TABLE OF CONTENTS

TITLE SHEET — A1

GENERAL SITE PLAN INFORMATION — C1.0
EXISTING SITE CONDITIONS AND SITE DEMOLITION PLAN — C1.1
OVERALL SITE PLAN AND SESC PLAN — C1.2
SERVICE CENTER SITE PLAN — C2.1
RAIL YARD SITE PLAN — C2.2
SERVICE CENTER GRADING AND DRAINAGE PLAN — C3.1
RAIL YARD GRADING AND DRAINAGE PLAN — C3.2
MID PROJECT GRADING AND DRAINAGE PLAN — C3.3
SERVICE CENTER UTILITY PLAN — C4.1
SITE/CIVIL DETAILS — C5.1
SANITARY SYSTEM DETAILS — C5.2
MDOT ENTRANCE DETAILS — C5.3
FIRE SUPPRESSION DETAILS — C5.4

FLOOR PLAN / ROOM FINISH SCHEDULE — A2
ROOF PLAN — A3
EXTERIOR ELEVATIONS — A4
ENLARGED FLOOR PLAN — A5
REFLECTED CEILING PLAN — A6
BUILDING SECTIONS — A7
BUILDING SECTIONS — A8
INTERIOR ELEVATIONS — A9
DOOR TYPES / WINDOW TYPES, INTERIOR ELEVATIONS — A10
WALL SECTIONS — A11
WALL TYPES / CONSTRUCTION DETAILS — A12
CONSTRUCTION DETAILS — A13
CONSTRUCTION DETAILS — A14
CONSTRUCTION DETAILS — A15
CONSTRUCTION DETAILS — A16
BARRIER-FREE STANDARDS — A17
PUMP HOUSE DRAWINGS AND SPECIFICATIONS — A18

FOUNDATION PLAN — S1.0
STRUCTURAL GENERAL NOTES & TYPICAL DETAILS — S3.0
STRUCTURAL DETAILS & SECTIONS — S4.0

PLUMBING FLOOR PLANS — P1
PLUMBING SCHEDULES & DETAILS — P2

MECHANICAL FLOOR PLANS — M1
MECHANICAL SCHEDULES & DETAILS — M2

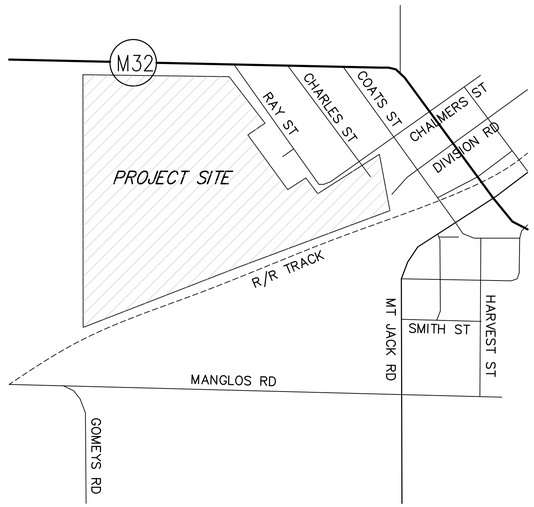
SITE ELECTRICAL PLAN - NORTH — SE1
SITE ELECTRICAL PLAN - SOUTH — SE2
SITE ELECTRICAL DETAILS — SE3
ELECTRICAL SITE LIGHTING CALCULATIONS — SLC1
ELECTRICAL SITE LIGHTING CALCULATIONS — SLC2
ELECTRICAL SCHEDULES & DETAILS — E0
ELECTRICAL LIGHTING FLOOR PLAN — E1L
ELECTRICAL POWER FLOOR PLAN — E1P
ELECTRICAL SCHEDULES & DETAILS — E2
ELECTRICAL LIGHTING SCHEDULES & DETAILS — E3

PUMP HOUSE MECHANICAL/ELECTRICAL FLOOR PLAN, SCHEDULES & DETAILS — ME1
PUMP HOUSE MECHANICAL/ELECTRICAL SPECIFICATIONS — ME2

SECURITY LAYOUT - SITE PLAN — 001
SECURITY LAYOUT - FIRST FLOOR — 002
DATA LAYOUT - FIRST FLOOR — 003

INDEMNIFICATION

TO THE FULLEST EXTENT PERMITTED BY LAW AND TO THE EXTENT CLAIMS, DAMAGES, LOSSES OR EXPENSES ARE NOT COVERED BY PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE PURCHASED BY THE CONTRACTOR, THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER, ARCHITECT, ARCHITECT'S CONSULTANTS, AND AGENTS AND EMPLOYEES OF ANY OF THEM FROM AND AGAINST CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, ARISING OUT OF OR RESULTING FROM PERFORMANCE OF THE WORK, PROVIDED THAT SUCH CLAIM, DAMAGE, LOSS OR EXPENSE IS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH, OR TO INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY (OTHER THAN THE WORK ITSELF), BUT ONLY TO THE EXTENT CAUSED BY THE NEGLIGENT ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT SUCH CLAIM, DAMAGE, LOSS OR EXPENSE IS CAUSED IN PART BY A PARTY INDEMNIFIABLE HEREUNDER. SUCH OBLIGATION SHALL NOT BE CONSTRUED TO NEGATE, ABRIDGE, OR REDUCE OTHER RIGHTS OR OBLIGATIONS OF INDEMNITY WHICH WOULD OTHERWISE EXIST AS TO A PARTY OR PERSON DESCRIBED IN THIS PARAGRAPH. IN CLAIMS AGAINST ANY PERSON OR ENTITY INDEMNIFIED UNDER THIS PARAGRAPH BY AN EMPLOYEE OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, THIS INDEMNIFICATION OBLIGATION SHALL NOT BE LIMITED BY A LIMITATION ON AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR A SUBCONTRACTOR UNDER WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFIT ACTS.



AREA MAP
(NO SCALE)

N

WARNER TWP., MICHIGAN
(ANTRIM COUNTY)

ARCHITECT:

STRUCTURAL ENGINEER:

MECH/ELEC ENGINEER:

SITE/CIVIL ENGINEER:

CONSTRUCTION DOCUMENTS DRAWING SET

WOLVERINE POWER COOPERATIVE

FIRE SAFING / AIR SEALING NOTES

1. Seal air-tight all joints, perimeters, and penetrations in floor, wall, ceiling, and roof assemblies (including both interior and exterior assemblies) where such assemblies are either thermally insulated or acoustically insulated.
2. Use listed and approved, rated fire safing assemblies where assemblies are required to be fire rated.

PROJECT SUMMARY

This project consists of a new, one story, 22,925 SF, electric utility service center building and its associated site development. The project includes equipment storage/service bays, employee areas, work rooms, and related support functions. The project also includes a one story, 220 SF, wood framed pump house for fire suppression equipment.

DESIGN LOADS SUMMARY

1. Soil Bearing Capacity: 2,500 PSF (assumed for foundation design) (Contractor to verify actual site bearing conditions by field testing)
2. Interior Floor Design Live Load: 100 PSF (t1607.1)
3. Interior Floor Design Concentrated Load: 5,000 LBS (t1607.1)
4. Maximum Roof Snow Load Deflection: l/360
5. Maximum Floor Live Load Deflection: l/720
6. Maximum Ceiling Live Load Deflection: l/360
7. Maximum Exterior Wall Wind Load Lateral Deflection: l/360
8. Building Risk Category (t1604.5): II
9. Seismic Design Category: A (1613.5)
10. Seismic Site Class (Ch 20, ASCE 7): D (Stiff Soil Profile)
11. Ultimate Wind Speed, V_{ult} (fig. 1609A): 115 MPH
12. Nominal Design Wind Speed, V_{asd} (t1609.3.1): 89 MPH
13. Site Wind Exposure Category (1609.4): C
14. Wind Load Importance Factor, I_w (ASCE7, t6-1): 1.0
15. 100 Year, 1-Hour Design Rainfall: 2.5 Inches (1611.1)
16. Roof Thermal Factor, C_t (ASCE7, t7-3): 1.1
17. Snow Exposure Factor, C_e (ASCE7, t7-2): 1.0
18. Snow Load Importance Factor, I_s (ASCE7, t7-2): 1.0
19. Ground Snow Load, P_g (1608.2): 70 PSF
20. Roof Slope Factor, C_s (ASCE7, f7-2): 1.0
21. Sloped Roof Design Snow Load, P_s (ASCE7, 7.4): 54 PSF
22. Roof Snow Drift & Unbalanced Design Snow Loads: See Roof Plan
23. Design Roof Loads: Calculated in accordance with ASCE 7

SOIL BORING ANALYSIS

Soil Borings and analysis have been conducted and a geotechnical report is available for information. See "GEOTECHNICAL INVESTIGATION REPORT" prepared by Otwell Mawby Geotechnical, P.C., bound into the Project Manual.

SCOPE OF DESIGN SERVICES

1. The following services are not included within the scope of the architectural/engineering design package and are to be provided by others:
   - Pre-engineered metal building system design.
   - Fire suppression system design (including tank & pump system).
   - Data/communications/security system design.
2. Pre-engineered metal building components, systems, and structural design are not reviewed or approved by the Architect, except as required by Authorities Having Jurisdiction for general conformity to the Contract Documents and overall design intent.
3. Construction means, methods, equipment, sequences, and safety procedures are not reviewed or approved by the Architect.

DEFERRED SUBMITTALS (107.3.4.1)

1. Pre-Engineered Steel Frame Building Structures
2. Automatic Fire Suppression System Design

OWNER-PROVIDED TESTING

1. Soil Bearing Capacity
2. Fill Soils Placement and Compaction (if required)
3. Concrete Strength
4. Structural Steel Special Inspections
5. Concrete Special Inspections

BUILDING CODE SUMMARY

GENERAL BUILDING CODE SUMMARY

1. Applicable Building Code: 2015 "Michigan Building Code" (Admincode R 408.30401), including, as applicable:
   "Michigan Uniform Energy Code"
   "Michigan Electrical Code"
   "Michigan Mechanical Code"
   "Michigan Plumbing Code"
2. Building Code Jurisdiction: Antrim County, Michigan.
3. Building Use Group: Mixed (Ch 3).
   S-1 Moderate Hazard Storage.
   B Business/Services.
4. Rack storage is not to exceed 12 feet in height (no high-piled storage).
5. Hazardous Materials stored, dispensed, and/or used in this building are limited to the maximum allowable quantities per control area as indicated in Table 307.1(1) and Table 307.1(2) in the Michigan Building Code. No Group H occupancy areas are included in the building.
6. Use Separation: Nonseparated (508.3).
7. Building Construction Type: iiB, Noncombustible/Unprotected (602).
8. Building Area: 22,925 SF (503, 506).
   Storage/Service Areas: 18,590 SF.
   Business Areas: 4,335 SF.
9. Building Height: 1 story, 25 FT (503, 504).
10. Building Open Perimeter: 100% (506.2).
11. Automatic Fire Protection: Fully sprinklered per NFPA 13 (903). Supervision and Alarms: Electronic supervision and alarms (903.4).
12. Fire Alarm System: None.
13. Number of Exits Required: 2 (1021.2).
14. Maximum Exit Access Travel Distance: 250 FT (t1017.2).
15. Maximum Common Path of Egress Travel: 100 FT (t1006.2).
16. Occupant Load (egress calculation) (t1004.1.2): 106 persons.
    S-1 Areas: 62 persons (18,590/300 SF).
    B Areas: 44 persons (4,335/100 SF).
17. Accessibility: All New Construction and Circulation to New Construction to be Barrier-Free (ch 11).
18. Accessible Means of Egress: 2 (1007). Consisting of accessible routes (1104, 1007.3).
19. Toilet Facilities (IPC t403.1).
    Men's Water Closets: 2
    Men's Urinals: 3
    Men's Lavatories: 3
    Women's Water Closets: 1
    Women's Lavatories: 1
20. Drinking Fountains: 1 (BF/dual-height) (IPC t403.1).
21. Utility/Mop Sinks: 2 (IPC t403.1).
22. Knox-Box Key Access Vault: 1 (per fire department).
23. Fire Extinguishers: Minimum 3A per NFPA 10 (906).
    7 extinguishers in open storage areas.
    1 extinguisher and cabinet in office area.
24. Maximum Travel Distance from Any Point in the Building to the Nearest Fire Extinguisher: 75 Ft. (t906.3(1)).

ELEMENT FIRE RATINGS AND COMBUSTIBILITY SUMMARY

1. Only noncombustible materials may be incorporated into the Work, except as permitted by Section 603 and Chapter 8 of the Building Code.
2. Exterior Walls: Noncombustible/Unprotected (based on Separation Distance > 10 Ft, t602).
3. Exit Access Enclosures: Noncombustible/Unprotected (t1018.1).
4. Exit Access Enclosure Opening Protectives: Noncombustible/Unprotected (t716.5)
5. Boiler/Furnace Rooms: Noncombustible/Unprotected (per equip. < 400,000 Btu) (t509)
6. Laundry Rooms < 100 SF: Noncombustible/Unprotected (t509)
7. Structural Frame (including columns, beams, girders, and trusses): Noncombustible/Unprotected (t601).
8. Other Non-Load-Bearing Partitions: Noncombustible/Unprotected (t601)
9. Floor Construction (including supporting beams and joists): Noncombustible/Unprotected (t601).
10. Roof Construction (including supporting beams and joists): Noncombustible/Unprotected (t601).
11. Interior Finish Combustibility Requirements: (t803.9, 804.4)
    Walls and Ceilings: Class C.
    Floors, Corridors and Exits: Class II.
    Floors, Other Areas: DOC FF-1 (pill test) or ASTM D2859.
12. Minimum Required Roof Covering Classification: Class C (t1505.1).

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT: ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER: WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

PROJECT: SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS: TITLE SHEET

SITE/CIVIL ENGINEER:
jozwiak consulting
p.o. box 5342
traverse city, mi 49696
231-218-1201
www.jozwiakconsulting.com

STRUCTURAL ENGINEER & CONSTRUCTION MANAGER:
APEX ENGINEERING & MANAGEMENT, INC.
3409 VETERANS DRIVE
TRAVERSE CITY, MI 49684
(231) 275-2600

MECHANICAL, ELECTRICAL, PLUMBING ENGINEER:
nealis ENGINEERING
830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

DATA / COMMUNICATIONS / SECURITY DESIGN/BUILDER:
PRO-TECH CABLING SYSTEMS, INC.
1805 E. MAPLE RD.
CLARE, MI 48617
(989) 386-3722

WSC_ELMIRA

ISSUED:	01-28-21
REV.:	
REV.:	
REV.:	
REV.:	
REV.:	

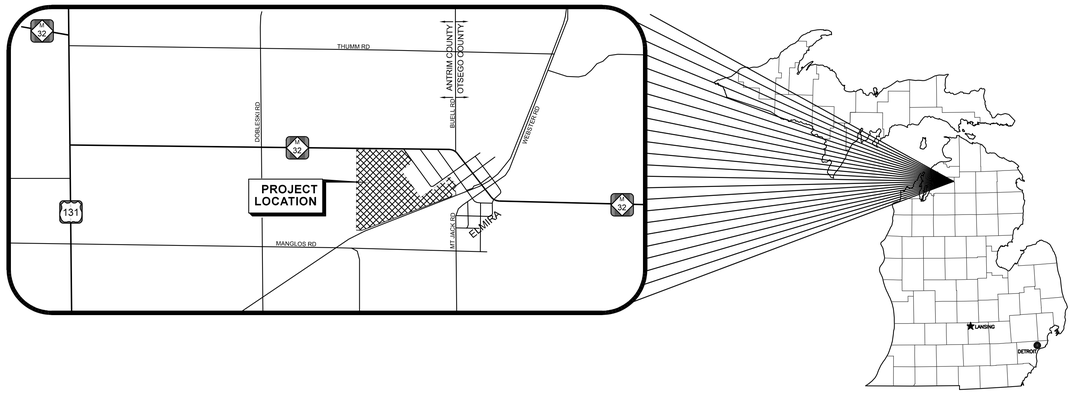
ELECTRIC UTILITY SERVICE CENTER BUILDING

HIGHWAY M-32, ELMIRA, MICHIGAN (WARNER TWP., ANTRIM COUNTY)

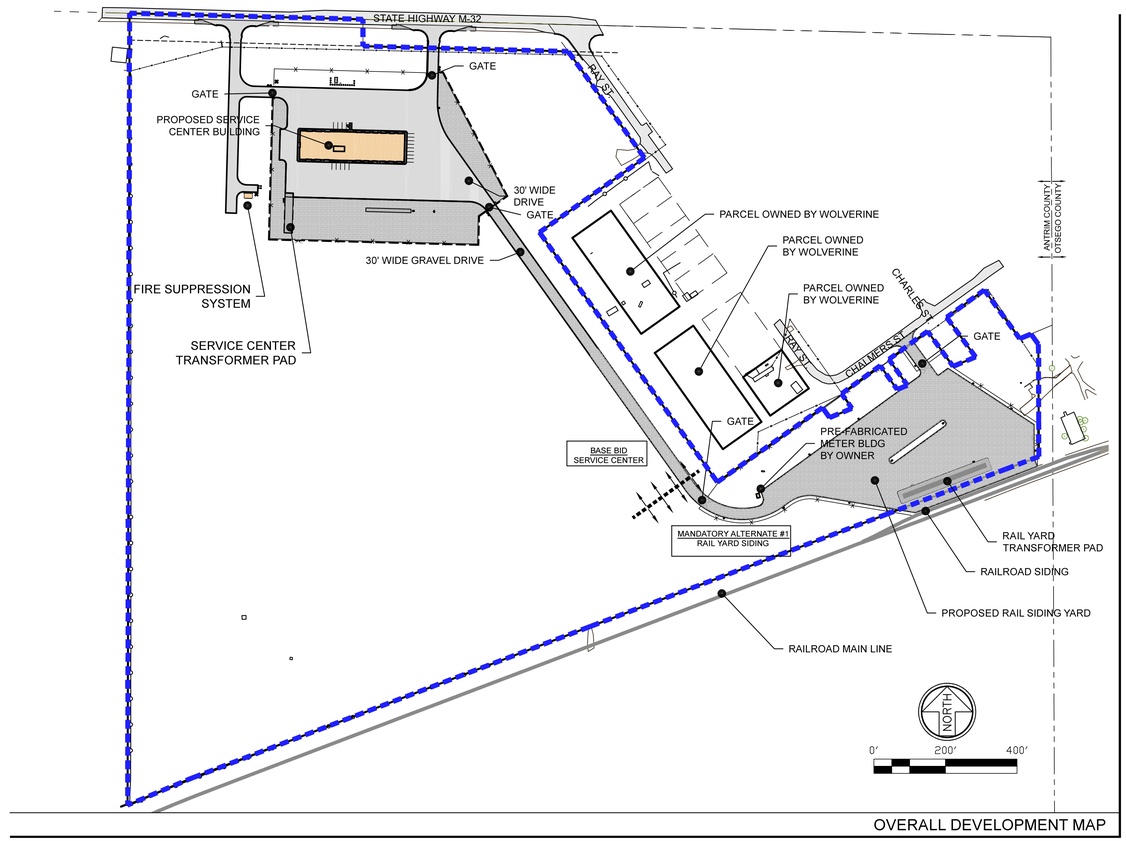
A1

WOLVERINE POWER CO-OP

PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W,WARNER TWP
ANTRIM CO., MICHIGAN



PROJECT LOCATION MAP



OVERALL DEVELOPMENT MAP

GENERAL SITE NOTES
ALL CONSTRUCTION, WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE CURRENT APPLICABLE LOCAL, COUNTY, STATE OR FEDERAL SPECIFICATIONS AND DETAILS.

THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS GOVERNING THE FURNISHING AND USE OF SAFEGUARDS, SAFETY DEVICES AND PROTECTION EQUIPMENT. THE CONTRACTOR SHALL TAKE ANY NECESSARY PRECAUTIONS TO PROTECT THE LIFE AND HEALTH OF EMPLOYEES AND THE PUBLIC IN THE PERFORMANCE OF THE WORK.

ANY CHANGES IN PLANS OR SPECIFICATIONS MUST BE REVIEWED BY THE PROJECT ENGINEER, ARCHITECT AND/OR THE OWNER.

THE LOCATIONS OF UNDERGROUND UTILITIES AND STRUCTURES, AS SHOWN ON THE DRAWINGS, ARE APPROXIMATE AND MAY NOT BE COMPLETE. LOCATIONS ARE BASED ON PREVIOUS CONSTRUCTION PLANS, DATED AS-BUILTS AND UTILITY FLAGGING AS DISCOVERED IN THE FIELD. NO GUARANTEE IS MADE THAT ALL UTILITIES AND STRUCTURES ARE SHOWN.

REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS.

SOIL EROSION CONTROL
SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO THE COMMENCEMENET OF ANY EARTHWORK.

THE SOIL EROSION CONTROL MEASURES SHOWN ARE THE MINIMUM CONTROLS TO BE USED ON THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES TO PROTECT THE DISTURBED AREAS AND ADJACENT PROPERTIES FROM ACCELERATED EROSION AND SEDIMENTATION RESULTING FROM PROJECT CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

SHOULD ADDITIONAL SOIL EROSION CONTROL MEASURES BE DETERMINED NECESSARY, THEY SHALL BE PLACED NO LATER THAN 24 HOURS FROM THE TIME OF NOTIFICATION TO THE GENERAL CONTRACTOR. IF NOT INSTALLED, ALL ON SITE CONSTRUCTION WILL BE HALTED UNTIL SUCH MEASURES HAVE BEEN INSTALLED AND APPROVED.

ALL DISTURBED AREAS SHALL BE TOPSOILED WITH A MINIMUM OF 4" OF TOPSOIL, SEEDED AND MULCHED.

THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING GROUND COVER ON AREAS DISTURBED BY CONSTRUCTION AND SHALL REPAIR ALL WASHOUTS AND EROSION DURING THE GUARANTEE PERIOD OF ONE (1) YEAR AFTER GROUND COVER IS ESTABLISHED, AT NO ADDITIONAL COST TO THE OWNER.

ALL SEDIMENT DROPPED OR ERODED ONTO PUBLIC RIGHT-OF-WAY OR PRIVATE ROADS SHALL BE REMOVED AT THE END OF EACH WORKING DAY.

ALL EROSION/SEDIMENT CONTROL DEVICES SHALL BE MAINTAINED IN WORKING ORDER AT ALL TIMES.

ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.

IF ADDITIONAL SOIL EROSION CONTROL MEASURES BECOME NECESSARY, CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING SUCH MEASURES IF REQUESTED BY THE ENGINEER OR THE SOIL EROSION CONTROL OFFICER, AT NO ADDITIONAL COST TO THE OWNER.

DEMOLITION
ALL DEMOLITION SHALL BE IN ACCORDANCE WITH STATE AND FEDERAL CODES.

SPECIAL CARE SHALL BE TAKEN IN EXCAVATING IN THE PROXIMITY OF ALL UTILITIES. THE CONTRACTOR SHALL SECURE ASSISTANCE FROM THE APPROPRIATE UTILITY COMPANY IN LOCATING ITS LINES. THE CONTRACTOR SHALL ALSO: PROVIDE SUPPORT FOR ANY UTILITY WITHIN THE EXCAVATION, PROVIDE PROPER COMPACTION UNDER ANY UNDERMINED UTILITY STRUCTURE AND, IF NECESSARY, INSTALL TEMPORARY SHEETING OR USE A TRENCH BOX TO MINIMIZE THE EXCAVATION. THE CONTRACTOR SHALL PROTECT AND SAVE HARMLESS FROM DAMAGE ALL UTILITIES, WHETHER PRIVATELY OR PUBLICLY OWNED ABOVE OR BELOW GROUND SURFACE, WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION.

UTILITY LEAD WORK SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANIES BY THE CONTRACTOR. WHERE UTILITIES ARE TO BE REINSTALLED OR RELOCATED, COORDINATE THESE ACTIVITIES WITH DEMOLITION WORK.

ALL DEMOLITION MATERIAL SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF IN A LEGALLY DESIGNATED DISPOSAL AREA. NO ON-SITE BURNING WILL BE PERMITTED. PERMITS AND FEES FOR DISPOSAL OF DEMOLITION MATERIAL SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

EXCAVATED AREAS, HOLES, OPEN BASEMENTS, AND OTHER HAZARDOUS OPENINGS SHALL BE FILLED WITH CLEAN GRANULAR MATERIAL MEETING MDOT CLASS II REQUIREMENTS. BACKFILL SHALL BE PLACED IN 8"-10" LIFTS LOOSE MEASURE AND COMPACTED TO 95% MAX. DRY DENSITY AS DETERMINED BY MODIFIED PROCTOR (ASTM D 1557).

AT THE COMPLETION OF THE DEMOLITION OPERATIONS, THE ENTIRE WORK AREA SHALL BE LEFT IN A CLEAN CONDITION WITH ANY PROTECTIVE DEVICES AND BARRIERS REMOVED. ALL EXPOSED AREAS SHALL BE SUITABLY TOPSOILED, SEEDED AND MULCHED. ALL REPLACED OR REPAIRED ITEMS TO BE DONE TO EQUAL OR BETTER CONDITIONS.

SITE REMEDIATION
REFER TO SOILS REPORT FOR ALL SITE WORK AND BUILDING FOUNDATION PREPARATION.

EARTHWORK
CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ANY EARTHWORK CALCULATIONS NECESSARY. ENGINEER WILL WORK WITH THE CONTRACTOR TO AMEND GRADES AS DEEMED NECESSARY, WHERE POSSIBLE.

EXCESS TOPSOIL SHALL BE SPREAD ON SITE.

ALL FILLED AREAS SHALL BE COMPACTED AND MOISTURE CONDITIONED. ALL BASE MATERIAL SHALL BE COMPACTED TO 95% OF ITS MAXIMUM UNIT WEIGHT.

PARKING LOT GRADING IN BARRIER FREE AREAS SHALL NOT EXCEED 2% IN ANY DIRECTION. ALL BARRIER FREE ROUTES SHALL NOT EXCEED A 2% CROSS SLOPE AND 5.0% GRADE ALONG THE ROUTE UNLESS A CURB RAMP IS INDICATED.

CONTRACTOR SHALL REFER TO BUILDING PLANS FOR FOUNDATION EXCAVATION.

GRAVEL PLACEMENT MUST COMPLY WITH THE CURRENT MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

GRADES AROUND THE BUILDING PAD SHALL BE SLOPED AWAY FROM THE STRUCTURE.

SANITARY SEWER SERVICE
A NEW SEPTIC SYSTEM IS PROPOSED.

ALL WORKMANSHIP AND MATERIALS SHALL MEET DPW SPECIFICATIONS.

WATER SERVICE
A NEW WATER WELL IS PROPOSED FOR DOMESTIC WATER SUPPLY

CONCRETE FLAT WORK
ALL CONCRETE SHALL BE A MINIMUM OF 4,000 PSI OR AS PRESCRIBED IN THE ARCHITECTURAL PLANS.

SITE LIGHTING
A COMPLETE LIGHTING PLAN IS INCLUDED IN THIS PACKAGE AND TO BE INSTALLED BY ELECTRICAL CONTRACTOR.

BUILDING MOUNTED LIGHTING SHALL BE IN ACCORDANCE WITH THE TOWNSHIP LIGHTING ORDINANCE AND REVIEWED BY ZONING ADMINISTRATOR PRIOR TO INSTALLATION.

LIGHTING CONTRACTOR SHALL SECURE APPROVAL FROM MUNICIPALITY PRIOR TO SELECTING AND INSTALLING LIGHT FIXTURES.

ALL SITE LIGHTING SHALL BE DARK SKY TYPE AND LIGHT RAYS CUT OFF AT THE PROPERTY LINES AND MEET ALL PRESCRIBED REQUIREMENTS OF THE LONG LAKE TOWNSHIP ORDINANCE.

NOTES

ORDINANCE REQUIREMENTS: NOT SPECIFICALLY LISTED FOR THIS TYPE OF USE

BUILDING SIZE = 23,500 SF
NUMBER OF EMPLOYEES = 14

SPACES PROVIDED = 16

IN THE EVENT OF AN EMERGENCY RESULTING FROM A LARGE POWER OUTAGE IN THE VICINITY DUE TO SEVERE WEATHER OR SIMILAR CAUSES, AMPLE SPACE IS AVAILABLE ON PREMISES TO PERMIT TEMPORARY OUTDOOR STAGING OF SERVICE VEHICLES THAT WOULD CONVERGE ON THE AREA AND SPACE FOR ADDITIONAL EMPLOYEE PARKING IF WARRANTED.

NOTE:
THIS IS A FULLY SECURE FACILITY IN THAT CREDENTIALS AND ACCESS CODES MUST BE OBTAINED IN ORDER TO ENTER THE FACILITY.

ENTRY OF NON-EMPLOYEES IS PROHIBITED WITHOUT AUTHORIZATION AND THEREFORE THIS FACILITY DOES NOT PROVIDE FOR ANY SERVICES RELATED TO CONSUMERS.

THIS IS NOT A BILL-PAY FACILITY.

PARKING CALCULATIONS

SHEET INDEX

SHEET	SHEET TITLE
C1.0	GENERAL PLAN INFORMATION
C1.1	DEMOLITION PLAN
C1.2	OVERALL GRADING AND SESC PLAN
C2.1	SERVICE CENTER SITE PLAN
C2.2	RAIL YARD SITE PLAN
C3.1	SERVICE CENTER GRADING AND DRAINAGE PLAN
C3.2	RAIL YARD GRADING AND DRAINAGE PLAN
C3.3	MID PROJECT GRADING AND DRAINAGE PLAN
C4.1	SERVICE CENTER UTILITY PLAN
C5.1	SITE DETAILS
C5.2	UTILITY DETAILS
C5.3	MDOT ENTRANCE DETAILS
C5.4	FIRE SUPPRESSION DETAILS

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

GENERAL PLAN INFORMATION

C1.0

STATE HIGHWAY M-32

REMOVE TREES

REMOVE TREES

EX. OVERHEAD POWER

REMOVE TREES

RAY ST.

REMOVE TREES

REMOVE TREES

REMOVE CONCRETE SLAB

REMOVE TREES

REMOVE TREES

REMOVE TREES

REMOVE TREES

CHARLES ST.

RAY ST.

CHALMERS ST.

REMOVE FENCE

REMOVE FENCE

REMOVE TREES

REMOVE ANY TRASH, DEBRIS AND VEGETATION

REMOVE TREES

BASE BID
SERVICE CENTER

MANDATORY ALTERNATE #1
RAIL YARD SIDING

REMOVE FENCE

REMOVE FENCE

REMOVE JUNK

EX. RAILROAD SIDING

REMOVE FENCE

EX. FENCE TO REMAIN

REMOVE FENCE

EX. FENCE TO REMAIN

NORTH

0' 100' 200'

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT NO.:
2018-114

EXISTING CONDITIONS AND DEMOLITION PLAN

C1.1

TOTAL AREA DISTURBED : 18 ACRES

DISTANCE TO NEAREST WATER BODY: 1,100 FT± TO LOSEY LAKE

SOIL EROSION CONTROL PLAN INFORMATION

NORTH

0' 80' 160'

PROPOSED BUILDING
FF=1244.2

INSTALL SILT FENCE

SILT

GRADING IN THIS AREA IS DISCRETIONARY IN ORDER TO ACHIEVE A SITE BALANCE. EXPAND OR REDUCE LIMITS OF GRADING IN THIS AREA AS NECESSARY.

BASE BID
SERVICE CENTER

MANDATORY ALTERNATE #1
RAIL YARD SIDING

ENLARGE BASIN AS NECESSARY TO BALANCE RAILYARD

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

OVERALL GRADING AND SESC PLAN

C1.2

STATE HWY M-32

EX. EDGE OF ASPHALT

550' CURB CUT SEPARATION

EX. GRAVEL SHOULDER

SEE SHEET C5.3 FOR ENTRANCE DETAIL

SEE SHEET C5.3 FOR ENTRANCE DETAIL

B-2 CURB R30'

B-2 CURB R30'

B-2 CURB R30'

B-2 CURB R30'

TRANSITION FROM B-2 TO F-2 CURB

F-2 CURB

F-2 CURB

DUB DOWN

50'

30'

30'

PROPOSED FREE-STANDING SIGN (BY OWNER) SEE DETAIL SHT 5.1

RESTORATION:
ALL AREAS WITHIN THE SECURITY FENCE PERIMETER AND BETWEEN THE SECURITY FENCE AND M-32 AVE SHALL BE TOPSOILED, SEEDED AND MULCHED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.

ALL OTHER AREAS TO BE MDOT MIX.

TURF LAWN

TURF LAWN

TURF LAWN

TURF LAWN

TURF LAWN

CONCRETE SLAB FOR GENERATOR (BY CONCRETE CONTRACTOR) SEE ELECTRICAL PLAN FOR DETAIL

CARD READER
PROVIDE MINIMUM 18" DIA X MINIMUM 36" DEEP SONOTUBE CONCRETE BASE WITH ANCHOR BOLTS FOR READER. SEE MANUFACTURER SPECIFICATIONS FOR ANCHOR BOLT DETAIL.

CARD READER
PROVIDE MINIMUM 18" DIA X MINIMUM 36" DEEP SONOTUBE CONCRETE BASE WITH ANCHOR BOLTS FOR READER. SEE MANUFACTURER SPECIFICATIONS FOR ANCHOR BOLT DETAIL.

WELL

PIPE BOLLARD (TYP)

SECURITY FENCE

GATE

GATE CONTROLLER

LIGHT POLE

MAN GATE FOR EMERGENCY ACCESS WITH KNOX-BOX

LIGHT POLE

GATE

GATE CONTROLLER

PROPOSED ASPHALT

GRAVEL PAD FOR SNOW, EQUIPMENT AND MATERIALS STORAGE

115'

TURF LAWN

EDGE OF GRAVEL TO BE 3" BEYOND FENCE LINE

SECURITY FENCE

GRAVEL PAD FOR SNOW, EQUIPMENT AND MATERIALS STORAGE

SECURITY FENCE

EDGE OF GRAVEL TO BE 3" BEYOND FENCE LINE

PIPE BOLLARD (TYP)

12'

8'

8'

20'

293'

20'

WALL MOUNTED SIGN

PROPOSED BUILDING 23,500 SF

80.25'

BUILDING OVERHANG

6' WIDE CONCRETE APRON (SEE DETAIL SHEET C5.1)

20'

12'

100'

PROPOSED ASPHALT

PROPOSED ASPHALT

6" THICK CONCRETE DUMPSTER PAD

20'

PROPOSED WELL

PROPOSED FIRE SUPPRESSION SYSTEM

LIGHT POLE

22'

11'

100'

22'

12" THICK CONCRETE PAD FOR BREAKER STORAGE

120'

GRAVEL PAD FOR SNOW, EQUIPMENT AND MATERIALS STORAGE

126'

10'

8" CONCRETE PAD FOR TRAILER LANDING GEAR

LIGHT POLE

LIGHT POLE (LOCATED FOR FUTURE FUELING CENTER)

GRAVEL PAD FOR SNOW, EQUIPMENT AND MATERIALS STORAGE

GATE CONTROLLER

GATE

LIGHT POLE

CARD READER
PROVIDE MINIMUM 18" DIA X MINIMUM 36" DEEP SONOTUBE CONCRETE BASE WITH ANCHOR BOLTS FOR READER. SEE MANUFACTURER SPECIFICATIONS FOR ANCHOR BOLT DETAIL.

GRAVEL DRIVE TO RAIL YARD

30'

SECURITY FENCE

20' WIDE MANUALLY OPENED GATE FOR SNOW REMOVAL PURPOSES

EDGE OF GRAVEL TO BE 3" BEYOND FENCE LINE

GRAVEL SERVICE DRIVE

NORTH

0' 30' 60'

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

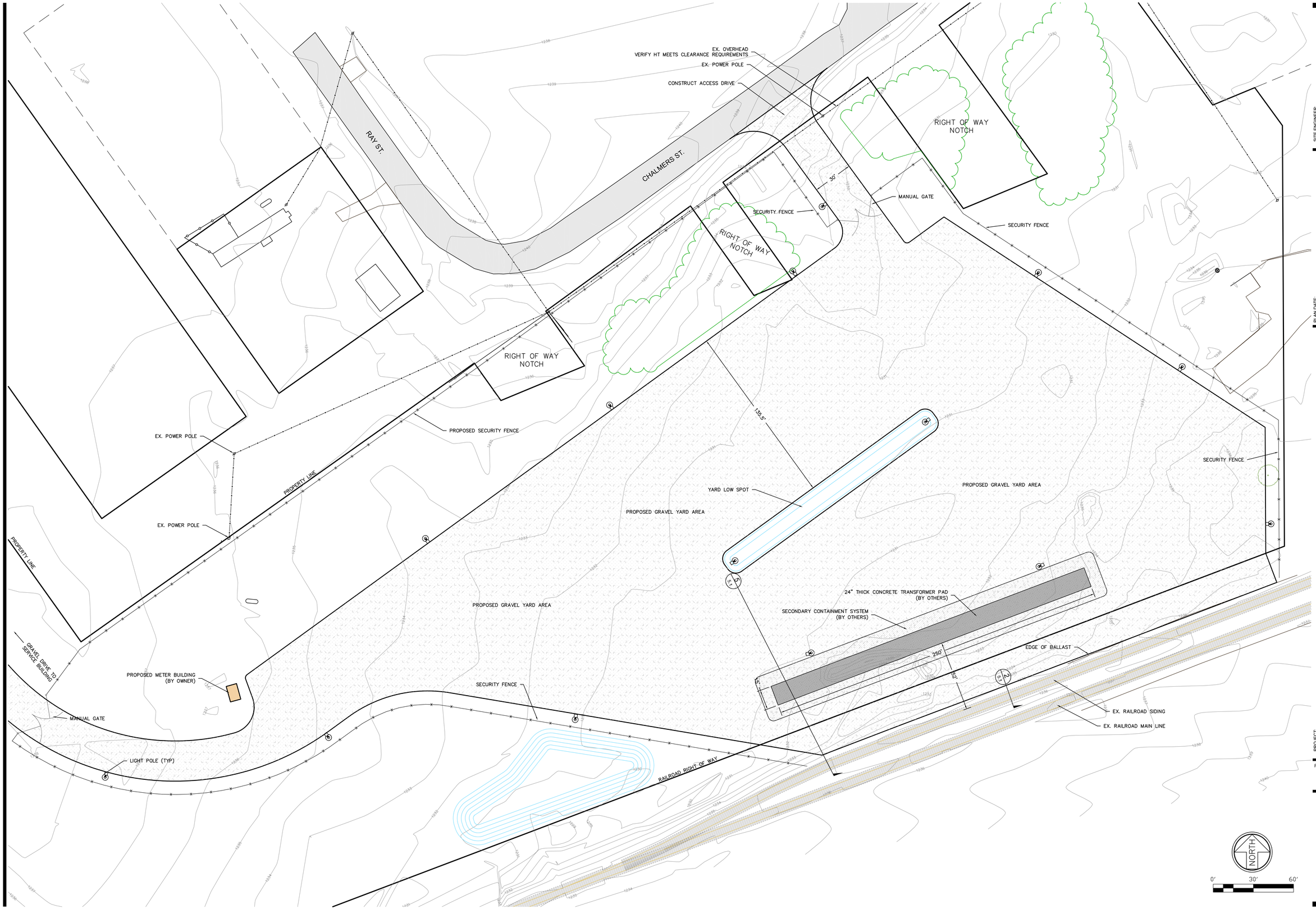
PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

SERVICE CENTER SITE PLAN

C2.1



SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-16-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT:
ELMIRA SERVICE CENTER BUILDING

PROJECT NO.:
2018-114

RAIL YARD
SITE PLAN

C2.2

NORTH

0' 30' 60'

CB-A4
RIM=1241.93
INV(S)(15")1238.8

CB-A1
RIM=1242
INV(E)(15")1236.87
INV(W)(18")1236.62

145 FT OF 15" CPP @ 0.5%

CB-A2
RIM=1242
INV(E)(15")1237.59
INV(W)(15")1237.59

126 FT OF 15" CPP @ 0.5%

CB-A3
RIM=1241.95
INV(N)(15")1238.22
INV(W)(15")1238.22

116 FT OF 15" CPP @ 0.5%

173 FT OF 8" CPP @ 0.5%

OUTFALL-A
INV(E)(18")=1235.75
INV=1235.75

NODE D-1
RIM=1244.14
INV(E)(8")=1238.93
INV(W)(8")=1238.93

98 FT OF 8" CPP @ 2.99%

OUTFALL-D
INV(E)(8")=1236
INV=1236

PROPOSED INFILTRATION BASIN #1
TOP OF BASIN=1241
BTM OF BASIN=1236

NOTE:
PLACE NO MORE THAN 2" OF TOPSOIL IN THE BASIN BOTTOM

PROPOSED
BUILDING
FF=1244.2

NODE D-2
RIM=1244.14
INV(W)(8")=1241.83

292 FT OF 8" CPP @ 0.09%

NODE E-1
RIM=1244.13
INV(E)(8")=1238.89
INV(W)(8")=1238.89

OUTFALL-E
INV(E)(8")=1236
INV=1236

96 FT OF 8" CPP @ 3.01%

NODE E-2
RIM=1244.14
INV(W)(8")=1241.82

INLET C-2
RIM=1235.56
INV(SW)(15")1235.56

OUTFALL-B
INV(E)(18")=1236
INV=1236

171 FT OF 18" CPP @ 0.5%

CB-B1
RIM=1242.01
INV(E)(15")1236.85
INV(W)(18")1236.85

146 FT OF 15" CPP @ 1%

CB-B2
RIM=1242.01
INV(W)(15")1238.31

CB-C1
RIM=1239.18
INV(NE)(15")1234.74
INV(S)(18")1234.49

47 FT OF 24" CPP @ 0.17%

175 FT OF 18" CPP @ 0.17%

OUTFALL-C
INV(N)(18")1233.26
INV=1233.26

SEE SHEET 3.3 FOR GRADING TO THE SOUTH

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231.218.1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

SERVICE CENTER GRADING AND DRAINAGE PLAN

C3.1

RAY ST.

CHALMERS ST.

