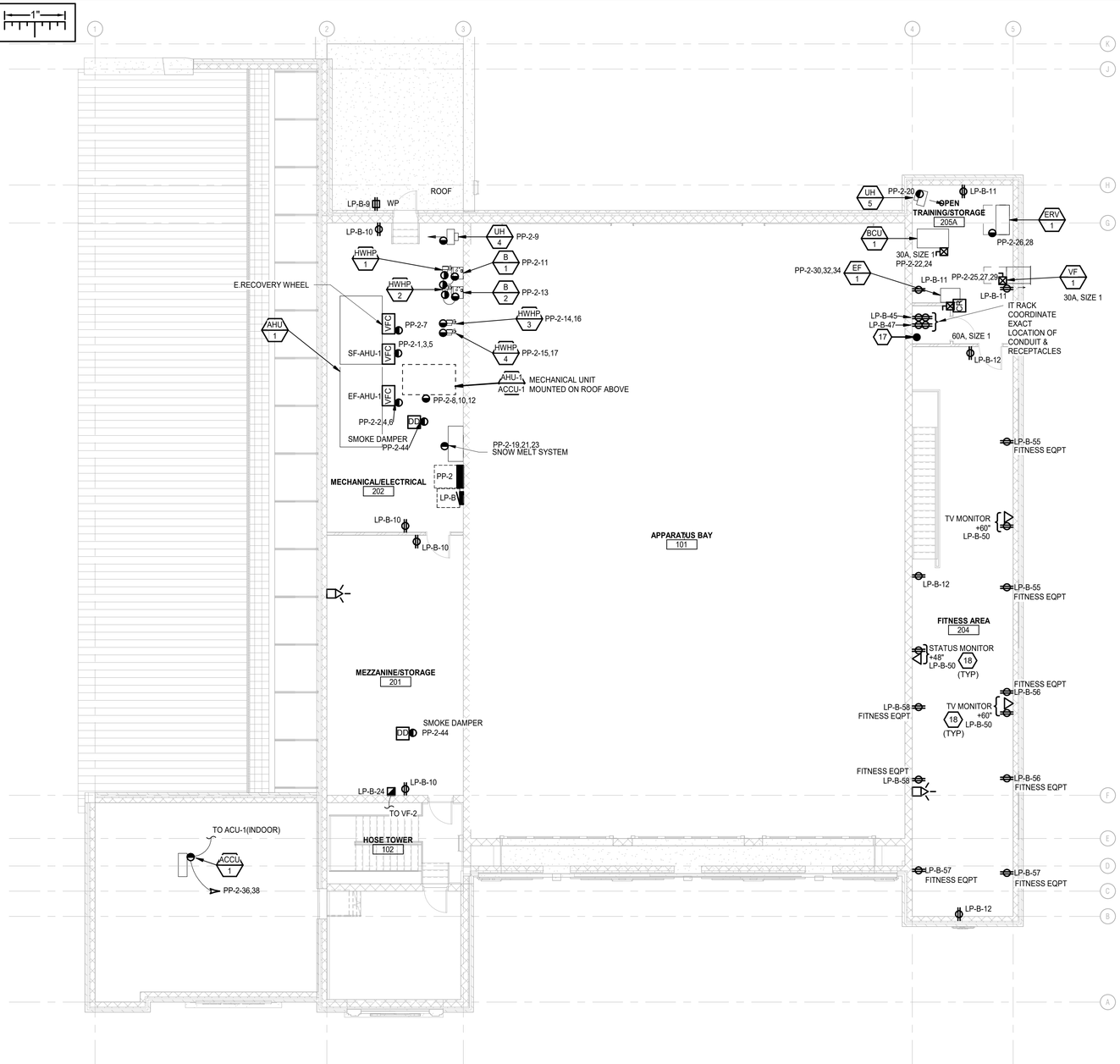
GROUND FLOOR POWER AND AUXILIARY SYSTEMS PLAN

SHEET NO.

E3-01

6/12/2023 8:17:14 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



MEZZANINE POWER AND AUXILIARY SYSTEMS PLAN

SCALE: 1/8" = 1'-0"

ELECTRICAL GENERAL NOTES:

1 THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.

2 INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.

3 COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

4 PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.

5 TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

6 MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.

7 COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.

8 COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.

9 REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.

10 REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.

11 THE FIRE ALARM DEVICES SHOWN ON PLAN ARE A PARTIAL REPRESENTATION OF THE FIRE ALARM SYSTEM. PROVIDE THE DESIGN AND INSTALLATION OF A COMPLETE AND FUNCTIONAL FIRE ALARM SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND ALL APPLICABLE CODES. THE FIRE ALARM VENDOR SHALL PROVIDE LAYOUT DRAWINGS INDICATING THE REQUIRED QUANTITIES AND LOCATIONS OF MANUAL PULL STATIONS, NOTIFICATION APPLIANCES, SMOKE AND HEAT DETECTORS, CONTROL MODULES, INTERFACE MODULES. MODULES FOR SPRINKLER FLOW AND TAMPER SWITCHES, ALL CONTROL PANELS, POWER SUPPLIES, AND ADDITIONAL DEVICES AND EQUIPMENT REQUIRED. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL FINISHES AND REFLECTED CEILING PLANS, INCLUDING ADDITIONAL SMOKE AND HEAT DETECTORS REQUIRED FOR NON-SMOOTH CEILING APPLICATIONS. INCLUDE ALLOWANCES FOR ADJUSTMENT OF DEVICES BY THE ARCHITECT AT THE TIME OF SUBMITTAL TO COORDINATE WITH BUILDING FINISHES AND OTHER CEILING ELEMENTS.

12 REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.

CONSTRUCTION KEY NOTES:

1 ACCESS CONTROL SYSTEM BY OTHERS. SECURITY/DOOR HARDWARE EQUIPMENT. REFER TO ARCHITECTURAL AND DOOR HARDWARE PLANS AND SPECIFICATIONS FOR EXACT LOCATIONS AND DETAILED REQUIREMENTS . COORDINATE RACEWAY, BACKBOX, AND OTHER REQUIREMENTS.

2 COORDINATE LOCATION AND OTHER REQUIREMENTS OF VISITOR NOTIFICATION DEVICE TYPE FOR SECURITY RACEWAY AND BOX REQUIREMENTS WITH SECURITY CONSULTANT/CONTRACTOR.

3 PROVIDE WALL MOUNTED STEEL SURFACE RACEWAY WITH RECEPTACLES (EVERY FOOT) AND ALTERNATING CIRCUITS AT APPROX. 3'-8"AFF SIMILAR TO WIREMOLD PLUGMODE MULTIOUTLET SYSTEM 2000. APPROXIMATE LENGTH IS ON 3 WALLS AND AS INDICATED ON PLAN.

4 MOUNT RECEPTACLE FLUSH TO COUNTER SIDE APPROX. 1 FOOT BELOW COUNTERTOP LIP. ROUTE CIRCUIT UP THROUGH FLOOR SLAB AND INSIDE COUNTER.