RIGHT OF WAY NOTCH

RIGHT OF WAY NOTCH

RIGHT OF WAY NOTCH

PROPOSED GRAVEL YARD AREA

PROPOSED GRAVEL YARD AREA

YARD LOW SPOT

CB-F2
RIM=1229
INV(SW)(15")1226.6

CB-F1
RIM=1229
INV(NE)(18")=1226.02
INV(SW)(18")=1225.77

OUTFALL-F
INV(NE)(18")=1225
INV=1225

PROPOSED INFILTRATION BASIN #3
TOP OF BASIN=1230
BTM OF BASIN=1225

NOTE:
PLACE NO MORE
THAN 2" OF TOPSOIL
IN THE BASIN
BOTTOM

ENLARGE BASIN AS NECESSARY
TO BALANCE RAILYARD

EX. RAILROAD SIDING

EX. RAILROAD MAIN LINE

NORTH

0' 30' 60'

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

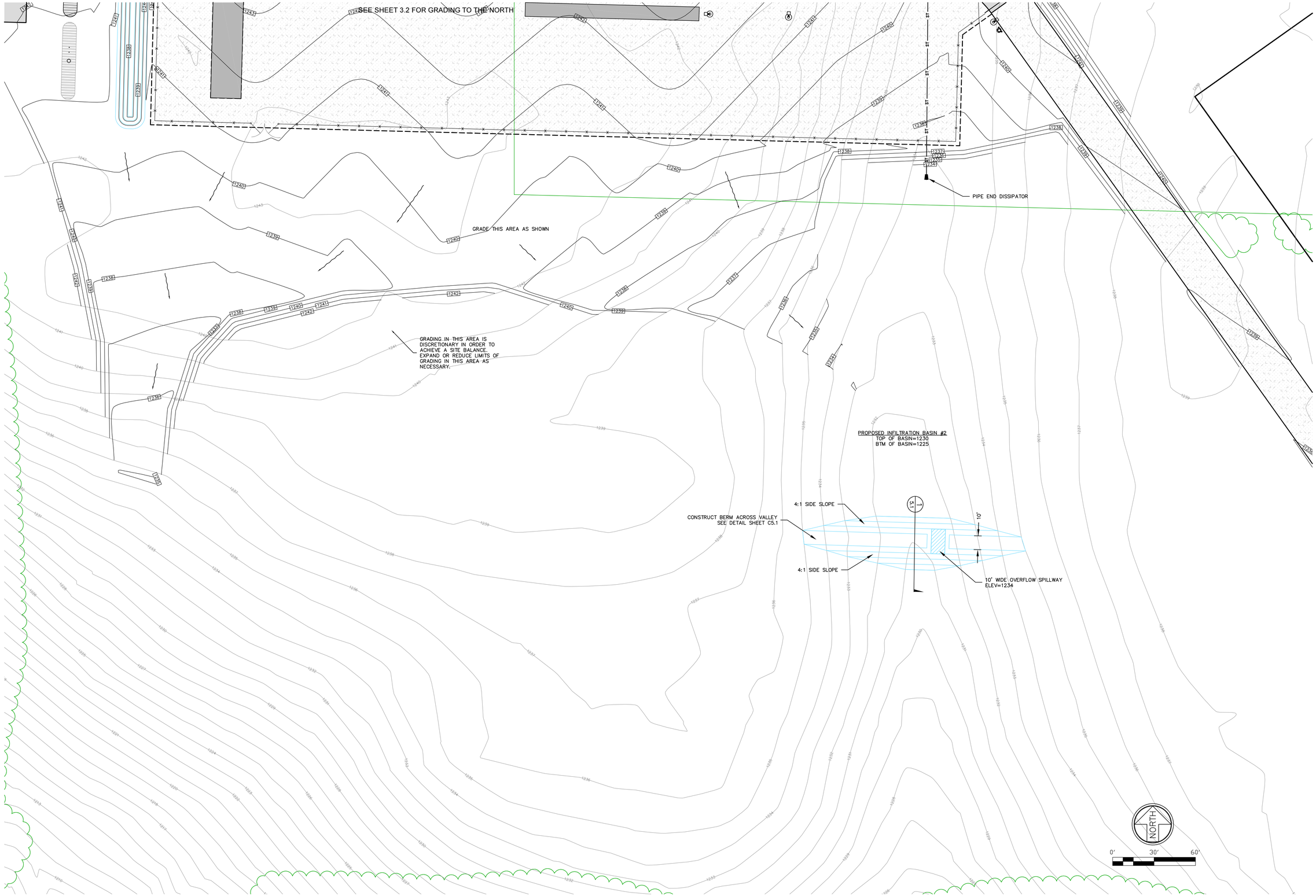
CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT NO.:
2018-114

RAIL YARD GRADING AND DRAINAGE PLAN

C3.2



SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

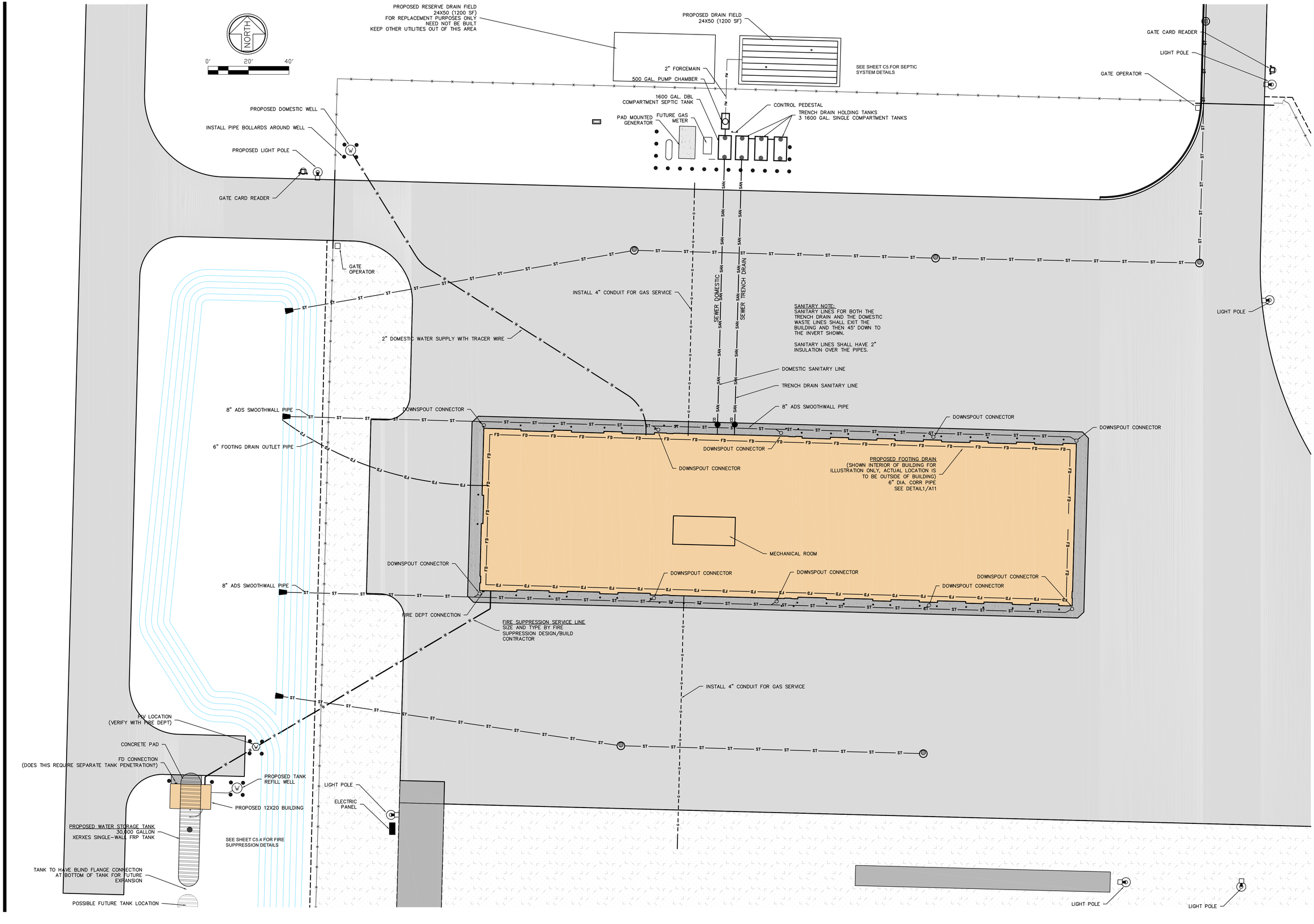
PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

MID PROJECT GRADING AND DRAINAGE PLAN

C3.3



SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231.218.1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

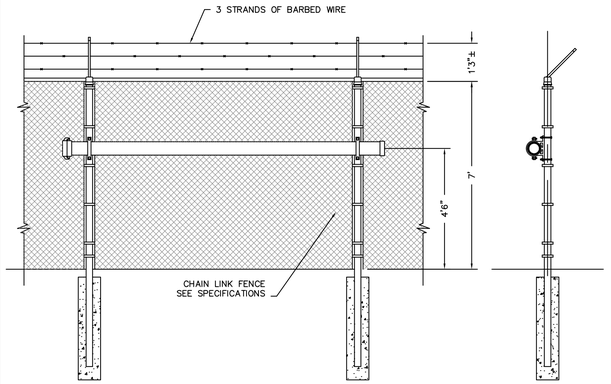
PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

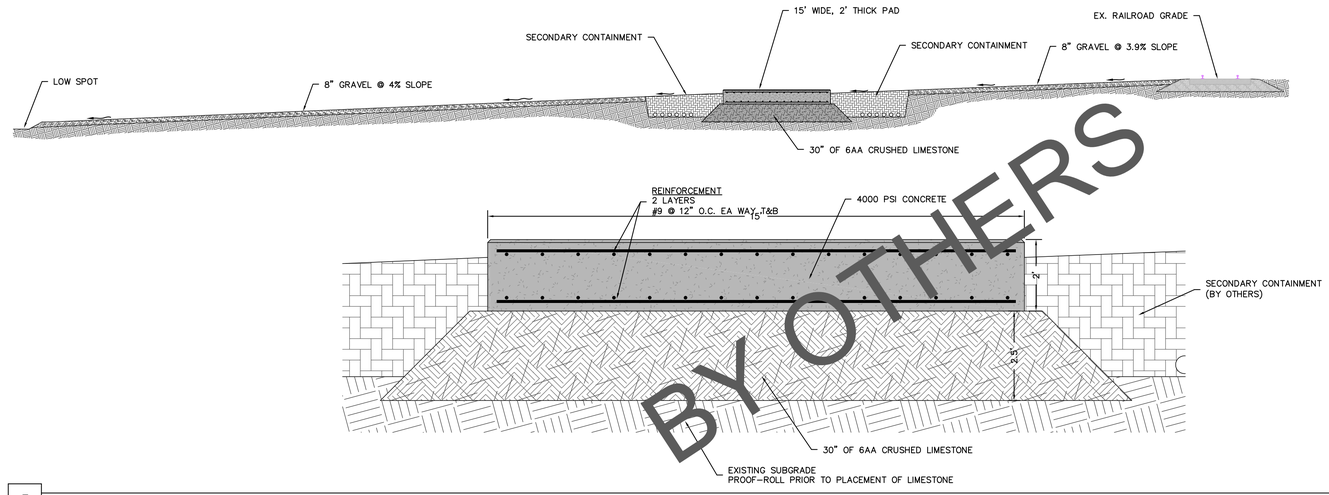
PROJECT NO.:
2018-114

SERVICE
CENTER
UTILITY PLAN

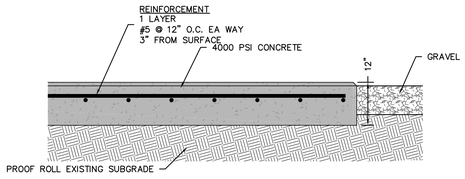
C4.1



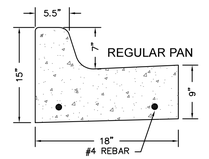
SECURITY FENCE DETAIL



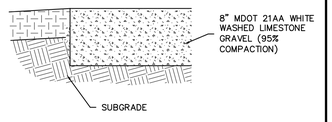
5 RAIL YARD TRANSFORMER PAD DETAIL



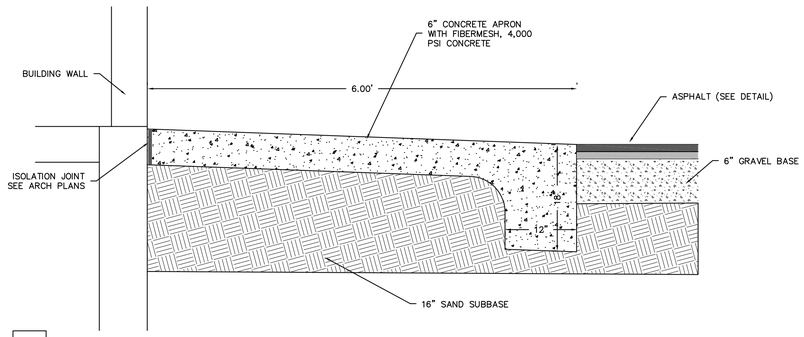
6 SERVICE BUILDING TRANSFORMER PAD DETAIL



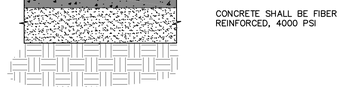
4 F-2 CURB (MODIFIED)



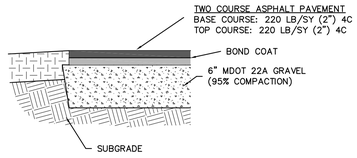
GRAVEL DETAIL



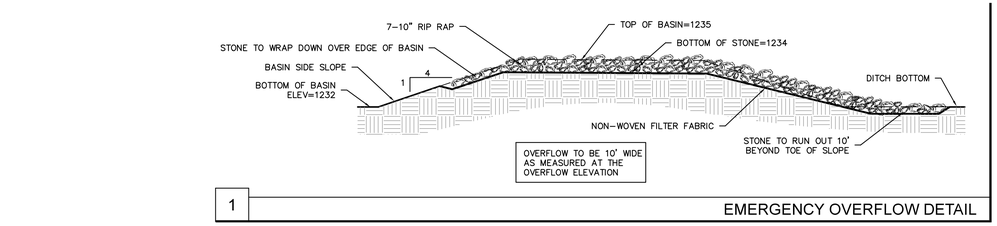
3 APRON DETAIL



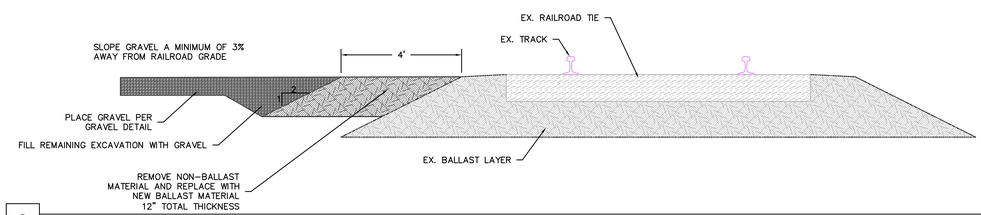
6" CONCRETE APRON AND PAD DETAIL



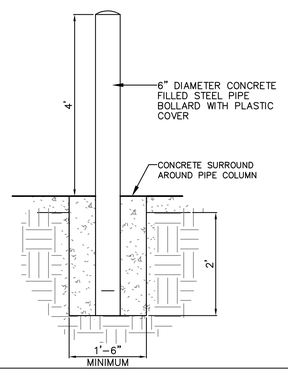
PAVING DETAIL



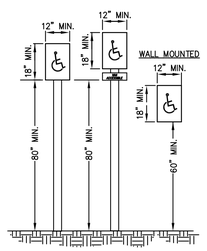
1 EMERGENCY OVERFLOW DETAIL



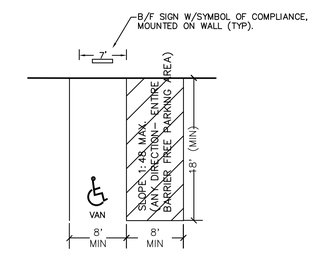
2 RAILROAD SIDING DETAIL



PIPE BOLLARD DETAIL



B/F SIGN DETAIL



GRADE NOT TO EXCEED 2% IN ANY DIRECTION

BARRIER FREE PARKING DETAIL

jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231.218.1201
www.jozwiakconsulting.com
SITE ENGINEER:

PLAN DATE:
2-16-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

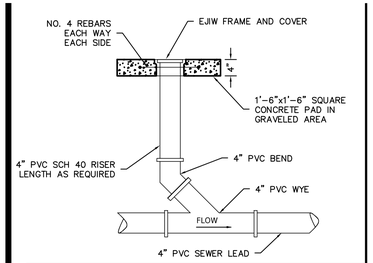
LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

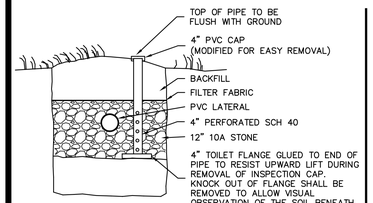
PROJECT NO.:
2018-114

DETAILS

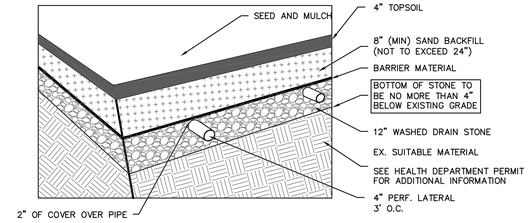
C5.1



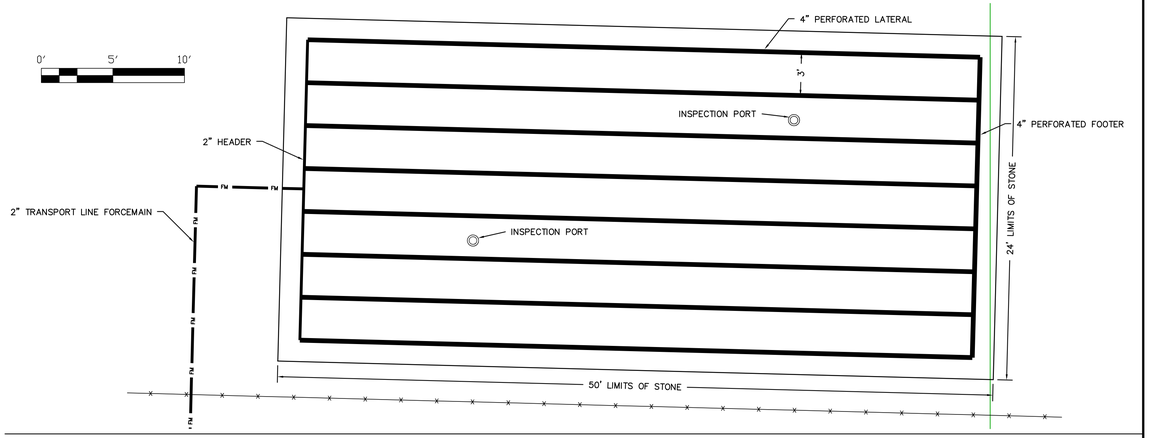
CLEAN-OUT DETAIL



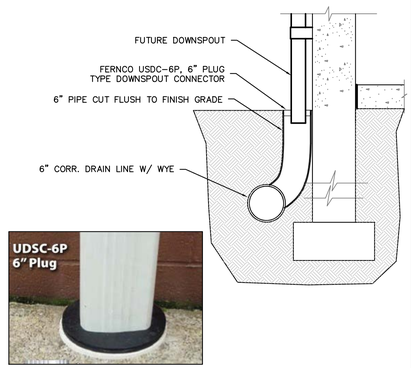
INSPECTION PORT DETAIL



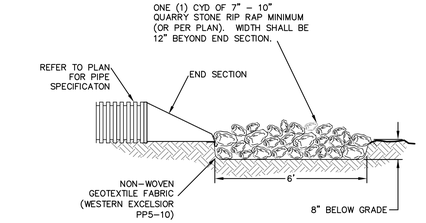
DRAINFIELD SECTION VIEW DETAIL



DRAIN FIELD PLAN VIEW DETAIL

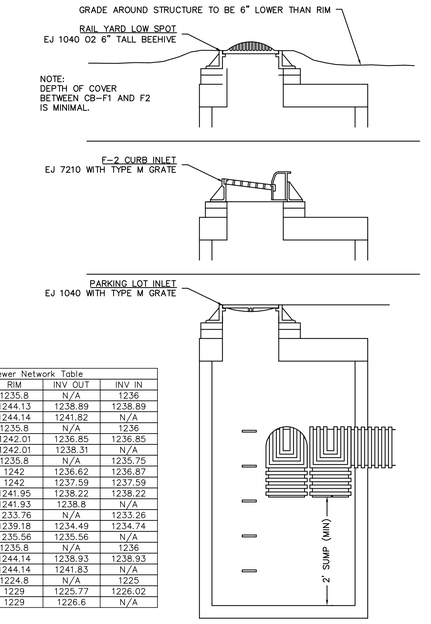


DOWNSPOUT CONNECTOR DETAIL



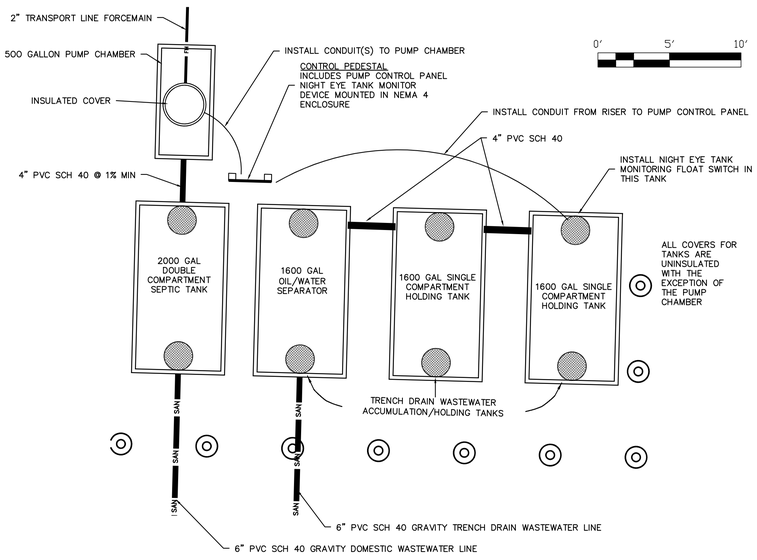
INSTALL PIPE END DISSIPATOR ON ALL OUTFALLS

STORM OUTLET

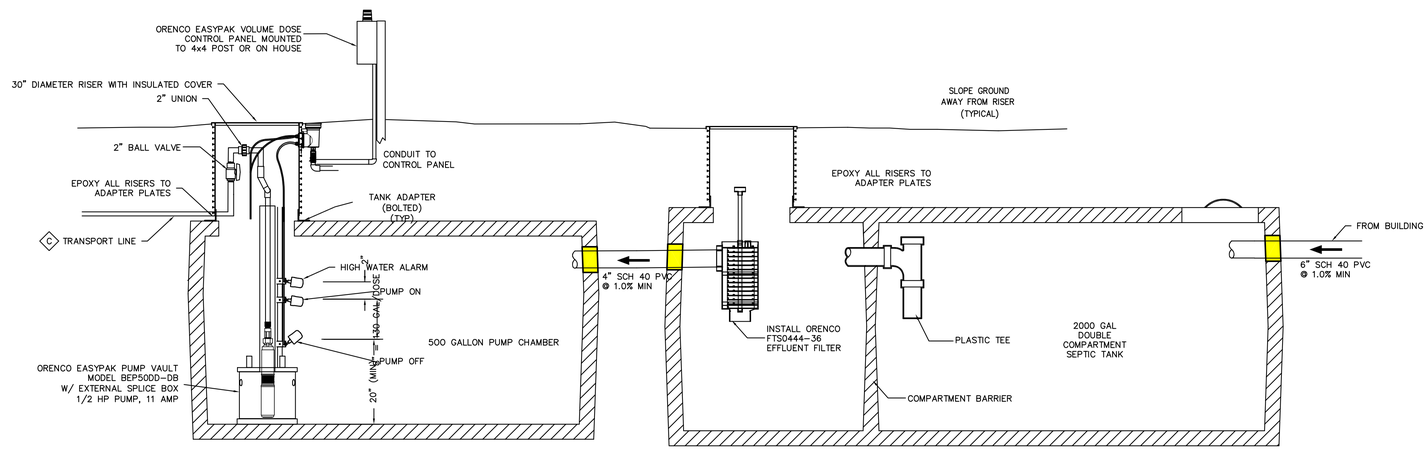


Sewer Network Table			
NAME	RIM	INV OUT	INV IN
OUTFALL-E	1235.8	N/A	1236
NODE E-1	1244.13	1238.89	1238.89
NODE E-2	1244.14	1241.82	N/A
OUTFALL-B	1235.8	N/A	1236
CB-B1	1242.01	1236.85	1236.85
CB-B2	1242.01	1238.31	N/A
OUTFALL-A	1235.8	N/A	1235.75
CB-A1	1242	1236.62	1236.87
CB-A2	1242	1237.59	1237.59
CB-A3	1241.95	1238.22	1238.22
CB-A4	1241.93	1238.8	N/A
OUTFALL-C	1233.76	N/A	1233.26
CB-C1	1239.18	1234.49	1234.74
INLET C-2	1235.56	1235.56	N/A
OUTFALL-D	1235.8	N/A	1236
NODE D-1	1244.14	1238.93	1238.93
NODE D-2	1244.14	1241.83	N/A
OUTFALL-F	1224.8	N/A	1225
CB-F1	1229	1225.77	1226.02
CB-F2	1229	1226.6	N/A

4' DIA. CATCH BASIN DETAIL



SEPTIC TANK AND PUMP CHAMBER SECTION VIEW



SEPTIC TANK AND PUMP CHAMBER SECTION VIEW

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231.218.1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

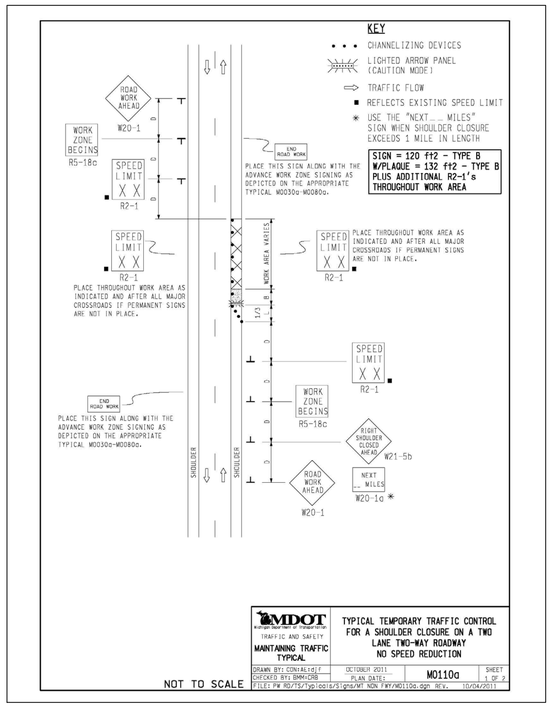
CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

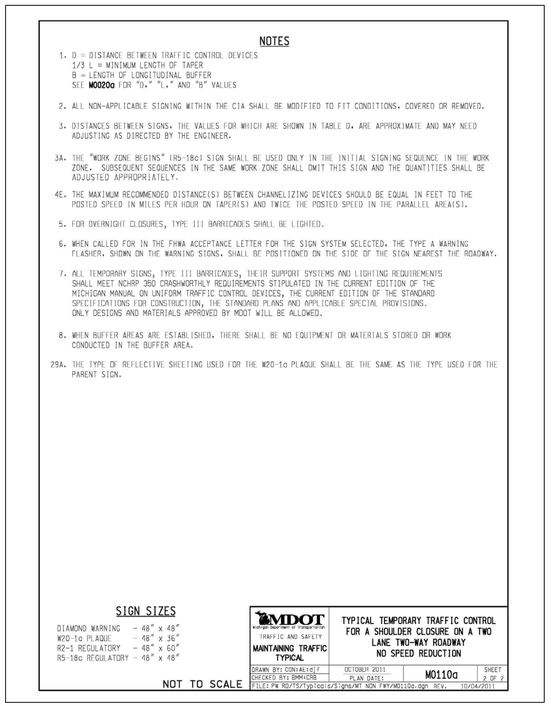
LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT NO.:
2018-114

SANITARY SYSTEM DETAILS

C5.2





TEMPORARY TRAFFIC CONTROL FOR SHOULDER CLOSURE

MDOT GENERAL NOTES:
All facilities, including drainage facilities, shall be located prior to excavation in the MDOT right-of-way.

MDOT facilities are not located through the Miss Dig system. A 72 hours advance written notice is required to have freeway lighting staked or MITS-Freeway Ops facilities located.

No parking or storage of material or equipment will be allowed within the MDOT right-of-way.

Saw cut the existing concrete curb and gutter and approach full depth and remove them prior to placing the driveway approach.

All trees within the MDOT right of way shall remain uncut unless prior written approval has been received and a tree replacement plan has been approved.

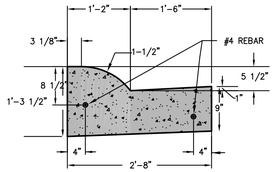
All traffic control devices shall be MMUTCD compliant. Traffic control devices are inclusive of signs, barricades, vertical panels, drums, warning lights, arrow boards, changeable message signs, cones, tubular markers, pavement tape, and paint and pavement markers.

Pavement areas and curb lengths adjacent to the proposed pavement repairs shall be removed when the adjacent pavement area or curb length is less than six (6) feet in length or within six (6) feet of an existing joint. The removal shall be performed as specified in Section 603 of the MDOT 2012 Standard Specifications for Construction.

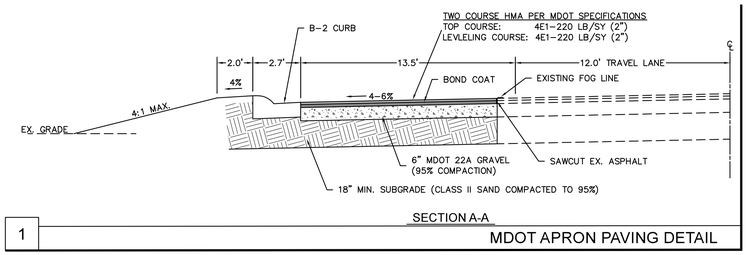
Work shall only occur on one side of the highway at a time

All work on the passing flare shall be done by an MDOT pre-qualified contractor.

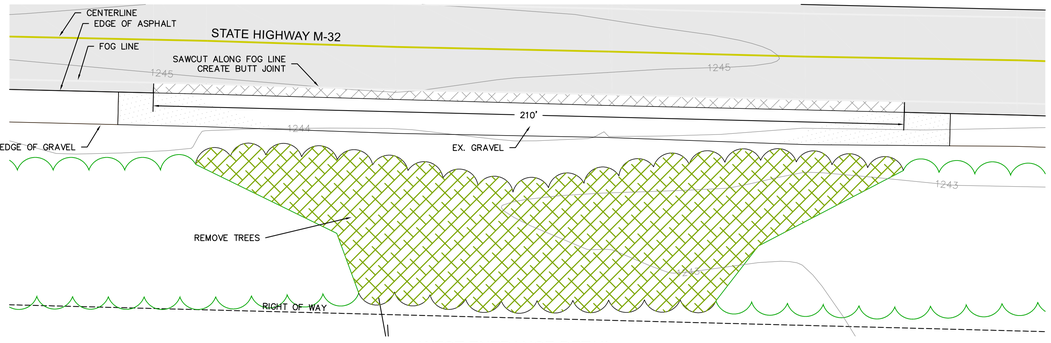
MDOT NOTES



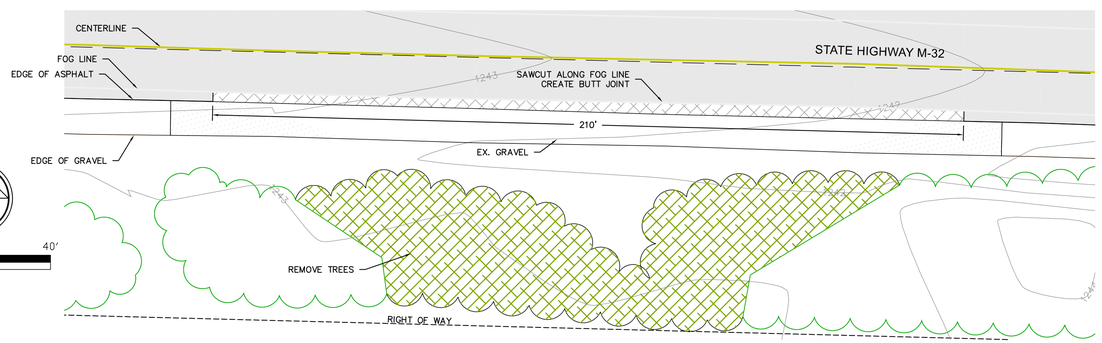
2 B2 CURB DETAIL



1 MDOT APRON PAVING DETAIL

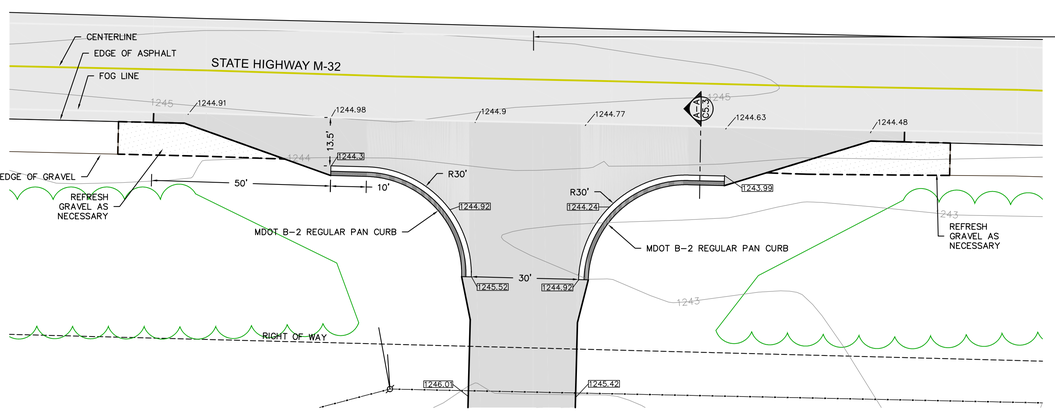


WEST ENTRANCE DETAIL

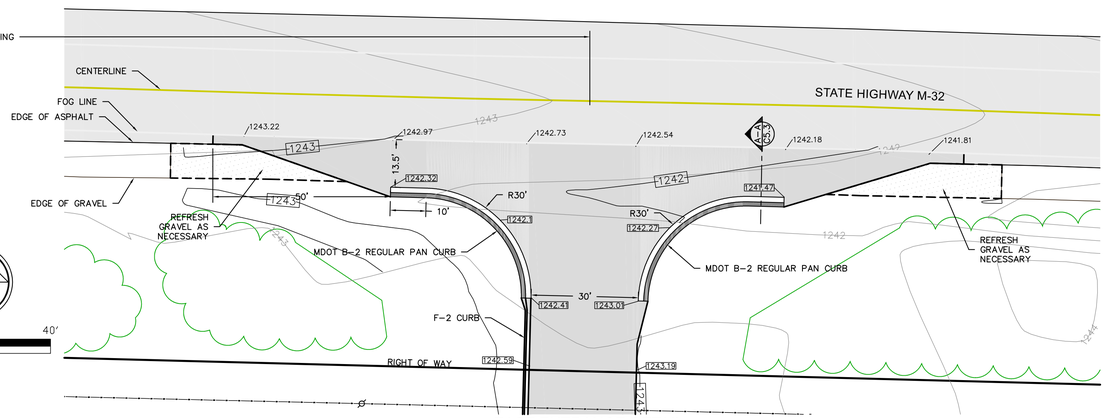


EAST ENTRANCE DETAIL

DEMOLITION PLAN FOR ENTRANCES



WEST ENTRANCE DETAIL



EAST ENTRANCE DETAIL

DIMENSION AND GRADING PLAN FOR ENTRANCES

SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231.218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

PROJECT:
ELMIRA SERVICE CENTER BUILDING

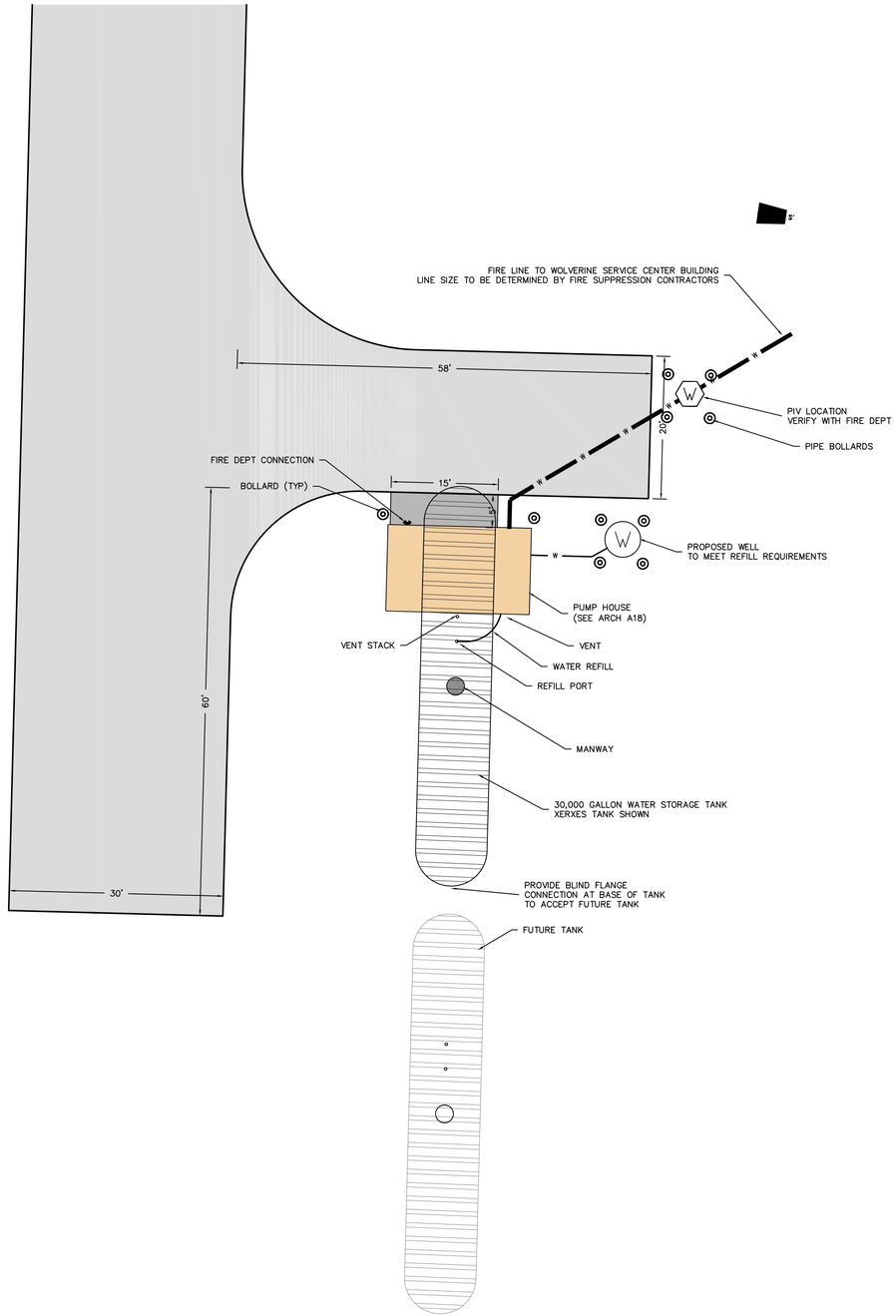
CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

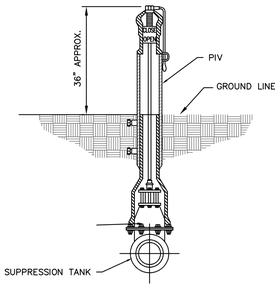
LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

PROJECT NO.:
2018-114

MDOT ENTRANCE DETAIL

C5.3





POST INDICATOR VALVE DETAIL

FIRE SUPPRESSION WATER SUPPLY PUMP SYSTEM DESIGN IS BY THE FIRE SUPPRESSION SYSTEM DESIGN–BUILD CONTRACTOR.

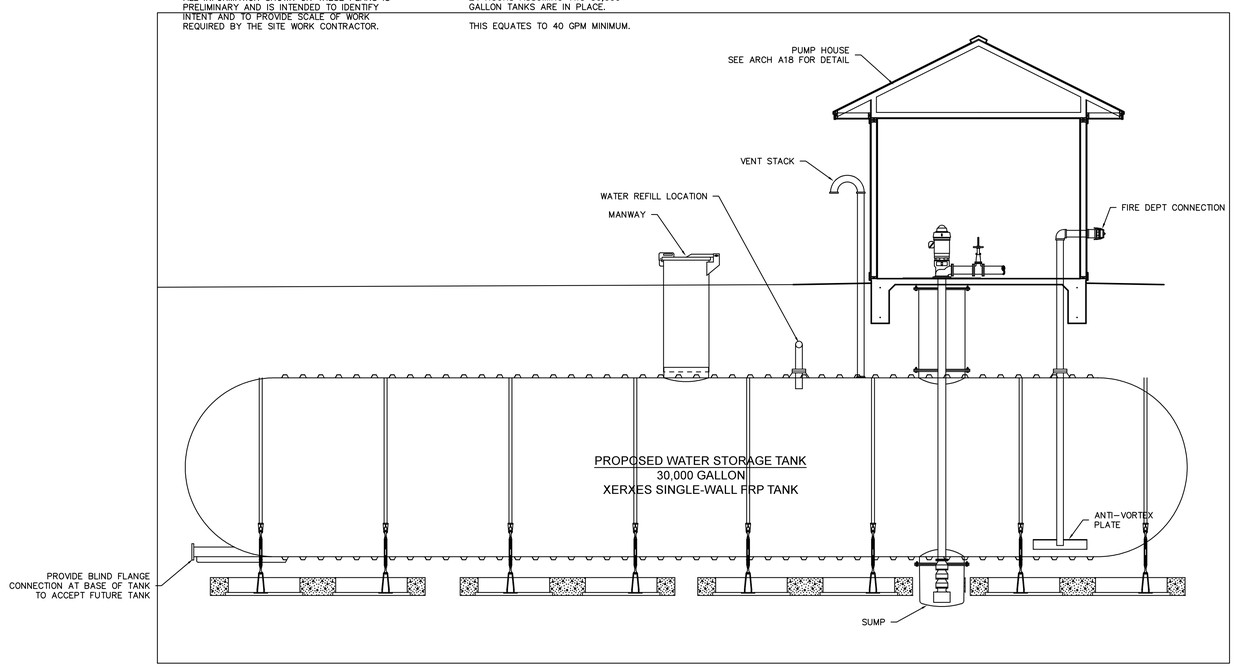
FIRE SUPPRESSION SYSTEM ENGINEERED DESIGN IS NOT PROVIDED BY ARCHITECTURE TECHNOLOGY, JOZWIAK CONSULTING OR ITS DESIGN CONSULTANTS.

ALL INFORMATION SHOWN ON THESE PLANS IS PRELIMINARY AND IS INTENDED TO IDENTIFY INTENT AND TO PROVIDE SCALE OF WORK REQUIRED BY THE SITE WORK CONTRACTOR.

NOTES:
TANK SHALL BE CAPABLE OF AUTOFILL AND SELF–MONITORING.

WELL SHALL BE CAPABLE OF PROVIDING MINIMUM REFILL RATE OF 24 HOURS ASSUMING TWO 30,000 GALLON TANKS ARE IN PLACE.

THIS EQUATES TO 40 GPM MINIMUM.



SITE ENGINEER:
jozwiak consulting
p.o. box 5342 | traverse city, mi 49696 | 231-218-1201
www.jozwiakconsulting.com

PLAN DATE:
2-11-2021 BID SET

LOCATION:
PART OF THE SOUTHEAST 1/4 OF SECTION 24
T31N, R05W, WARNER TWP.,
ANTRIM CO., MICHIGAN

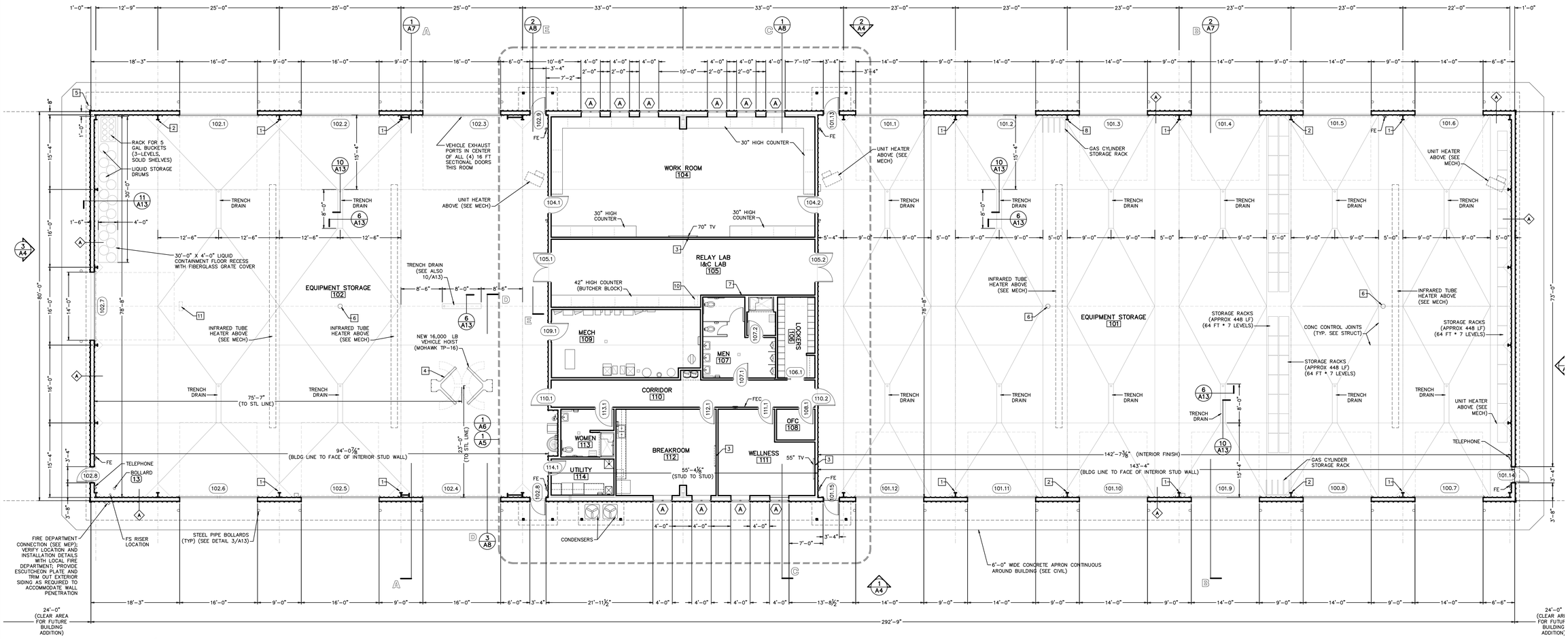
PROJECT:
ELMIRA SERVICE CENTER BUILDING

CLIENT:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE RD.
CADILLAC, MI 49601

PROJECT NO.:
2018-114

FIRE SUPPRESSION DETAILS

C5.4



1 **FLOOR PLAN**
SCALE: 1" = 10'-0"

ROOM FINISH SCHEDULE

RM#	ROOM NAME	FLOOR		BASE		N WALL		E WALL		S WALL		W WALL		CEILING			ENCLOSURE RATING & FIRE PROTECTION	NOTES
		MAT'L	FIN	MAT'L	FIN	MAT'L	FIN	MAT'L	FIN	MAT'L	FIN	MAT'L	FIN	MAT'L	FIN	HEIGHT		
101	EQUIPMENT STORAGE	CONC	2	NONE	--	MTL	31	MTL	31	MTL	31	MTL	31	MTL	31	VARIES	NONE	(3), (5), (6)
102	EQUIPMENT STORAGE	CONC	2	NONE	--	MTL	31	MTL	31	MTL	31	MTL	31	MTL	31	VARIES	NONE	(2), (3), (5), (6)
103	(NOT USED)																	
104	WORK ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	10'-0"	NONE	(3), (4)
105	RELAY LAB / I&C LAB	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	10'-0"	NONE	(3), (4), (9)
106	LOCKER ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	8'-0"	NONE	(4), (7)
107	MEN'S TOILET ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	8'-0"	NONE	(2), (3), (7)
107A	MEN'S SHOWER ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	8'-0"	NONE	(3), (7)
108	OFFICE	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	8'-0"	NONE	(7)
109	MECHANICAL ROOM	CONC	2	RCB	13	PLYWD/GYP	24	PLYWD/GYP	24	PLYWD/GYP	24	PLYWD/GYP	24	SAC	61	10'-0"	NONE	(3), (8)
110	CORRIDOR	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	9'-0"	NONE	(3), (7)
111	WELLNESS ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	10'-0"	NONE	(3)
112	BREAK ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	10'-0"	NONE	(3), (4)
113	WOMEN'S TOILET/SHWR RM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	8'-0"	NONE	(3), (7)
114	UTILITY ROOM	CONC	3	RCB	13	GYP	24	GYP	24	GYP	24	GYP	24	SAC	61	9'-0"	NONE	(2), (3), (4)

ROOM FINISH SCHEDULE NOTES LEGEND

(1) NOT USED.
(2) PROVIDE WALL PROTECTION (FINISH #71) AS INDICATED IN INTERIOR ELEVATIONS.
(3) SEE DOOR TYPES (SHEET A10) FOR HOLLOW METAL DOOR AND FRAME FINISHES.
(4) PLASTIC LAMINATE CASEWORK WITH PLASTIC LAMINATE TOPS, FINISHES #51 AND #52.
(5) PROVIDE PAINTED FINISH ON ALL EXPOSED STRUCTURAL STEEL (FINISH #25).
(6) PROVIDE SECTIONAL OVERHEAD DOORS WITH PREFINISHED INTERIOR FACES (WHITE).
(7) PROVIDE PAINTED GYPSUM BOARD BULKHEADS (FINISH #23).
(8) PROVIDE PAINTED 3/4" FRT PLYWOOD FROM FLOOR TO 10'-0" AFF ON ALL WALLS IN MECHANICAL ROOM.
(9) PROVIDE SOLID HARDWOOD BUTCHER BLOCK TOP.

FINISHES GENERAL NOTES

1. APPLY FINISHES IN STRICT ACCORDANCE WITH THE FINISH MATERIAL MANUFACTURERS INSTRUCTIONS, INCLUDING ADHERENCE TO RECOMMENDED ENVIRONMENTAL CONDITIONS FOR APPLICATION, AND PROTECTION OF FINISHED WORK.
2. OBTAIN FINAL APPROVAL FROM THE OWNER FOR ALL FINISH MATERIALS AND FINISH COLORS PRIOR TO PROCUREMENT AND INSTALLATION/APPLICATION OF FINISHES.
3. RACK STORAGE IS NOT TO EXCEED 12 FEET IN HEIGHT (NO HIGH-PILED STORAGE).

FLOOR PLAN KEY NOTES

1. LOCATION FOR 120V AND 208V ELECTRIC POWER, 3/4" COLD WATER, WATER HOSE REEL, AND 1/2" HARD AIR LINE, 3/8" AIR HOSE REEL WITH 50' RETRACTABLE HOSE. MOUNT TO FACE OF COLUMN FLANGE, WITH SWIVEL BRACKET AT 48" AFF. 3/8" AIR HOSES TO BE EQUIPPED WITH 3/8" NPT FITTINGS, STYLE "M".
2. LOCATION FOR 120V ELECTRIC POWER, 3/4" COLD WATER, WATER HOSE REEL, AND 1/2" HARD AIR LINE, 3/8" AIR HOSE REEL WITH 50' RETRACTABLE HOSE. MOUNT TO FACE OF COLUMN FLANGE, WITH SWIVEL BRACKET AT 48" AFF. 3/8" AIR HOSES TO BE EQUIPPED WITH 3/8" NPT FITTINGS, STYLE "M".
3. PROVIDE FRT PLYWOOD BACKING BEHIND GYPSUM BOARD FOR MOUNTING TV'S. VERIFY/COORDINATE MOUNTING HEIGHTS WITH OWNER.
4. LOCATION FOR NEW MOHAWK MODEL TP-16 TRUCK LIFT (BY OWNER): PROVIDE 220V ELECTRIC POWER FOR LIFT, AND 50' RETRACTABLE ELECTRIC FROM ABOVE, AND 3/8" RETRACTABLE AIR HOSE REEL FROM ABOVE. ELECTRIC AND AIR TO BE LOCATED FLANKING LIFT ON THE EAST AND WEST SIDES (NOT CENTERED DIRECTLY OVER LIFT). INSTALL TIGHT TO CEILING DECK. 3/8" AIR HOSE TO BE EQUIPPED WITH 3/8" NPT FITTING, STYLE "M".
5. LOCATION FOR (2) SECURITY CAMERAS, MOUNTED ON WALL UNDER ROOF EAVES. VERIFY WITH OWNER. REFER TO ELECTRICAL DRAWINGS AND COORDINATE WITH DATA/SECURITY DESIGN-BUILD CONTRACTOR.
6. LOCATION FOR SECURITY CAMERA, PENDANT-MOUNTED FROM CEILING. VERIFY WITH OWNER. REFER TO ELECTRICAL DRAWINGS AND COORDINATE WITH DATA/SECURITY DESIGN-BUILD CONTRACTOR. SEE EXTERIOR CAMERA LOCATIONS ON ELEVATIONS AND DATA/SECURITY DRAWINGS.
7. PROVIDE (4) PAINTED, 4' X 8" X 3/4" THICK FRT PLYWOOD PANELS, WITH 1X2 WOOD TRIM AROUND THE SIDES AND TOP. ORIENT PANELS HORIZONTALLY, AND FASTEN TO WALL IN LOCATION INDICATED WITH 1/4" DIA SCREWS INTO STEEL WALL STUDS @ 16" O/C. E/W. BOTTOM OF LOWER PANEL AT FLOOR LEVEL. PROVIDE VCB WALL BASE OVER BOTTOM OF LOWER PANEL. PAINT PANELS AND TRIM TO MATCH WALL.
8. LOCATION FOR 120V ELECTRIC POWER, 1/2" HARD AIR LINE, 3/8" AIR HOSE REEL WITH 50' RETRACTABLE HOSE. MOUNT TO FACE OF WALL WITH SWIVEL BRACKET NEAR CEILING. AIR HOSE TO BE EQUIPPED WITH 3/8" NPT FITTINGS, STYLE "M".
9. LOCATION FOR 1/2" HARD AIR LINE, 3/8" AIR HOSE REEL WITH 50' RETRACTABLE HOSE. MOUNT TO FACE OF COLUMN FLANGE, WITH SWIVEL BRACKET AT 48" AFF. AIR HOSES TO BE EQUIPPED WITH 3/8" NPT FITTINGS, STYLE "M".
10. LOCATION FOR 1/2" HARD AIR LINE, 3/8" AIR HOSE REEL WITH 50' RETRACTABLE HOSE. MOUNT TO FACE OF WALL WITH SWIVEL BRACKET NEAR CEILING. AIR HOSES TO BE EQUIPPED WITH 3/8" NPT FITTINGS, STYLE "M".
11. LOCATION FOR CEILING-MOUNTED AUXILIARY POWER RETRACTABLE CORD REEL. VERIFY LOCATION WITH OWNER. SEE ELECTRICAL FOR ADDITIONAL INFORMATION.

SUMMARY OF INTERIOR FINISHES

DESIG	TYPE	DESCRIPTION
0	VARIES	UNFINISHED SUBSTRATE
2	CONC SEALER	CLEAR CONCRETE HARDENER AND SEALER FOR EXPOSED SLAB-ON-GRADE FLOORS (033000) EUCLID CHEMICAL CO., "EUCO DIAMOND HARD," OR EQUIVALENT
3	EPOXY FLOORING	XTREME ENGINEERED FLOOR SYSTEMS, "V-8 HYBRID XT FULL CHIP VINYL SYSTEM" (096700) COLOR: "GARNET - C-9305"
13	RCB	RUBBER COVE BASE (096500): MFR: ROPPE COLOR: 129, "DOLPHIN"
21 (HM FRAMES)	PAINT	INTERIOR LATEX SEMI GLOSS PAINT (099000): MFR: SHERWIN WILLIAMS COMPANY COLOR: "HIGH TEA" SW6159
22 (DOORS)	PAINT	INTERIOR LATEX SEMI GLOSS PAINT (099000): MFR: SHERWIN WILLIAMS COMPANY COLOR: "HIGH TEA" SW6159
23 (CEILINGS)	PAINT	MFR: INTERIOR LATEX FLAT PAINT (099000): SHERWIN WILLIAMS COMPANY COLOR: "PURE WHITE" SW7005
24 (WALLS)	PAINT	INTERIOR LATEX EGG-SHELL PAINT (099000): MFR: SHERWIN WILLIAMS COMPANY COLOR: "RICE GRAIN" SW6155
25 (STEEL)	PAINT	INTERIOR WATERBORNE ACRYLIC DRYFALL PAINT OR DTM ACRYLIC COATING (099000): MFR: SHERWIN WILLIAMS COMPANY COLOR: WHITE (MATCHING LINER PANEL)
31	LINER PANEL	PREFINISHED METAL INTERIOR LINER PANEL (133419) BY PRE-ENG METAL BUILDING MANUFACTURER COLOR: WHITE
51 (FACES)	PLAM	PLASTIC LAMINATE (064000): MFR: PIONITE, COLOR: "IL PALIO PAPEL" #AV981, SUEDE; (EDGE BAND: CHARTER INDUSTRIES, #WD 478 "AMAZON")
52 (TOPS)	PLAM	PLASTIC LAMINATE (064000): MFR: PIONITE, COLOR: "TAUPE" #ST606, SUEDE
61	SAC	ACOUSTIC CEILING TILE (095100): MFR: INTERSOURCE SPECIALTIES CO., "ALL IN ONE INSULATING FIBERGLASS CEILING PANELS," WHITE, SQUARE EDGE, 2'X2' X 3" THICK INSULATING CEILING PANELS TILE GRID (095100): MFR: ARMSTRONG, "PRELUDE XL HO.7x1 15/16 EXPOSED TEE," 2'X2', WHITE MTL CLG GRID (SEE 1/A15)
71	FRP	FIBER REINFORCED PLASTIC (064000): MFR: CRANE COMPOSITES, INC., GLASBORD COLOR: "COLONIAL WHITE" #83

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

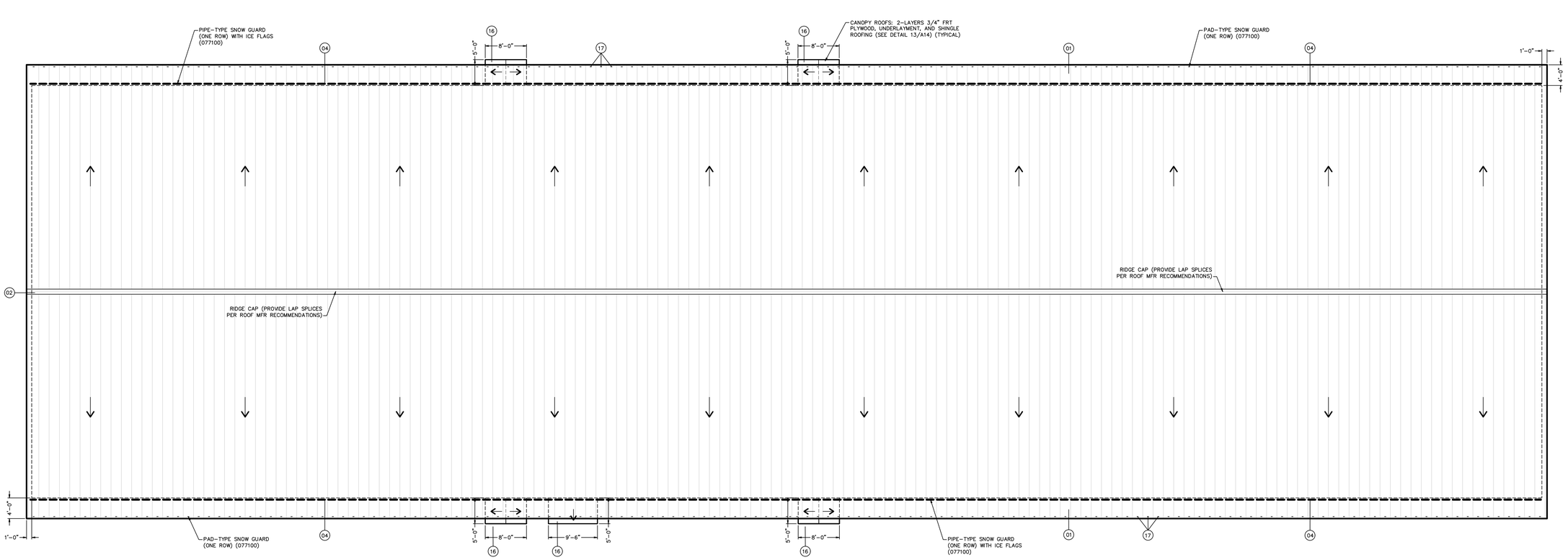
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
FLOOR PLAN

WSC_ELMIRA

ISSUED	
01-28-21	
REV.	
REV.	
REV.	
REV.	
REV.	

A2



1 **ROOF PLAN**
SCALE: 1" = 10'-0"

N

FEET
0 10 20 30 40

FLOOR PLAN GENERAL NOTES

1. FIELD-VERIFY PLAN DIMENSIONS DURING LAYOUT. NOTIFY THE ARCHITECT OF DISCREPANCIES IMMEDIATELY UPON DISCOVERY.
2. FLOOR PLAN DIMENSIONS ARE TAKEN TO FACE OF FRAMING, UNLESS INDICATED OTHERWISE.
3. PROVIDE ALL NONCOMBUSTIBLE FRAMING AND FURRING REQUIRED TO ACHIEVE WALL PLANES INDICATED.
4. MECHANICAL AND ELECTRICAL ELEMENTS ARE NOT SHOWN; SEE MEP FOR MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.
5. PROVIDE ALL OPENINGS IN FLOORS, CEILINGS, & WALLS REQUIRED FOR PASSAGE OF MECHANICAL AND ELECTRICAL DUCTS, PIPES, WIRES, CONDUITS, AND EQUIPMENT.
6. SEE MEP FOR REQUIRED DUCT PENETRATIONS (NOT SHOWN IN ARCH DRAWINGS).
7. COORDINATE ARCHITECTURAL DETAILS AND ACCESSORIES LOCATIONS WITH MECHANICAL, ELECTRICAL, AND PLUMBING FIXTURES (NOT NECESSARILY SHOWN IN ARCHITECTURAL DRAWINGS).
8. WHERE SYMBOL NOTED "FEC" IS SHOWN, PROVIDE PORTABLE FIRE EXTINGUISHER AND RECESSED CABINET (104400) PER DETAIL 5/A13. WHERE SYMBOL NOTED "FE" IS SHOWN, PROVIDE WALL MOUNTED PORTABLE FIRE EXTINGUISHER AS SPECIFIED.
9. PROVIDE MINIMUM 4" THICK CONCRETE PADS FOR ALL EXTERIOR GROUND-MOUNTED TRANSFORMERS, CONDENSERS, AND OTHER MEP AND UTILITIES EQUIPMENT. COORDINATE EQUIPMENT PADS WITH MEP AND SITE CIVIL DESIGN.
10. PROVIDE BLOCKING IN WALLS AS REQUIRED FOR SECURE ATTACHMENT OF ALL ACCESSORIES ATTACHED THERETO. COORDINATE LOCATIONS AND MOUNTING ELEVATIONS OF ALL WALL-MOUNTED ACCESSORIES WITH THE OWNER AT THE TIME WALLS ARE FRAMED AND PRIOR TO APPLICATION OF GYPSUM BOARD.
11. NOT ALL EQUIPMENT, FURNISHINGS, ARTWORK, AND ACCESSORY ITEMS ARE SHOWN IN DRAWINGS.

EXTERIOR FINISHES LEGEND

01	METAL ROOFING:	STANDING SEAM METAL PANEL ROOFING (133419) PRODUCT: METAL BUILDING MFR'S ROOFING, MEETING SPECIFICATION COLOR: GALVALUME
02	METAL ROOF CAP:	STANDING SEAM METAL PANEL ROOFING RIDGE CAP (133419) PRODUCT: METAL BUILDING MFR'S RIDGE CAP, MEETING SPECIFICATION COLOR: GALVALUME
03	METAL ROOF FASCIA/RAKE TRIM:	PREFINISHED METAL ROOFING FASCIA AND RAKE TRIM (133419) PRODUCT: METAL BUILDING MFR'S TRIM, MEETING SPECIFICATION COLOR: MATCHING VP "COOL ARCTIC WHITE"
04	PIPE-STYLE SNOW GUARD:	PREFINISHED, PIPE-STYLE CONTINUOUS SNOW GUARDS (077100) PRODUCT: ALPINE SNOWGUARDS, "ASG4025-AL" SNOW GUARD SYSTEM WITH 6000 SERIES ALUMINUM ICE FLAGS. COLOR: MILL ALUMINUM
05	EXTERIOR SOFFIT:	PREFINISHED METAL EXTERIOR SOFFIT PANELS (133419) PRODUCT: METAL BUILDING MFR'S SOFFIT, MEETING SPECIFICATION COLOR: MATCHING VP "COOL ARCTIC WHITE"
06	EXTERIOR METAL PANEL SIDING:	PREFINISHED METAL PANEL EXTERIOR SIDING (133419) PRODUCT: METAL BUILDING MFR'S SIDING, MEETING SPECIFICATION COLOR: MATCHING VP "COOL DARK BRONZE"
07	EXTERIOR CORNER TRIM:	PREFINISHED METAL EXTERIOR CORNER TRIM (133419) PRODUCT: METAL BUILDING MFR'S SIDING, MEETING SPECIFICATION COLOR: PREFINISHED - MATCHING ADJACENT EXTERIOR METAL PANEL SIDING
08	PORCH COLUMNS:	STRUCTURAL STEEL PORCH COLUMNS (133419) PRODUCT: METAL BUILDING MFR'S STEEL FRAMING, MEETING SPECIFICATION COLOR: PAINTED, MATCHING VP "COOL ARCTIC WHITE"
09	PIPE BOLLARDS:	CONCRETE-FILLED, STRUCTURAL STEEL PIPE BOLLARDS (321700) COVERS: PREFINISHED POLYETHYLENE COVERS W/ REFLECTIVE RINGS COLOR: YELLOW, W/ (2) RED RINGS (SEE ACCESSORY #13 & DETAIL 3/A13)
10	EXTERIOR OPENINGS TRIM:	PREFINISHED METAL EXTERIOR OPENINGS PERIMETER TRIM (133419) PRODUCT: METAL BUILDING MFR'S TRIM, MEETING SPECIFICATION COLOR: PREFINISHED - MATCHING ADJACENT EXTERIOR METAL PANEL SIDING
11	WINDOWS:	PREFINISHED VINYL WINDOWS (085313) PRODUCT: MANUFACTURER'S STANDARD, MEETING SPECIFICATION COLOR: MANUFACTURER'S STANDARD WHITE
12	HM EXTERIOR DOORS:	INSULATED HOLLOW METAL EXTERIOR DOORS (081100) AND HM FRAMES COLOR: MATCHING VP "COOL ARCTIC WHITE"
13	SECTIONAL DOORS:	PREFINISHED, SECTIONAL OVERHEAD DOORS W/ LIGHTS AS SHOWN (083613) COLOR: MANUFACTURER'S STANDARD WHITE
14	LOUVER VENTS:	PREFINISHED ALUMINUM LOUVER VENTS (SEE ALSO MECHANICAL) COLOR: PREFINISHED - MATCHING ADJACENT EXTERIOR METAL PANEL SIDING
15	WEATHERHOOD:	FABRICATED SHEET METAL WEATHERHOOD (SEE ALSO MECHANICAL) COLOR: PAINTED - MATCHING ADJACENT EXTERIOR METAL PANEL SIDING NOTE: PROVIDE FULL 90-DEGREE CUT-OFF WEATHERHOODS
16	SHINGLE ROOFING:	ASPHALT/FIBERGLASS SHINGLES (073100) PRODUCT: ATLAS ROOFING CORP., PINNACLE PRISTINE ARCHITECTURAL SINGLE SIGNATURE GOLD SHINGLE SERIES; COLOR: "PRISTINE WEATHERED SHADOW"
17	PAD-STYLE SNOW GUARD:	ADHESIVE-APPLIED PAD-STYLE SNOW GUARDS @ 24" O/C (077100) PRODUCT: ALPINE SNOWGUARDS, "PD30" COLOR: NATURAL GALVANIZED STEEL

ROOF PLAN SYMBOLS LEGEND

↑	ARROW DENOTING DIRECTION OF WATER FLOW
	PREFINISHED STANDING SEAM METAL ROOFING (076113) (TYPICAL ROOFING)
- - - - - - - -	PREFINISHED BAR-TYPE SNOW GUARDS ON STANDING SEAM METAL ROOF (077100) (SEE DETAIL 7/A13)

ROOF PLAN GENERAL NOTES

1. ROOFING STANDARD: NRCA "ROOFING AND WATERPROOFING MANUAL"
2. SHEET METAL ROOFING, FLASHING, AND ROOFING ACCESSORY STANDARD: SMACNA "ARCHITECTURAL SHEET METAL MANUAL"
3. ARROW SYMBOLS DENOTE DIRECTION OF WATER FLOW.
4. PROVIDE CLASS C ROOF COVERING MINIMUM.
5. SEE MEP DRAWINGS FOR MEP ROOF PENETRATIONS AND EQUIPMENT (NOT NECESSARILY SHOWN ON ARCHITECTURAL ROOF PLAN).
6. PROVIDE CONTINUOUS METAL BAR TYPE SNOW GUARDS AT THE LOW ENDS OF ALL STANDING SEAM METAL ROOFS (SEE DETAIL 7/A13). DETAILS AND LAYOUTS SHOWN ARE CONCEPTUAL. SNOW GUARD MANUFACTURER SHALL PROVIDE ENGINEERED SNOW GUARD SYSTEM DESIGN CUSTOMIZED TO THE SPECIFIC CONDITIONS OF THIS PROJECT.

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

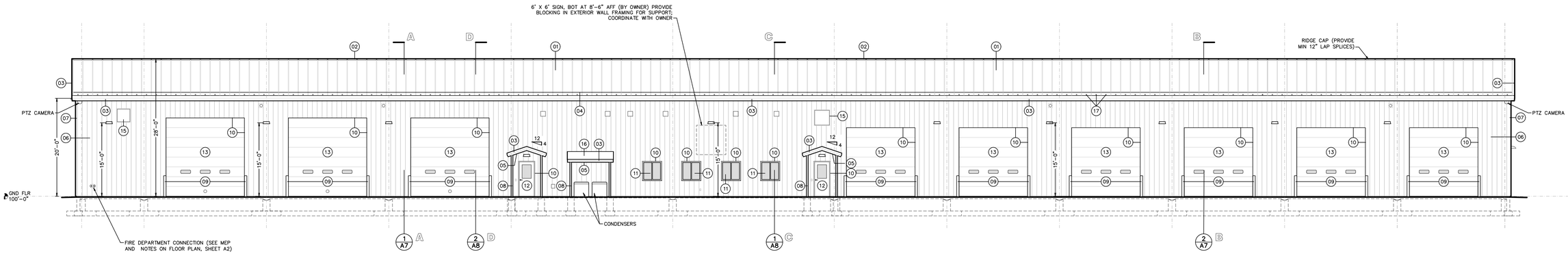
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
ROOF PLAN

WSC_ELMIRA

ISSUED	01-28-21				
REV					
REV					
REV					
REV					
REV					

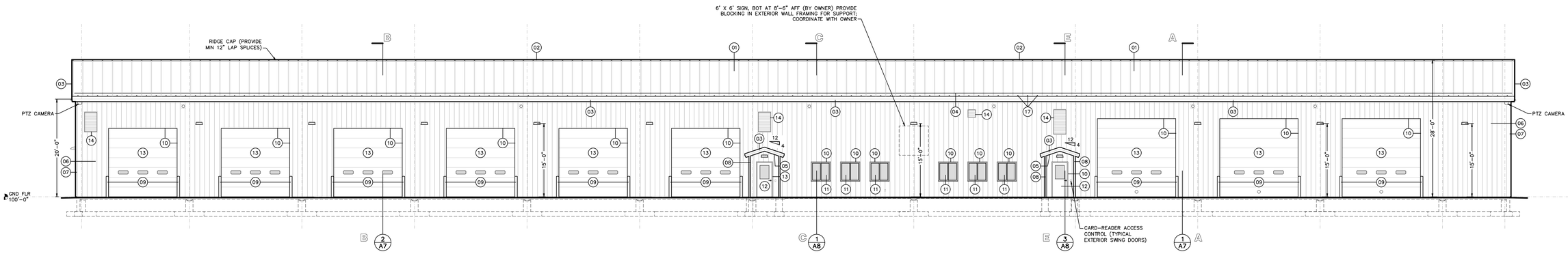
A3



1 SOUTH EXTERIOR ELEVATION

SCALE: 1" = 10'-0"

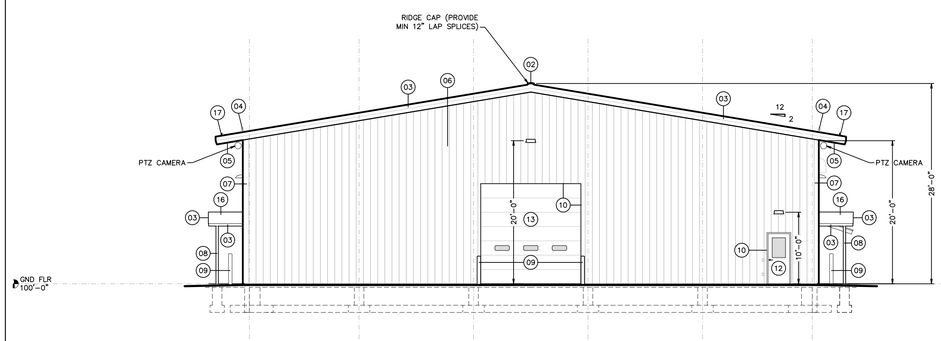
FEET 0 10 20 30 40



2 NORTH EXTERIOR ELEVATION

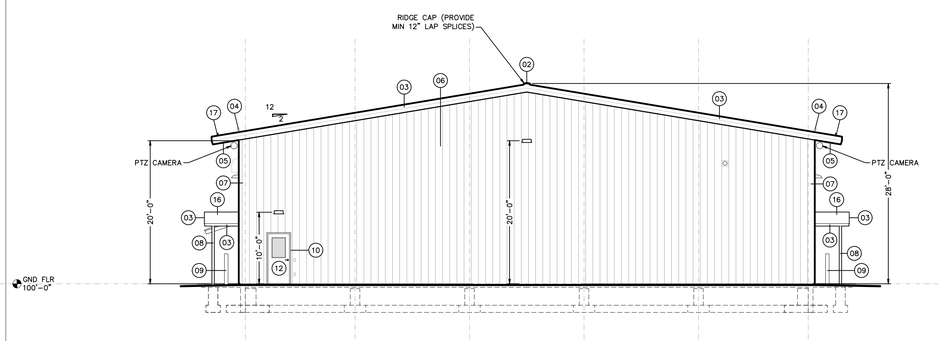
SCALE: 1" = 10'-0"

FEET 0 10 20 30 40



3 WEST EXTERIOR ELEVATION

SCALE: 1" = 10'-0"



4 EAST EXTERIOR ELEVATION

SCALE: 1" = 10'-0"

EXTERIOR ELEVATIONS GENERAL NOTES

1. LABELED EXTERIOR ELEVATION MATERIALS AND ELEMENTS ARE TYPICAL.
2. EXTERIOR HOSE BIBS ARE NOT SHOWN ON ARCHITECTURAL ELEVATIONS. SEE PLUMBING PLAN FOR HOSE BIB LOCATIONS.
3. VERIFY ALL UTILITY CONNECTIONS TO BUILDING WITH MEP AND SITE CIVIL DRAWINGS AND SPECIFICATIONS (NOT NECESSARILY SHOWN ON ARCHITECTURAL ELEVATIONS).
4. VERIFY LOCATIONS OF ALL MEP PENETRATIONS, LOUVERS, AND EQUIPMENT WITH MEP DRAWINGS AND SPECIFICATIONS; NOT ALL MEP PENETRATIONS AND ELEMENTS ARE SHOWN IN EXTERIOR ELEVATIONS; SEE MEP.
5. SNOW GUARD DETAILS AND LAYOUTS SHOWN ARE CONCEPTUAL. SNOW GUARD MANUFACTURER SHALL PROVIDE ENGINEERED SNOW GUARD SYSTEM DESIGN CUSTOMIZED TO THE SPECIFIC CONDITIONS OF THIS PROJECT.

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

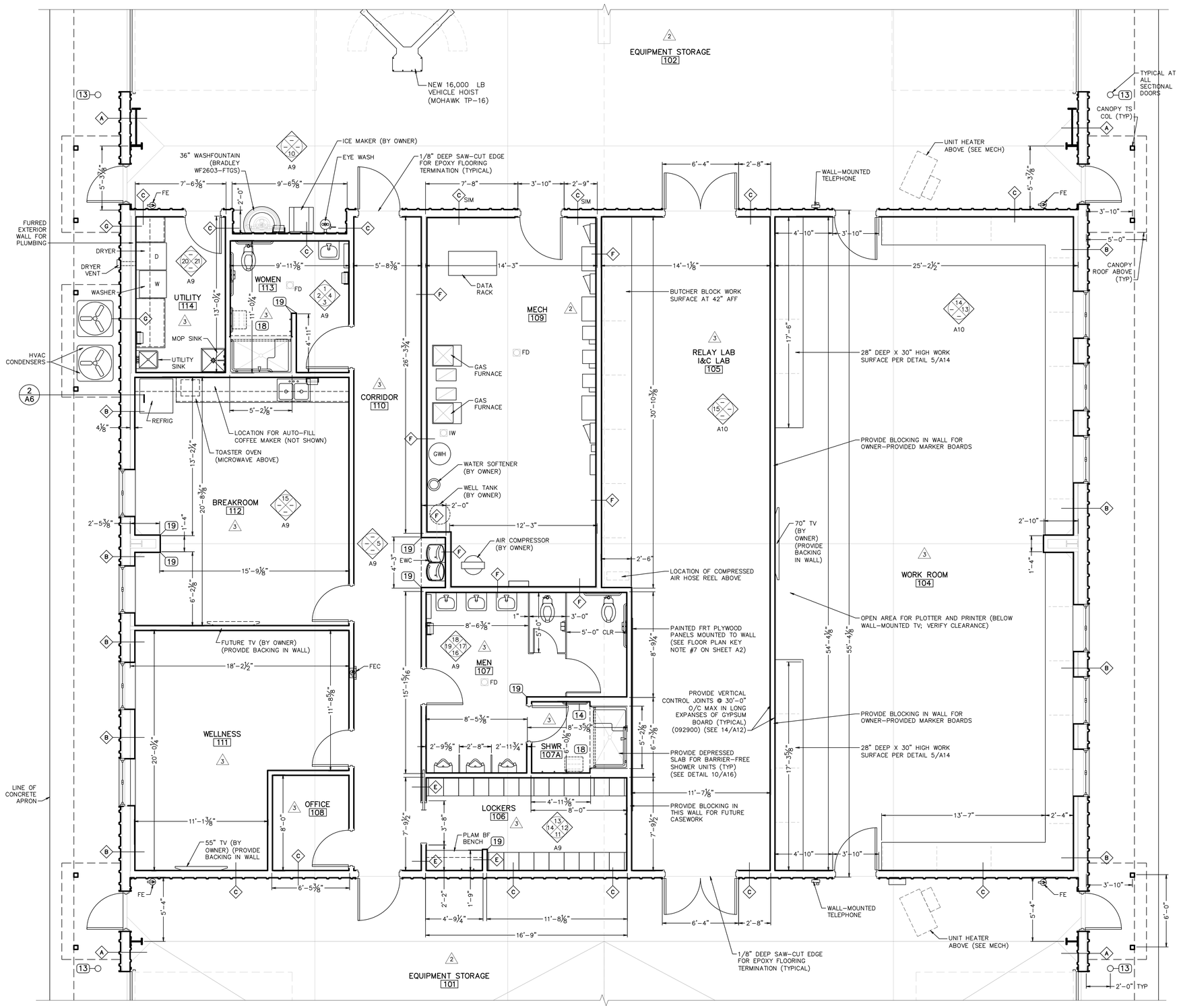
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
EXTERIOR ELEVATIONS

WSC_ELMIRA

ISSUED	
01-28-21	
REV.	
REV.	
REV.	
REV.	
REV.	