5 PROVIDE STAINLESS STEEL COVERPLATES FOR KITCHEN RECEPTACLES.

6 COORDINATE WITH MECHANICAL DRAWINGS FOR SYSTEM SHUTOFF AND STATION HOUSE ALERTING SYSTEM CONSULTANT AND SHOP DRAWINGS FOR EXACT REQUIREMENTS AND LOCATION.

7 MOUNT IN TRUSS. PROVIDE LENGTH SUITABLE TO REACH 2 FOOT AFF WITH 6 FOOT SLACK CABLE. CORD REEL SHALL HAVE NEMA 5-20R RECEPTACLE AT END WITH PULL AWAY CONNECTION FOR EASY RELEASE.

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14 REFER TO ELECTRICAL SITE PLAN FOR TERMINATION POINT AT PARKING AREA.

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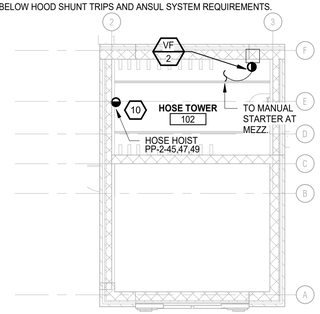

HOSE TOWER POWER AND AUXILIARY SYSTEMS PLAN

SCALE: 1/8" = 1'-0"

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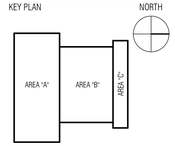
PBA Project No.: 2021.0370.01

KEY PLAN



OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

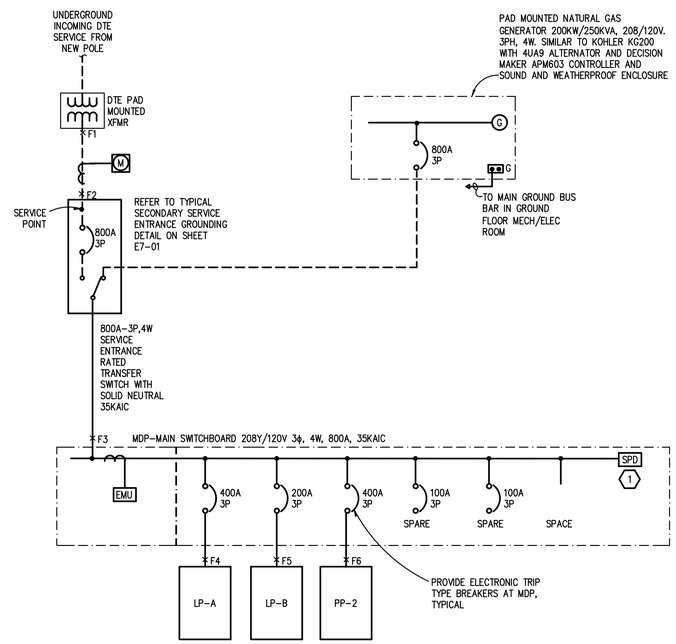
SHEET NAME

MEZZANINE AND HOSE TOWER POWER AND AUXILIARY SYSTEMS PLANS

SHEET NO.

E3-02

6/12/2023 8:17:17 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt



MDP LOAD SUMMARY (208/120V, 3PH,4W)		
ID	KVA	AMPS
LP-A	96.96	269.14
LP-B	51.78	143.73
PP-2	100.19	278.1
TOTAL	248.93	690.97

SHORT-CIRCUIT CALCULATIONS

FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE Isc	CONDUIT TYPE	CONDUCTOR MATERIAL	CONDUCTOR OR BUS SIZE	'C' VALUE	E (V)	L (FT)	XFMR kVA	XFMR %Z	f	M	Isc
1	UTILITY XFMR							208		300	1.6			52,046
2	ATS	1	52,046	NM	CU	2 SETS OF 300 KCML	20868	208	99.0			1.028	0.49	25,664
3	MDP	2	25,664	M	CU	2 SETS OF 300 KCML	18177	208	12.0			0.071	0.93	23,973
4	LP-A	3	23,973	M	CU	1 SET OF 500 KCML	22185	208	105.0			0.945	0.51	12,327
5	LP-B	3	23,973	M	CU	1 SET OF 3/0	12844	208	120.0			1.865	0.35	8,367
6	PP-2	3	23,973	NM	CU	1 SET OF 500 KCML	26706	208	102.0			0.762	0.57	13,602

THE FOLLOWING THREE PHASE CALCULATIONS ARE BASED ON THE "POINT-BY POINT" METHOD WHERE:

$Isc = Isc \times M$

$M = 1/(1+f)$

CONDUCTOR OR BUS: $f = \frac{1.732 \times L \times Isc}{C \times n \times E}$

UTILITY XFMR: $Isc = \frac{kVA \times 100{,}000}{E \times 1.732 \times \%Z}$

XFMR: $f = \frac{Ip(sc) \times Ep \times 1.73 \times \%Z}{100{,}000 \times KVA}$ $Is(sc) = \frac{Ep \times M \times Ip(sc)}{Es}$

L = LENGTH (ft) OF CONDUCTOR, C = CONSTANT FROM TABLE, n = NUMBER OF CONDUCTORS PER PHASE

Isc = AVAILABLE SHORT CIRCUIT (A), E = VOLTAGE OF CIRCUIT

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DIAGRAM GENERAL NOTES:

1. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
2. FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
3. TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "TRANSFORMER CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
4. MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
5. BASIS OF DESIGN IS SQUARE D/SCHNEIDER DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
6. SELECTIVE COORDINATION (PER NEC ARTICLES 517.31(G), 700.32 AND 701.27) IS BASED ON SQUARE D/SCHNEIDER DISTRIBUTION EQUIPMENT AND ASCO TRANSFER SWITCHES. ELECTRICAL CONTRACTOR SHALL SUBMIT SELECTIVE COORDINATION STUDY WITH TIME CURRENT CHARACTERISTIC CURVES (AND TABLES FOR TESTED PAIR INSTANTANEOUS COORDINATION) FOR THE EMERGENCY SYSTEMS. ELECTRICAL CONTRACTORS SHALL RECEIVE APPROVED SHOP DRAWINGS BACK FROM ENGINEER OF RECORD PRIOR TO PURCHASING OR INSTALLING ANY ELECTRICAL DISTRIBUTION EQUIPMENT. BREAKERS MUST BE COORDINATED WITH AUTOMATIC TRANSFER SWITCHES 3-CYCLE WITHSTAND RATING. ALTERNATE MANUFACTURERS SHALL MEET SELECTIVE COORDINATION CRITERIA AT NO ADDITIONAL COST TO THE PROJECT.
7. VARIABLE FREQUENCY CONTROLLERS (VFC) FURNISHED BY MECHANICAL TRADES. ELECTRICAL CONTRACTOR SHALL INSTALL VFC, PROVIDE POWER FEEDER FROM DISTRIBUTION EQUIPMENT TO VFC AND PROVIDE POWER FEEDER FROM VFC TO MOTOR. REFER TO SPECIFICATIONS FOR APPLICATION OF VFC POWER CABLE FROM VFC TO MOTOR.

CONSTRUCTION KEY NOTES:

1. SIZE PER MANUFACTURERS RECOMMENDATIONS.

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PBA Project No.: 2021370.01

KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

SHEET NAME

ONE LINE DIAGRAM

SHEET NO.

E5-01

g:\2021\2021-0370-00\CAD\01 station no. 5\2021-0370-01-E5-DG.dwg, E5-01, 6/12/2023 8:00:02 AM, Nadeen F. Hamid, Peter Basso Associates Inc.

PANELBOARD PP-2

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	M	SF-AHU-1 MECH/ELEC 202		60	3864	3864					60		EF-AHU-1 MECH/ELEC 202	M	2
3							3864	3864							4
5									3864	3864					6
7	M	ENERGY RECOVERY WHEEL - AHU-1		15	130	5837					80		ACCU-1/AHU-1 ROOF	M	8
9	M	UH-4 MECH/ELEC 202		15			16	5837							10
11	C	B-1/HWHP-1 MECH/ELEC 202		15					396	5837					12
13	C	B-2/HWHP-2 MECH/ELEC 202		15	396	960					15		HWHP-3 MECH/ELEC 202	M	14
15	M	HWHP-4 MECH/ELEC 202		15			960	0							16
17									0	300	15		DWH-1 MECH/ELEC 202	C	18
19	M	SNOW MELT SYSTEM MECH/ELEC		30	2880	16					15		UH-5 OPEN TRNING/STORAGE 205	M	20
21							2880	0			15		BCU-1 OPEN TRNING/STORAGE 205	M	22
23									2880	0					24
25	M	VF-1 OPEN TRNING/STORAGE 205		15	300	358					15		ERV-1 OPEN TRNING/STORAGE 205	M	26
27							300	358							28
29									300	3036	50		EF-1 OPEN TRNING/STORAGE 205	M	30
31	C	GARAGE PANEL LP-G		60	777	3036									32
33							777	3036							34
35									777	1373	20		ACU-1/ACCU-1	M	36
37	E	GENERATOR - COOLANT JKT HTR		20	1248	1373									38
39							1248	12480			20		GENERATOR OIL HEATER	E	40
41	C	GENERATOR - BATTERY CHARGER		20					1440	1248					42
43	NC	GENERATOR ENCL - RECEPT.		20	1920	800					20		SMOKE DAMPER	Other	44
45	M	HOSE HOIST		20			1440	1800			20		ENTRY GATE	M	46
47									1440	1800	20		ENTRY GATE	M	48
49					1440	0					20	--	SPARE	--	50
51	--	SPARE	--	--			0	0			20	--	SPARE	--	52
53	--	SPARE	--	--					0	0	20	--	SPARE	--	54
55	--	SPARE	--	--	0	0					20	--	SPARE	--	56
57	--	SPACE	--	--			0	0			--	--	SPACE	--	58
59	--	SPACE	--	--					0	0	--	--	SPACE	--	60
61	--	SPACE	--	--	0	0					--	--	SPACE	--	62
63	--	SPACE	--	--			0	0			--	--	SPACE	--	64
					29198		38859		28554						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	4862	100%	4862	125% 6077.5	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	16224	100%	16224	100% 16224	
MAIN TYPE:	400A MCB	NON-CONTINUOUS LOAD (NC):	1920	100%	1920	100% 1920	
MINIMUM A.I.C.:	14,000	KITCHEN LOAD (K):	0		0	100% 0	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	0	100%	0	100% 0	
		RECEPT DEMAND LOAD (R):	0	50%	0	100% 0	
		LIGHTING LOAD (L):	0	100%	0	125% 0	
		ADDITIONAL TRACK LIGHTING...				100% 0	
		MOTORS, HIGHEST LOAD (M):	17510	125 %	21887.5	100% 21887.5	
PANELBOARD LOCATION		MOTORS, REMAINING	55296	100 %	55296	100 % 55296	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	100.19		
				TOTAL...	278.10	TOTAL... 281.47	

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PANELBOARD LP-A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES - ELEC 123		20	360	1080					20		RECEPTACLES - EXTERIOR	R	2
3	K	FREEZER RECEPT - KITCHEN 122	GFCI	20			1200	1200			20	GFCI	REFRIG RECEPT - KITCHEN 122	K	4
5	K	REFRIG RECEPT - KITCHEN 122	GFCI	20					1200	0	20		COUNTERTOP RECEPTS - KITCHEN...	K	6
7	K	DISPOSER RECEPT - KITCHEN 122		20	1800	180					20	SHNT TRIP	GAS RANGE ELECTRONICS - KITCH...	K	8
9	R	ISLAND RECEPTS - KITCHEN 122		20			360	1800			20		COUNTER RECEPT - KITCHEN 122	K	10
11	K	COFFEEMAKER RECEPT - KITCHEN...		20					1800	540	20		RECEPTACLES - DAY RM 122	R	12
13	R	TV MON. RECEPTS - DAY RM 122		20	400	1400					20		DRYER RECEPT - LAUNDRY 125	R	14
15	R	RECEPTACLE - WC 126		20			360	1000			20	GFCI	WASHER RECEPT - LAUNDRY 125	R	16
17	R	RECEPTACLES & MONITOR - CORR...		20					940	540	20		RECEPTS - STORAGE 127 & 128	R	18
19	R	RECEPTS & MONITOR CORR & SEC...		20	1300	180					20		RECEPTACLE - BATH 120	R	20
21	R	RECEPTACLES - DORM 119		20			780	780			20		RECEPTACLES - DORM 122	R	22
23	R	RECEPTACLES - DORM 116		20					780	180	20		RECEPTACLE - BATH 117	R	24
25	R	RECEPTACLES - DORM 113		20	780	780					20		RECEPTACLES - DORM 118	R	26
27	R	RECPTACLE - BATH 114		20			180	780			20		RECEPTACLES - DORM 115	R	28
29	R	RECEPTACLE - BATH 111		20					180	780	20		RECEPTACLES - DORM 112	R	30
31	R	RECEPTACLES - DORM 110		20	780	780					20		RECEPTACLES - SENIOR OFFICER	R	32
33	R	RECEPTACLE - BATH 130		20			180	120000			20		RECEPTACLE - SLEEP 108	R	34
35	R	RECEPTACLE - BATH 109		20					180	540	20		RECEPTACLES - WATCH DESK 107	R	36
37	C	FACP - WATCH DESK 107		20	1200	1400					20		PRINTER & CNTR RECEPTS - W DESK	R	38
39	R	EWC RECEPTACLE - CORRIDOR	GFCI	20			180	400			20		COUNTER RECEPTS - WATCH DESK	R	40
41	R	QUAD RECEPTACLE - IT/STOR 106		20					360	720	20		QUAD RECEPTS - IT/STOR 106	R	42
43	R	RECEPTACLE - WC 104		20	180	900					20		RECEPTS - COMM RM 103	R	44
45	R	FLOOR BOX - COMM RM 103		20			360	360			20		RECEPTACLES - COMM RM 103	R	46
47	R	REFRIG. RECEPT - COMM RM 103	GFCI	20					180	1800	20		COFFEEMKR RECEPT- COMM RM 103	R	48
49	R	DISPOSER RECEPT - COMM RM		20	1200	180					20		COUNTER RECEPTACLE - COMM RM	R	50
51	M	CUH-1 SECURE VEST 105		15			200	16			15		UH-1 ELEC RM 123	M	52
53	C	KITCHEN HOOD CONTROL PANEL	SHNT TRIP	15					1440	530	20		LTG - ELEC RM, KITCHEN/DINING	L	54
55	L	LTG - DAYRM, LAUNDRY, WC,		20	878	934					20		LTG - CORRIDOR 141	L	56
57	L	LTG - DORMS & BATHS		20			336	336			20		LTG - DORMS & BATHS	L	58
59	L	LTG - BATH, SEN OFF, EMS STOR,...		20					237	666	20		LTG - SLEEP, BATH, WATCH,WC, VES...	L	60
61	L	LTG		20	40	362					20		LTG - OUTDR STOR, DECON, BATH,...	L	62
63	L	LTG - PPE...		20			380	800			20		STATION ALERTING SYSTEM	C	64
65	L	BUILDING MTD EXTERIOR...		20					499	1200	20	GFCI	ICEMAKER RECEPT - KITCH 122	K	66
67	L	BUILDING MTD EXTERIOR...		20	465	1800					20		MICROWAVE RECEPT - KITCH 122	R	68
69	L	FLAGPOLE & DRIVE LIGHTING		20			460	0			20	--	SPARE	--	70
71	L	DRIVE AND PARKING LOT LTG		20					426	1200	20		ANSUL FIRE SYSTEM - KITCH 122	C	72
73	R	DISHWASH RECEPT -KITCHEN	GFCI	20	180	400					20		RECEPT MONITOR - WATCH...	R	74
75	--	SPARE	--	20			0	0			20	--	SPARE	--	76
77	--	SPARE	--	20					0	0	20	--	SPARE	--	78
79	--	SPARE	--	20	0	0					20	--	SPARE	--	80
81	--	SPARE	--	20			0	0			20	--	SPARE	--	82
83	--	SPARE	--	20					0	0	20	--	SPARE	--	84
85	--	SPARE	--	20	0										86
					19939		132448		16919						
					ØA		ØB		ØC						