A4



1 ENLARGED FLOOR PLAN

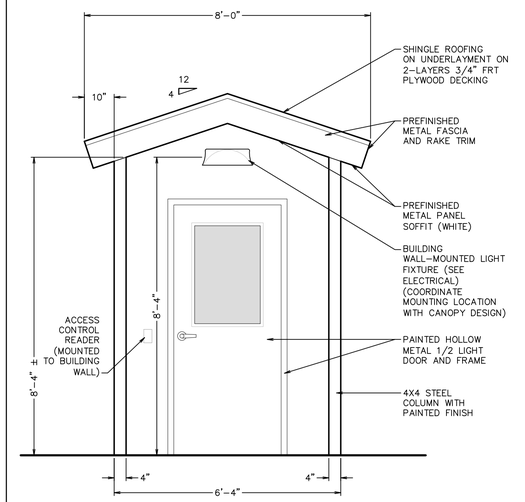
SCALE: 1/4" = 1'-0"

SYMBOLS LEGEND

- OFFICE C13 — ROOM NUMBER DESIGNATION
- K — WINDOW TYPE DESIGNATION
- H04.1 — DOOR NUMBER DESIGNATION
- 1 / A6 — EXTERIOR ELEVATION TAG
- 9 / 8 / 7 / 6 / A12 — INTERIOR ELEVATION TAG
- 1 / A6 — SECTION DETAIL CUT
- A — WALL TYPE DESIGNATION
- 26 — FIXTURE TYPE DESIGNATION
- 26 — FINISH TYPE DESIGNATION
- 12. — KEYED NOTE DESIGNATION

SEE ALSO "FLOOR PLAN GENERAL NOTES," SHEET A3

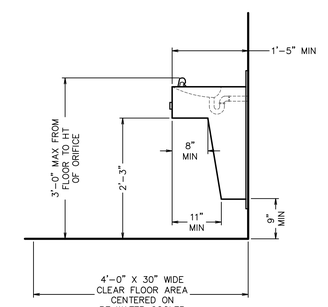
NOTE: ALL CANOPY FRAMING TO BE ENGINEERED AND PROVIDED BY PRE-ENGINEERED METAL BUILDING MANUFACTURER



SEE ALSO DETAIL 13/A14

3 ENLARGED CANOPY ELEVATION

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



2 EWC BARRIER-FREE CLEARANCES

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

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT: ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER: WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

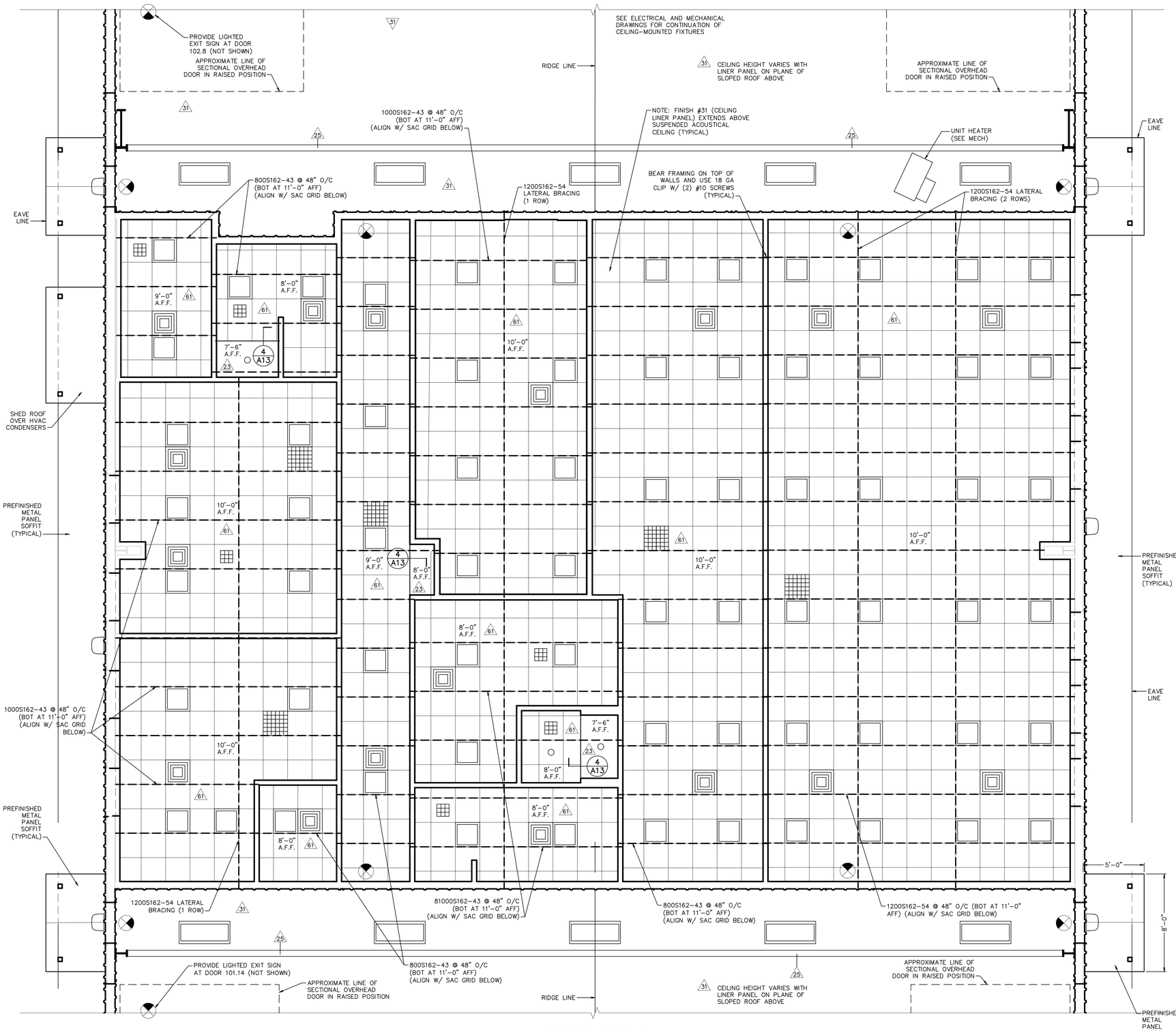
PROJECT: SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS: ENLARGED FLOOR PLAN

WSC_ELMIRA

ISSUED: 01-28-21
REV
REV
REV
REV
REV

A5



1 REFLECTED CEILING PLAN

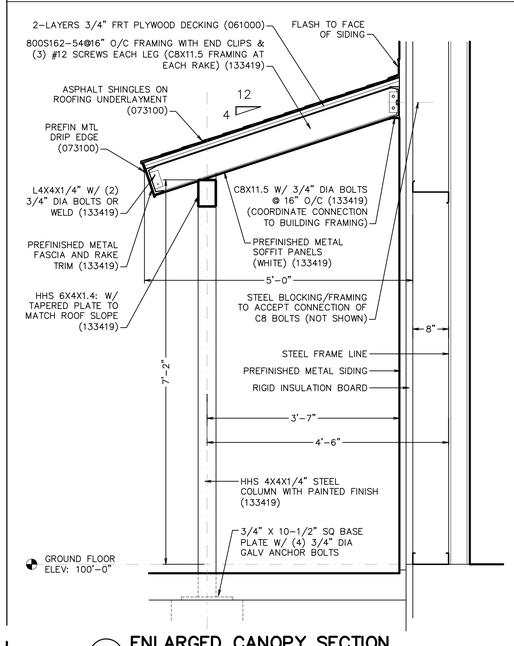
SCALE: 1/4" = 1'-0"

REFLECTED CEILING SYMBOLS LEGEND

	2' X 2' SUSPENDED ACOUSTICAL CEILING (SAC) (095100); SEE DETAIL 1/A15 (NOTE: CEILINGS SHOWN WITHOUT SAC GRID ARE TO BE FINISHED GYPSUM BOARD, UNLESS OTHERWISE NOTED)
	LIGHTING FIXTURES (VARIOUS); SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE SPECIFICATIONS, LEDS, CIRCUITING, AND CONTROLS
	LIGHTED, DIRECTIONAL EXIT SIGN (101400); SEE ALSO ELECTRICAL AND DETAIL 13/A16
	CEILING RECESSED SUPPLY AIR DIFFUSER; SEE MECHANICAL
	CEILING RECESSED RETURN AIR GRILLE; SEE MECHANICAL
	CEILING RECESSED EXHAUST AIR GRILLE; SEE MECHANICAL

REFLECTED CEILING PLAN NOTES

1. NOTE PROVIDE INTERIOR WALL BRACING/SUSPENDED ACOUSTICAL CEILING SUPPORT FRAMING AS INDICATED. BEAR SUPPORT FRAMING MEMBERS ON LIGHT GAGE METAL INTERIOR AND PERIMETER WALLS AT 11'-0" AFF. ALIGN FRAMING WITH SUSPENDED ACOUSTICAL CEILING (SAC) GRID BELOW.
2. MECHANICAL AND ELECTRICAL SYMBOLS SHOWN ARE SCHEMATIC AND ARE NOT EXHAUSTIVE; NOT ALL MECHANICAL AND ELECTRICAL ITEMS ARE SHOWN IN ARCHITECTURAL DRAWINGS; SEE MEP FOR MECHANICAL AND ELECTRICAL ELEMENTS IN CEILINGS.
3. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR LIGHT FIXTURES AND LIGHTING CONTROLS.
4. PROVIDE PREFINISHED METAL LINER PANEL (FINISH #31) THROUGHOUT BUILDING (INCLUDING ABOVE AREAS RECEIVING SUSPENDED ACOUSTICAL CEILINGS) TO SUPPORT BATT INSULATION IN ROOF PURLIN SPACES.
5. PROVIDE BLOCKING FOR EQUIPMENT AND ACCESSORIES ATTACHED TO CEILING, INCLUDING AIR HOSE REELS AND ELECTRIC REELS.



2 ENLARGED CANOPY SECTION

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

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

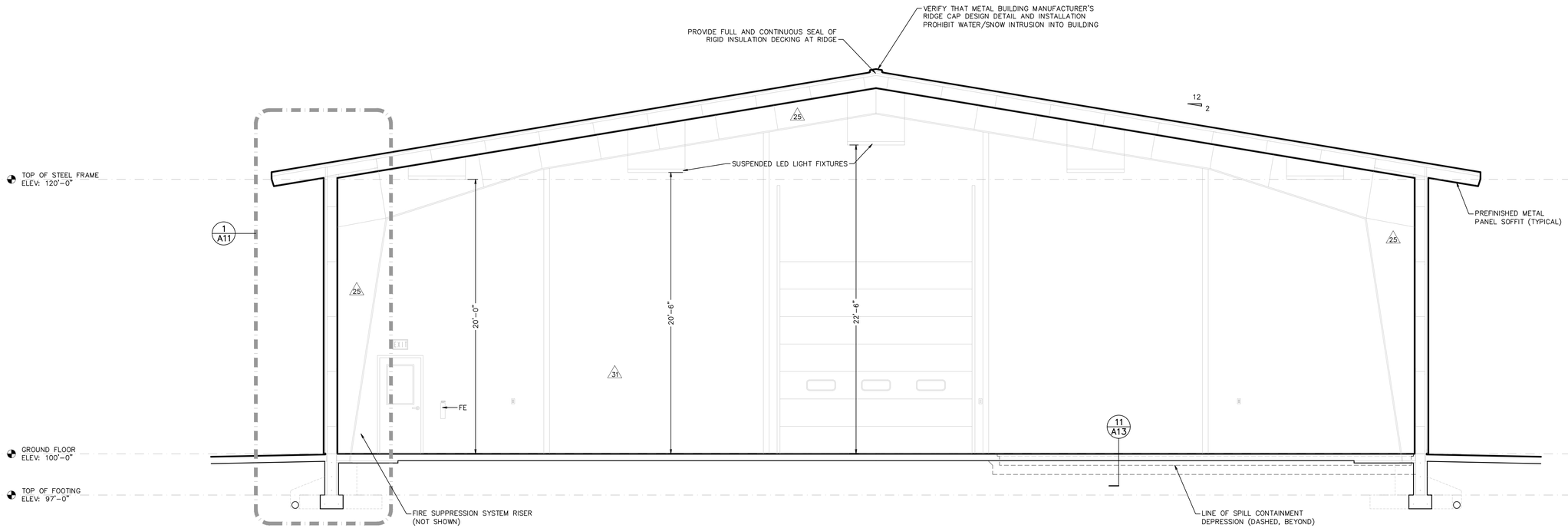
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
REFLECTED CEILING PLAN

WSC_ELMIRA

ISSUED	
01-28-21	
REV.	
REV.	
REV.	
REV.	
REV.	

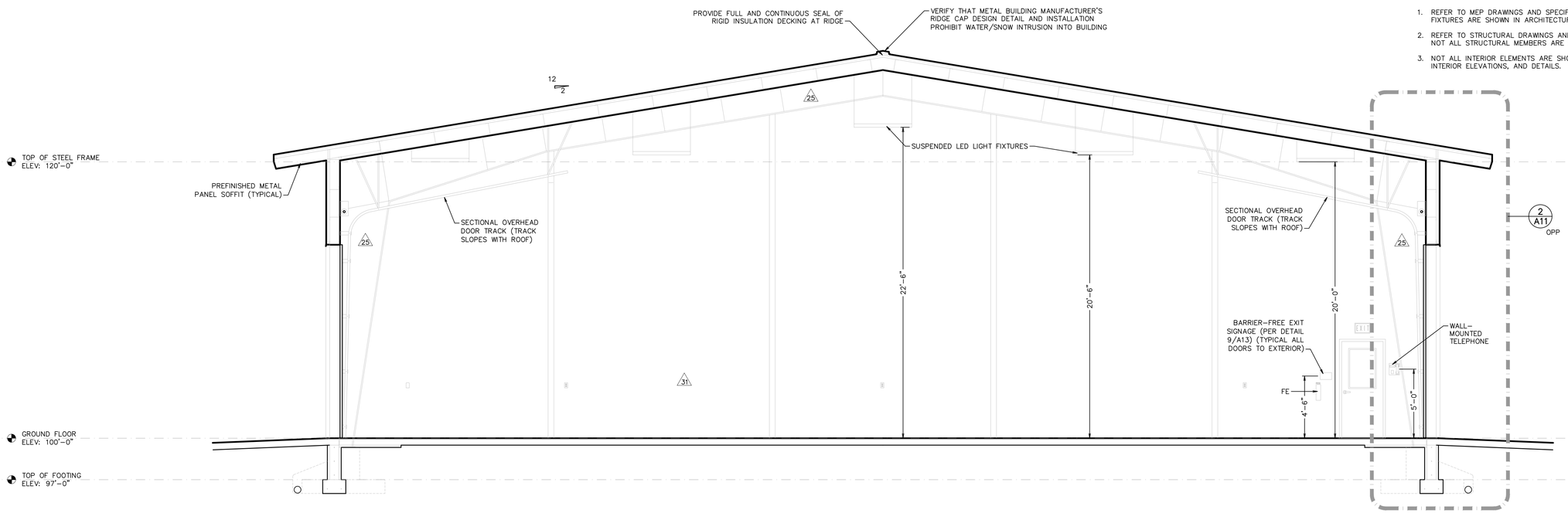
A6



1 BUILDING SECTION – A

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

FEET
0 5 10 15 20



2 BUILDING SECTION – B

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

BUILDING SECTION NOTES

1. REFER TO MEP DRAWINGS AND SPECIFICATIONS FOR MEP FIXTURES; NOT ALL MEP FIXTURES ARE SHOWN IN ARCHITECTURAL DRAWINGS.
2. REFER TO STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR STRUCTURAL MEMBERS; NOT ALL STRUCTURAL MEMBERS ARE SHOWN IN ARCHITECTURAL DRAWINGS.
3. NOT ALL INTERIOR ELEMENTS ARE SHOWN IN BUILDING SECTIONS; REFER TO PLANS, INTERIOR ELEVATIONS, AND DETAILS.

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

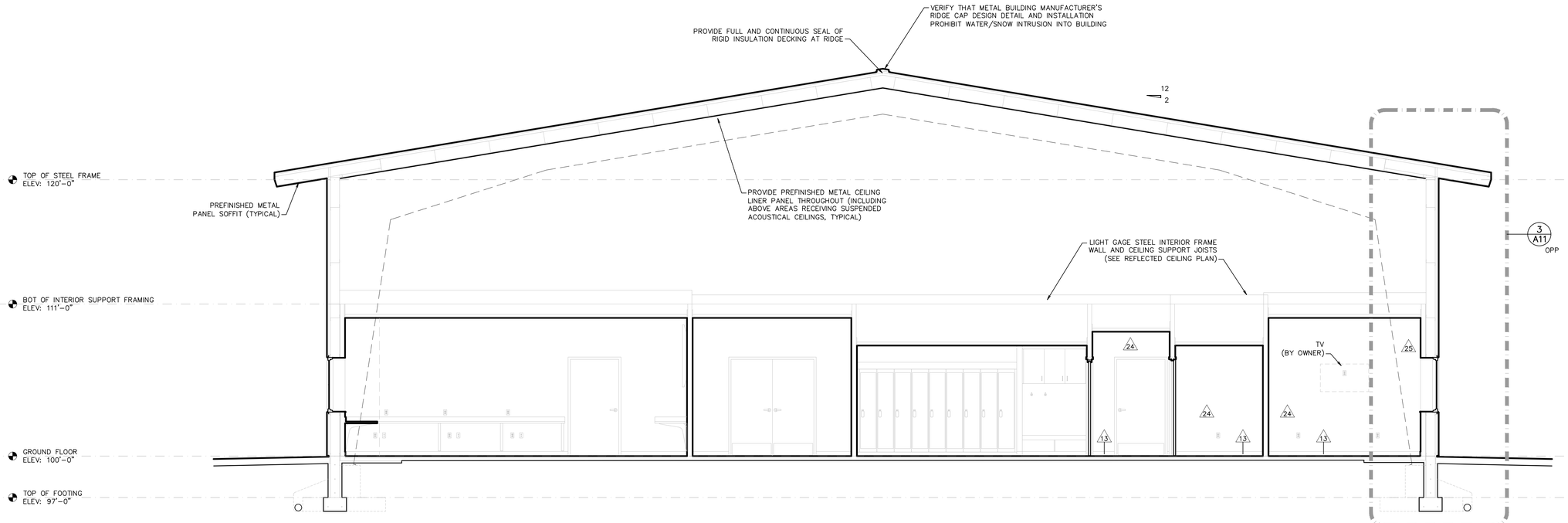
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
BUILDING SECTIONS

WSC_ELMIRA

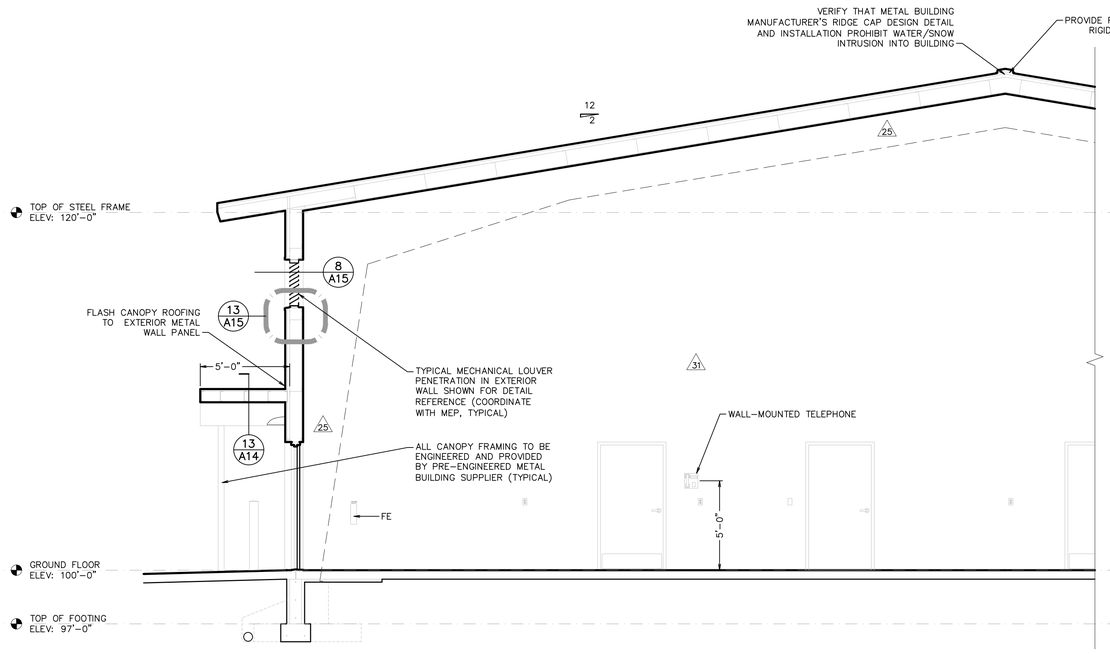
ISSUED:	
01-28-21	
REV:	
REV:	
REV:	
REV:	
REV:	

A7

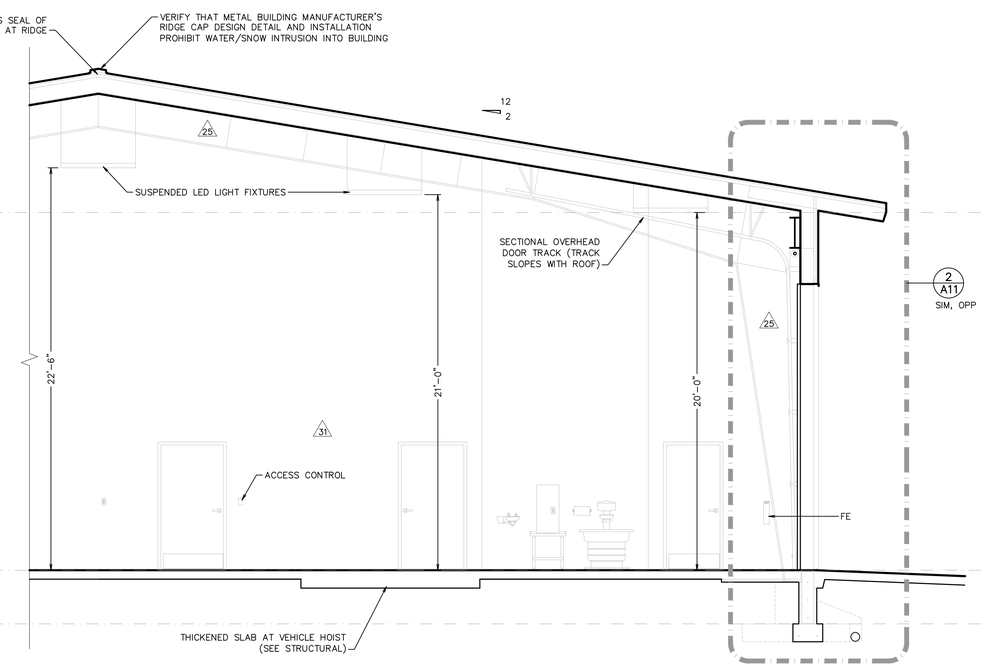


1 **BUILDING SECTION – C**
SCALE: 1/4" = 1'-0"

FEET
0 5 10 15 20



2 **BUILDING SECTION – E**
SCALE: 1/4" = 1'-0"



3 **BUILDING SECTION – D**
SCALE: 1/4" = 1'-0"

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
BUILDING SECTIONS

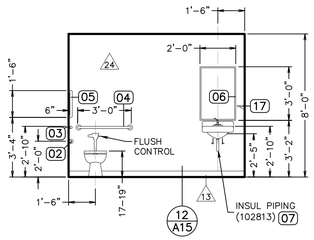
WSC_ELMIRA

ISSUED	
01-28-21	
REV	
REV	
REV	
REV	
REV	

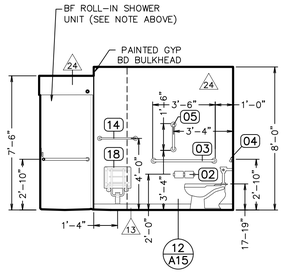
A8

WOMEN'S TOILET/SHOWER 113

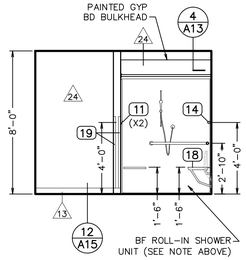
NOTE: PROVIDE BF SHOWER UNIT COMPLETE AND FULLY EQUIPPED WITH STAINLESS STEEL GRAB BARS, L-SHAPED FOLD-UP SEAT, HAND-HELD SHOWER ASSEMBLY WITH SLIDE BAR AND HOSE, PRESSURE BALANCING MIXING VALVE, SOAP DISH, CURTAIN ROD, SHOWER CURTAIN, AND DRAIN.



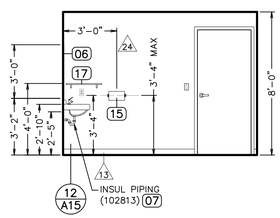
1 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



2 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

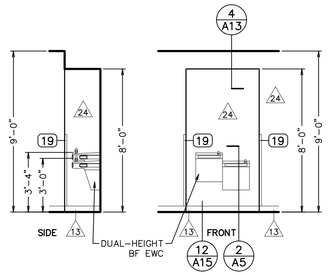


3 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



4 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

CORRIDOR 110



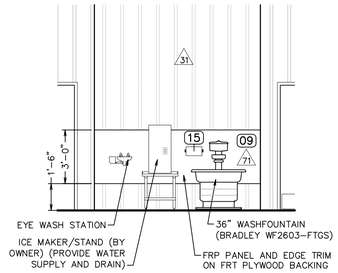
5 INTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"

NOT USED

FIXTURES NOTES

1. PROVIDE ALL BLOCKING AND ANCHORAGES REQUIRED FOR PROPER AND SECURE INSTALLATION OF ALL FIXTURES, INCLUDING OWNER-FURNISHED AND OWNER-PROVIDED FIXTURES AND ACCESSORIES.
2. FIELD-VERIFY ALL ROUGH DIMENSIONS PRIOR TO FABRICATION OF CABINETRY; ADJUST CABINET DIMENSIONS AS REQUIRED TO FIT SPACES AVAILABLE.
3. PROVIDE PLASTIC LAMINATE FILLERS AS REQUIRED TO FILL GAPS BETWEEN CABINETS AND ADJOINING SURFACES.
4. COORDINATE FIXTURES INSTALLATION WORK WITH MECHANICAL, ELECTRICAL, AND PLUMBING TRADES.
5. PROVIDE GROMMETS IN WORK SURFACES IN SIZES, COLORS, AND LOCATIONS AS DIRECTED BY THE OWNER.

EQUIPMENT STORAGE 102

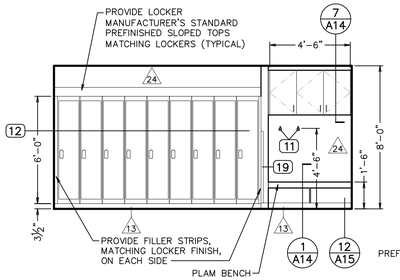


10 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

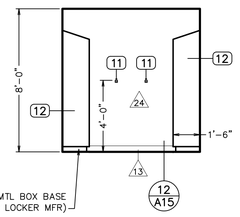
FIXTURES LEGEND

DESIG	TYPE	DESCRIPTION	DETAIL	SPEC	FINISH
01	FE CABINET & FE	FIRE EXTINGUISHER CABINET AND PORTABLE FIRE EXTINGUISHER: JL INDUSTRIES/ACTIVAR, "AMBASSADOR" MODEL #1816F17 (FOR SEMI-RECESSED APPLICATIONS) FIRE EXTINGUISHER: ANSUL "SENTRY ABC" MODEL #AA05-1	5/A13	104400	PAINTED STEEL WHITE
02	TLT PAPER DISPENSER	STAINLESS STEEL, DOUBLE-ROLL TOILET TISSUE DISPENSER BOBRICK "CLASSIC SERIES" #B-2740	1/A16	102813	SATIN CAST ALUMINUM
03	42" GRAB BAR	42" ST STL GRAB BAR, CONCEALED MOUNTING, 1-1/2" DIAMETER BOBRICK "CLASSIC SERIES" #B-6806 X 42	2/A16	102813	SATIN STAINLESS STL
04	36" GRAB BAR	36" ST STL GRAB BAR, CONCEALED MOUNTING, 1-1/2" DIAMETER BOBRICK "CLASSIC SERIES" #B-6806 X 36	2/A16	102813	SATIN STAINLESS STL
05	18" GRAB BAR	18" ST STL GRAB BAR, CONCEALED MOUNTING, 1-1/2" DIAMETER BOBRICK "CLASSIC SERIES" #B-6806 X 18	2/A16	102813	SATIN STAINLESS STL
06	MIRROR	2'-0" W x 3'-0" H MIRROR IN STAINLESS STEEL CHANNEL FRAME BOBRICK #B-165 2436	3/A16	102813	SATIN STAINLESS STL
07	PIPE INSUL	MOLDED RIGID VINYL, ANTIMICROBIAL INSULATING PIPING COVERINGS IPS CORP., TRUEBRO, INC, LAV-GUARD2 UNDER-SINK PROTECTIVE PIPE COVERS	4/A16	102813	WHITE
08	URINAL SCREEN	WALL-MOUNTED, POWDER-COATED STEEL URINAL SCREEN: 48" HIGH X 18" WIDE HADRIAN "STANDARD METAL TOILET PARTITIONS"	5/A16	102113	HADRIAN #603 "ALMOND"
09	WALL PROTECTION	FIBERGLASS REINFORCED PLASTIC (FRP) WALL PROTECTION PANELS CRANE CO., KEMLITE "GLASBORD-P" (PEBBLE EMBOSSED)	---	064000	COLONIAL WHITE (#83)
10		---NOT USED---			
11	CLOTHES HOOK	SURFACE WALL-MOUNTED SINGLE-PRONG CLOTHES HOOK BOBRICK "CLASSIC SERIES" #B-7671	9/A16	102813	POLISHED STAINLESS STL
12	LOCKERS	18"D X 72"H X15"W PREFINISHED METAL LOCKERS WITH SLOPED TOPS & BOX BASES, HADRIAN MFG. INC., "EMPEROR" SINGLE TIER METAL LOCKERS	---	105113	HADRIAN #603 "ALMOND"
13	BOLLARD COVERS	PREFINISHED HDPE PLASTIC PIPE SLEEVES FOR STEEL PIPE BOLLARDS ENCORE COMMERCIAL PRODUCTS, POST GUARD 7" X 52"	3/A13	055000	SAFETY YELLOW W/ RED BANDS
14	TOWEL BAR	EXTRA HEAVY-DUTY TOWEL BAR WITH CONCEALED MOUNTING AND SNAP FLANGE BOBRICK #B-530 X 24	8/A16	102813	SATIN STAINLESS STL
15	TOWEL DISPENSER	SURFACE-MOUNTED ROLL PAPER TOWEL DISPENSER BOBRICK #B-253	7/A16	102813	SATIN CAST ALUMINUM
16	TOILET PARTITION	WALL/FLOOR-MOUNTED, POWDER-COATED STL TOILET PARTITION PANELS & DOOR HADRIAN "STANDARD METAL TOILET PARTITIONS"	10/A14	102113	HADRIAN #603 "ALMOND"
17	ST STL SHELF	SURFACE WALL-MOUNTED STAINLESS STEEL SHELF BOBRICK #B-295 X24	---	102813	SATIN STAINLESS STL
18	FOLDING SEAT	SURFACE WALL-MOUNTED SOLID PHENOLIC DRESSING AREA SEAT BOBRICK #B-5191	11/A14	102813	SATIN ST STL & IVORY PHENOLIC
19	CORNER GUARD	STAINLESS STEEL CORNER GUARDS: 1-1/2" X 1-1/2" X 48" HIGH INPRO CORPORATION, MODEL #181124C-304	---	102600	SATIN STAINLESS STL

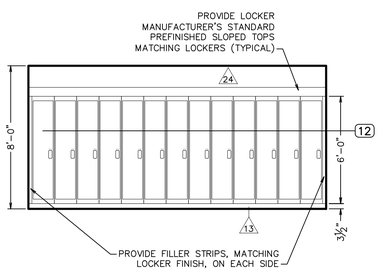
LOCKERS 106



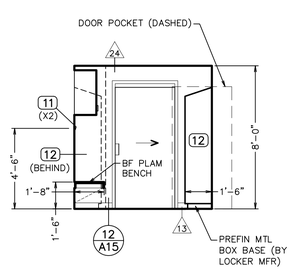
11 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



12 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

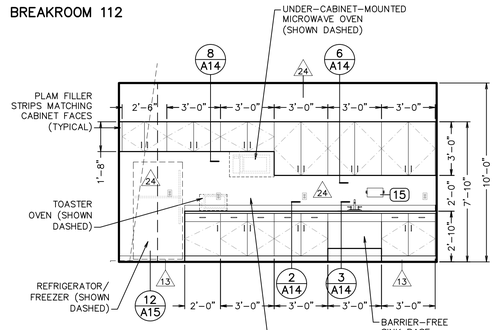


13 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



14 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

BREAKROOM 112



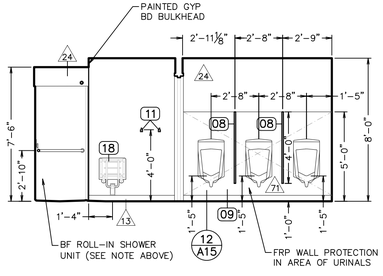
15 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

APPLIANCES LEGEND

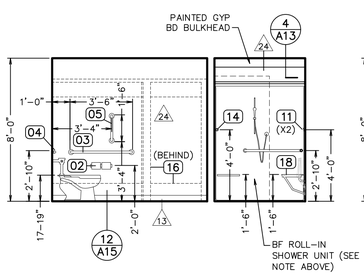
APPLIANCE	DESCRIPTION	COLOR
REFRIGERATOR	21.2 CUBIC FOOT CAPACITY, TOP-FREEZER REFRIGERATOR GENERAL ELECTRIC, MODEL #GTE21GSHSS	SATIN STAINLESS STL
MICROWAVE OVEN	1.9 CUBIC FOOT CAPACITY, OVER-THE-RANGE MICROWAVE OVEN GENERAL ELECTRIC, MODEL #JNM7196SFSS	SATIN STAINLESS STL
TOASTER OVEN	1800 WATT COUNTERTOP CONVECTION OVEN BREVILLE USA "SMART OVEN" #BOV800XL	SATIN STAINLESS STL
WASHING MACHINE	4.6 CUBIC FOOT CAPACITY TOP-LOADING WASHER; GENERAL ELECTRIC, MODEL #GTW680BSJWS	WHITE
DRYER	7.4 CUBIC FOOT CAPACITY FRONT-LOADING ELECTRIC DRYER GENERAL ELECTRIC, MODEL #GTD65EBSJWS	WHITE
COFFEE MAKER	MAXIMUM 20" HIGH COFFEE MAKER WITH AUTOMATIC FILL CONNECTION TO PLUMBING. (COFFEE MAKER TO BE PROVIDED BY OWNER)	-----

MEN'S TOILET/SHOWER 107

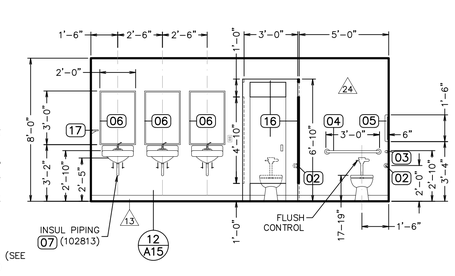
NOTE: PROVIDE BF SHOWER UNIT COMPLETE AND FULLY EQUIPPED WITH STAINLESS STEEL GRAB BARS, L-SHAPED FOLD-UP SEAT, HAND-HELD SHOWER ASSEMBLY WITH SLIDE BAR AND HOSE, PRESSURE BALANCING MIXING VALVE, SOAP DISH, CURTAIN ROD, SHOWER CURTAIN, AND DRAIN.



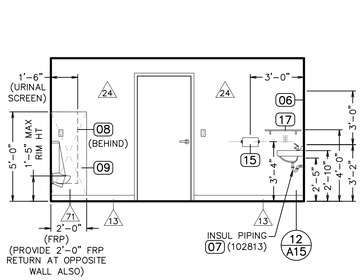
16 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



17 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

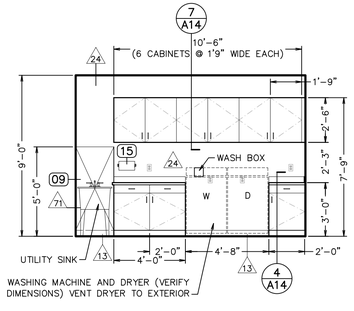


18 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

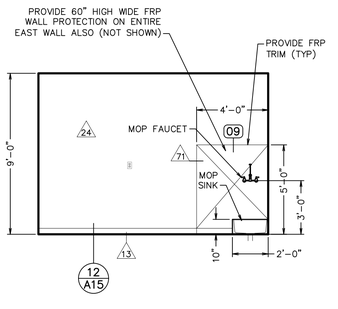


19 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

UTILITY 116



20 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



21 INTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

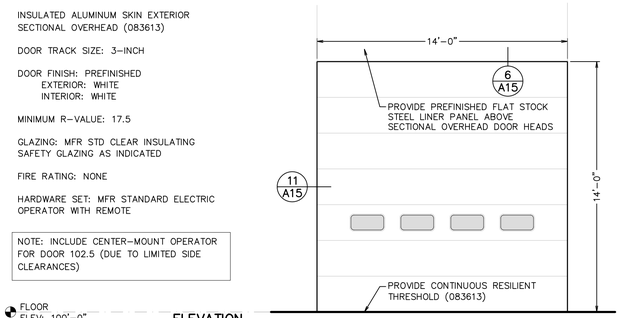
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
INTERIOR ELEVATIONS

WSC_ELMIRA

ISSUED:	01-28-21				
REV.					
REV.					
REV.					
REV.					
REV.					

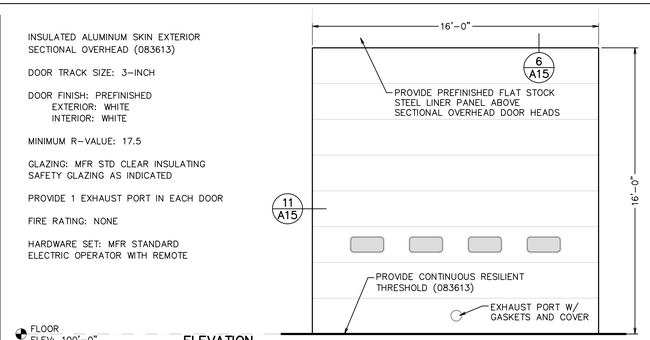
A9



1 DOOR TYPE AA

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

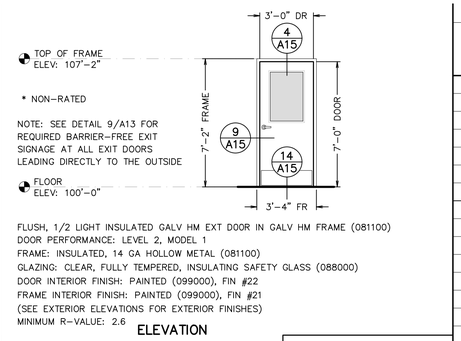
INSULATED ALUMINUM EXTERIOR SECTIONAL OVERHEAD DOOR



2 DOOR TYPE BB

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

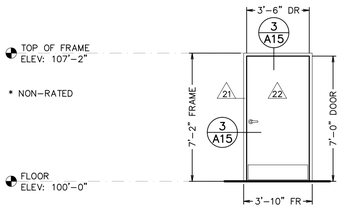
INSULATED ALUMINUM EXTERIOR SECTIONAL OVERHEAD DOOR



3 DOOR TYPE CC

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

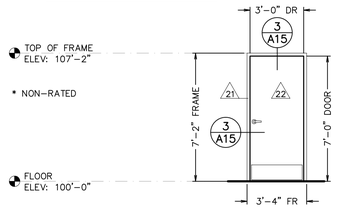
INSULATED HOLLOW METAL EXTERIOR DOOR



4 DOOR TYPE DD

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

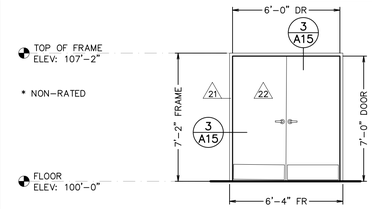
HOLLOW METAL INTERIOR DOOR



5 DOOR TYPE EE

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

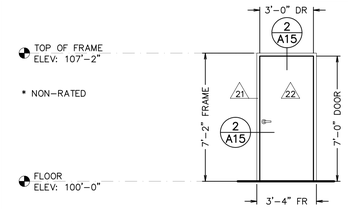
HOLLOW METAL INTERIOR DOOR



6 DOOR TYPE FF

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

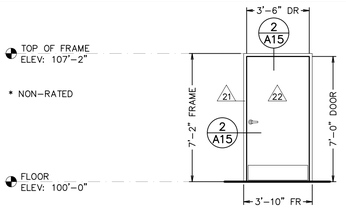
HOLLOW METAL INTERIOR DOUBLE DOOR



7 DOOR TYPE GG

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

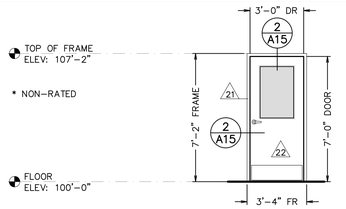
HOLLOW METAL INTERIOR DOOR



8 DOOR TYPE HH

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

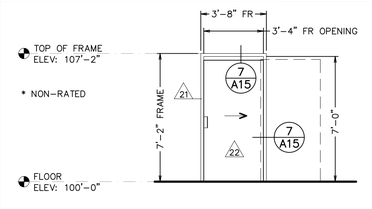
HOLLOW METAL INTERIOR DOOR



9 DOOR TYPE JJ

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

HOLLOW METAL INTERIOR DOOR WITH HALF LIGHT



10 DOOR TYPE KK

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

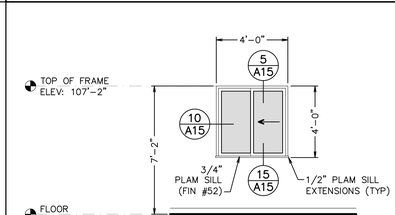
HOLLOW METAL INTERIOR POCKET DOOR

DOOR TYPE NOTES

1. DOOR HANDING INDICATED IN DOOR/FRAME ELEVATIONS IS NOT NECESSARILY THAT REQUIRED FOR THE PROJECT. SEE FLOOR PLANS AND DOOR SCHEDULE FOR CORRECT HANDING; VERIFY CORRESPONDENCE BETWEEN ELEVATIONS, FLOOR PLAN, AND SCHEDULE.
2. DOOR HARDWARE SHOWN IN DOOR TYPE ELEVATIONS IS REPRESENTATIONAL AND DOES NOT NECESSARILY DEPICT THE APPEARANCE OR STYLE OF THE HARDWARE SPECIFIED.
3. SEE SCHEDULES AND SPECIFICATIONS FOR FURTHER DOOR, FRAME, AND HARDWARE REQUIREMENTS.
4. SEE ALSO ELECTRICAL DRAWINGS FOR REQUIREMENTS FOR ELECTRIFIED HARDWARE AND DOOR ACCESSORIES.
5. NOT ALL HARDWARE IS SHOWN ON DOOR TYPE ELEVATIONS. REFER TO HARDWARE SCHEDULE AND SPECIFICATION SECTION 087100, "DOOR HARDWARE."

INTERIOR ELEVATION NOTES

1. NOT ALL MECHANICAL AND ELECTRICAL FIXTURES AND ELEMENTS ARE SHOWN; SEE MECHANICAL & ELECTRICAL DRAWINGS & SPECIFICATIONS. COORDINATE AS REQUIRED.
2. INSTALL NONCOMBUSTIBLE BLOCKING AND REINFORCEMENTS IN WALLS, FLOORS, AND CEILINGS AS REQUIRED FOR PROPER INSTALLATION OF FIXTURES AND ACCESSORIES; VERIFY FIXTURES AND ACCESSORIES LOCATIONS.
3. VERIFY MOUNTING ELEVATIONS OF ELEMENTS REQUIRED TO MEET BARRIER-FREE ACCESSIBILITY STANDARDS.