PANELBOARD INFORMATION		BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD	FEEDER AND OVERCURRENT...	NOTES
VOLTAGE:	208Y/120V	CONTINUOUS LOAD (C):	4640	100%	4640	125% 5800	
BUS AMPACITY:	400A	ELECTRIC HEAT (E)	0	100%	0	100% 0	
MAIN TYPE:	400A MCB	NON-CONTINUOUS LOAD (NC):	0	100%	0	100% 0	
MINIMUM A.I.C.:	14,000	KITCHEN LOAD (K):	10380	65.00%	6747	100% 6747	
MOUNTING:	SURFACE	RECEPT BASE LOAD (R):	10000	100%	10000	100% 10000	
		RECEPT DEMAND LOAD (R):	137520	50%	68760	100% 68760	
		LIGHTING LOAD (L):	6549	100%	6549	125% 8186.25	
		ADDITIONAL TRACK LIGHTING...				100% 0	
		MOTORS, HIGHEST LOAD (M):	200	125 %	250	100% 250	
PANELBOARD LOCATION		MOTORS, REMAINING	16	100 %	16	100 % 16	
		NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	96.96		
				TOTAL...	269.14	TOTAL... 276.90	

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KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

SHEET NAME

PANEL SCHEDULES

SHEET NO.

E5-02

PANELBOARD LP-B

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	A		B		C		CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	R	RECEPTACLES - APP BAY 101		20	900	360					20		RECEPTACLES - APP BAY 101	R	2
3	R	RECEPTACLE - BATH 152		20			180	540			20		RECEPTS - PPE LAUNDRY 154	R	4
5	R	DRYER RECEPT - PPE LAUNDRY	GFCI	20					1400	1000	20	GFCI	WASHER RECEPT - PPE LAUNDRY	R	6
7	R	RECEPTS - PPE STOR & SCBA		20	720	540					20		RECEPTS - COMP, ENTRY, UTIL RMS	R	8
9	R	ROOFTOP RECEPTACLE		20			180	720			20		RECEPTS - MECH/ELEC & MEZZ STOR	R	10
11	R	RECEPTS - OPEN TRNG/STORAGE		20					540	540	20		RECEPTS - FITNESS AREA	R	12
13	R	CORD REEL - APP BAY 101		20	180	180					20		CORD REEL - APP BAY 101	R	14
15	R	CORD REEL - APP BAY 101		20			180	180			20		CORD REEL - APP BAY 101	R	16
17	R	CORD REEL - APP BAY 101		20					180	180	20		CORD REEL - APP BAY 101	R	18
19	R	CORD REEL - APP BAY 101		20	180	180					20		CORD REEL - APP BAY 101	R	20
21	R	CORD REEL - APP BAY 101		20			180	360			20		IHU-1 - APP BAY 101	C	22
23	C	IHU-2 - APP BAY 101		20					360	200	20		VF-2 - HOSE TOWER 102	M	24
25	M	UH-2 - OUTDOOR STORAGE 150		15	16	16					15		UH-3 - UTIL 158	M	26
27	M	APP BAY DOOR		20			1656	1656			20		APP BAY DOOR	M	28
29	M	APP BAY DOOR		20					1656	1656	20		APP BAY DOOR	M	30
31	M	APP BAY DOOR		20	1656	1656					20		APP BAY DOOR	M	32
33	L	LIGHTING - APPARATUS BAY		20			938	938			20		LIGHTING - APPARATUS BAY	L	34
35	L	LTG - TRNG/STOR, FITNESS, STAIR...		20					920	287	20		LTG - MECH/ELEC, MEZZ STORAGE	L	36
37	L	LTG - HOSE TOWER		20	225	540					20		RECEPT RCWAY - ALCOVE 153	R	38
39							2100	360			20		RECEPT RCWAY - ALCOVE 153	R	40
41	M	AC-1 AIR COMPRSR 5HP		35					2100	2100	35		AIR COMPRSR (OWNER-FURN) 5HP	M	42
43					2100	2100									44
45	C	QUAD RECEPT - IT MEZZ		20			1800	2100							46
47	C	QUAD RECEPT - IT MEZZ		20					360	150	20		DOOR CONTROL PNLS ENTRY...	C	48
49					2124	1200					20		RECEPTS MONITORS MEZZ.	R	50
51	M	GEAR DRYER - PPE LAUNDRY 154		30			2124	800			20		RECEPTS MONITORS APP BAY	R	52
53									2124	800	20		RECEPTS MONITORS APP BAY	R	54
55	R	RECEPTS FITNESS EQPT - MEZ...		20	1800	1080					20		RECEPTS FITNESS EQPT - MEZ...	R	56
57	R	RECEPTS FITNESS EQPT - MEZ...		20			1800	1800			20		RECEPTS FITNESS EQPT - MEZ...	R	58
59	--	SPARE	--	20					0	0	20	--	SPARE	--	60
61	--	SPARE	--	20	0	0					20	--	SPARE	--	62
63	--	SPARE	--	20			0	0			20	--	SPARE	--	64
65	--	SPARE	--	20					0	0	20	--	SPARE	--	66
67	--	SPARE	--	20	0	0					20	--	SPARE	--	68
69	--	SPARE	--	20			0	0			20	--	SPARE	--	70
71	--	SPARE	--	20					0	0	20	--	SPARE	--	72
73	--	SPARE	--	20	0	0					20	--	SPARE	--	74
75	--	SPARE	--	20			0	0			20	--	SPARE	--	76
77	--	SPARE	--	20					0	0	20	--	SPARE	--	78
79	--	SPARE	--	20	0	0					20	--	SPARE	--	80
81	--	SPARE	--	20			0	0			20	--	SPARE	--	82
					17753		20592		16553						
					ØA		ØB		ØC						

PANELBOARD INFORMATION	
VOLTAGE:	208Y/120V
BUS AMPACITY:	225A
MAIN TYPE:	200A MCB
MINIMUM A.I.C.:	10,000
MOUNTING:	SURFACE

PANELBOARD LOCATION

BRANCH CIRCUIT CONNECTED LOAD		DEMAND FACTOR	CALCULATED LOAD		FEEDER AND OVERCURRENT...	NOTES
CONTINUOUS LOAD (C):	3030	100%	3030	125%	3787.5	
ELECTRIC HEAT (E)	0	100%	0	100%	0	
NON-CONTINUOUS LOAD (NC):	0	100%	0	100%	0	
KITCHEN LOAD (K):	0		0	100%	0	
RECEPT BASE LOAD (R):	10000	100%	10000	100%	10000	
RECEPT DEMAND LOAD (R):	9420	50%	4710	100%	4710	
LIGHTING LOAD (L):	3308	100%	3308	125%	4135	
ADDITIONAL TRACK LIGHTING...				100%	0	
MOTORS, HIGHEST LOAD (M):	6372	125 %	7965	100%	7965	
MOTORS, REMAINING	22768	100 %	22768	100 %	22768	
NOTE: DEMAND AND SIZING INFORMATION IS CALCULATED...		TOTAL (kVA):	51.78			
		TOTAL...	143.73	TOTAL...	148.13	

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6/12/2023 8:17:20 AM 2021-0370_MEP_Warren_Fire_Station_V19_detached.rvt

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PBA Project No.: 2021.0370.01

KEY PLAN

OWNER

City of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction	06/13/2023

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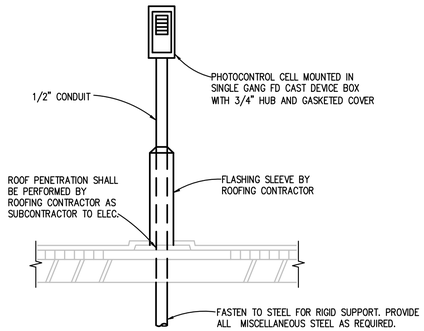
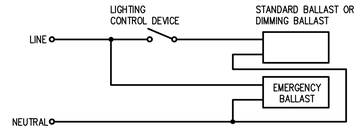
SHEET NAME
PANEL SCHEDULES

SHEET NO.
E5-03

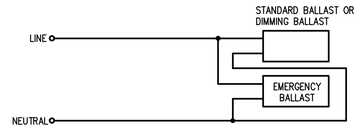


PHOTOCONTROL CELL MOUNTING DETAIL

NO SCALE



SWITCHED (NON-NIGHT LIGHT EMERGENCY FIXTURE)



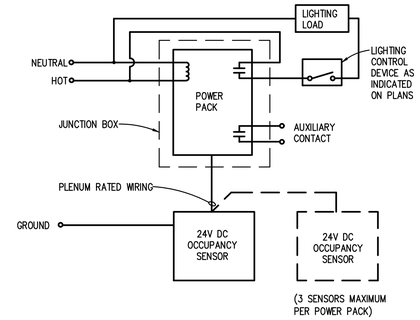
UNSWITCHED (NIGHT LIGHT EMERGENCY FIXTURE)

EMERGENCY BALLAST WIRING DIAGRAM

NO SCALE

NOTE:

PRIMARY CIRCUIT ONLY. LAMP LEADS NOT SHOWN.

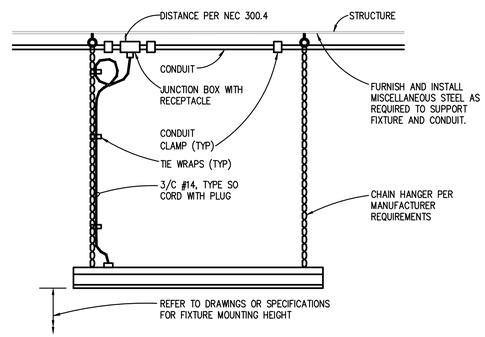


OCCUPANCY SENSOR WIRING DIAGRAM

NO SCALE

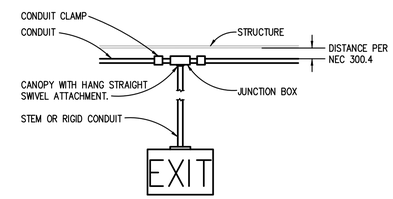
NOTES:

1. REFER TO SPECIFICATIONS FOR ACCEPTED MANUFACTURERS.
2. PROVIDE POWER PACKS AND SLAVE PACKS AS REQUIRED FOR SWITCHING AS INDICATED ON PLAN. REVISE DETAIL AS REQUIRED BY MANUFACTURER.
3. MOUNTING LOCATION PER MANUFACTURER'S RECOMMENDATION.
4. ADJUST SENSITIVITY LEVELS PER THE OWNER REQUIREMENTS.
5. PROVIDE FACTORY SUPPORT FOR AIMING/ADJUSTING OF SENSORS.
6. PLACE CEILING MOUNTED OCCUPANCY SENSORS IN CENTER OF A FULL CEILING TILE, WHERE APPLICABLE.
7. SENSOR ADJUSTMENT: BEFORE MAKING ADJUSTMENTS, MAKE SURE ROOM FURNITURE IS INSTALLED, LIGHTING CIRCUITS ARE TURNED ON, AND THE HVAC SYSTEMS ARE IN THE ON POSITION. VAV SYSTEMS SHOULD BE SET TO THEIR HIGHEST AIRFLOW. SET THE LOGIC CONFIGURATION DIP SWITCHES TO "EITHER". EITHER REQUIRES MOTION DETECTION BY ONLY ONE TECHNOLOGY. SET THE TIME DELAY PER OWNERS DIRECTION.