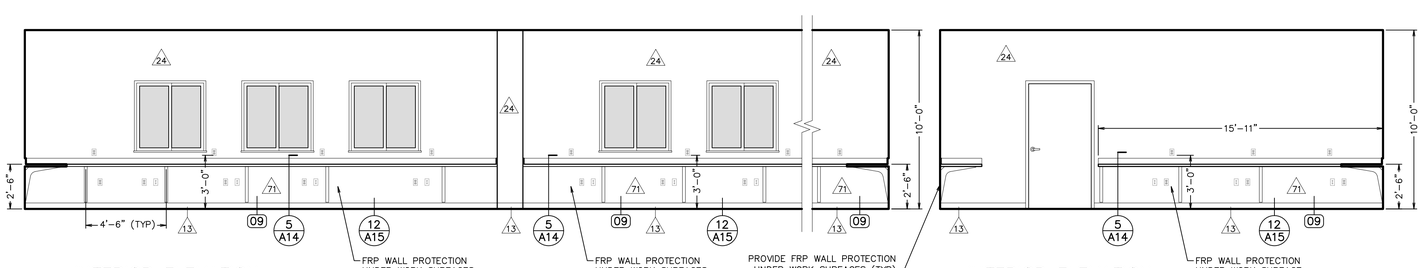


12 WINDOW TYPE A

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

PRE-FINISHED VINYL SLIDER EXTERIOR WINDOW WITH CLEAR INSULATING GLAZING

WORK ROOM 104



13 INTERIOR ELEVATION

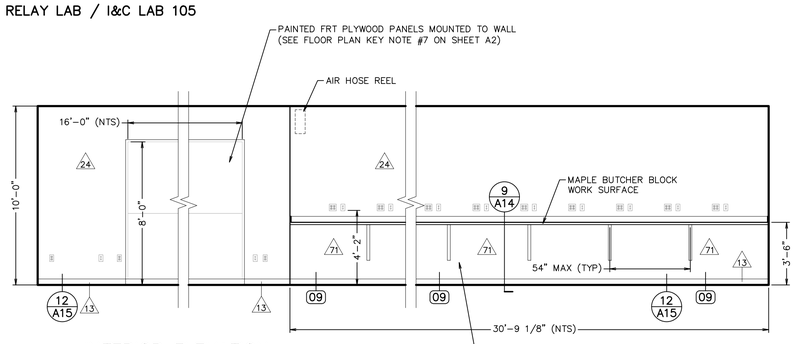
SCALE: 1/4" = 1'-0"

14 INTERIOR ELEVATION

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

FRP WALL PROTECTION UNDER WORK SURFACE

RELAY LAB / I&C LAB 105



15 INTERIOR ELEVATION

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

DOOR AND FRAME SCHEDULE

DESIG	FROM RM	TO RM	DOOR/ FRAME TYPE	DOOR SWING	FIRE RATING	HDWR SET
101.1	EXT	101	AA	OV SECT	NONE	14
101.2	EXT	101	AA	OV SECT	NONE	14
101.3	EXT	101	AA	OV SECT	NONE	14
101.4	EXT	101	AA	OV SECT	NONE	14
101.5	EXT	101	AA	OV SECT	NONE	14
101.6	EXT	101	AA	OV SECT	NONE	14
101.7	EXT	101	AA	OV SECT	NONE	14
101.8	EXT	101	AA	OV SECT	NONE	14
101.9	EXT	101	AA	OV SECT	NONE	14
101.10	EXT	101	AA	OV SECT	NONE	14
101.11	EXT	101	AA	OV SECT	NONE	14
101.12	EXT	101	AA	OV SECT	NONE	14
101.13	EXT	101	CC	LHR	NONE	03
101.14	EXT	101	CC	LHR	NONE	03
101.15	EXT	101	CC	RHR	NONE	03
102.1	EXT	102	BB	OV SECT	NONE	14
102.2	EXT	102	BB	OV SECT	NONE	14
102.3	EXT	102	BB	OV SECT	NONE	14
102.4	EXT	102	BB	OV SECT	NONE	14
102.5	EXT	102	BB	OV SECT	NONE	14
102.6	EXT	102	BB	OV SECT	NONE	14
102.7	EXT	102	AA	OV SECT	NONE	14
102.8	EXT	102	CC	RHR	NONE	03
102.9	EXT	102	CC	LHR	NONE	03
102.8	EXT	102	CC	RHR	NONE	03
104.1	102	104	DD	LH	NONE	01
104.2	101	104	DD	RH	NONE	09
105.1	102	105	FF	DBL	NONE	16
105.2	101	105	FF	DBL	NONE	06
106.1	110	106	KK	POCKET	NONE	15
107.1	110	107	GG	RH	NONE	13
107.2	107	107A	GG	LH	NONE	07
108.1	110	108	HH	LH	NONE	11
109.1	102	109	DD	LH	NONE	04
110.1	102	110	DD	RHR	NONE	02
110.2	101	110	DD	LHR	NONE	10
111.1	110	111	JJ	LH	NONE	08
112.1	110	112	JJ	LH	NONE	08
113.1	110	113	GG	LH	NONE	07
114.1	102	114	EE	LH	NONE	05

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY
ARCHITECT: ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER: WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

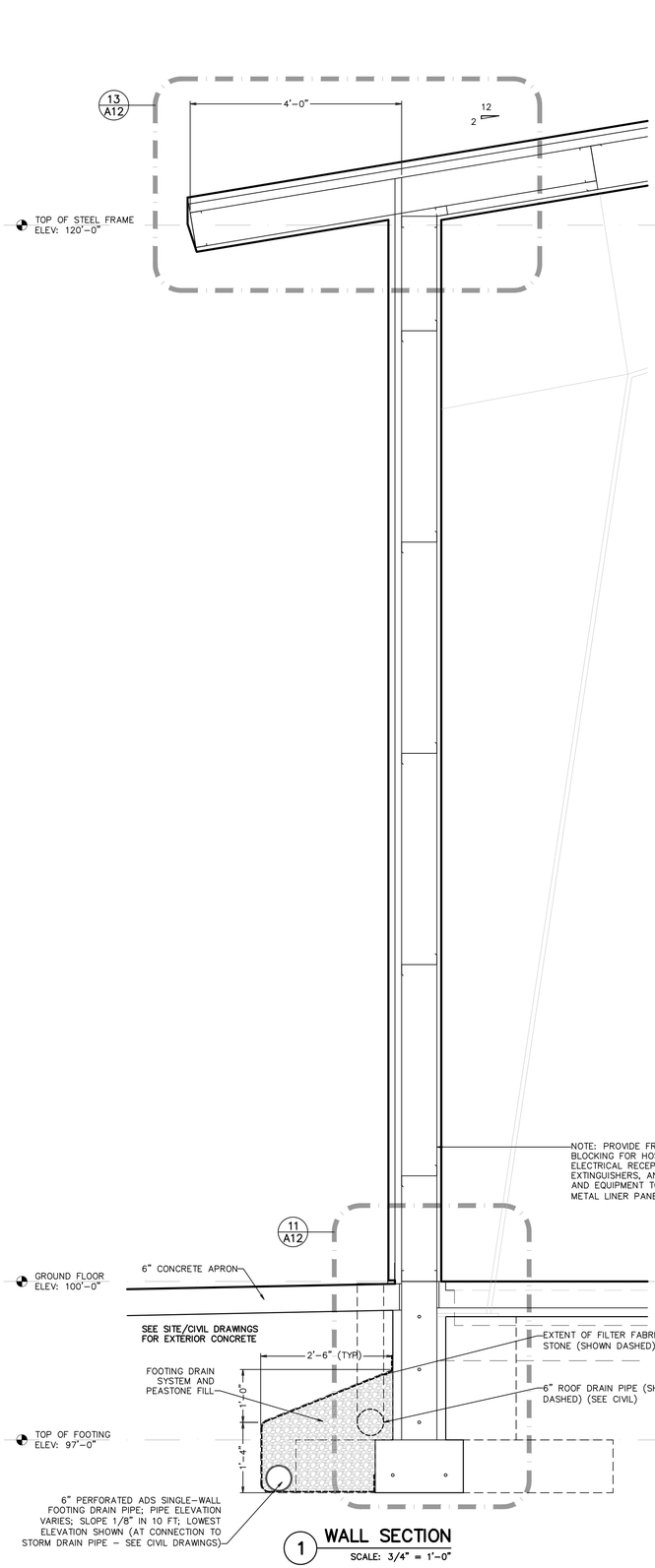
PROJECT: SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS: DOOR TYPES
WINDOW TYPES

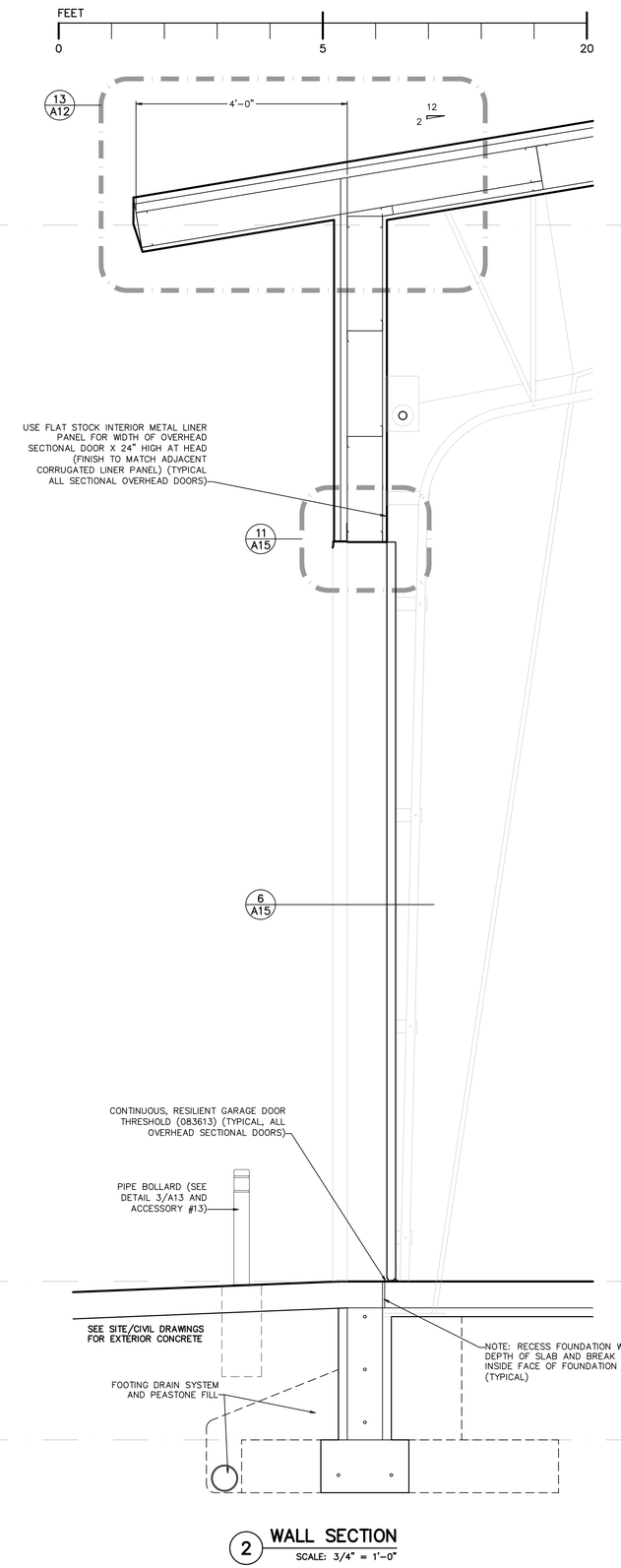
WSC_ELMIRA

ISSUED:	01-28-21				
REV.	REV.	REV.	REV.	REV.	REV.

A10



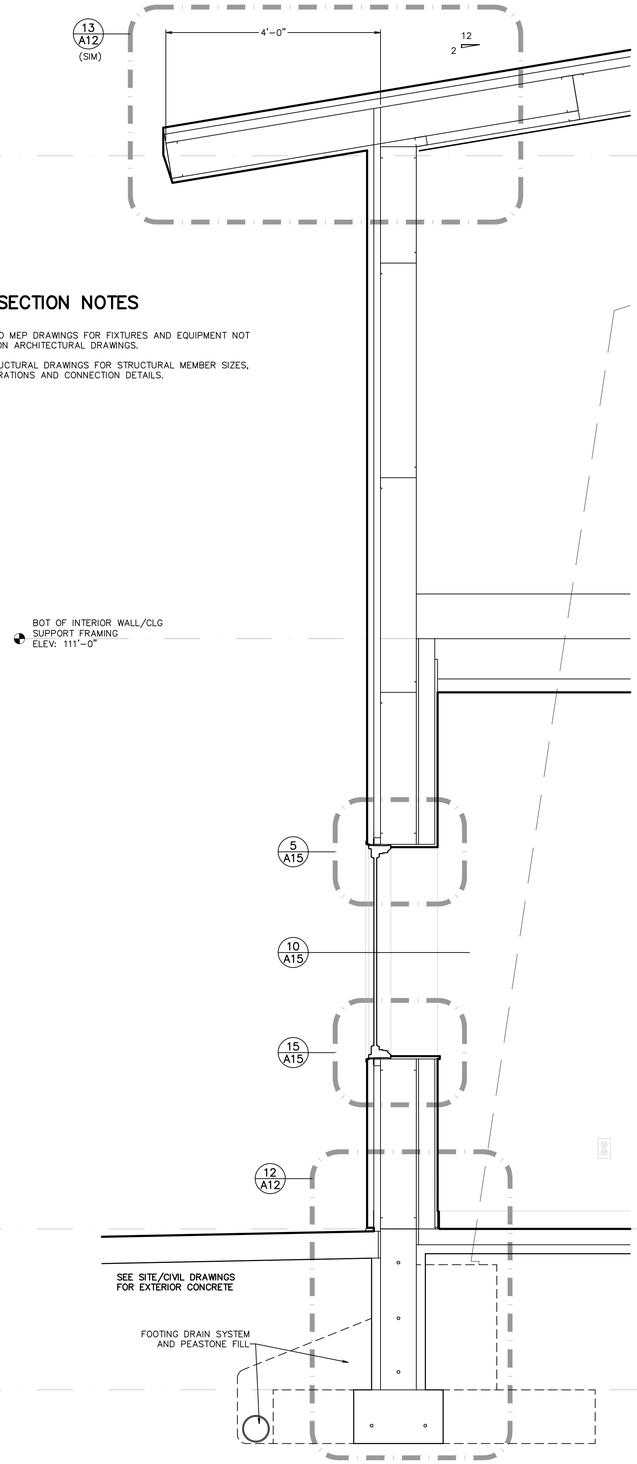
1 WALL SECTION
SCALE: 3/4" = 1'-0"



2 WALL SECTION
SCALE: 3/4" = 1'-0"

WALL SECTION NOTES

1. SEE ALSO MEP DRAWINGS FOR FIXTURES AND EQUIPMENT NOT SHOWN ON ARCHITECTURAL DRAWINGS.
2. SEE STRUCTURAL DRAWINGS FOR STRUCTURAL MEMBER SIZES, CONFIGURATIONS AND CONNECTION DETAILS.



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

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

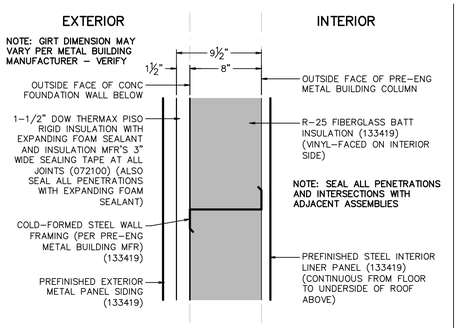
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
WALL SECTIONS

WSC_ELMIRA

ISSUED:	01-28-21				
REV.					
REV.					
REV.					
REV.					
REV.					

A11

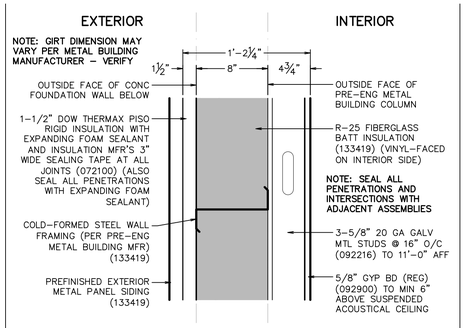


VERTICAL SECTION

1 WALL TYPE – A

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

PRE-ENGINEERED METAL FRAME BUILDING EXTERIOR WALL (TYPICAL EXTERIOR WALL AT STORAGE AREAS)

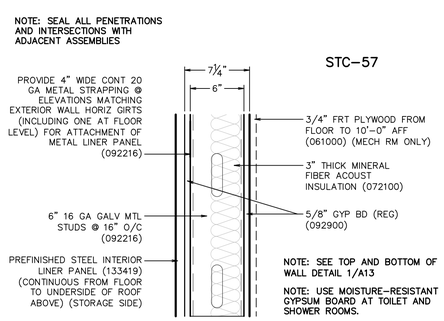


VERTICAL SECTION

2 WALL TYPE – B

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

PRE-ENGINEERED METAL FRAME BUILDING EXTERIOR WALL (TYPICAL EXTERIOR WALL AT OFFICE AREAS)

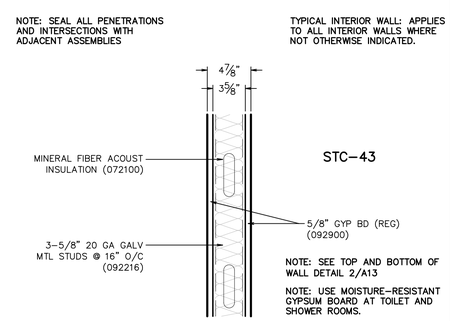


VERTICAL SECTION

3 WALL TYPE – C

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

METAL FRAME INTERIOR WALL WITH ACOUSTICAL INSULATION AND LINER PANEL ONE SIDE

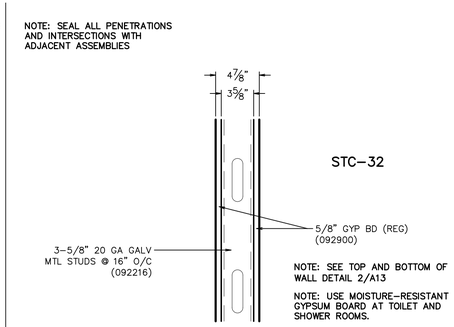


VERTICAL SECTION

4 WALL TYPE – D

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

LIGHT GAGE METAL FRAME INTERIOR WALL W/ ACOUSTICAL INSULATION

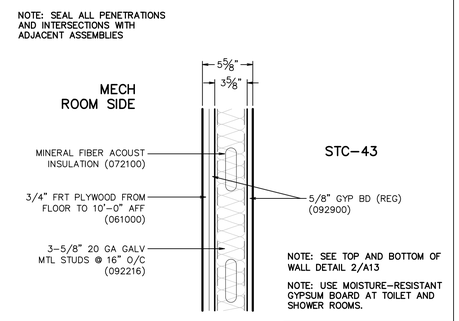


VERTICAL SECTION

5 WALL TYPE – E

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

LIGHT GAGE METAL FRAME INTERIOR WALL

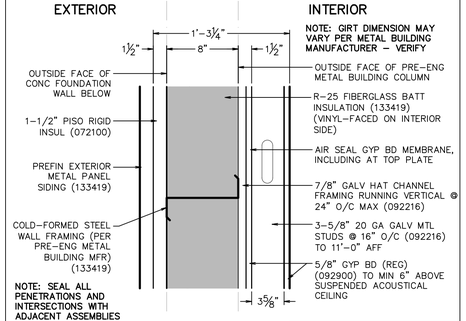


VERTICAL SECTION

6 WALL TYPE – F

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

LIGHT GAGE METAL FRAME INTERIOR WALL W/ ACOUSTICAL INSULATION



VERTICAL SECTION

7 WALL TYPE – G

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

PRE-ENGINEERED METAL FRAME BUILDING EXTERIOR WALL (FURRED EXTERIOR WALL FOR PLUMBING)

NOT USED

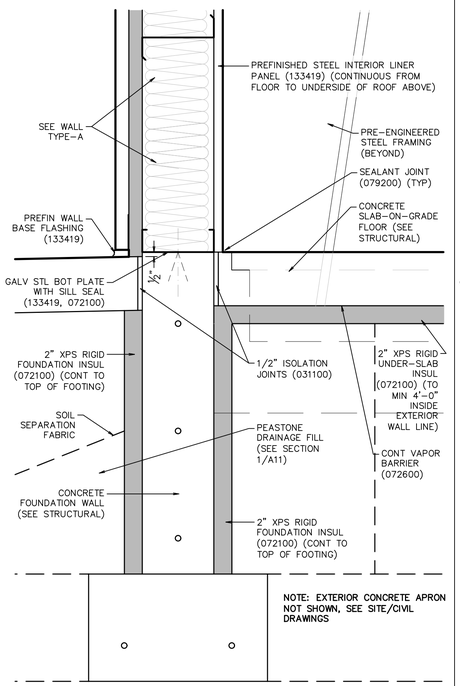
NOTE ON METAL WALL PANEL INTERIOR FINISHES

PROVIDE ALL TRIMS TO FINISH OFF PANELS AT ALL PENETRATIONS, PERIMETERS, AND INTERSECTIONS.

PROVIDE J-MOLDING AROUND ALL SURFACE-MOUNTED JUNCTION BOXES, RECEPTACLES, SWITCHES, CONTROLS, AND DEVICES.

PROVIDE FLAT STOCK METAL PANEL MATCHING FINISH OF ADJACENT CORRUGATED PANELS, WHERE NECESSARY TO ACCOMMODATE SURFACE-MOUNTED DEVICES AND EQUIPMENT.

NOT USED

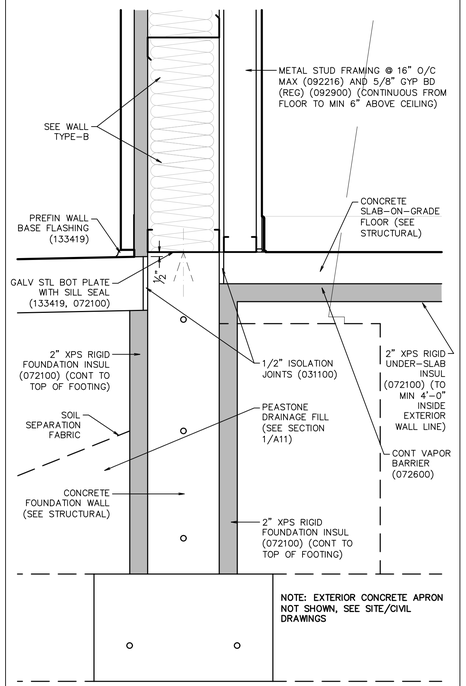


VERTICAL SECTION

11 EXT WALL DETAIL

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

BASE OF EXTERIOR WALL DETAIL

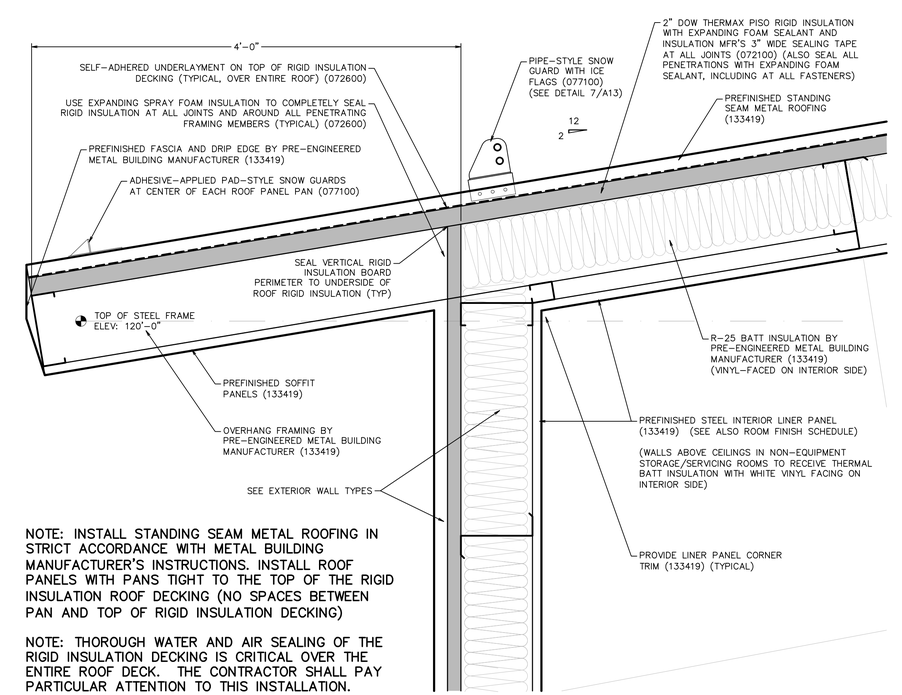


VERTICAL SECTION

12 EXT WALL DETAIL

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

BASE OF EXTERIOR WALL DETAIL



NOTE: INSTALL STANDING SEAM METAL ROOFING IN STRICT ACCORDANCE WITH METAL BUILDING MANUFACTURER'S INSTRUCTIONS. INSTALL ROOF PANELS WITH PANS TIGHT TO THE TOP OF THE RIGID INSULATION ROOF DECKING (NO SPACES BETWEEN PAN AND TOP OF RIGID INSULATION DECKING)

NOTE: THOROUGH WATER AND AIR SEALING OF THE RIGID INSULATION DECKING IS CRITICAL OVER THE ENTIRE ROOF DECK. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THIS INSTALLATION.

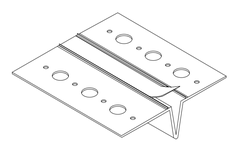
VERTICAL SECTION

13 EXT WALL/ROOF DETAIL

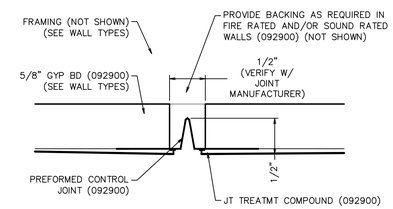
SCALE: 1-1/2" = 1'-0"

TYPICAL DETAIL AT TOP OF EXTERIOR WALL

NOTE: LOCATIONS FOR CONTROL JOINTS SHOWN IN DRAWINGS ARE NOT EXHAUSTIVE. SEE SPECIFICATION SECTION 092900 FOR REQUIREMENTS



3-D VIEW



HORIZONTAL/VERTICAL SECTION

14 CONTROL JOINT

FULL SIZE

DETAIL AT TYPICAL CONTROL JOINT IN GYPSUM BOARD WALLS AND CEILINGS

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

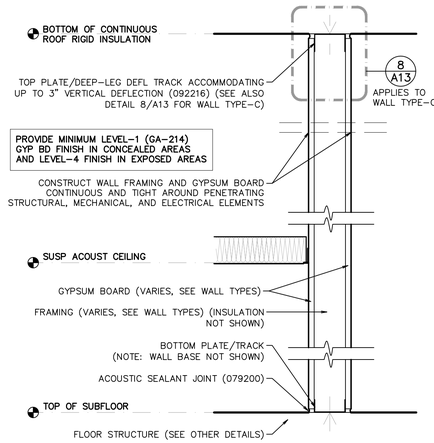
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
WALL TYPES
CONST. DETAILS

WSC_ELMIRA

ISSUED: 01-28-21
REV.
REV.
REV.
REV.
REV.
REV.

A12

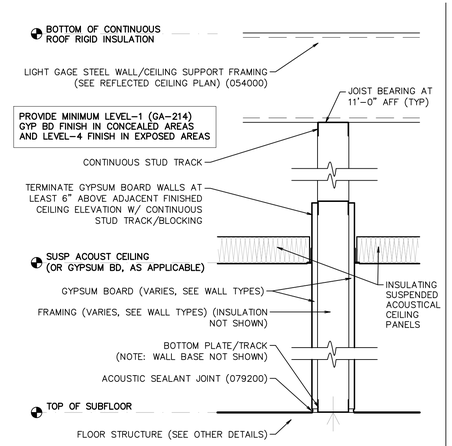


VERTICAL SECTION

1 INT WALL DETAIL

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

TYPICAL TOP AND BOTTOM TERMINATION FOR INTERIOR WALLS

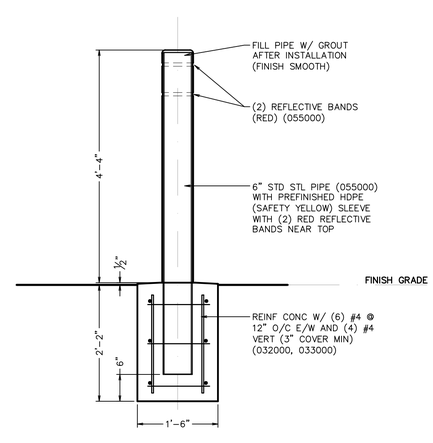


VERTICAL SECTION

2 INT WALL DETAIL

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

TOP AND BOTTOM TERMINATION FOR INTERIOR WALLS CONSTRUCTED TO ABOVE CEILING

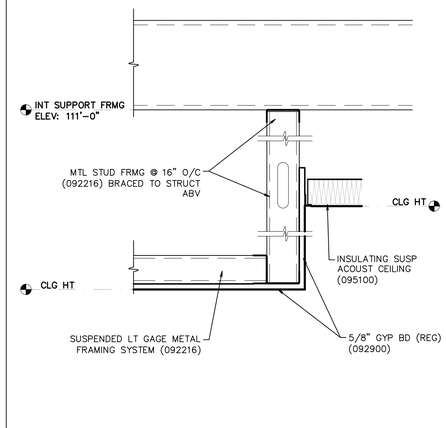


VERTICAL SECTION

3 BOLLARD DETAIL

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

TYPICAL DETAIL AT SLEEVED STEEL PIPE BOLLARD IN CONCRETE BASE (SEE ALSO ACCESSORY #13)

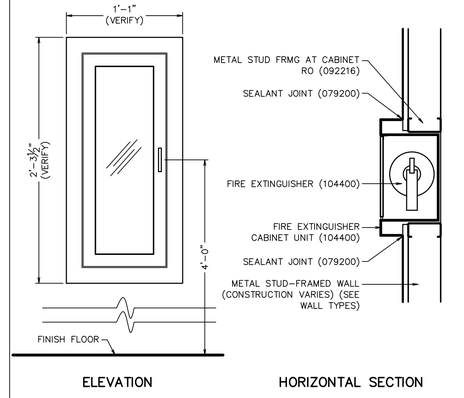


VERTICAL SECTION

4 CEILING DETAIL

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

DETAIL AT SUSPENDED ACOUSTICAL CEILING AT GYPSUM BOARD SOFFIT AND BULKHEAD



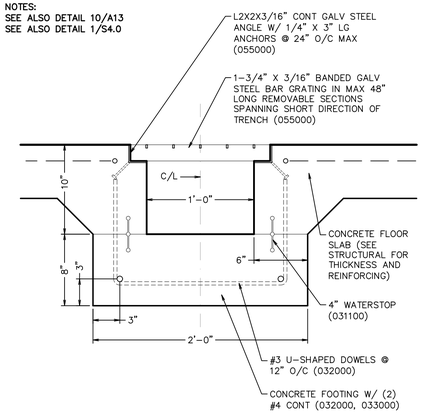
ELEVATION HORIZONTAL SECTION

5 FE CABINET DETAILS

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

DETAILS AT TYPICAL FIRE EXTINGUISHER CABINET (ELEVATION AND PLAN SECTION) (SEE ALSO ACCESSORY "01")

NOTES:
SEE ALSO DETAIL 10/A13
SEE ALSO DETAIL 1/S4.0



VERTICAL SECTION

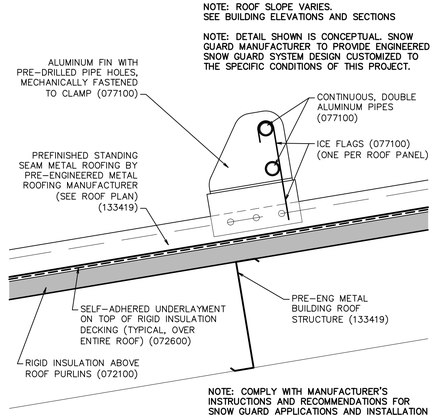
6 TRENCH DRAIN DETAIL

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

SECTION DETAIL AT FORMED CONCRETE TRENCH DRAIN WITH OPEN STEEL GRATE COVER

NOTE: ROOF SLOPE VARIES.
SEE BUILDING ELEVATIONS AND SECTIONS

NOTE: DETAIL SHOWN IS CONCEPTUAL. SNOW GUARD MANUFACTURER TO PROVIDE ENGINEERED SNOW GUARD SYSTEM DESIGN CUSTOMIZED TO THE SPECIFIC CONDITIONS OF THIS PROJECT.



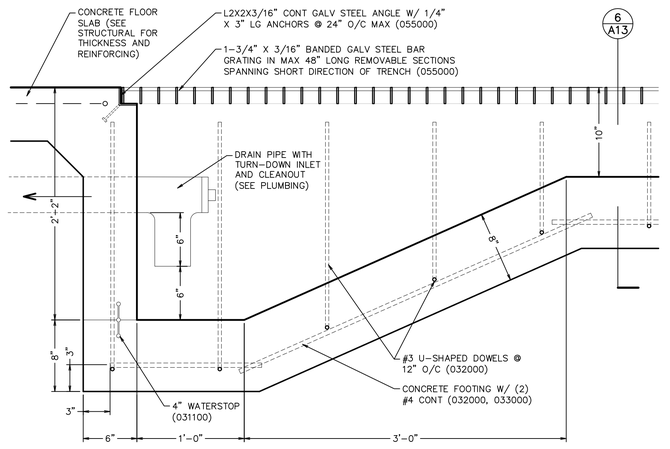
NOTE: COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SNOW GUARD APPLICATIONS AND INSTALLATION

VERTICAL SECTION

7 SNOW GUARD DETAIL

SCALE: 3" = 1'-0"

TYPICAL PIPE-STYLE SNOW GUARD ATTACHMENT TO STANDING SEAM METAL ROOF



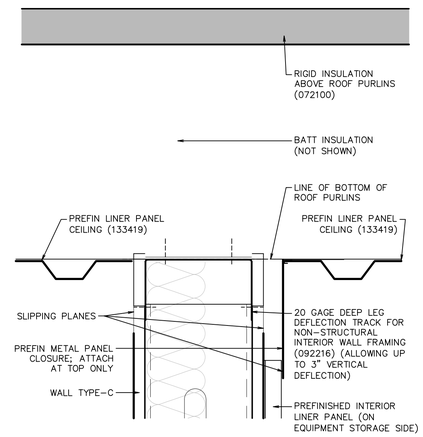
VERTICAL SECTION

10 TRENCH DRAIN DETAIL

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

SECTION DETAIL AT FORMED CONCRETE TRENCH DRAIN WITH OPEN STEEL GRATE COVER

NOT USED



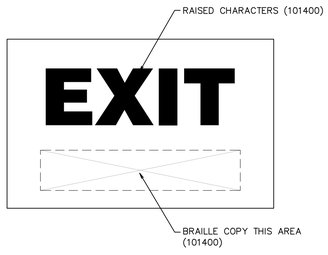
VERTICAL SECTION

8 TOP OF PARTITION

SCALE: 3" = 1'-0"

DETAIL AT TOP OF INTERIOR (NON-LOAD-BEARING) LIGHT GAGE METAL-FRAMED WALL

NOTE: PROVIDE AS REQUIRED BY CODE ADJACENT TO EACH DOOR TO AN AREA OF REFUGE, AN AREA FOR ASSISTED RESCUE, EGRESS STAIRWAY, AN EXIT RAMP, AN EXIT PASSAGEWAY, AND AN EXIT DISCHARGE (INCLUDING ALL EXIT DOORS THAT LEAD DIRECTLY TO THE OUTSIDE)



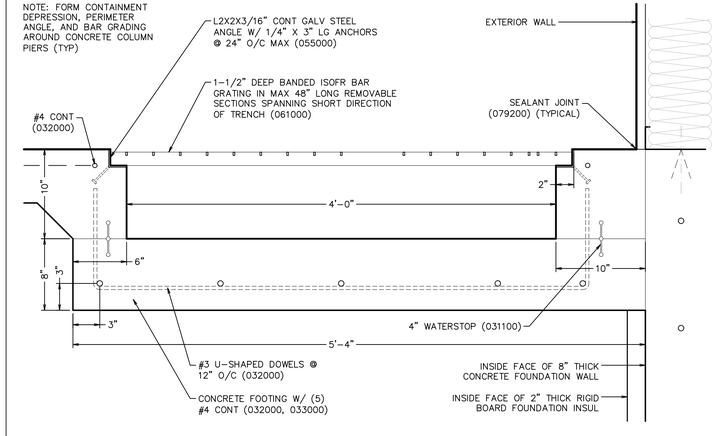
NOTE: PROVIDE SIGNAGE COMPLYING WITH ICC/ANSI A117.1 AND THE BUILDING CODE

ELEVATION

9 BARRIER-FREE EXIT IDENTIFICATION SIGN

NO SCALE

EXAMPLE BARRIER-FREE ACCESSIBLE EXIT IDENTIFICATION SIGN; VERIFY DESIGN, SIZE, AND LOCATIONS REQUIRED WITH AUTHORITIES HAVING JURISDICTION (101400)



VERTICAL SECTION

11 SPILL CONTAINMENT DEPRESSION DETAIL

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

SECTION DETAIL AT FORMED CONCRETE LIQUID CONTAINMENT FLOOR DEPRESSION WITH OPEN FIBERGLASS GRATE COVER

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY
ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

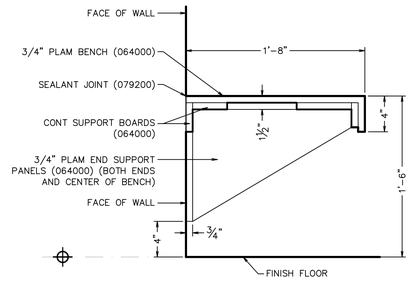
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
CONSTRUCTION. DETAILS

WSC_ELMIRA

ISSUED:	01-28-21				
REV.	REV.	REV.	REV.	REV.	REV.