TYPICAL MOUNTING DETAIL FOR CHAIN HUNG LIGHTING FIXTURES

NO SCALE

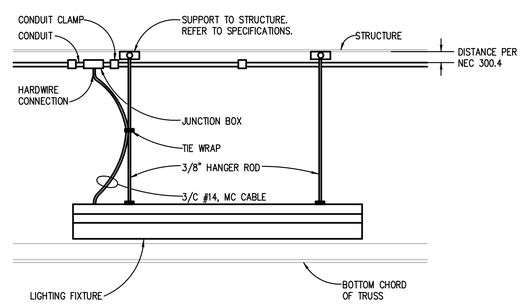


EXIT SIGN PENDANT MOUNTING DETAIL

NO SCALE

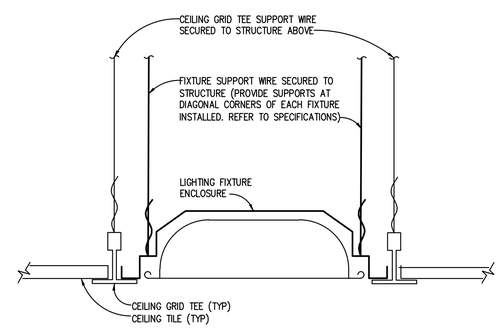
NOTES:

1. STEM OR RIGID CONDUIT LENGTH TO BE COORDINATED TO ENSURE SIGNAGE IS READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL. THE BOTTOM OF THE SIGNAGE SHALL NOT BE MORE THAN 6'-8" ABOVE THE TOP EDGE OF THE EGRESS OPENING INTENDED FOR DESIGNATION BY THE SIGNAGE (NFPA 101 7.10.1.9).
2. MOUNT EXIT SIGN PER MANUFACTURER'S RECOMMENDATIONS AT BOTTOM OF STEM/RIGID CONDUIT.



DETAIL OF PENDANT MOUNTED LINEAR LIGHTING FIXTURE

NO SCALE



RECESSED LIGHTING FIXTURE INSTALLATION DETAIL

NO SCALE

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PBA Project No.: 2021-0370.01

KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.

21-146B

ISSUES / REVISIONS

Bidding / Construction 06/13/2023

DRAWN BY

SAM

CHECKED BY

EMG

APPROVED BY

EMG

SHEET NAME

ELECTRICAL DETAILS AND DIAGRAMS

SHEET NO.

E7-01

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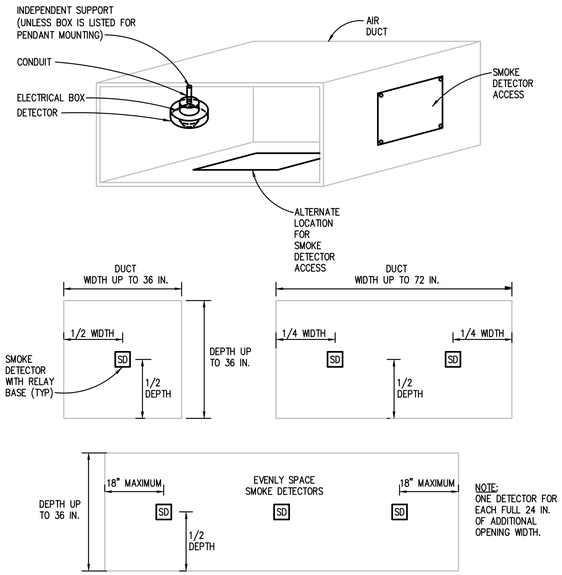
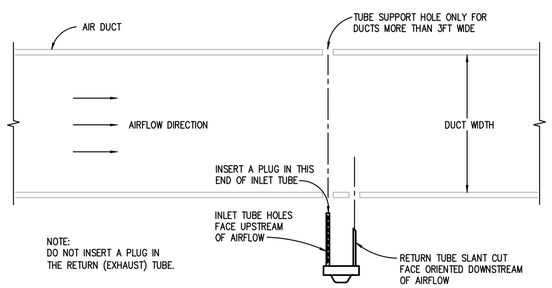


SPOT-TYPE DUCT DETECTOR INSTALLATION DETAIL

NO SCALE

NOTES:

1. WHERE IN-DUCT SMOKE DETECTORS ARE INSTALLED IN CONCEALED LOCATIONS MORE THAN 10FT AFF OR IN A LOCATION THAT IS NOT VISIBLE, THE DETECTORS SHALL BE PROVIDED WITH REMOTE ALARM OR SUPERVISORY INDICATION IN A LOCATION THAT IS ACCEPTABLE TO THE AHJ.
2. PROVIDE QUANTITY OF SMOKE DETECTORS REQUIRED AT EACH SMOKE DAMPER BASED ON DUCT SIZE, DETAIL ABOVE AND NFPA 72 REQUIREMENTS. REFER TO MECHANICAL PLANS FOR DUCT SIZES.
3. THE NUMBER AND SPACING OF THE DETECTOR(S) IN THE DEPTH (VERTICAL) OF THE OPENING SHOULD BE THE SAME AS THOSE GIVEN FOR THE WIDTH (HORIZONTAL).

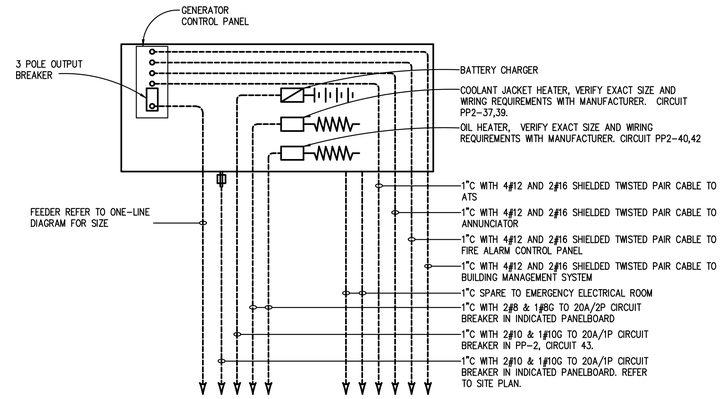


DUCT TYPE DETECTOR INSTALLATION

NO SCALE

NOTES:

1. PROVIDE SAMPLING TUBE LENGTH AS REQUIRED FOR WIDTH OF DUCT.



GENERATOR WIRING CONNECTION DETAIL

NO SCALE

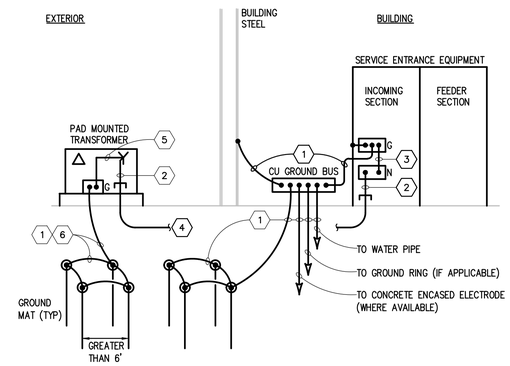
NOTES:

1. VERIFY ALL WIRING WITH SELECTED GENERATOR MANUFACTURERS DRAWINGS AND WIRING DIAGRAMS

			SYSTEM OUTPUTS																		
			ANNUNCIATION									NOTIFICATION							FIRE SAFETY		
			INITIATE FIRE ALARM SIGNAL	INITIATE CARBON MONOXIDE ALARM SIGNAL	IDENTIFY ALARM AT FACP	IDENTIFY ALARM AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE SUPERVISORY SIGNAL AT FACP	ANNUNCIATE SUPERVISORY SIGNAL AT REMOTE ANNUNCIATOR(S)	ANNUNCIATE TROUBLE SIGNAL AT FACP	ANNUNCIATE TROUBLE SIGNAL AT REMOTE ANNUNCIATOR(S)	RING TROUBLE BELL (WHEN PROVIDED)	OPERATE ALARM NOTIFICATION APPLIANCES CONTINUOUSLY	TRANSMIT ALARM SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT SUPERVISORY SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT TROUBLE SIGNAL TO REMOTE ALARM RECEIVING STATION	TRANSMIT ALARM SIGNAL TO BUILDING AUTOMATION SYSTEM	TRANSMIT TROUBLE SIGNAL TO BUILDING AUTOMATION SYSTEM	RECORD EVENTS IN THE SYSTEM MEMORY	SHUTDOWN HVAC UNIT SERVING ZONE IN ALARM VIA CONTROL MODULE (INTERLOCK)	SWITCH HVAC EQUIPMENT CONTROLS TO FIRE ALARM MODE	CLOSE SMOKE DAMPERS IN AIR DUCT SYSTEM SERVING ZONE WHERE ALARM WAS INITIATED
SYSTEM INPUTS	INITIATION	MANUAL FIRE BOX OPERATION	●		●	●						●	●			●					
		SMOKE DETECTOR OPERATION	●		●	●						●	●			●					
		CARBON MONOXIDE DETECTOR OPERATION		●								●	●			●					
		DUCT DETECTOR OPERATION	●		●	●						●	●			●			●	●	●
		AUTOMATIC SPRINKLER SYSTEM WATER FLOW OPERATION	●		●	●						●	●			●					
	EXTERNAL SYSTEM INPUT	FIRE EXTINGUISHING SYSTEM OPERATION	●		●	●						●	●			●		●			
		FIRE PROTECTION SYSTEM VALVE TAMPER OPERATION					●	●			●			●				●			
	STATUS	OPEN CIRCUIT, SHORT CIRCUIT, OR GROUND FAULT ON INITIATING DEVICE, SIGNALING LINE, OR NOTIFICATION APPLIANCE CIRCUIT.							●	●	●				●		●	●			
		OPENING, TAMPERING, OR REMOVAL OF ALARM-INITIATING DEVICES							●	●	●				●		●	●			
		OPENING, TAMPERING, OR REMOVAL OF SUPERVISORY SIGNAL INITIATING DEVICES							●	●	●				●		●	●			
		LOSS OF PRIMARY POWER OF FACP							●	●	●				●		●	●			
		GROUND OR SIGNAL BREAK IN FACP INTERNAL CIRCUITS							●	●	●				●		●	●			
		ABNORMAL AC VOLTAGE AT THE FACP							●	●	●				●		●	●			
		STANDBY BATTERY CIRCUITRY BREAK							●	●	●				●		●	●			
		FAILURE OF BATTERY CHARGING SYSTEM							●	●	●				●		●	●			
		ABNORMAL POSITION OF ANY SWITCH AT THE FACP							●	●	●				●		●	●			
		ABNORMAL POSITION OF ANY SWITCH AT THE ANNUNCIATOR							●	●	●				●		●	●			
		GENERATOR FAULT							●	●	●				●		●	●			
		GENERATOR SWITCH IN NON AUTOMATIC POSITION							●	●	●				●		●	●			
		GENERATOR RUNNING					●	●						●				●			

FIRE ALARM MATRIX

NO SCALE

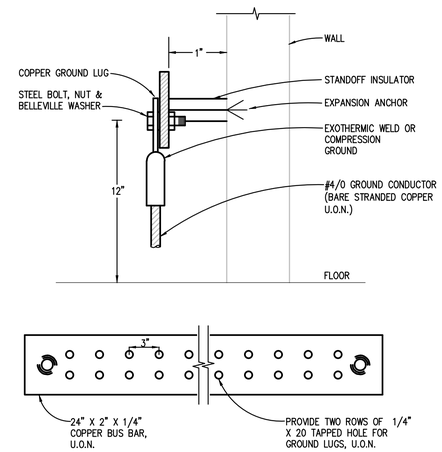


TYPICAL SECONDARY SERVICE ENTRANCE GROUNDING

NO SCALE

(#) KEYED NOTES:

1. GROUNDING ELECTRODE CONDUCTOR, #4/0 COPPER.
2. GROUNDED CONDUCTOR (NEUTRAL), SEE ONE LINE DIAGRAM.
3. MAIN BONDING JUMPER, PROVIDED BY MANUFACTURER AS PART OF LISTED EQUIPMENT SIZED PER NEC 250.28 AND 250.102.
4. SERVICE ENTRANCE PHASE CONDUCTORS AND GROUNDED CONDUCTOR IN CONDUIT. SEE ONE LINE DIAGRAM.
5. CONNECTION FROM GROUNDED SERVICE CONDUCTOR TO GROUNDING ELECTRODE AT THE TRANSFORMER PER NEC 250.24. COORDINATE WITH UTILITY.
6. COORDINATE REQUIREMENTS WITH UTILITY COMPANY PRIOR TO INSTALLATION. PROVIDE ALL NECESSARY GROUND RODS AND CONDUCTORS TO MEET UTILITY COMPANY REQUIREMENTS.