A13

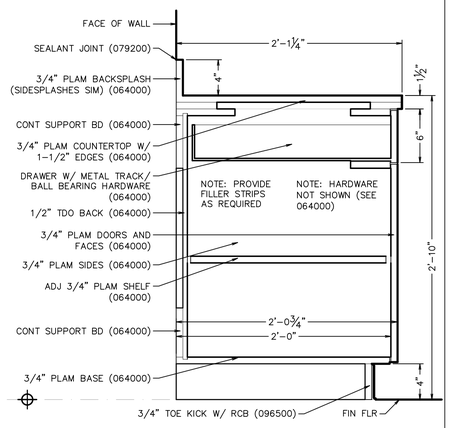


VERTICAL SECTION

1 BENCH DETAIL

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

DETAIL AT PLASTIC LAMINATE WALL-MOUNTED BENCH

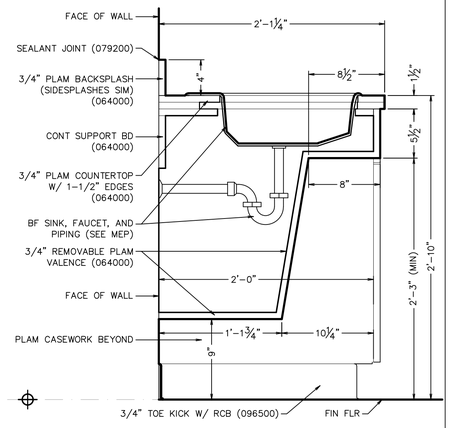


VERTICAL SECTION

2 BASE CABINET DETAIL

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

DETAIL AT BARRIER-FREE FLUSH OVERLAY PLASTIC LAMINATE BASE CABINET

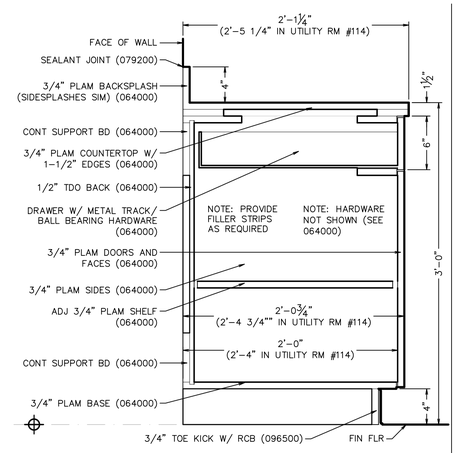


VERTICAL SECTION

3 SINK BASE DETAIL

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

DETAIL AT BARRIER-FREE FLUSH OVERLAY PLASTIC LAMINATE SINK BASE CABINET

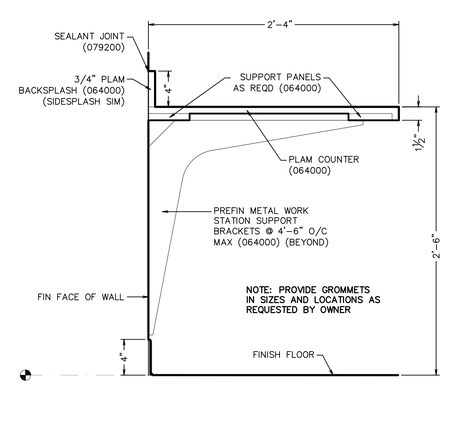


VERTICAL SECTION

4 BASE CABINET DETAIL

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

DETAIL AT STANDARD FLUSH OVERLAY PLASTIC LAMINATE BASE CABINET

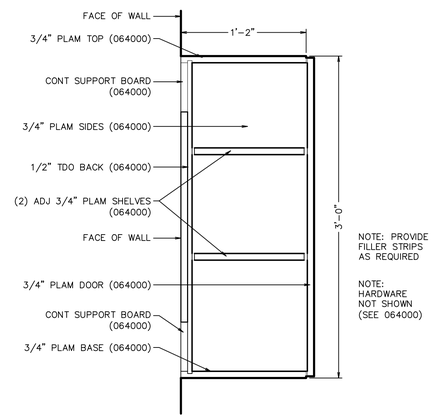


VERTICAL SECTION

5 WK COUNTER DETAIL

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

DETAIL AT BARRIER-FREE PLASTIC LAMINATE WORK SURFACE

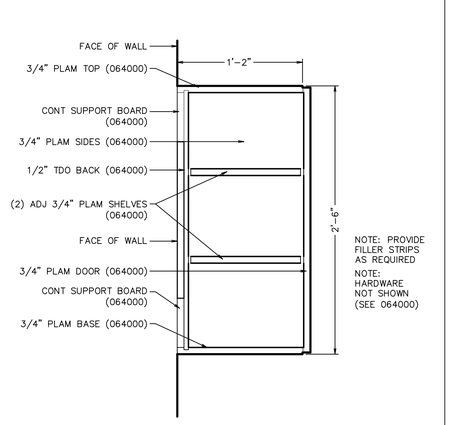


VERTICAL SECTION

6 WALL CABINET DETAIL

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

FLUSH OVERLAY PLASTIC LAMINATE WALL CABINET

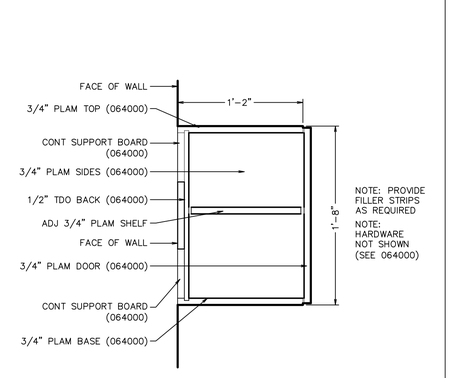


VERTICAL SECTION

7 WALL CABINET DETAIL

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

FLUSH OVERLAY PLASTIC LAMINATE WALL CABINET

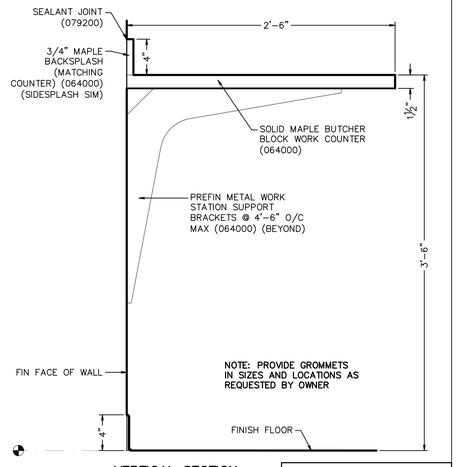


VERTICAL SECTION

8 WALL CABINET DETAIL

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

FLUSH OVERLAY PLASTIC LAMINATE WALL CABINET

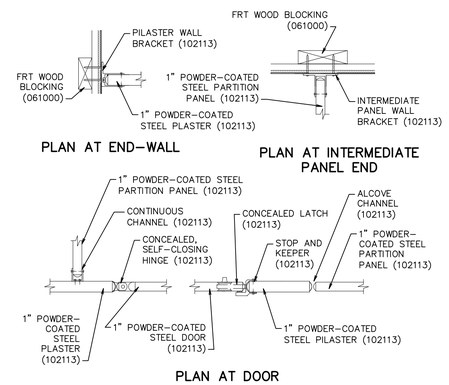


VERTICAL SECTION

9 WK COUNTER DETAIL

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

DETAIL AT BAR-HEIGHT BUTCHER BLOCK WORK SURFACE



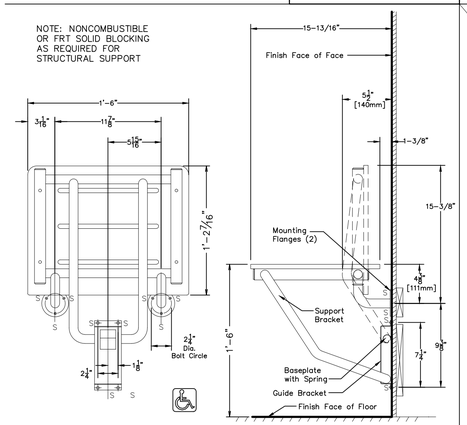
NOTE: FOLLOW MANUFACTURER'S WRITTEN INSTRUCTIONS FOR OVERHEAD SUPPORT OF PARTITION SYSTEM

NOTE: SEE ALSO MANUFACTURER'S STANDARD DETAILS AND INSTALLATION INSTRUCTIONS

10 PARTITION DETAIL

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

TYPICAL DETAILS AT METAL TOILET COMPARTMENT PARTITIONS

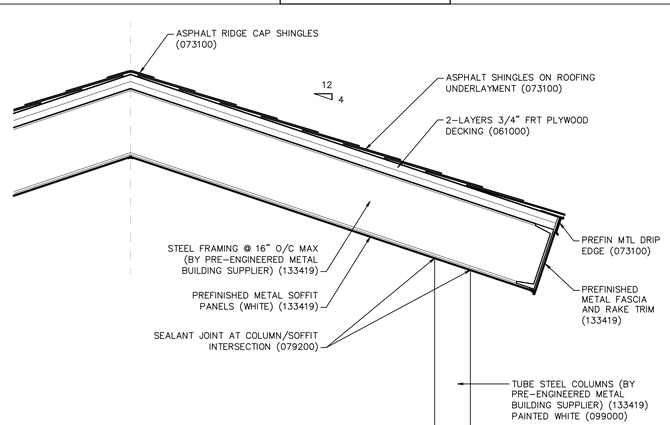


11 FOLDING SEAT

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

DETAIL AT FOLDING BARRIER-FREE SEAT (102813) (SEE ALSO ACCESSORY "18")

NOT USED



VERTICAL SECTION

13 CANOPY ROOF DETAIL

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

SECTION DETAIL AT CANOPY ROOF EAVE

NOT USED

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY
ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

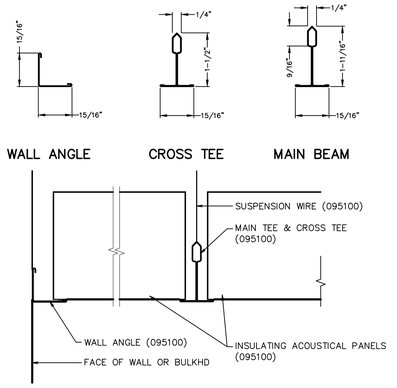
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
CONSTRUCTION. DETAILS

WSC_ELMIRA

ISSUED:	01-28-21					
REV.	REV.	REV.	REV.	REV.	REV.	

A14

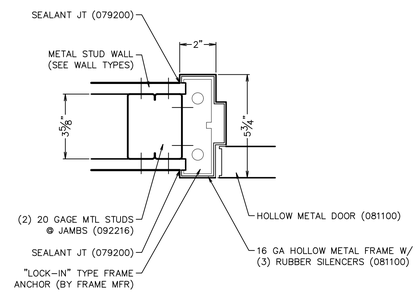


VERTICAL SECTION

1 SUSP ACOUST CLG

SCALE: 6" = 1'-0"

TYPICAL SUSPENDED ACOUSTICAL CEILING DETAILS (095100)

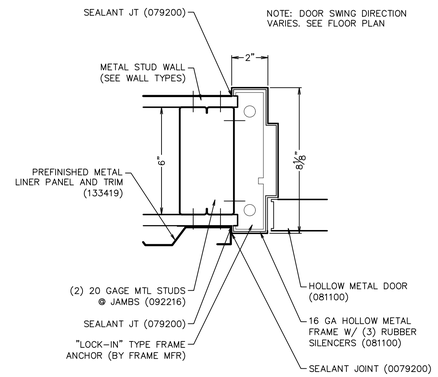


VERTICAL/HORIZONTAL SECTION

2 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT HOLLOW METAL DOOR FRAME IN INTERIOR METAL FRAMED WALL (HEAD DETAIL SIMILAR)

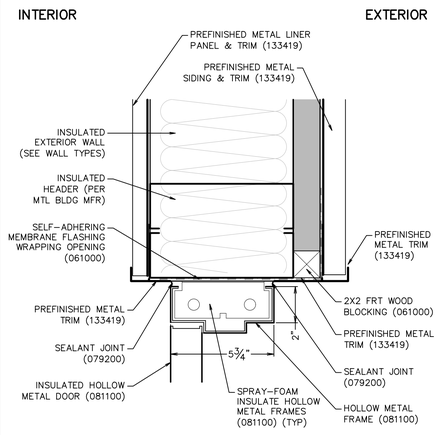


VERTICAL/HORIZONTAL SECTION

3 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT HOLLOW METAL DOOR FRAME IN INTERIOR METAL FRAMED WALL (HEAD DETAIL SIMILAR)

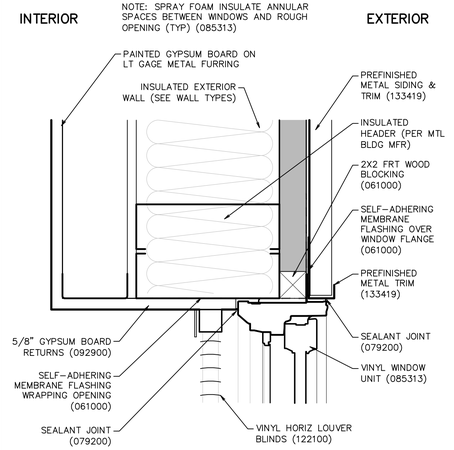


VERTICAL SECTION

4 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

HEAD DETAIL AT INSULATED EXTERIOR HOLLOW METAL DOOR

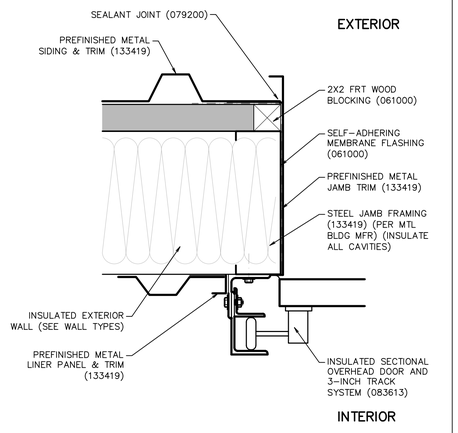


VERTICAL SECTION

5 WINDOW DETAIL

SCALE: 3" = 1'-0"

HEAD DETAIL AT WINDOW UNIT IN EXTERIOR WALL

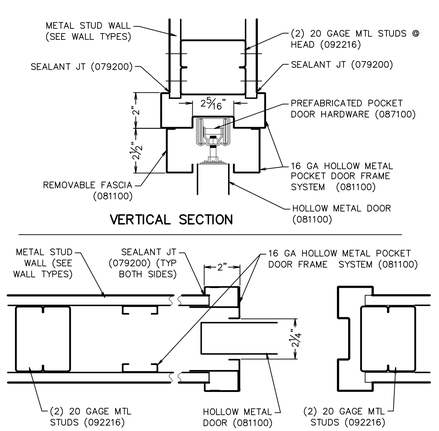


HORIZONTAL SECTION

6 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT INSULATED SECTIONAL OVERHEAD DOOR

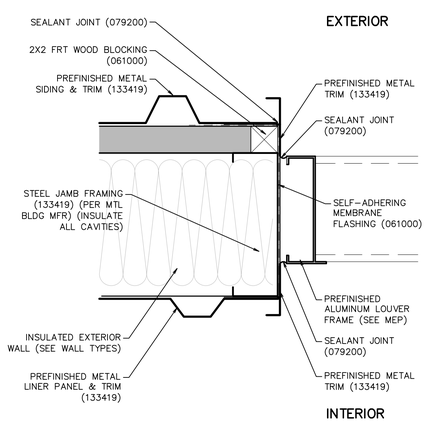


HORIZONTAL SECTION

7 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

HEAD AND JAMB DETAIL AT POCKET DOORS IN INTERIOR METAL FRAMED WALLS

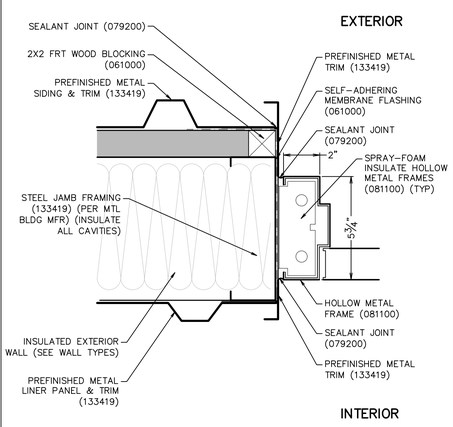


HORIZONTAL SECTION

8 LOUVER FRAME DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT HVAC LOUVER IN EXTERIOR WALL

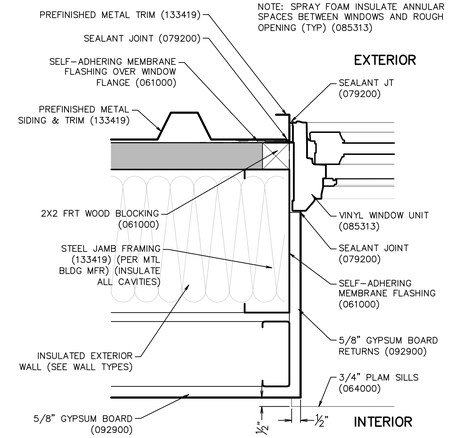


HORIZONTAL SECTION

9 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT INSULATED EXTERIOR HOLLOW METAL DOOR

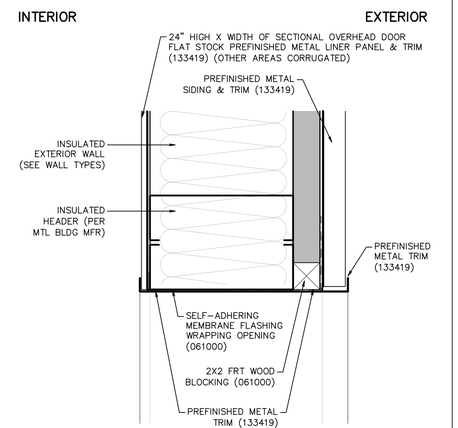


HORIZONTAL SECTION

10 WINDOW DETAIL

SCALE: 3" = 1'-0"

JAMB DETAIL AT WINDOW UNIT IN EXTERIOR WALL

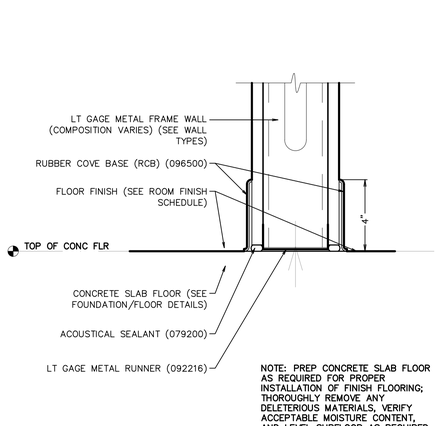


VERTICAL SECTION

11 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

HEAD DETAIL AT INSULATED SECTIONAL OVERHEAD DOOR

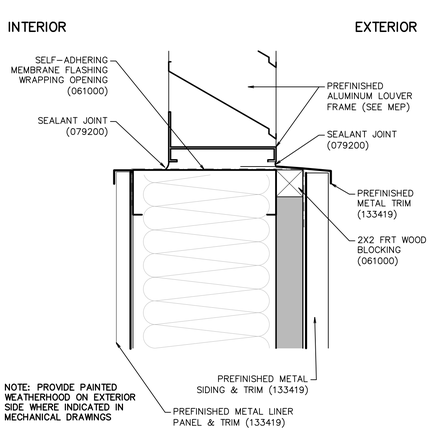


VERTICAL SECTION

12 FLOOR DETAIL

SCALE: 3" = 1'-0"

RUBBER COVE BASE (RCB) DETAIL AT METAL FRAMED WALL ON CONCRETE SLAB FLOOR

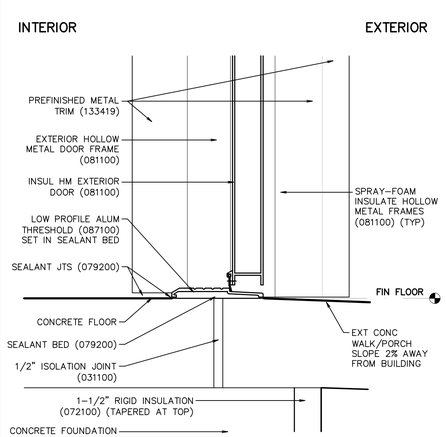


VERTICAL SECTION

13 LOUVER FRAME DETAIL

SCALE: 3" = 1'-0"

SILL DETAIL AT HVAC LOUVER IN EXTERIOR WALL

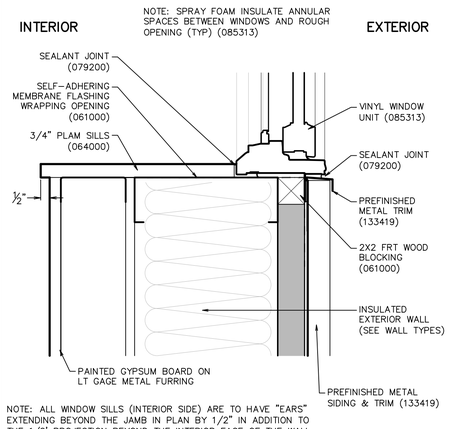


VERTICAL SECTION

14 DOOR FRAME DETAIL

SCALE: 3" = 1'-0"

THRESHOLD DETAIL AT INSULATED EXTERIOR HOLLOW METAL DOOR



VERTICAL SECTION

15 WINDOW DETAIL

SCALE: 3" = 1'-0"

SILL DETAIL AT WINDOW UNIT IN EXTERIOR WALL

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

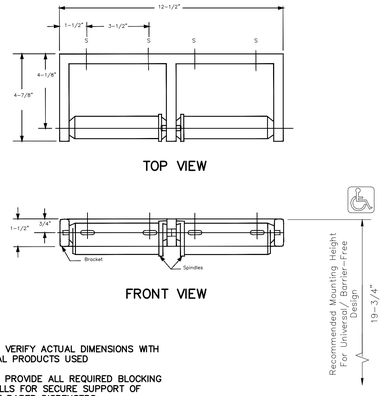
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
CONSTRUCTION. DETAILS

WSC_ELMIRA

ISSUED	01-28-21
REV	
REV	
REV	
REV	
REV	

A15



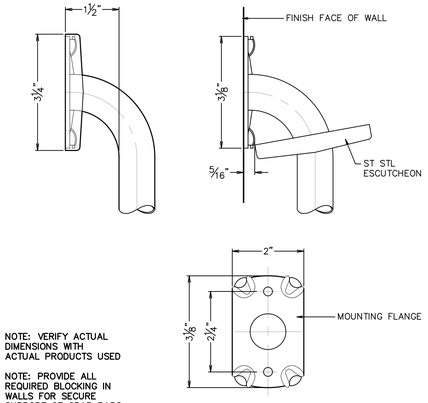
NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF TOILET PAPER DISPENSERS

1 TOILET PAPER DISP

SCALE: 3" = 1'-0"

DETAIL AT SURFACE WALL-MOUNTED TOILET PAPER DISPENSER (102813) (SEE ALSO ACCESSORY "02")



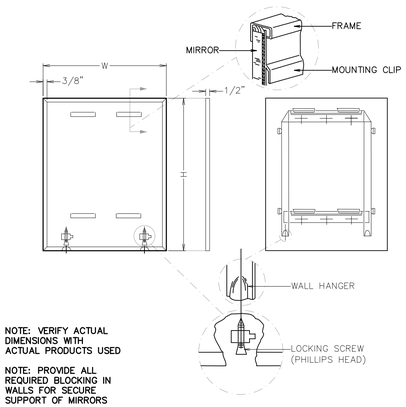
NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF GRAB BARS

2 GRAB BAR DETAIL

SCALE: 6" = 1'-0"

TYPICAL MOUNTING DETAILS AT STAINLESS STEEL GRAB BARS (102813) (SEE ALSO ACCESSORIES "03" "04" & "05")



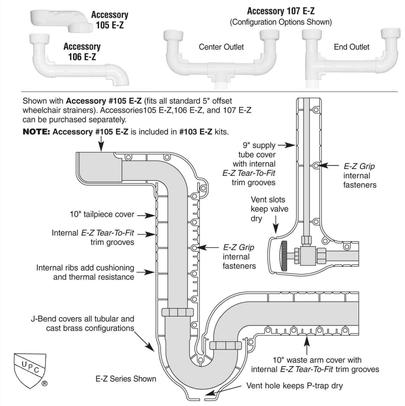
NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF MIRRORS

3 LAVATORY MIRROR

NO SCALE

DETAIL AT MIRROR IN STAINLESS STEEL FRAME (102813) (SEE ALSO ACCESSORY "06")



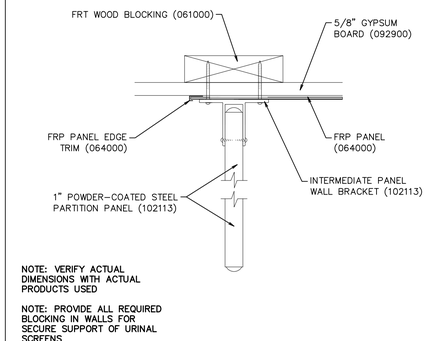
SOURCE OF DETAIL: TRUBRO LAV GUARD II

VERTICAL SECTIONS

4 BF LAV GUARDS

NO SCALE

DETAIL AT BARRIER-FREE LAVATORY GUARDS (102813) (SEE ALSO ACCESSORY "07")



NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF URINAL SCREENS

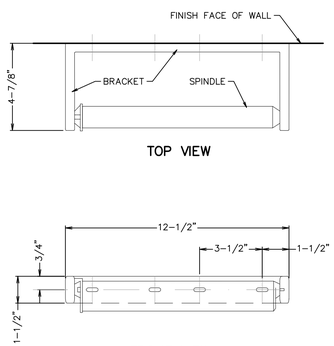
PLAN VIEW

5 URINAL SCREEN

SCALE: 3" = 1'-0"

DETAIL AT URINAL SCREEN (102113) (SEE ALSO ACCESSORY "08")

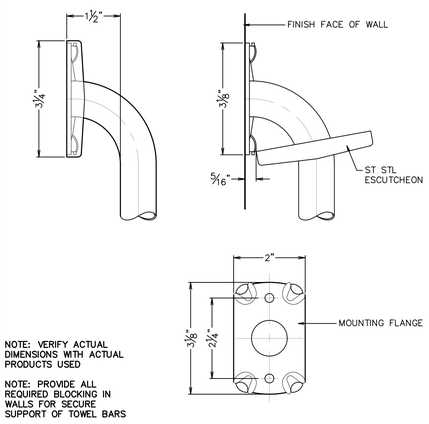
NOT USED



7 PAPER TOWEL DISP

SCALE: 3" = 1'-0"

DETAIL AT SURFACE WALL-MOUNTED PAPER DISPENSER (102813) (SEE ALSO ACCESSORY "15")



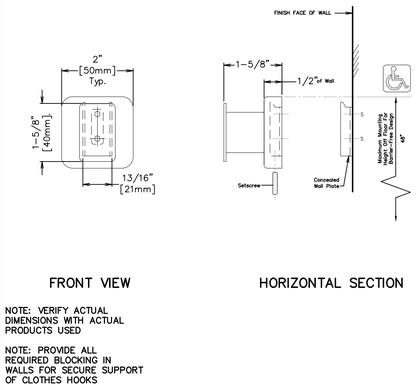
NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF TOWEL BARS

8 TOWEL BAR DETAIL

SCALE: 6" = 1'-0"

TYPICAL MOUNTING DETAIL AT STAINLESS STEEL TOWEL BARS (102813) (SEE ALSO ACCESSORY "14")



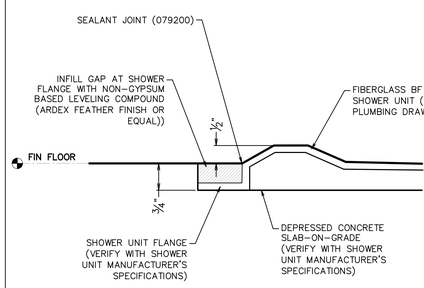
NOTE: VERIFY ACTUAL DIMENSIONS WITH ACTUAL PRODUCTS USED

NOTE: PROVIDE ALL REQUIRED BLOCKING IN WALLS FOR SECURE SUPPORT OF CLOTHES HOOKS

9 CLOTHES HOOK DETAIL

SCALE: 6" = 1'-0"

TYPICAL MOUNTING DETAIL AT STAINLESS STEEL CLOTHES HOOKS (102813) (SEE ALSO ACCESSORY "11")



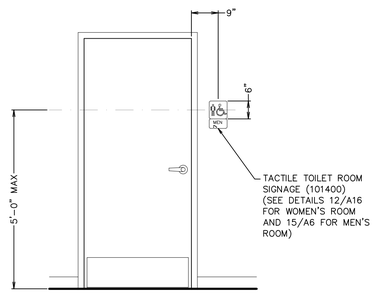
VERTICAL SECTION

10 BF SHOWER DETAIL

SCALE: 6" = 1'-0"

THRESHOLD DETAIL AT BARRIER-FREE SHOWER UNIT IN RECESSED CONCRETE SLAB FLOOR (VERIFY WITH SHOWER MANUFACTURER'S DETAILS)

NOTE:
APPLIES TO THE CORRIDOR SIDE OF DOORS 107.1 AND 108.1 (VIEW IS OPPOSITE FOR DOOR 108.1).



ELEVATION

11 INTERIOR ELEVATION

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

INTERIOR ELEVATION AT CORRIDOR SIDE OF TOILET ROOM DOORS, SHOWING BARRIER-FREE SIGNAGE REQUIREMENT



NOTE: PROVIDE SIGNAGE COMPLYING WITH ICC/ANSI A117.1 AND THE BUILDING CODE

ELEVATION

12 WOMEN'S BF TOILET ROOM SIGN

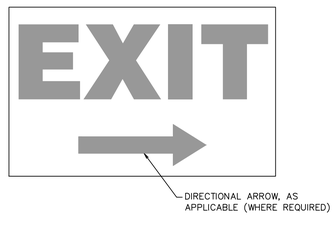
NO SCALE

EXAMPLE BARRIER-FREE WOMEN'S TOILET ROOM SIGN: VERIFY DESIGN, SIZE, AND LOCATIONS REQUIRED WITH AUTHORITIES HAVING JURISDICTION (101400)

PROVIDE ELECTRICALLY-POWERED, SELF-LUMINOUS, AND PHOTOLUMINESCENT INTERNALLY ILLUMINATED EXIT SIGNS, LISTED AND LABELED IN ACCORDANCE WITH UL 924, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THE BUILDING CODE.

EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES.

EVERY EXIT SIGN AND DIRECTIONAL EXIT SIGN SHALL HAVE PLAINLY LEGIBLE LETTERS NOT LESS THAN 6 INCHES HIGH WITH THE PRINCIPAL STROKES OF THE LETTERS NOT LESS THAN 0.75 INCH WIDE. THE WORD 'EXIT' SHALL HAVE LETTERS HAVING A WIDTH NOT LESS THAN 2 INCHES WIDE, EXCEPT THE LETTER 'I,' AND THE MINIMUM SPACING BETWEEN LETTERS SHALL NOT BE LESS THAN 0.375 INCH. SIGNS LARGER THAN THE MINIMUM REQUIREMENT SHALL HAVE LETTER WIDTHS, STROKES AND SPACING IN PROPORTION TO THEIR HEIGHT.



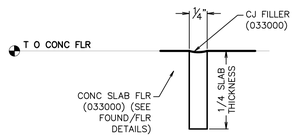
NOTE: PROVIDE SIGNAGE COMPLYING WITH ICC/ANSI A117.1 AND THE BUILDING CODE

ELEVATION

13 EXIT SIGN DETAIL

NO SCALE

EXAMPLE EXIT SIGN: VERIFY DESIGN, SIZE, AND LOCATIONS REQUIRED WITH AUTHORITIES HAVING JURISDICTION (101400)



CONC SLAB CONTROL JOINT

14 CONC JOINT DETAIL

FULL SIZE

TYPICAL MOVEMENT JOINT DETAIL IN CONCRETE FLOORS



NOTE: PROVIDE SIGNAGE COMPLYING WITH ICC/ANSI A117.1 AND THE BUILDING CODE

ELEVATION

15 MEN'S BF TOILET ROOM SIGN

NO SCALE

EXAMPLE BARRIER-FREE MEN'S TOILET ROOM SIGN: VERIFY DESIGN, SIZE, AND LOCATIONS REQUIRED WITH AUTHORITIES HAVING JURISDICTION (101400)

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T3IN - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

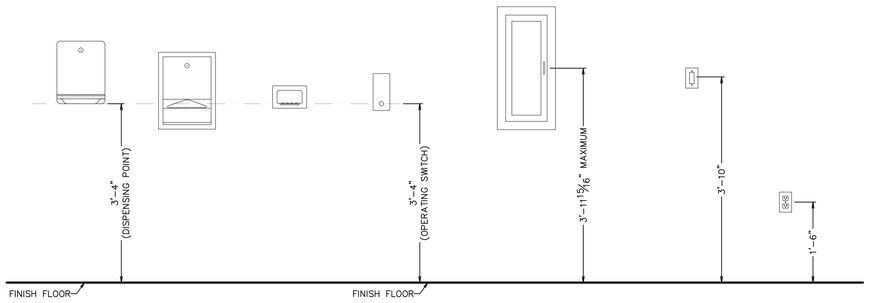
SHEET CONTENTS:
CONSTRUCTION. DETAILS

WSC_ELMIRA

ISSUED:	
01-28-21	
REV.	
REV.	
REV.	
REV.	
REV.	

A16

NOTE: MOUNTING HEIGHTS SHOWN ARE PREFERRED DIMENSIONS. SEE ALSO REACH RANGE REQUIREMENTS INDICATED IN OTHER ACCESSIBILITY DETAILS AND APPLICABLE CODES.



ELEVATION DETAILS

1 BF CONTROLS, DISPENSER & RECEPTACLE MOUNTING HEIGHTS

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

ELEVATION DETAILS INDICATING STANDARD BARRIER-FREE MOUNTING DIMENSIONS AT COMMON CONTROLS, DISPENSERS AND RECEPTACLES

ACCESSIBILITY NOTES

1. COMPLY WITH ALL APPLICABLE BUILDING CODE REQUIREMENTS FOR BARRIER-FREE ACCESSIBILITY, INCLUDING ICC A117.1, AS REFERENCED IN THE BUILDING CODE, AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
2. ACCESSIBLE ROUTES SHALL CONSIST OF WALKING SURFACES WITH A SLOPE NOT GREATER THAN 1:20, DOORS AND DOORWAYS, RAMPS, CURB RAMPS EXCLUDING THE FLARED SIDES, ELEVATORS AND PLATFORM LIFTS.
3. THE RUNNING SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:20, THE CROSS SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:48 (2%).
4. PROVIDE SOLID BLOCKING CONCEALED IN FRAME WALLS FOR SECURELY ANCHORING FIXTURES AND ACCESSORIES TO WALLS. MOUNT FIXTURES AND ACCESSORIES TO WITHSTAND A MINIMUM FORCE OF 250 POUNDS IN ANY DIRECTION, WITHOUT ROTATION, DEFORMATION, OR FAILURE OF ATTACHMENT.
5. INSTALL BARRIER-FREE FIXTURES AND ACCESSORY UNITS IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. INSTALL FIXTURES AND ACCESSORY UNITS LEVEL, PLUMB, TRUE TO LINE, AND IN ACCORDANCE WITH BARRIER-FREE ACCESSIBILITY GUIDELINES.
7. PROVIDE (FURNISH AND INSTALL) THE FOLLOWING ACCESSIBILITY SIGNS:
   - 7.1. ALL BF IDENTIFICATION AND DIRECTIONAL SIGNAGE REQUIRED BY CODE
   - 7.2. ALL REQUIRED BARRIER-FREE TOILET ROOM SIGNAGE
   - 7.3. EXTERIOR SIGNAGE IDENTIFYING BARRIER-FREE PARKING SPACES
8. PROVIDE ACCESSIBLE LANDINGS, TURNING SPACES, MANEUVERING SPACES, AND CLEAR SPACES IN ACCORDANCE WITH THE REQUIREMENTS OF ICC A117.1, AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
   - 8.1. MAXIMUM FLOOR SLOPE PERMITTED: 1:48 (2%).
9. FLOOR SURFACES SHALL BE STABLE, FIRM, AND SLIP-RESISTANT.
10. CHANGES IN LEVEL OF 1/4 INCH MAXIMUM IN HEIGHT SHALL BE PERMITTED TO BE VERTICAL. CHANGES IN LEVEL GREATER THAN 1/4 INCH IN HEIGHT AND NOT MORE THAN 1/2 INCH MAXIMUM IN HEIGHT SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2. CHANGES IN LEVEL GREATER THAN 1/2 INCH IN HEIGHT SHALL BE SLOPED NOT STEEPER THAN 1:48 AT LANDINGS AND MANEUVERING SPACES, SLOPED NOT STEEPER THAN 1:20 AT OTHER AREAS, OR RAMPED NOT STEEPER THAN 1:12.



NOTE: PROVIDE 4" X 4" MINIMUM SIZE

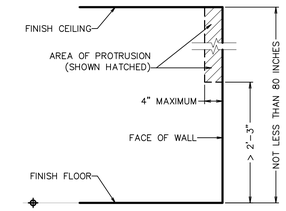
NOTE: PROVIDE SIGNAGE COMPLYING WITH ICC/ANSI A117.1 AND THE BUILDING CODE

ELEVATION

2 ACCESSIBILITY SIGN

NO SCALE

EXAMPLE BARRIER-FREE ACCESSIBILITY SIGN: VERIFY DESIGN, SIZE, AND LOCATIONS REQUIRED WITH AUTHORITIES HAVING JURISDICTION



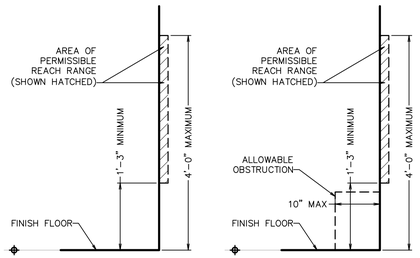
NOTES:
1. PROTRUDING OBJECTS SHALL NOT REDUCE THE REQUIRED CLEAR WIDTH AT ACCESSIBLE ROUTES.
2. HANDRAILS ARE PERMITTED TO PROTRUDE 4-1/2 INCHES MAXIMUM

VERTICAL SECTION

3 PROTRUSION LIMITS

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

VERTICAL SECTION DETAIL ILLUSTRATING MAXIMUM ALLOWABLE HORIZONTAL PROTRUSIONS INTO THE CIRCULATION PATH

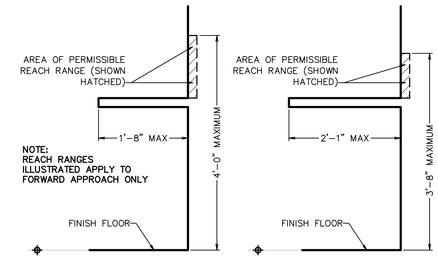


VERTICAL SECTIONS

4 REACH RANGES

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

VERTICAL SECTION DETAIL ILLUSTRATING ALLOWABLE REACH RANGE LIMITS (UNOBSTRUCTED FORWARD AND SIDE APPROACHES)

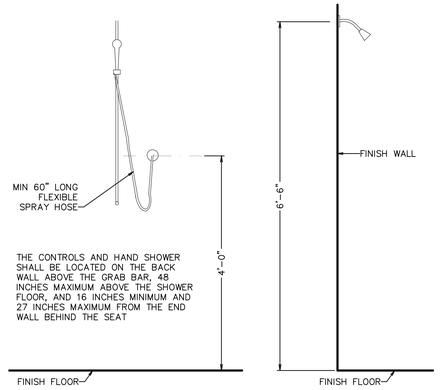


VERTICAL SECTIONS

5 REACH RANGES

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

VERTICAL SECTION DETAIL ILLUSTRATING ALLOWABLE REACH RANGE LIMITS (OBSTRUCTED FORWARD APPROACH)

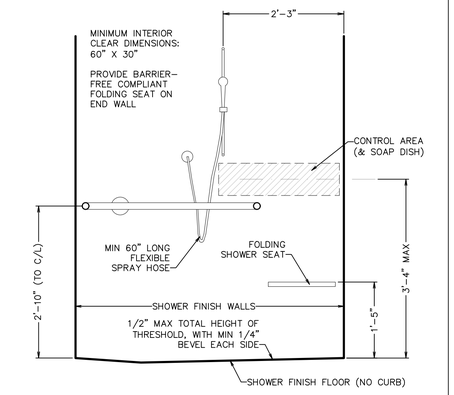


ELEVATION DETAILS

6 BF SHOWER HEAD

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

ELEVATION DETAILS INDICATING STANDARD BARRIER-FREE MOUNTING DIMENSIONS AT SHOWER HEADS



ELEVATION DETAIL

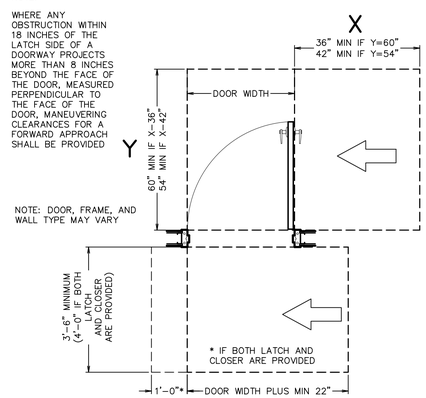
7 BF SHOWER CONTROL

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

ELEVATION DETAILS INDICATING STANDARD BARRIER-FREE SHOWER CONTROL DIMENSIONS AT ROLL-IN SHOWER

NOTE:

WHERE ANY OBSTRUCTION WITHIN 18 INCHES OF THE LATCH SIDE OF A DOORWAY PROJECTS MORE THAN 8 INCHES BEYOND THE FACE OF THE DOOR, MEASURED PERPENDICULAR TO THE FACE OF THE DOOR, MANEUVERING CLEARANCES FOR A FORWARD APPROACH SHALL BE PROVIDED

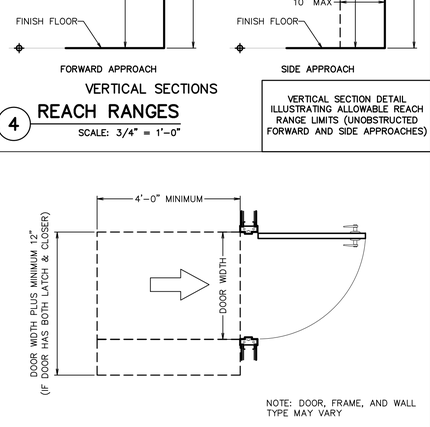


HORIZONTAL SECTION

8 DOOR APPROACH

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

PLAN DETAIL ILLUSTRATING REQUIRED MANEUVERING SPACE FOR ACCESSIBLE DOORS (PULL SIDE, HINGE APPROACH)

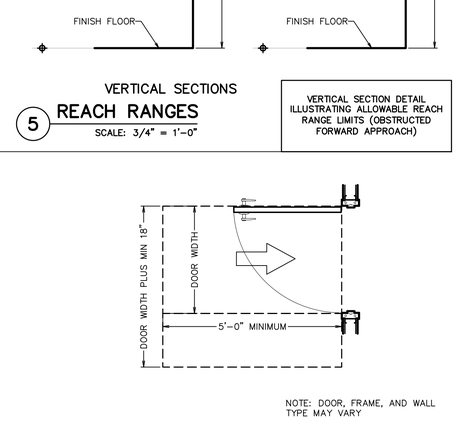


HORIZONTAL SECTION

9 DOOR APPROACH

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

PLAN DETAIL ILLUSTRATING REQUIRED MANEUVERING SPACE FOR ACCESSIBLE DOORS (PUSH SIDE, FORWARD APPROACH)

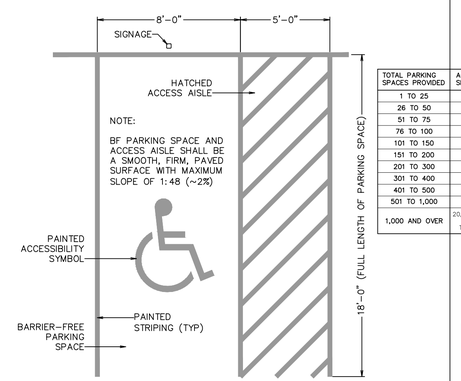


HORIZONTAL SECTION

10 DOOR APPROACH

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

PLAN DETAIL ILLUSTRATING REQUIRED MANEUVERING SPACE FOR ACCESSIBLE DOORS (PULL SIDE, FORWARD APPROACH)



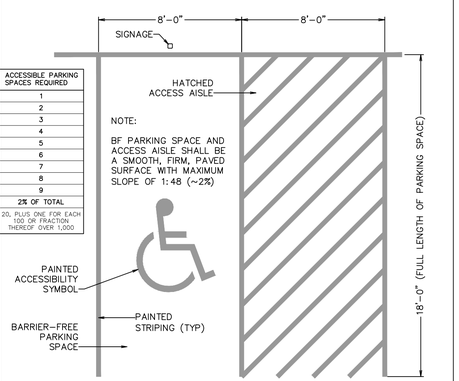
TOTAL PARKING SPACES PROVIDED	ACCESSIBLE PARKING SPACES REQUIRED
1 TO 25	1
26 TO 50	2
51 TO 75	3
76 TO 100	4
101 TO 150	5
151 TO 200	6
201 TO 300	7
301 TO 400	8
401 TO 500	9
501 TO 1,000	2% OF TOTAL
1,000 AND OVER	20, PLUS ONE FOR EACH 100 OR FRACTION THEREOF OVER 1,000

PLAN DETAIL

11 BF PARKING SPACE

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

PLAN LAYOUT DETAIL AT STANDARD BARRIER-FREE ACCESSIBLE PARKING SPACE

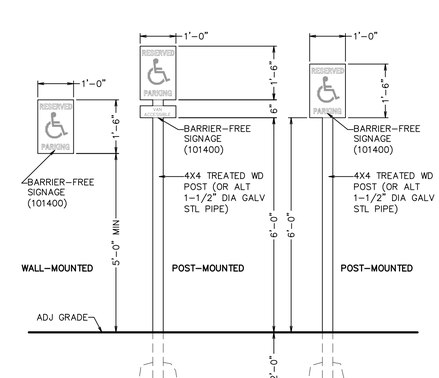


PLAN DETAIL

12 BF PARKING SPACE

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

PLAN LAYOUT DETAIL AT VAN ACCESSIBLE BARRIER-FREE PARKING SPACE (PROVIDE 1 FOR EACH 6 OR FRACTION THEREOF TOTAL BF PARKING SPACES)



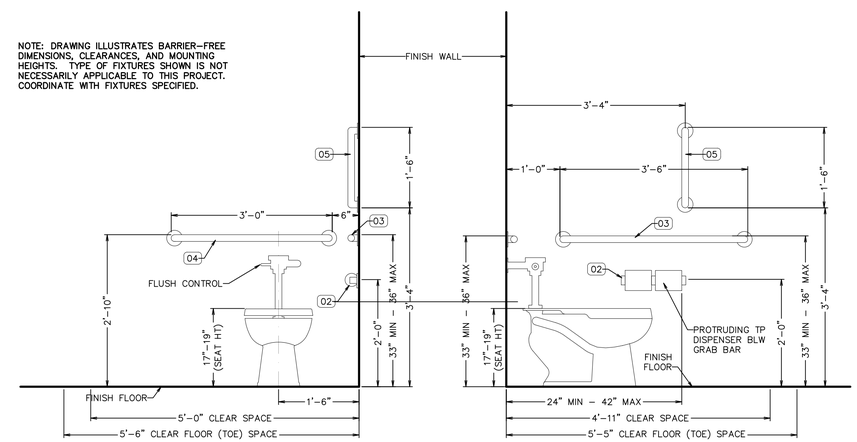
ELEVATION DETAILS

13 BF PARKING SIGNAGE

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

ELEVATION DETAIL AT BARRIER-FREE PARKING SPACES

NOTE: DRAWING ILLUSTRATES BARRIER-FREE DIMENSIONS, CLEARANCES, AND MOUNTING HEIGHTS. TYPE OF FIXTURES SHOWN IS NOT NECESSARILY APPLICABLE TO THIS PROJECT. COORDINATE WITH FIXTURES SPECIFIED.