ELECTRICAL GROUND BUS DETAIL

NO SCALE

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KEY PLAN

OWNER
City Of Warren

PROJECT NAME
Warren Fire Station #5

30619 Schoenherr Rd
Warren, MI 48088

PROJECT NO.
21-146B

ISSUES / REVISIONS
Bidding / Construction 06/13/2023

DRAWN BY
SAM

CHECKED BY
EMG

APPROVED BY
EMG

SHEET NAME
ELECTRICAL DETAILS AND DIAGRAMS

SHEET NO.
E7-02

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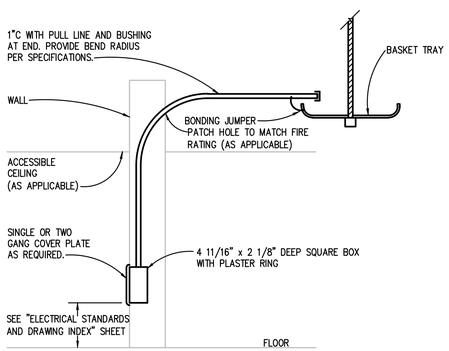
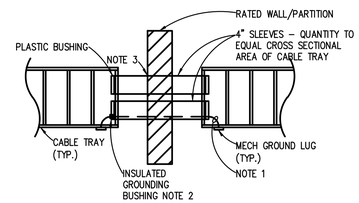


TELECOMMUNICATION OUTLET DETAIL

NO SCALE

NOTES:

1. IF CEILING IN ROOM IS NOT ACCESSIBLE, ROUTE CONDUIT THROUGH NEAREST ACCESSIBLE CEILING TO CABLE/WIRE BASKET TRAY.

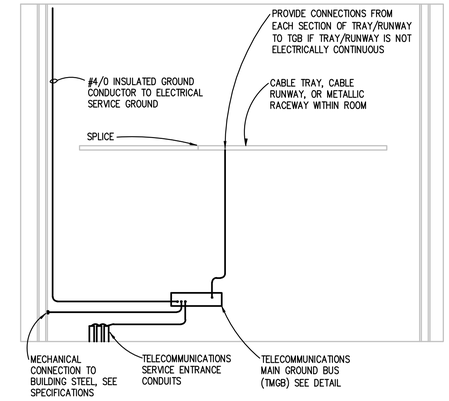


CABLE TRAY TO CONDUIT TRANSITION THROUGH RATED WALL

NO SCALE

NOTES:

1. BOND TRAY TO CONDUIT WITH A #6 AWG COPPER GREEN INSULATED GROUND WIRE.
2. PROVIDE GROUNDING BUSHINGS ON CONDUIT SLEEVES AND BOND SLEEVES WITH #6 AWG COPPER GREEN INSULATED GROUND WIRE.
3. PROVIDE FIRE-STOPPING IN AND AROUND ALL CONDUITS MAINTAIN FIRE RATING OF PARTITION AND TO MAKE PENETRATION AIR TIGHT.

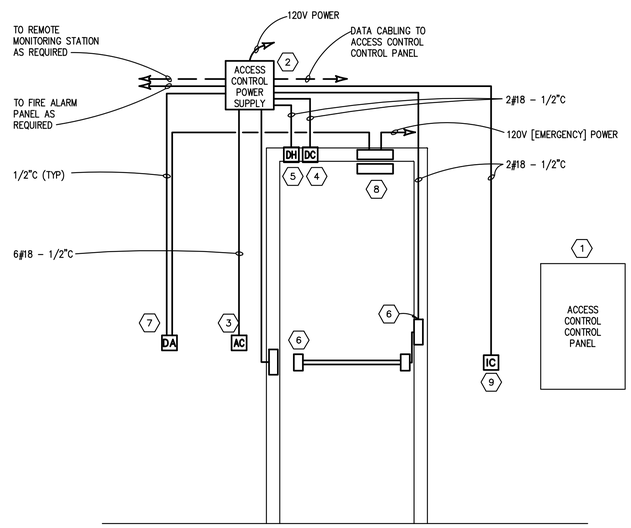


MAIN TELECOMMUNICATIONS ROOM GROUNDING DETAIL

NO SCALE

NOTES:

1. ALL GROUNDING SHALL COMPLY WITH NEC ARTICLE 250 AND TIA/EIA-607.



DOOR HARDWARE SINGLE DOOR CONNECTION DIAGRAM

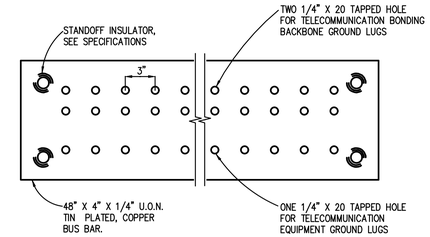
NO SCALE

GENERAL NOTES:

1. REFER TO ELECTRICAL FLOOR PLANS FOR INDIVIDUAL DOOR REQUIREMENTS AND DEVICE LOCATIONS.
2. PROVIDE BACK BOXES, CONDUIT, WIRING, CABLING, AND TERMINATIONS AS REQUIRED BY MANUFACTURER. ROUTE AND SUPPORT CABLING PER TELECOMMUNICATIONS CABLING REQUIREMENTS. COORDINATE EXACT REQUIREMENTS AND SCOPE OF WORK WITH OWNER AND ACCESS CONTROL CONTRACTOR.
3. WIRE SIZES AND QUANTITIES ARE TYPICAL ONLY. WIRING SHALL BE PER MANUFACTURER'S REQUIREMENTS.
4. SOME DEVICES INDICATED MAY NOT APPLY. REFER TO DOOR HARDWARE AND DOOR SCHEDULE AND COORDINATE ALL WORK WITH HARDWARE CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE INTERCONNECTION WITH FIRE ALARM PANEL TO RELEASE DOORS (I.E. ELECTROMAGNETIC LOCKS) UPON AN ALARM CONDITION, AS REQUIRED.

(#) KEYED NOTES:

1. ACCESS CONTROL CONTROL PANEL BY OTHERS. COORDINATE EXACT LOCATION WITH OWNER OR ACCESS CONTROL CONTRACTOR.
2. ACCESS CONTROL POWER SUPPLY. COORDINATE EXACT LOCATION AND QUANTITY WITH OWNER OR ACCESS CONTROL CONTRACTOR.
3. ACCESS CONTROL STATION. QUANTITY AND DEVICE TYPE PER DOOR HARDWARE SCHEDULE. (EXAMPLE DEVICES: CARD READER, KEYPAD, REQUEST TO EXIT PUSH PAD, MOTION DETECTOR, ETC)
4. DOOR MONITOR CONTACT SWITCH.
5. DOOR HOLDER: ELECTROMAGNETIC SWITCH MOUNTED ON/IN DOOR AND FRAME. [FOR DELAYED OPERATION] IN LIEU OF ELECTRIC STRIKE.
6. ELECTRIC STRIKE, PANIC HARDWARE, POWER TRANSFER: PROVIDED BY HARDWARE CONTRACTOR. COORDINATE POWER REQUIREMENTS AND WIRING CONNECTIONS.
7. DOOR OPERATOR ACTUATOR (EXAMPLE DEVICES: PUSH PAD, TOUCHLESS, ETC): PROVIDED BY OTHERS, PROVIDE INTERCONNECTION WIRING AND CONDUIT AS REQUIRED.
8. DOOR OPERATOR: PROVIDED BY HARDWARE CONTRACTOR. COORDINATE POWER REQUIREMENTS WIRING AND CONDUIT AS REQUIRED.
9. INTERCOM STATION: PROVIDE INTERCONNECTION FROM MASTER STATION TO [TWO] REMOTE STATIONS FOR MANUAL RELEASE OF DOOR STRIKE.



TELECOMMUNICATIONS MAIN GROUND BUS (TMGB) DETAIL

NO SCALE

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KEY PLAN

OWNER

City Of Warren

PROJECT NAME

Warren Fire Station #5

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ISSUES / REVISIONS

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