ELEVATION DETAILS

14 BARRIER-FREE WATER CLOSET CLEARANCES AND MOUNTING HEIGHTS

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

ELEVATION DETAILS INDICATING STANDARD BARRIER-FREE MOUNTING DIMENSIONS AT ACCESSIBLE WATER CLOSETS

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT: ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER: WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

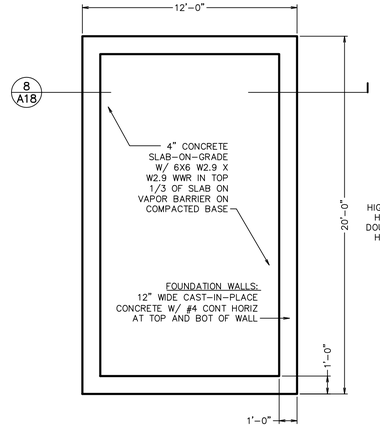
PROJECT: SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T3IN - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS: BARRIER-FREE STANDARDS

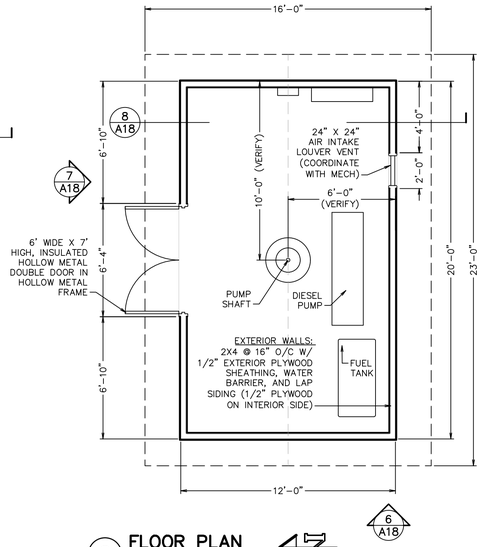
WSC_ELMIRA

ISSUED:	01-28-21				
REV.					
REV.					
REV.					
REV.					
REV.					

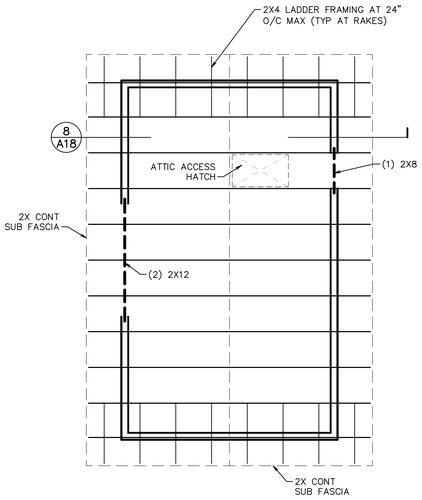
A17



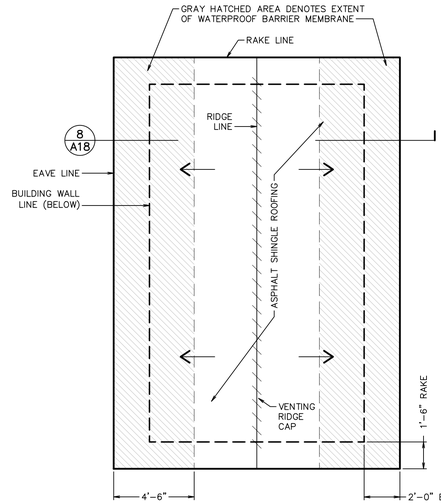
1 FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



2 FLOOR PLAN
SCALE: 1/4" = 1'-0"



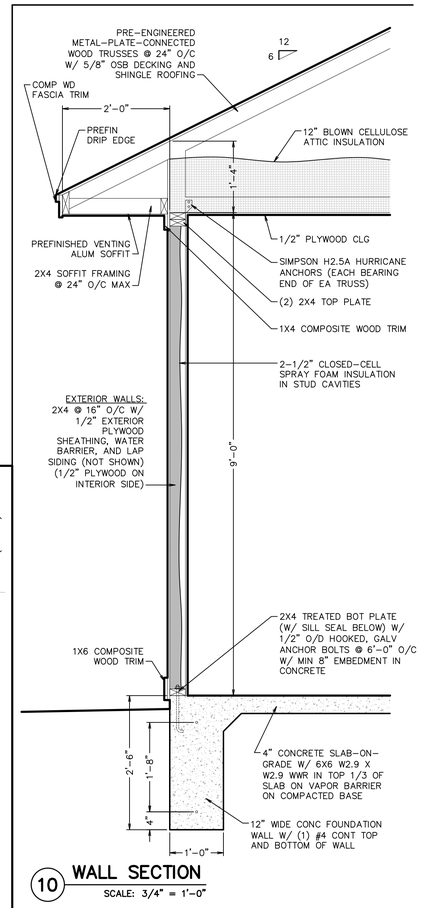
3 ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"



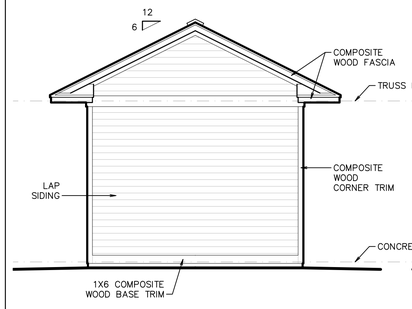
4 ROOF PLAN
SCALE: 1/4" = 1'-0"

ROOF PLAN NOTES

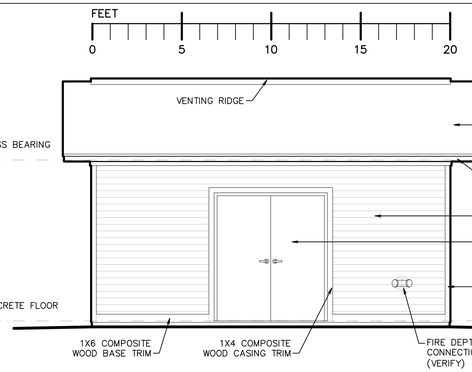
1. ARROW SYMBOLS DENOTE DIRECTION OF WATER FLOW.
2. HATCHING DENOTES AREAS REQUIRING WATERPROOF BARRIER MEMBRANE UNDER SHINGLE ROOFING. EXTEND WATERPROOF BARRIER MEMBRANE MINIMUM 24" BACK (TOWARD INTERIOR) FROM THE INSIDE OF THE EXTERIOR WALL LINE AT EAVES.



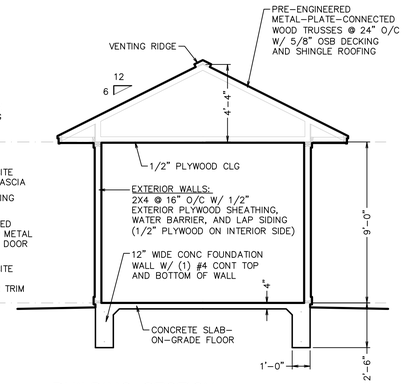
10 WALL SECTION
SCALE: 3/4" = 1'-0"



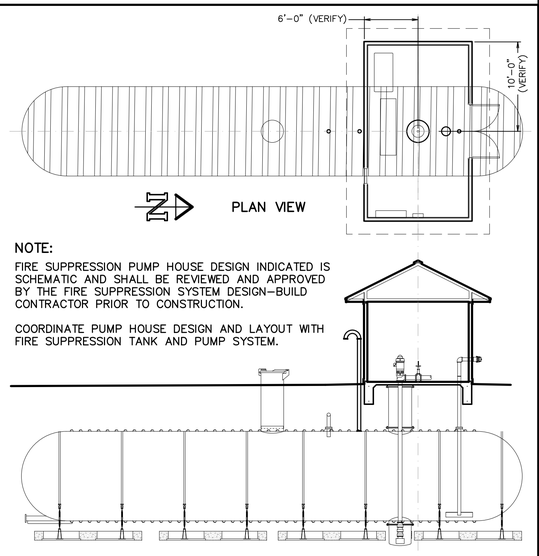
6 ENDWALL EXTERIOR ELEVATIONS
SCALE: 1/4" = 1'-0"



7 NORTH EXTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



8 BUILDING SECTION
SCALE: 1/4" = 1'-0"



NOTE:
FIRE SUPPRESSION PUMP HOUSE DESIGN INDICATED IS SCHEMATIC AND SHALL BE REVIEWED AND APPROVED BY THE FIRE SUPPRESSION SYSTEM DESIGN-BUILD CONTRACTOR PRIOR TO CONSTRUCTION.

COORDINATE PUMP HOUSE DESIGN AND LAYOUT WITH FIRE SUPPRESSION TANK AND PUMP SYSTEM.

9 WATER TANK DRAWINGS
SCALE: 1/8" = 1'-0"

PUMP HOUSE BUILDING CODE SUMMARY

1. Applicable Building Code: 2015 Michigan Building Code.
2. Building Code Jurisdiction: Antrim County, Michigan.
3. Building Use Group: U – Utility.
4. Building Construction Type: VB, Combustible/Unprotected.
5. Building Area: 220 SF.
6. Building Height: 1 story, 12 FT.
7. Building Open Perimeter: 100%.
8. Automatic Fire Protection / Fire Alarm Systems: None.
9. Occupant Load (egress calculation): 1 person (1/300 SF gross).
10. Wall and Roof Construction: Combustible/Unprotected.
11. Proposed building to be semi-heated (kept above freezing).
12. Diesel fuel storage tank (NFPA Class II Combustible Liquid) located inside the building is to be an approved safety vessel of not greater than 240 gallons capacity.

NOTES:

FIRE SUPPRESSION WATER SUPPLY PUMP SYSTEM DESIGN IS BY THE FIRE SUPPRESSION SYSTEM DESIGN-BUILD CONTRACTOR.

FIRE SUPPRESSION SYSTEM ENGINEERED DESIGN IS NOT PROVIDED BY ARCHITECTURE TECHNOLOGY, P.C., OR ITS DESIGN CONSULTANTS.

COORDINATE PUMP, DIESEL ENGINE, FUEL TANK, PIPING, VALVES, AND CONTROLS LOCATIONS WITH THE PUMP SUPPLIER AND THE FIRE SUPPRESSION DESIGN-BUILD CONTRACTOR.

CONCRETE NOTES

1. FOLLOW ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS."
2. REINFORCING STEEL: ASTM A615, GRADE 60.
3. WELDED WIRE REINFORCEMENT (WWR): ASTM A185, 6" x 6" W2.9 X W2.9, Fy 65 KSI.
4. MINIMUM CONCRETE STRENGTH FOR FOOTINGS, FOUNDATION WALLS, AND SLABS-ON-GRADE: 3,500 PSI (AT 28 DAYS).
5. DO NOT USE CONCRETE ADMIXTURES CONTAINING CHLORIDE IONS.

WOOD FRAMING NOTES

1. FOLLOW AF&PA, "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION."
2. FOLLOW TPI AND WTCA PUBLISHED STANDARDS FOR DESIGN AND ERECTION OF PRE-ENGINEERED WOOD TRUSSES.
3. FRAMING LUMBER: DRESSED (S4S), SEASONED (S-DRY OR KD), SOFTWOOD SPECIES, MINIMUM NO. 2.
4. STRUCTURAL SHEATHING/DECKING: APA RATED MANUFACTURED PLYWOOD PANELS MEETING APA PRP-108 AND VOLUNTARY PRODUCT STANDARD PS-1.
5. PRESERVATIVE TREATED WOOD: ACQ, TYPES B AND D, OR CBA-A AND CA-B.
6. DESIGN RESPONSIBILITY FOR PRE-ENGINEERED WOOD TRUSSES LIES WITH THE TRUSS MANUFACTURER. PROVIDE SEALED TRUSS SHOP DRAWINGS TO THE BUILDING CODE OFFICIAL AS A DEFERRED SUBMITTAL AND TO THE ARCHITECT FOR THE ARCHITECT'S FILE.
7. PRE-ENGINEERED WOOD TRUSS DESIGN TO INCLUDE ALL BRACING (TEMPORARY AND PERMANENT) REQUIRED FOR STABILITY OF THE OVERALL TRUSSED (ROOF OR FLOOR) STRUCTURE.
8. PROVIDE ONE SIMPSON H2.5A METAL HURRICANE ANCHOR AT EACH BEARING POINT OF EACH ROOF TRUSS AND RAFTER.

PRE-ENGINEERED WOOD TRUSS NOTES

1. PRE-ENGINEERED WOOD TRUSS LAYOUT IS SCHEMATIC AND NOT INTENDED TO RELIEVE THE TRUSS MANUFACTURER'S RESPONSIBILITY OF COMPLETE TRUSS SYSTEM DESIGN, LAYOUT, AND INDIVIDUAL TRUSS MEMBER AND INTERNAL BRACING DESIGN.
2. PRE-ENGINEERED WOOD TRUSS MEMBER DESIGNATIONS, DIMENSIONS AND PROFILES SHOWN IN ARCHITECTURAL DRAWINGS ARE NOT EXHAUSTIVE OR COMPLETE. TRUSS MANUFACTURER IS RESPONSIBLE FOR COMPLETE TRUSS SYSTEM DESIGN BASED ON THE BUILDING DESIGN, ROOF CONFIGURATION, BUILDING CODE, AND STRUCTURAL REQUIREMENTS INDICATED.
3. TRUSSES AND TRUSS BRACING SHALL BE DESIGNED BY AN ENGINEER LICENSED IN THE STATE OF MICHIGAN.
4. PROVIDE SEALED TRUSS SHOP DRAWINGS TO THE BUILDING OFFICIAL AS A DEFERRED SUBMITTAL, AND TO THE ARCHITECT FOR THE ARCHITECT'S FILE.
5. WHERE NOT SPECIFICALLY INDICATED OTHERWISE, PROVIDE CONTINUOUS DIAGONAL BRACING (IN ADDITION TO THE REQUIRED LATERAL BRACING) AT ALL LOCATIONS WHERE THE TRUSS SHOP DRAWINGS INDICATE LATERAL BRACING. BRACING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MICHIGAN.
6. CONTRACTOR SHALL COORDINATE TRUSS LAYOUT AND POINT LOAD LOCATIONS.
7. THE TRUSS MANUFACTURER IS RESPONSIBLE FOR ALL TRUSS-TO-TRUSS STRUCTURAL CONNECTIONS.

FINISHES NOTES

1. PREPARE SURFACES TO RECEIVE PAINTS, INCLUDING SCRAPING, FILLING, SANDING, CLEANING, AND APPLICATION OF PRIMERS.
2. APPLY PAINTS IN STRICT ACCORDANCE WITH THE PAINT MANUFACTURERS INSTRUCTIONS, INCLUDING ADHERENCE TO RECOMMENDED ENVIRONMENTAL CONDITIONS FOR APPLICATION OF PAINTS AND PROTECTION OF FINISHED WORK.
3. APPLY PAINTS IN MULTIPLE COATS, AS RECOMMENDED BY THE PAINT MANUFACTURER AND AS REQUIRED FOR COMPLETE AND THOROUGH COVERAGE OF SURFACES WITH NO BLEED-THROUGH OF UNDERLYING MATERIALS AND FINISHES.
4. ALL FINISH PRODUCTS, MATERIALS AND COLORS ARE TO BE SELECTED AND APPROVED BY THE OWNER.

DOORS & OPENINGS NOTES

1. STEEL DOORS AND FRAMES: FOLLOW STEEL DOOR INSTITUTE (SDI) PUBLISHED STANDARDS.
2. HOLLOW METAL DOOR FRAMES: ANSI A250.8, 16 GAGE. FOLLOW STEEL DOOR INSTITUTE (SDI) PUBLISHED STANDARDS. PROVIDE GALVANIZED FRAMES FOR PAINT FINISH.
3. EXTERIOR DOORS: FLUSH, INSULATED HOLLOW METAL. PROVIDE GALVANIZED DOORS FOR PAINT FINISH.
4. WOOD DOOR WARRANTY PERIOD: LIFETIME ON WORKMANSHIP AND MATERIALS.
5. PROVIDE ALL BLOCKING AND REINFORCEMENTS IN DOORS AND FRAMES AS REQUIRED FOR SECURE ATTACHMENT OF HARDWARE, DURABILITY, AND PROPER FUNCTION OF OPENINGS.
6. DOOR HARDWARE STANDARDS: FOLLOW BHMA A156 SERIES DOCUMENTS, AS APPLICABLE, MINIMUM GRADE 2.
7. PROVIDE BARRIER-FREE DOOR HARDWARE, WITH LEVER-TYPE HANDLES, ON ALL LATCHING DOORS. PROVIDE BARRIER-FREE THRESHOLDS ON EXTERIOR DOORS.
8. PROVIDE "LEVEL" SURFACES ON BOTH SIDES OF ALL NEW DOORS WITH SLOPES NOT STEEPER THAN 1:48 (2%)
9. INSTALL EXTERIOR DOORS AND LOUVER OPENING IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WITH ASTM E2112.

THERMAL/MOISTURE PROTECTION NOTES

1. ROOFING STANDARD: NRCA "ROOFING AND WATERPROOFING MANUAL"
2. WATERPROOF BARRIER MEMBRANE: RUBBERIZED ASPHALT AND POLYETHYLENE SELF-ADHERING SHEET MEMBRANE CONFORMING TO ASTM D1970, COLD-APPLIED MEMBRANE COMPOSED OF A HIGH DENSITY, CROSS LAMINATED POLYETHYLENE FILM COATED ON ONE SIDE WITH A LAYER OF RUBBERIZED ASPHALT ADHESIVE.
   2.1. MINIMUM THICKNESS: 40 MILS (TESTED PER ASTM D3767, METHOD A).
   2.2. APPROVED PRODUCT: W. R. GRACE & CO., "ICE & WATER SHIELD."
   2.3. APPROVED PRODUCT: GAF MATERIALS CORP., "WEATHERWATCH."
   2.4. APPROVED PRODUCT: TAMKO ROOFING PRODUCTS, INC., "MOISTURE GUARD."
3. ASPHALT SHINGLES: ASPHALT/NON-WOVEN FIBERGLASS MAT SHINGLES CONFORMING TO ASTM D3462; MINIMUM 250 LBS/SQUARE; MINIMUM 30 YEAR WARRANTY.
4. SHEET METAL ROOFING, FLASHING, AND ROOFING ACCESSORY STANDARD: SMACNA "ARCHITECTURAL SHEET METAL MANUAL."
5. BUILDING WRAP: MATERIALS MEETING ASTM E1677.
6. LOOSE-FILL CELLULOSE INSULATION: MATERIALS MEETING ASTM C739.
7. SPRAY-APPLIED, SEMI-FLEXIBLE CELLULAR PLASTIC FOAM INSULATION: SELF-SUPPORTING, HYDROPHOBIC, MEDIUM-DENSITY, AIR-AND-MOISTURE-IMPERMEABLE, CLOSED-CELL POLYURETHANE FOAM INSULATION FOR USE IN FRAMED WALL AND CEILING CAVITIES.
8. UNDER-CONCRETE-SLAB VAPOR BARRIER MINIMUM 10 MIL THICK POLYETHYLENE SHEETING.
9. FLASH AND SEAL ALL PENETRATIONS IN EXTERIOR WALLS AND ROOFS TO PREVENT WATER INTRUSION INTO THE BUILDING.
10. SEAL ALL PENETRATIONS IN EXTERIOR ENVELOPE SUCH AS THOSE MADE FOR PASSAGE OF PIPING OR CONDUIT. SEAL ALL EDGES OF BUILDING WRAP AIR INFILTRATION BARRIER WITH SEALING TAPE APPROVED BY THE BUILDING WRAP MANUFACTURER.
11. PROVIDE COMPLETE INSULATION AND SEALING OF EXTERIOR ENVELOPE AND ATTIC SPACES. PROVIDE ALL INSULATION ACCESSORIES, ADHESIVES, SEALANTS, FASTENERS, ETC., REQUIRED FOR A COMPLETE INSTALLATION.

© COPYRIGHT 2021 ARCHITECTURE TECHNOLOGY, P.C.

ARCHITECTURE AT TECHNOLOGY

ARCHITECT:
ARCHITECTURE TECHNOLOGY, P.C.
1304 BUSINESS PARK DRIVE
TRAVERSE CITY, MI 49686
(231) 933-4489

OWNER:
WOLVERINE POWER COOPERATIVE
10125 W. WATERGATE ROAD
CADILLAC, MICHIGAN 49601

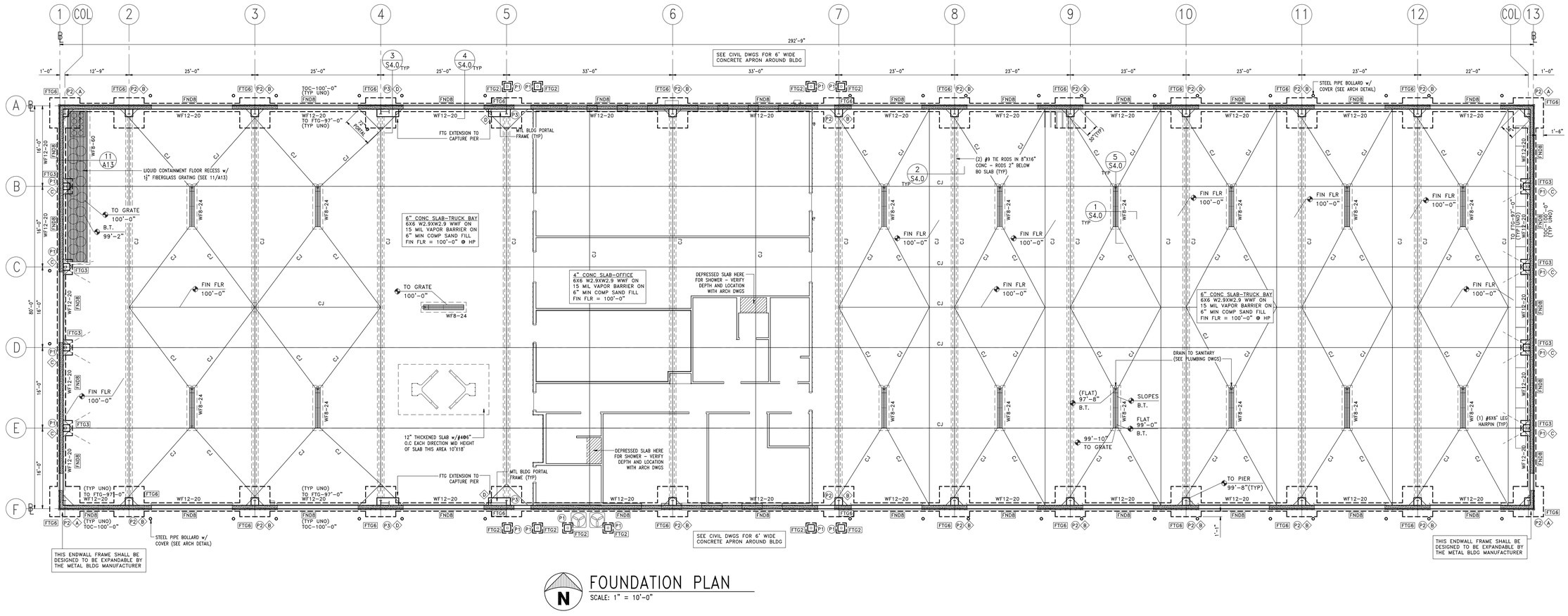
PROJECT:
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI
(PART OF SE 1/4, SECT 24, T31N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET CONTENTS:
PUMP HOUSE DRAWINGS & SPECIFICATIONS

WSC_ELMIRA

ISSUED	REV.	REV.	REV.	REV.	REV.
01-28-21					

A18



FOUNDATION PLAN

SCALE: 1" = 10'-0"

CONCRETE FOUNDATION WALL SCHEDULE

MARK	WIDTH	REINFORCING		NOTES
		VERTICAL	HORIZONTAL	
FNDB	8"	#5@12" O.C. w/TYP BEND INTO FTG	(4)-#5 EQUALLY SPACED - 12" MAX	

COLUMN FOOTING SCHEDULE

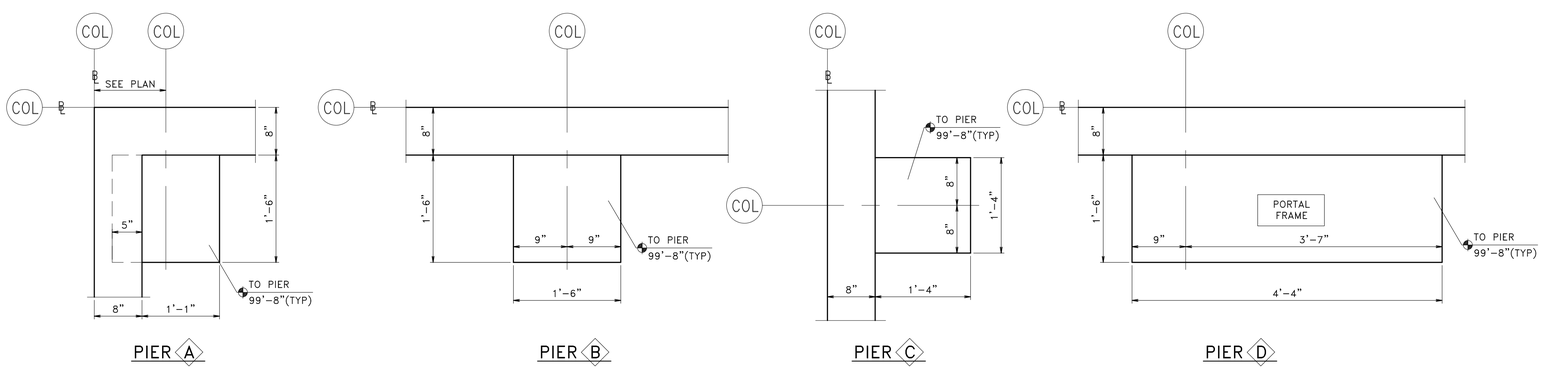
MARK	SIZE	REINF EA DIR	NOTES
FTG2	2'-0" X 2'-0" X 1'-0"	(3) - #5	
FTG3	3'-0" X 3'-0" X 1'-0"	(4) - #5	
FTG6	6'-0" X 6'-0" X 1'-0"	(7) - #5	

WALL/SPECIAL FOOTING SCHEDULE

MARK	SIZE		REINFORCING	NOTES
	DEPTH	WIDTH		
WF8-24	8"	24"	(2) - #4 CONT	
WF12-20	12"	20"	(3) - #5 CONT	
WF8-60	8"	60"	(5) - #4 CONT	#3 U-SHAPED DOWELS @ 12" O.C.

CONCRETE PIER SCHEDULE

MARK	SIZE	VERT REINF	TIES	NOTES
P1	16" X 16"	(4)-#5	#3@12" O.C.	
P2	18" X 18"	(6)-#5	#3@12" O.C. (2 EA/SET)	
P3	18" X 52"	(8)-#5	#3@12" O.C. (3 EA/SET)	



PIER A PIER B PIER C PIER D

PIER DIMENSIONS-ANCHOR BOLTS

SCALE 1"=1'-0"

ANCHOR BOLTS WILL NEED TO BE VERIFIED w/ APP'D SHOP DWGS - PLAN FOR (4) 1" DIAM PER COLUMN FOR BIDDING PURPOSES

LEGEND

FTGX	CONCRETE COLUMN FOOTING MARK - SEE SCHEDULE
WFXX-XX	CONCRETE WALL FOOTING MARK - SEE SCHEDULE
PX	CONCRETE PIER MARK - SEE SCHEDULE
X	CONCRETE PIER SHAPE - ANCHOR BOLT PATTERN - SEE DETAILS
TO FTG	TOP OF CONCRETE FOOTING
TO PIER	TOP OF CONCRETE PIER
TOC	TOP OF CONCRETE

FOUNDATION NOTES:

1. SEE S3.0 FOR GENERAL NOTES, TYPICAL DETAILS & DESIGN LOADS
2. REFER TO ARCH DRAWINGS FOR DIMENSIONS & DETAILS NOT INDICATED
3. REFER TO ARCH DRAWINGS FOR RECESSED FLOORS & MECH DWGS FOR FLOOR DRAINS & EQPT PADS
4. THIS PLAN SET IS FOR USE ALONG WITH PRE-ENGINEERED METAL BUILDING (PEMB) DRAWINGS PROVIDED BY THE CONTRACTOR. CONCRETE CONTRACTOR IS REQUIRED TO COORDINATE WITH PEMB CONTRACTOR SHOP DRAWINGS WITH REGARD TO ANCHOR BOLT SIZE & PLACEMENT.
5. FINAL CONCRETE PAD FOOTING SIZES, TIE ROD-HAIRPIN SIZING/LOCATION AND ANCHOR BOLT PLACEMENT TO BE DETERMINED BY ENGINEER AFTER PEMB SHOP DRAWINGS ARE FINALIZED AND SUBMITTED.

3409 Veterans Drive
Traverse City, MI 49684
231-275-2600 phone
231-946-5974 fax
apexem.net

APEX ENGINEERING & MANAGEMENT, INC.

THIS DRAWING IS THE PROPERTY OF APEX ENGINEERING AND MANAGEMENT, INC. AND HAS BEEN PRODUCED FOR THIS SPECIFIC PROJECT. IT SHALL NOT BE REPRODUCED, COPIED, OR USED IN ANY FASHION WITHOUT THE WRITTEN PERMISSION OF APEX ENGINEERING AND MANAGEMENT, INC.

DRAWING HISTORY

NO	DATE	DESCRIPTION
**	1/11/21	FOR REVIEW
	1/28/21	FOR CONSTRUCTION

FOUNDATION PLAN

WOLVERINE POWER COOPERATIVE
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI

SHEET INFO

DESIGN: SJS
DRAWN: SJS
APPROVED: SJS
ORIG CREATED: 2/11/19

APEX NO.
19-008-17

SHEET NO.
S1.0

STRUCTURAL GENERAL NOTES

1. SCALING OF THE DRAWINGS SHALL NOT BE ALLOWED. USE ONLY DIMENSIONS INDICATED ON THESE DRAWINGS OR ARCHITECTURAL DRAWINGS. IF DISCREPANCIES EXIST, CONTACT ARCHITECT OR ENGINEER.

2. CONSTRUCTION SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODE REQUIREMENTS.

3. BUILDING CODE – 2015 MICHIGAN BUILDING CODE

DESIGN LOADS:

DESIGN ROOF DEAD LOAD

ROOFING/SHEATHING/FRAMING @ TOP CHORD	10 PSF
CEILING/INSULATION/FRAMING/MECHANICAL ELECTRICAL @ BOTTOM CHORD	10 PSF
TOTAL	20 PSF

DESIGN LIVE LOADS

GROUND SNOW	60 PSF, I=1.0, Ct=1.1
ROOF SNOW – SLOPED ROOF (BALANCED)	46 PSF (NOT INCL DRIFT)
FLOORS	100 PSF
WIND	
BASIC WIND SPEED	115 MPH
DIRECTIONALITY FACTOR	0.85
IMPORTANCE FACTOR	1.0
INTERNAL PRESSURE COEFFICIENT	+/–0.18
WIND EXPOSURE	"C"
SEISMIC DESIGN CATEGORY	"A"

SPECIAL INSPECTIONS

1. ALL SPECIAL INSPECTIONS NOTED BELOW SHALL BE OWNER PROVIDED AND BE PERFORMED PER LISTED BUILDING CODE. REFER TO ARCHITECTURAL DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL SPECIAL INSPECTIONS REQUIRED.

2. STRUCTURAL STEEL ERECTION

SUBMITTALS

1. ALL SHOP DRAWINGS AND SUBMITTALS SHALL BE REVIEWED AND APPROVED PRIOR TO ORDERING MATERIAL. ENGINEER REVIEW IS LIMITED TO GENERAL CONFORMANCE WITH DESIGN DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONAL INFORMATION, QUANTITIES, DEVIATION FROM THE DESIGN DRAWINGS AND CONSTRUCTION MEANS AND METHODS.

2. SHOP DRAWINGS AND SUBMITTALS SHALL BE ORIGINAL DOCUMENTS AND NOT REPRODUCTIONS OF ARCHITECTURAL OR ENGINEERING DOCUMENTS.

3. SEE ARCHITECTURAL DRAWINGS & SPECIFICATIONS FOR SHOP DRAWINGS AND SUBMITTALS REQUIRED.

FOUNDATION/BACKFILL

1. FOUNDATION HAS BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL INVESTIGATION REPORT – WOLVERINE POWER SERVICE CENTER – ELMIRA, MICHIGAN, DATED JANUARY 2019 PREPARED BY OTWELL MAWBY GEOTECHNICAL, PC.

2. COLUMN FOOTINGS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING CAPACITY OF 2500 PSF. ALL WALL FOOTINGS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING CAPACITY OF 2500 PSF. FOOTINGS SHALL BEAR ON NATURAL, UNDISTURBED SOIL OR COMPACTED FILL PROPERLY PLACE UPON THESE NATURAL SOILS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THE ALLOWABLE SOIL PRESSURE IS ATTAINED. IF THE ALLOWABLE SOIL PRESSURE CANNOT BE ATTAINED FOR ANY REASON, FOOTINGS SHALL BE ENLARGED OR LOWERED AT THE DIRECTION OF THE ARCHITECT/ENGINEER.

3. WHERE ENGINEERED BACKFILL IS REQUIRED, IT SHALL BE A CLEAN, UNIFORMLY GRADED, GRANULAR MATERIAL, FREE OF FROZEN CHUNKS, ORGANICS, DEBRIS, OR OTHER DELETERIOUS MATERIAL. ALL BACKFILL SHALL BE PLACED IN 8"–12" LOOSE LIFTS AND COMPACTED TO A DRY DENSITY OF 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY ASTM D–1557 (MODIFIED PROCTOR). THIS MAY BE DECREASED TO 90% IN THOSE AREAS TO BE LANDSCAPED AND NOT SUPPORTING STRUCTURE OR PAVEMENT.

4. CONTRACTOR SHALL BE AWARE OF AND VERIFY THE LOCATION OF ANY AND ALL UNDERGROUND UTILITIES, TANKS, EXISTING FOOTINGS, ETC. DUE CARE SHALL BE EXERCISED DURING EXCAVATION SUCH THAT EXISTING ITEMS ARE NOT DAMAGED.

5. WHERE FOUNDATION AND RETAINING WALLS REQUIRE FILL PLACED ON EACH SIDE, THE FILL SHALL BE PLACED AND COMPACTED SIMULTANEOUSLY SO AS TO MAINTAIN A COMMON ELEVATION ON EACH SIDE OF THE WALL.

6. WALLS THAT RETAIN EARTH SHALL BE TEMPORARILY BRACED AGAINST BACKFILLING PRESSURES UNTIL PERMANENT FLOOR TIE–INS ARE CONSTRUCTED AND WALLS HAVE REACHED THEIR DESIGN CAPACITIES.

7. FOUNDATION CONTRACTOR SHALL VERIFY LOCATION OF ALL MECHANICAL LINES PRIOR TO CASTING FOUNDATIONS AND PROVIDE SLEEVES, LOWER FOUNDATIONS OR CAST PROTECTION AROUND LINES AS REQUIRED.

8. BOTTOM OF EXTERIOR FOOTINGS SHALL BEAR A MINIMUM OF 42 INCHES BELOW FINAL GRADE, UNLESS NOTED OTHERWISE.

PRE–ENGINEERED METAL BUILDING (PEMB)

1. PRE–ENGINEERED METAL BUILDING SHALL BE DESIGNED BY THE MANUFACTURER BASED ON THE ARCHITECTURAL AND STRUCTURAL DRAWINGS OUTLINED. IF DISCREPANCIES EXIST BETWEEN ACTUAL DESIGN OF THE (PEMB) AND THE ARCHITECTURAL AND STRUCTURAL DRAWINGS, THEY MUST BE POINTED OUT IN THE ENGINEERED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER. THE FINAL PEMB DRAWINGS MUST BE SEALED BY AN ENGINEER LICENSED IN THE STATE OF MICHIGAN.

2. PEMB SHOP DRAWINGS MUST CONTAIN FOUNDATION REACTIONS ALONG WITH ANCHOR BOLTING REQUIREMENTS. THE ENGINEER WILL COMPARE THE REACTIONS AND ANCHOR BOLT REQUIREMENTS WITH PRELIMINARY DESIGN AND MAKE ADJUSTMENTS ACCORDINGLY. PLEASE EXPEDITE THIS INFORMATION SO THIS COMPARISON CAN BE MADE.

3. PEMB SHALL BE COGNIZANT OF DEFLECTION REQUIREMENTS NOTED ON ARCHITECTURAL DRAWINGS AND SPECIFICATIONS AND HOW THEY MAY IMPACT INTERIOR, NON–LOAD BEARING WALLS. IF DEFLECTIONS WILL NEGATIVELY IMPACT INTERIOR ELEMENTS, THEY MUST BE POINTED OUT BY THE PEMB MANUFACTURER.

4. THE DESIGN LOADS NOTED ARE FOR REFERENCE ONLY. THE PEMB MUST BE DESIGNED TO MEET THE CURRENT BUILDING CODE REQUIREMENTS THAT EXIST FOR THIS JURISDICTION.

CONCRETE

1. THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING, FABRICATION AND CONSTRUCTION OF ALL REINFORCED CONCRETE:

   A. BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)
   B. SPECIFICATION FOR STRUCTURAL CONCRETE (ACI 301)
   C. FIELD REFERENCE MANUAL (SP–15)

2. ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE A 28 DAY COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:

COLUMNS, BEAMS & PIERS	4000 psi
WALLS, SLABS & TOPPING SLABS	4000 psi
FOOTINGS	3500 psi

   *ALL EXTERIOR EXPOSED CONCRETE SHALL BE AIR–ENTRAINED 4–8% BY VOLUME

3. ALL DEFORMED BARS SHALL BE ASTM A615 GRADE 60.

4. ALL WELDED WIRE FABRIC SHALL MEET ASTM A185, FLAT SHEETS ONLY WITH A MINIMUM END AND SIDE LAP OF 6". PULLING UP OF WWF WILL NOT BE ALLOWED. SUPPORT ON CHAIRS OR CONCRETE BLOCKS.

5. ALL ANCHOR BOLTS SHALL BE ASTM A307 OR ASTM A36, UNO.

6. SPLICES IN DEFORMED BARS SHALL BE CLASS B WITH APPLICABLE INCREASES FOR BAR SPACING, COVER, TOP BAR EFFECT ETC., PER ACI 318.

7. PROVIDE BENT CORNER BARS IN ALL WALLS AND FOOTINGS OF THE SAME SIZE AND NUMBER AS THE CONTINUOUS REINFORCEMENT. SEE TYPICAL DETAILS FOR ADDITIONAL REQUIREMENTS FOR WALLS.

8. CONTROL AND CONSTRUCTION JOINT LOCATIONS ARE SHOWN ON PLANS. CONTRACTOR MAY DEVIATE FROM SUGGESTED JOINT LOCATIONS ONLY WITH PRIOR APPROVAL FROM THE ENGINEER.

9. CONTROL JOINTS IN SLAB SHALL BE CUT 4 TO 12 HOURS AFTER SLAB HARDENS.

10. ALL JOINTS IN CONCRETE SLAB ARE TO BE FILLED WITH A SEMI–RIGID EPOXY JOINT FILLER SUCH AS MM–80 BY METZGER AND McGUIRE.

11. ALL EXPOSED CONCRETE EDGES ABOVE GRADE SHALL HAVE 3/4" x 3/4" CHAMFERED EDGES UNLESS NOTED OTHERWISE. ALL EXPOSED WALLS SHALL BE GIVEN A FINISH, PER ARCHITECTURAL.

12. BEFORE PLACING CONCRETE SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS OF PIPE SLEEVES, EMBEDDED ITEMS, OPENINGS, EQUIPMENT PADS, ELECTRICAL CONDUITS, RECESSES, DRAINS, ETC. ALL OPENINGS FOR PIPE, CONDUITS, RECESSES, DRAINS, ETC. SHALL BE SLEEVED. MINIMUM SLEEVE SPACING SHALL BE 3 SLEEVE DIAMETERS. CORE DRILLING SHALL NOT BE PERFORMED WITHOUT CONSENT FROM THE ENGINEER.

13. ALL WALLS SHALL BE PROPERLY BRACED UNTIL BACKFILLING IS COMPLETE AND CONCRETE HAS REACHED ITS DESIGN STRENGTH UNLESS NOTED OTHERWISE. SEE PLANS FOR MORE DETAILS.

14. BASE PLATES, ANCHOR BOLTS, SUPPORT ANGLES, ETC. BELOW GRADE SHALL BE COVERED WITH A MINIMUM 3" CONCRETE.

15. PROVIDE DOWELS FROM FOOTINGS INTO WALLS OR PIERS AS INDICATED ON DETAILS. AT THE CONTRACTORS OPTION, LAP VERTICAL WALL/PIER REINFORCING PER MINIMUM REQUIREMENTS OR EXTEND DOWELS FULL HEIGHT OF WALL/PIER.

16. WATER MAY NOT BE ADDED TO CONCRETE MIX ON SITE UNLESS WATER IS WITHHELD AT BATCH PLANT. IF WATER IS WITHELD AT THE BATCH PLANT, IT SHALL BE REFLECTED ON THE LOAD TICKET. THE TOTAL AMOUNT OF WATER IN THE MIX SHALL NOT EXCEED THE APPROVED MIX DESIGN.

17. USE NON–SHRINK, NON–METALLIC GROUT UNDER ALL BASE PLATES, BEARING PLATES AND SETTING PLATES.

LIGHT GAUGE METAL FRAMING

1. ALL STRUCTURAL MEMBERS SHALL BE DESIGNED BY CONTRACTOR IN ACCORDANCE WITH THE NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD–FORMED STEEL STRUCTURAL MEMBERS – LATEST EDITION.

2. LIGHT GAUGE MEMBER AND CONNECTION DESIGN IS PART OF THIS PACKAGE AND FORMAL SHOP DRAWINGS AND CALCULATIONS WILL NOT NEED TO BE SUBMITTED. IF QUESTIONS ARISE REGARDING MEMBERS OR CONNECTIONS, CONTACT THE ARCHITECT OR ENGINEER FOR CLARIFICATION PRIOR TO SUBMITTING A BID.

3. REFERENCE ARCHITECTURAL DRAWINGS–SPECIFICATIONS FOR REQUIRED COATINGS ON FRAMING MEMBERS.

4. ALL STUDS AND/OR JOIST AND ACCESSORIES SHALL BE OF THE TYPE, SIZE, GAUGE AND SPACING AS SHOWN ON THE DRAWINGS. STUDS, HEADERS AND JOIST SHALL BE UN–PUNCHED UNLESS OTHERWISE NOTED–APPROVED.

5. ALL FRAMING COMPONENTS SHALL BE CUT SQUARELY FOR ATTACHMENT TO PERPENDICULAR MEMBERS, OR AS REQUIRED FOR AN ANGULAR FIT AGAINST ABUTTING MEMBERS. STUDS SHALL SEAT TIGHTLY INTO TRACKS WITH NO GAPPING.

6. UNLESS SPECIFICALLY DETAILED, FASTENING OF COMPONENTS SHALL BE BY WELDING OR SCREWING. WIRE TYING OF COMPONENTS SHALL NOT BE PERMITTED. ALL WELDS SHALL BE TOUCHED UP WITH ZINC RICH PAINT.

7. TRACKS SHALL BE SECURELY ANCHORED TO THE SUPPORTING STRUCTURE AS SHOWN ON THE DRAWINGS.

8. STUDS SHALL BE PLUMBED, ALIGNED AND SECURELY ATTACHED TO FLANGES OF BOTH UPPER AND LOWER TRACKS.

9. FRAMING OF WALL OPENINGS SHALL INCLUDE HEADERS AND SUPPORTING STUDS.

10. TEMPORARY BRACING, WHERE REQUIRED, SHALL BE PROVIDED UNTIL ERECTION IS COMPLETED.

11. RESISTANCE TO BENDING AND ROTATION ABOUT THE MINOR AXIS SHALL BE PROVIDED BY THE SHEATHING PER AISI SPECIFICATION SECTION 5.1 OR HORIZONTAL STRAPPING OR COLD–ROLLED CHANNEL BRACING AS REQUIRED OR INDICATED ON THE DRAWINGS. INSTALL BRIDGING PRIOR TO EXTERIOR LOAD APPLICATION.(5'–0" O.C. MAX FOR STRAPPING–BRACING AND WITHIN 12" OF DEFLECTION TRACK)

12. SPLICES IN STUDS SHALL NOT BE PERMITTED UNLESS APPROVED BY ENGINEER.

13. UNLESS INDICATED ON ARCHITECTURAL DRAWINGS, THE MAXIMUM ALLOWABLE DEFLECTION IN EXTERIOR WALLS SHALL BE L/360 AT NON–MASONRY VENEERED WALLS AND L/600 AT MASONRY VENEER WALLS.

14. MINIMUM EDGE DISTANCE FOR CONCRETE SCREWS SHALL BE (6)*Bd (BOLT DIAMETER) IN CONCRETE. MINIMUM CENTER TO CENTER SCREW SPACING SHALL BE (12)*Bd IN CONCRETE. IF THE MINIMUM EDGE OR CENTER–TO–CENTER DISTANCE CANNOT BE OBTAINED, CONTACT ENGINEER.

15. ALL DOUBLE–TRIPLE STUDS OR HEADERS SHALL BE CONNECTED TOGETHER WITH #10 SCREWS OF FILLET WELDS AT 12" O.C. MAX, UNLESS NOTED OTHERWISE. BUILT UP HEADER TOP AND BOTTOM TRACKS SHALL BE THE SAME DEPTH AS WALL THICKNESS AND THE SAME GAUGE AS HEADER MEMBER. THE TRACKS SHALL BE CONNECTED TO THE HEADERS WITH #10 SCREWS OR FILLET WELDS AT 12" O.C. MAX.

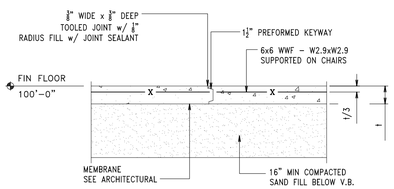
16. MINIMUM SCREW AND GAS/POWER ACTUATED FASTENER (GAF–PAF) SPACING AND EDGE DISTANCE SHALL NOT BE LESS THAN (3) TIMES THE DIAMETER OF THE SCREW. MINIMUM SCREW PENETRATION SHALL BE (3) EXPOSED THREADS. MINIMUM PENETRATION OF GAF–PAF SHALL BE AS REQUIRED BY MANUFACTURER TO PROVIDE THE FULL DESIGN CAPACITY UNLESS NOTED OTHERWISE.

17. ALL SLIDE CLIPS, SUPPORT CLIPS AND CLIP ANGLES SHALL BE 50KSI MINIMUM UNLESS NOTED OTHERWISE.

18. THE CONTRACTOR SHALL SUBMIT FABRICATION AND ERECTION DRAWINGS WITH SUPPORTING CALCULATIONS FOR ALL REQUIRED BRACING, CONNECTIONS AND MEMBER DESIGN REQUIRED FOR PRE–ENGINEERED LIGHT GAUGE TRUSS SYSTEM. TRUSS SYSTEM SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MICHIGAN.

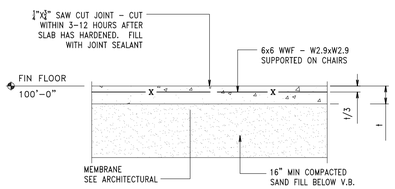
ABBREVIATION LIST

@	AT	EX	EXISTING	PERP	PERPINDICULAR
ABV	ABOVE	EXP	EXPANSION	PC	PRE CAST
AFF	ABOVE FINISHED FLOOR	EXT	EXTERIOR	PL	PLATE
ALT	ALTERNATE	FD	FLOOR DRAIN	PLF	POUNDS PER LINEAL FT
ALUM	ALUMINUM	FIN FLR	FINISHED FLOOR	PSF	POUNDS PER SQUARE FT
ANCH	ANCHOR	FLD	FIELD	PT	PRESSURE TREATED
APPROX	APPROXIMATE	FLR	FLOOR	RAD	RADIUS
ARCH	ARCHITECT(URAL)	FND	FOUNDATION	RD	ROOF DECK
BM	BEAM	FTG	FOOTING	REF	REFERENCE
BOTT	BOTTOM	FV	FIELD VERIFY	REINF	REINFORCE(D)(MENT)
BOS	BOTTOM OF STEEL	GALV	GALVANIZED	REQD	REQUIRED
BLDG	BUILDING	GA	GAUGE	REQMT	REQUIREMENT(S)
BLKG	BLOCKING	GC	GENERAL CONTRACTOR	RO	ROUGH OPENING
BRG	BEARING	HD	HEADED	RTU	ROOF TOP UNIT
BTWN	BETWEEN	H&V	HORIZONTAL & VERTICAL	SHT	SHEET
BSMT	BASEMENT	HSS	HOLLOW STRUCTURAL SECTION	SIM	SIMILAR
CIP	CAST IN PLACE	HORIZ	HORIZONTAL	SOG	SLAB ON GRADE
CLG	CEILING	HP	HIGH POINT	SCHD	SCHEDULE
CLR	CLEAR	HT	HEIGHT	SP	SPACES
COL	COLUMN	HWS	HEADED WELDED STUD	SPEC	SPECIFICATION
CONN	CONNECTION	IF	INSIDE FACE	STD	STANDARD
CONC	CONCRETE	JST	JOIST	SS	STAINLESS STEEL
CONT	CONTINUOUS	JT	JOINT	THKD	THICKENED
CONST	CONSTRUCTION	K	KIP(1000 POUNDS)	THRD	THREADED
COORD	COORDINATE	LB	POUND	TRTD	TREATED
CJ	CONTROL JOINT	LG	LONG	TYP	TYPICAL
℄	CENTERLINE	LLH	LONG LEG HORIZONTAL	TOS	TOP OF STEEL
CMU	CONCRETE MASONRY UNIT	LLV	LONG LEG VERTICAL	T/W	TOP OF WALL
CTR	CENTER	LT GA	LIGHT GAUGE METAL	T/BM	TOP OF BEAM
DB	DIAGONAL BRACE	MIN	MINIMUM	T&B	TOP & BOTTOM
DIAG	DIAGONAL	MO	MASONRY OPENING	T&G	TONGUE & GROOVE
DIA	DIAMETER	MP	MASONRY PIER	UNO	UNLESS NOTED OTHERWISE
DIM	DIMENSION	MAX	MAXIMUM	UNREINF	UNREINFORCED
DIST	DISTRIBUTE(D)	NA	NEUTRAL AXIS	VERT	VERTICAL
DN	DOWN	NTS	NOT TO SCALE	VIF	VERIFY IN FIELD
DO	DITTO(SAME AS ADJACENT)	N	NORTH	VSC	VERTICAL SLIDE CLIP
DS	DOWNSPOUT	NOM	NOMINAL	WD	WOOD
DWG	DRAWING	N–S	NORTH–SOUTH	w/	WITH
EA	EACH	OC	ON CENTER	WF	WIDE FLANGE STEEL BEAM
EMBED	EMBEDMENT(ED)	O–O	OUT–TO–OUT	W8X18	WIDE FLANGE STEEL BEAM
EB	EXPANSION BOLT	OF	OUTSIDE FACE	WP	WORK POINT
ELEV	ELEVATION	OH	OVERHEAD	WWF	WELDED WIRE FABRIC
EJ	EXPANION JOINT	OPNG	OPENING	WHL	WHEEL
EQ	EQUAL	OPP	OPPOSITE	XB	CROSS BRACE
EQUIP	EQUIPMENT	OPP HD	OPPOSITE HAND		
E–W	EAST–WEST	PAR	PARALLEL		



TYP CONSTRUCTION JOINT (CSJ)

NO SCALE



TYP CONTROL JOINT (CJ)

NO SCALE

NOTE:
CONTRACTOR TO DETERMINE THE NEED OF CSJ'S. THEY SHALL REPLACE CJ AS INDICATED ON THE PLAN.

3409 Veterans Drive
Traverse City, MI 49684
231–275–2600 phone
231–946–5974 fax
apexem.net

APEX ENGINEERING & MANAGEMENT, INC.

THIS DRAWING IS THE PROPERTY OF APEX ENGINEERING AND MANAGEMENT, INC. AND HAS BEEN PREPARED FOR THIS SPECIFIC PROJECT. IT SHALL NOT BE REPRODUCED, MODIFIED OR USED IN ANY FASHION WITHOUT THE WRITTEN PERMISSION OF APEX ENGINEERING AND MANAGEMENT, INC.

DRAWING HISTORY

NO	DATE	DESCRIPTION
**	1/11/21	FOR REVIEW
	1/28/21	FOR CONSTRUCTION

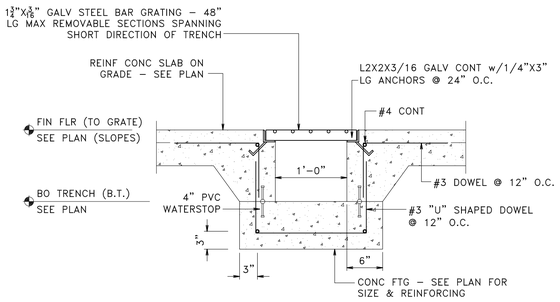
GENERAL NOTES & TYPICAL DETAILS

WOLVERINE POWER COOPERATIVE
SERVICE CENTER BUILDING
HIGHWAY M–32, ELMIRA, MI

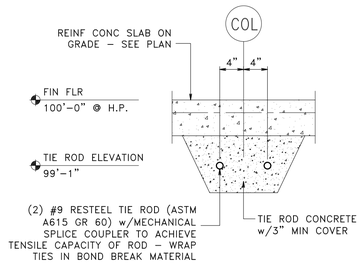
SHEET INFO
DESIGN: SJS
DRAWN: SJS
APPROVED: SJS
ORIG CREATED: 2/11/19

APEX NO.
19–008–17

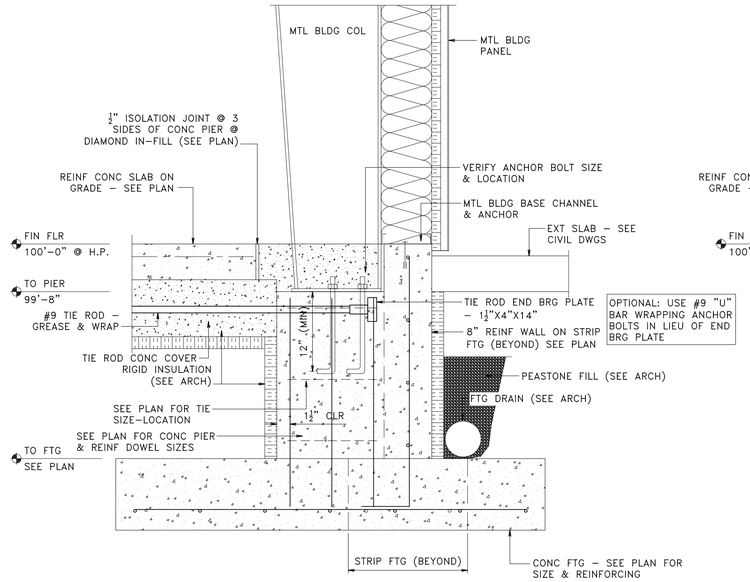
SHEET NO.
S3.0



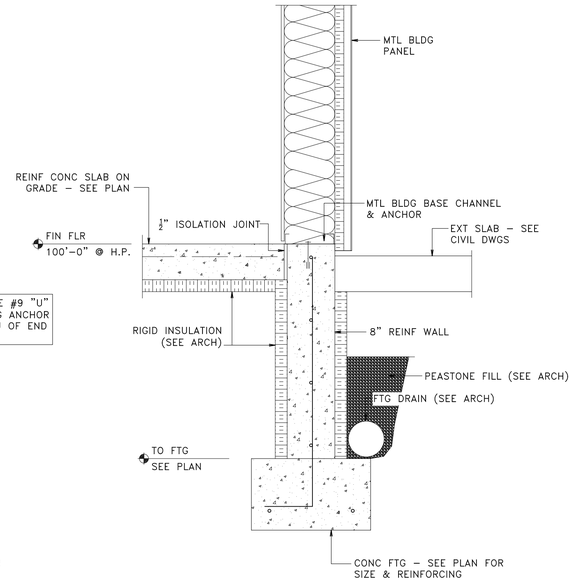
1 S4.0 SECTION
1" = 1'–0"



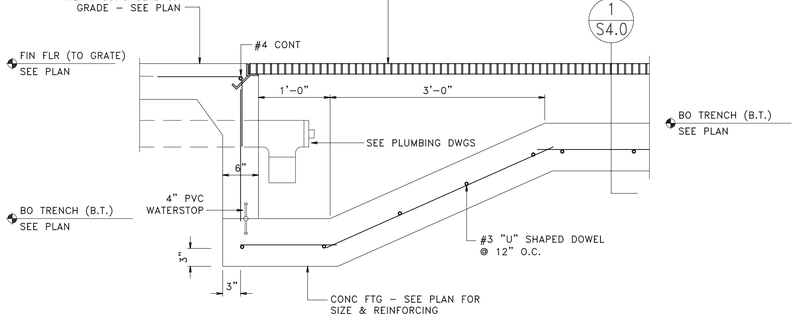
2 S4.0 SECTION
1" = 1'–0"



3 S4.0 SECTION
1" = 1'–0"



4 S4.0 SECTION
1" = 1'–0"



5 S4.0 SECTION
1" = 1'–0"

3409 Veterans Drive
Traverse City, MI 49684
231–275–2600 phone
231–346–5974 fax
apexem.net

APEX ENGINEERING & MANAGEMENT, INC.

THIS DRAWING IS THE PROPERTY OF APEX ENGINEERING AND MANAGEMENT, INC. AND HAS BEEN PRODUCED FOR THIS SPECIFIC PROJECT. IT SHALL NOT BE REPRODUCED, MODIFIED, OR USED IN ANY FASHION WITHOUT THE WRITTEN CONSENT OF APEX ENGINEERING AND MANAGEMENT, INC.

DRAWING HISTORY

NO	DATE	DESCRIPTION
1	1/11/21	FOR REVIEW
2	1/28/21	FOR CONSTRUCTION

DETAILS & SECTIONS

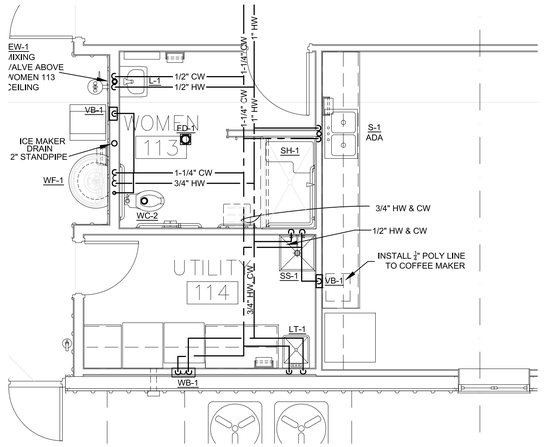
WOLVERINE POWER COOPERATIVE
SERVICE CENTER BUILDING
HIGHWAY M–32, ELMIRA, MI

SHEET INFO
DESIGN: SJS
DRAWN: SJS
APPROVED: SJS
ORIG CREATED: 2/11/19

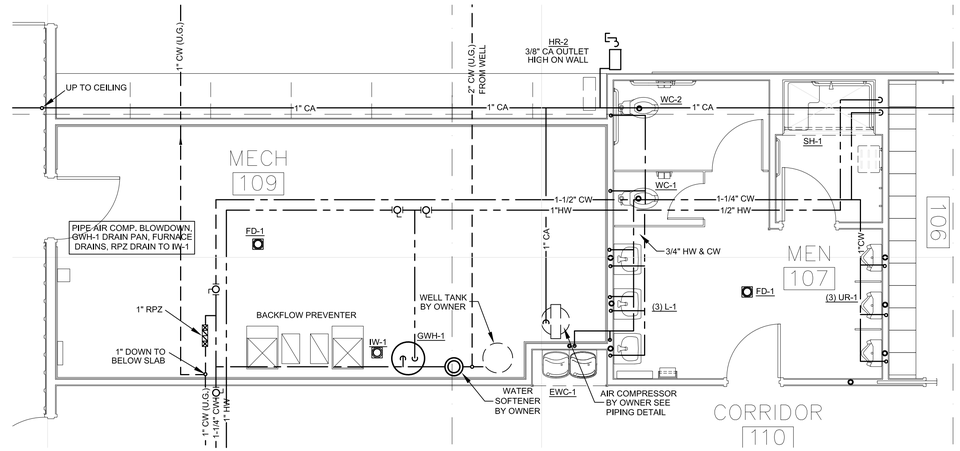
APEX NO.
19–008–17

SHEET NO.
S4.0

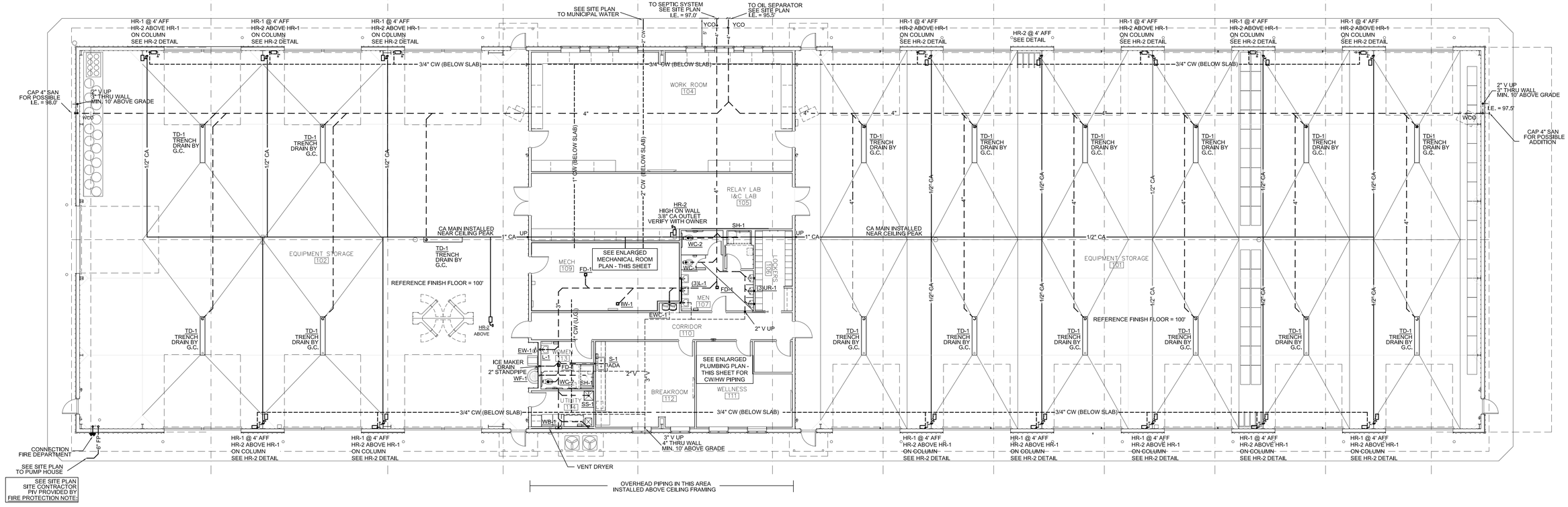
FEET 0 1 2 3
INCHES 0 12 24 36



1 ENLARGED WOMEN 113 / UTILITY 114 PLUMBING FLOOR PLAN
SCALE: 1" = 1/4"-0"



1 ENLARGED MECHANICAL ROOM PLUMBING FLOOR PLAN
SCALE: 1" = 1/4"-0"



1 PLUMBING LIGHTING FLOOR PLAN
SCALE: 1" = 10'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
PLUMBING
FLOOR PLANS

ENGR. PROJ.# 18101

DRAWN BY: WDH
CHECKED BY: GLN

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
P1

PLUMBING FIXTURE SCHEDULE

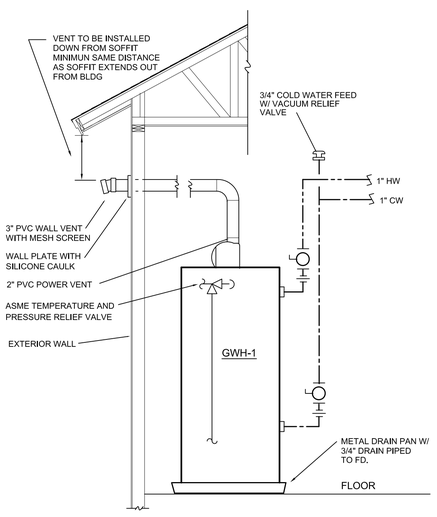
TAG	DESCRIPTION	MFG.	MODEL	ROUGH-IN SIZE				TRIM	REMARKS
				CW	HW	SAN	AIR		
WC-1	FL MTD, ELONGATED WATER CLOSET, FLUSH VALVE	KOHLER	K-4368	1"	——	3"		VALVE, SLOAN REGAL FLUSHOMETER #111-ADA, OPEN FRONT SEAT BEMIS #1055SSC	CHROME STOP 1/4 TURN, SUPPLY
WC-2	FL MTD, ELONGATED WATER CLOSET, FLUSH VALVE - ADA	KOHLER	K-4368	1"	——	3"		VALVE, SLOAN REGAL FLUSHOMETER #111-ADA, OPEN FRONT SEAT BEMIS #1055SSC	CHROME STOP 1/4 TURN, SUPPLY, HANDLE ON OPEN SIDE
L-1	WALL HUNG LAVATORY-ADA CONCEALED ARMS	KOHLER	K-2005	1/2"	1/2"	1-1/2"	——	KOHLER K-15182-F SINGLE LEVER FAUCET WITH FIXED STRAINER (1) (3)	CHROME STOPS 1/4 TURN, SUPPLIES INSUL SUPPLIES & TRAP PER ADA
UR-1	WALL HUNG URINAL-ADA	KOHLER	K-4991-ET	3/4"	——	2"	——	VALVE, SLOAN REGAL 186-1 FLUSH VALVE	WALL BRACKET SUPPORT SET AT ELEV, TO MEET ADA
S-1	2-COMP SINK 5-3/8" DEEP, 20 GA - ADA	ELKAY	GECR3321	1/2"	1/2"	1-1/2"	——	CHICAGO 1100-GN8AE3ABCP 13" HIGH x 8", 2.2 GPM GOOSENECK FAUCET, REMOVABLE STRAINER	CHROME STOPS 1/4 TURN SUPPLIES AND P-TRAP
IW-1	INDIRECT WASTE FLOOR DRAIN ALUMINUM DOME STRAINER	WADE	1630	——	——	2"	——	INDIRECT WASTE FLUSH WITH FLOOR (2)	
FD-1	FLOOR DRAIN WITH TRAP PRIMER	WADE	1002STD6,1	——	——	2"		SATIN STRAINER (2)	
TD-1	TRENCH DRAIN, SEE ARCH. DRWGS HUB DRAIN IN TRENCH	WADE	1100K	——	——	4"	——	SANITARY PIPING TO TD-1 TO BE AS DETAILED ON ARCHITECTURAL SHEET A13	PAINTED CAST IRON
SS-1	MOP SERVICE SINK	FLORESTONE	MSR-2424	3/4"	3/4"	3"	——	CHICAGO 897-MPRCF WALL MOUNT FAUCET, VACUUM BREAKER, HOSE THREADED END	HOSE AND HOSE CARRIER S.S. MOP HANGER
LT-1	1-COMP. LAUNDRY TUB	FLORESTONE	FM-1	1/2"	1/2"	2"	——	CHICAGO 772-CP DECK MOUNTED FAUCET	
EW-1	EMERGENCEY EYE WASH WITH DUST COVER	BRADLEY	S19224PDC	1/2" TEPID		2"	——	THERMOSTATIC MIXING VAVLE S19-2000 EFX8 BRONZE BODY	
EWC-1	ELECTRIC WATER COOLER TWO LEVEL - ADA	ELKAY	EZSTL8C	3/4"	——	1-1/2"	——	120V, 325 W, COLOR LIGHT GRAY	
SH-1	FIBERGLASS SHOWER, FOLD-UP SEAT, 60" X 36" ROLL IN - ADA	AQUATIC	1603-BFSB	1/2"	1/2"	2"	——	FULLY EQUIPPED SEE NOTE (4)	
GWH-1	GAS WATER HEATER 96 % EFFICIENCY	LOCHINVAR	PRN050 65ESST	1"	1"	——	——	3" PVC CONCENTRIC SIDEWALL VENT KIT ASME T & P RELIEF VALVE	50 GAL, 120V 65,000 BTU/HR INPUT
HR-1	HOSE REEL - WALL MOUNTED SPRING RETRACTABLE WATER HOSE REEL	REELCRAFT	83050 OLP & 600-980	3/4"	——	——	——	POLY, SWIVEL DESIGN, SPRING LOADED REWIND 3/4" 50 FOOT HOSE, MOUNTING BRACKET	PROVIDE BALL VALVE FOR ISOLATION AT FLOOR WITH 200 PSI 3/4" RUBBER HOSE BY FRONTIER FROM VALVE TO HOSE REEL
HR-2	HOSE REEL - WALL MOUNTED SPRING RETRACTABLE AIR HOSE REEL	REELCRAFT	5650 OLP & 600-626	——	——	——	3/8"	POLY, SWIVEL DESIGN, SPRING LOADED REWIND 3/8" I.D. 50 FOOT HOSE, MOUNTING BRACKET	
VB-1	ICE MAKER VALVE BOX	GUY GRAY	W9700	1/2"	——	——	——	1/4" TURN BALL VALVES	
WB-1	WASHER SUPPLY BOX 1/4" TURN BALL VALVE	GUY GRAY	MWB26	1/2"	1/2"	2"	——	1/4" TURN BALL VALVES, STELL BOX WHITE FINISH HAMMER ARRESTORS	
WF-1	36" SEMI-CIRCLE WASHFOUNTAIN CONST. OF STAINLESS STEEL	BRADLEY	WF2703	1/2"	1/2"	2"		FOOT CONTROL, THERMOSTATIC MIXING VALVE, LIQUID SOAP DISPENSER	CHROME STOPS 1/4 TURN SUPPLIES AND P-TRAP

(1) – PROVIDE MIXING VALVE TO MEET ADA REQUIREMENTS. EQUAL TO WATTS USG-B, MOUNT UNDER LAV.

(2) – FLOOR DRAIN TRAP SEALER WITH RUBBER DIAPHRAGM ASSE 1072 LISTED, EQUAL TO SURE SEAL.

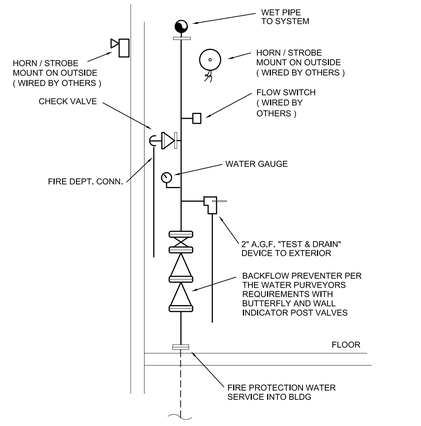
(3) – LAVATORY CARRIER CONCEALED ARMS, EQUAL TO WADE 520.

(4) – FULLY EQUIPPED WITH S.S. GRAB BAR, PRESSURE BALANCED MIXING VALVE, SLIDE BAR, PHENOLIC WHITE SEAT, SOAP DISH, SHOWER CURTAIN, BRASS DRAIN.



GAS WATER HEATER DETAIL

Scale: None

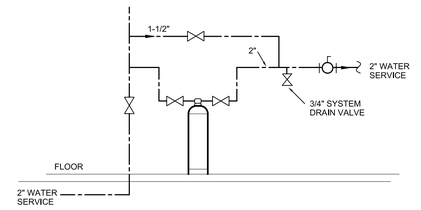


FIRE PROTECTION NOTES

THE FIRE PROTECTION SYSTEM IS A COMPLETE DESIGN / BUILD PROJECT ALL SYSTEMS, EQUIPMENT, PIPING, ETC. ARE TO BE PROVIDED UNDER THE CONTRACT FOR A COMPLETE FUNCTIONAL SYSTEM THAT PASSES ALL CODES AND LOCAL INSPECTIONS.

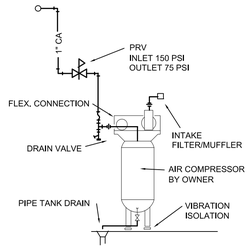
WET SPRINKLER RISER

Scale: None



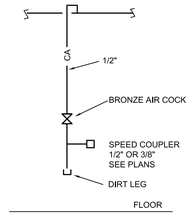
DOMESTIC WATER SERVICE DETAIL

Scale: None



AIR COMPRESSOR PIPING DIAGRAM

Scale: None



COMPRESSED AIR OUTLET

Scale: None

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

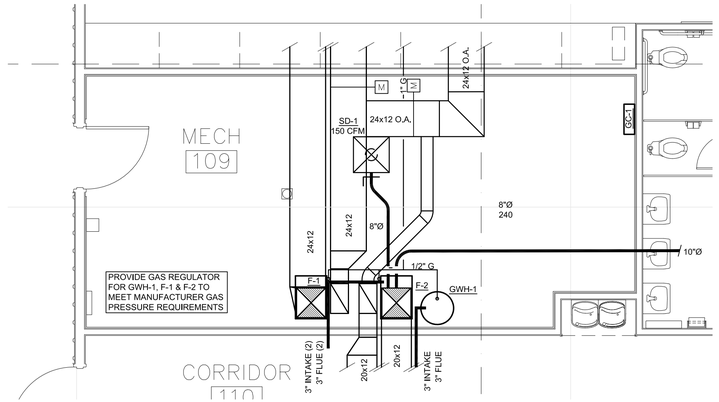
SHEET TITLE:
PLUMBING SCHEDULES & DETAILS

ENGR. PROJ.# 18101

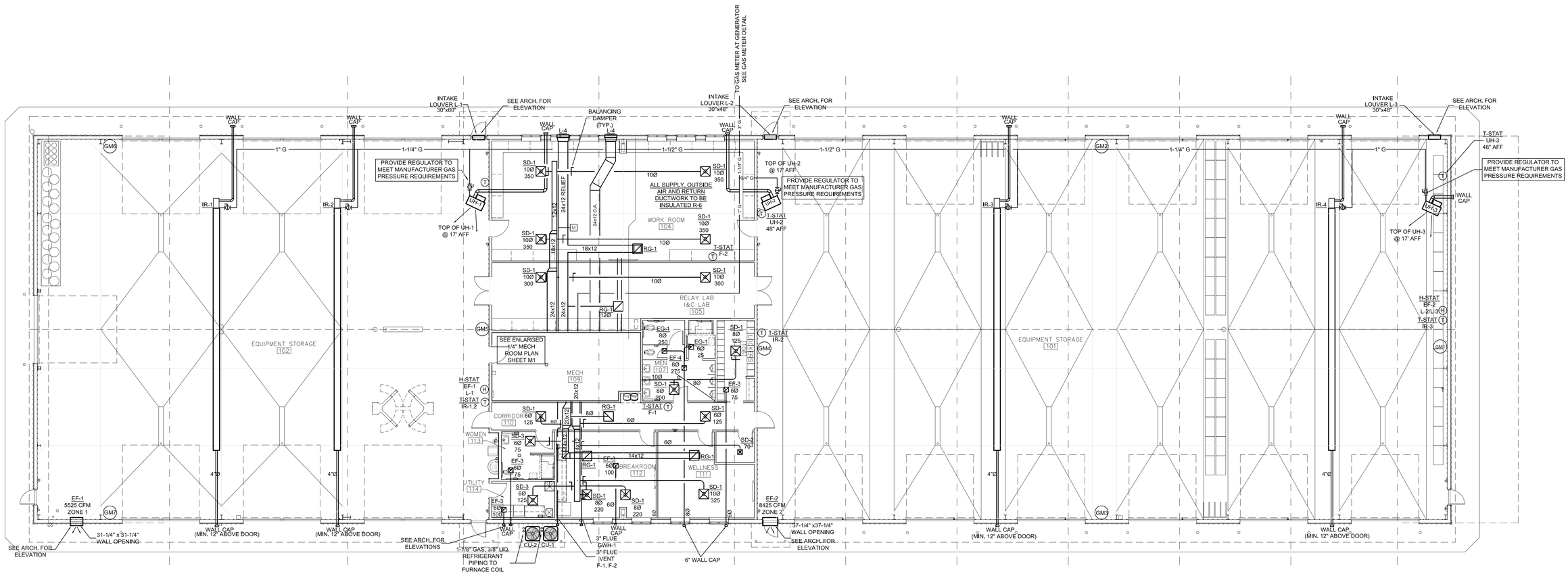
DRAWN BY: WDH
CHECKED BY: GLN

DATE: 01.28.2021 Bidding & Construction

SHEET NUMBER
P2



1 ENLARGED MECHANICAL ROOM MECHANICAL FLOOR PLAN
SCALE: 1" = 1/4"-0"



1 MECHANICAL FLOOR PLAN
SCALE: 1" = 10'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
MECHANICAL FLOOR PLANS

ENGR. PROJ.# 18101

DRAWN BY: WDH
CHECKED BY: GLN

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
M1

GAS FURNACE SCHEDULE

TAG	DUTY/ LOCATION	MANUFACTURER AND MODEL #	FURNACE CONFIG.	TOTAL AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	TOTAL E.S.P (IN. H2O)	HIGH FIRE CAPACITY				LOW FIRE CAPACITY				AFUE %	VENTING		ELECTRICAL		FUEL TYPE	ACCESSORIES/REMARKS
							INPUT (MBH)	OUTPUT (MBH)	EAT (°F)	LAT (°F)	INPUT (MBH)	OUTPUT (MBH)	EAT (°F)	LAT (°F)		SIZE	TYPE	VOLT/PHASE	M.C.A.		
F-1	WORK ROOM & LABS/ MECH ROOM	GOODMAN GMVC961005CX	HORIZONTAL UPFLOW	2000	300	0.30"	100	96	59	103	70	67.2	59	90	96	3"	PVC	115/1Ø	14.4	NG	
F-2	BREAK ROOMS/ MECH ROOM	GOODMAN GMVC960804CX	HORIZONTAL UPFLOW	1600	240	0.30"	80	76.8	59	103	56	53.76	59	90	96	3"	PVC	115/1Ø	10.6	NG	

CONDENSING UNIT SCHEDULE

TAG	LOCATION	MATCHING FURNACE	MANUFACTURER AND MODEL #	REFRIGERANT TYPE	COOLING CAPACITY (MBH)	EDB °F	EWB °F	REFRIGERANT LINE SIZES		ELECTRICAL				SEER	ACCESSORIES/REMARKS
								SUCTION LINES	LIQUID LINES	VOLT/PHASE	M.C.A.	MAX. FUSE	COMPRESSOR L.R.A.		
CU-1	OUTDOORS	F-1	GOODMAN GSX14060	R-410A (PURON)	60.0	80	67	1 1/8"	3/8"	208-230/1Ø	32.6	50	134	14	
CU-2	OUTDOORS	F-2	GOODMAN GSX14048	R-410A (PURON)	45.0	80	67	1 1/8"	3/8"	208-230/1Ø	26.4	45	109	14	

GAS-FIRED UNIT HEATER SCHEDULE

TAG	LOCATION	MANUFACTURER AND MODEL	FAN DATA			CAPACITY			BURNER DATA				WEIGHT LBS.	ELECTRICAL DATA			CONTROLS	STANDARD FEATURES	OPTIONS / ACCESSORIES	NOTES:
			AIRFLOW (CFM)	TYPE	HP	INPUT (MBH)	OUTPUT (MBH)	EFF.	FUEL	FUEL CONN.	MANIFOLD / GAS TRAIN	VENT Ø"		VOLTAGE	F.L.A	M.F.S				
UH-1	EQUIP. STORAGE 100	MODINE MODEL PTP-400	5995	PROP.	3/4	400	328	80	N.G.	3/4"	SINGLE STAGE	6"	320 LBS	120/60/1Ø	10.45	15	7- DAY THERMOSTAT	1. DIRECT SPARK-IGNITED 2. HIGH LIMIT SWITCHES 3. FAN INLET GUARD 4. WIRING PACKAGE	1. VERTICAL DEFLECTOR BLADES 2. 30° DOWNWARD SUPPLY AIR HOOD 3. FINGERPROOF FAN GUARD 4. HORIZONTAL VENT KIT	CONTRACTOR TO PROVIDE ALL NECESSARY MOUNTING HARDWARE, STRUT, HANGERS, ETC.
UH-2 UH-3	EQUIP. STORAGE 101	MODINE MODEL PTP-350	4483	PROP.	1/2	350	290.5	83	N.G.	3/4"	SINGLE STAGE	6"	310 LBS	120/60/1Ø	8.65	15				

INFRARED TUBE HEATER SCHEDULE

TAG	LOCATION	MANUFACTURER AND MODEL	MBH INPUT	LENGTH (FT)	FLUE DIA. (IN)	WEIGHT (LBS)	ELECTRICAL DATA			CONTROL DATA	ACCESSORIES - REMARKS
							VOLTAGE	M.C.A	M.F.S.		
IR-1	EQUIP. STORAGE 100	REZNOR VPT-200	200/150	50'	4"	475	120/60/1Ø	2.3	15	THERMOSTAT	WALL CAP AND ROOF CAP MOUNT REFLECTOR AT 0°
IR-2	EQUIP. STORAGE 100	REZNOR VPT-200	200/150	50'	4"	475	120/60/1Ø	2.3	15	THERMOSTAT	WALL CAP AND ROOF CAP MOUNT REFLECTOR AT 0°
IR-3	EQUIP. STORAGE 101	REZNOR VPT-200	200/150	50'	4"	475	120/60/1Ø	2.3	15	THERMOSTAT	WALL CAP AND ROOF CAP MOUNT REFLECTOR AT 0°
IR-4	EQUIP. STORAGE 101	REZNOR VPT-200	200/150	50'	4"	475	120/60/1Ø	2.3	15	THERMOSTAT	WALL CAP AND ROOF CAP MOUNT REFLECTOR AT 0°

EXHAUST FAN SCHEDULE

TAG	LOCATION AND SERVICE	MANUFACTURER AND MODEL	AIRFLOW (CFM)	E.S.P. (IN W.G.)	NOISE DATA (SONES)	ELECTRICAL DATA				CONTROL DATA	REMARKS
						VOLTAGE	HP	RPM	F.L.A.		
EF-1	102 EMERGENCY EXHAUST	LOREN COOK MODEL 24XP32D10	5,525	0.20"	15.8	120/60/1Ø	3/4	1075		GAS MONITORING SYSTEM + HUMIDITY+ MANUAL OVERIDE	FURNISH WITH INTEGRAL HOUSING, SHUTTER, INLET GUARD AND 90° WEATHERHOOD WITH MATCHING PAINT TO EXTERIOR
EF-2	101 EMERGENCY EXHAUST	LOREN COOK MODEL 30XLPH	8,425	0.20"	25.0	208/60/3Ø	1.5	805		GAS MONITORING SYSTEM + HUMIDITY+ MANUAL OVERIDE	FURNISH WITH INTEGRAL HOUSING, SHUTTER, INLET GUARD AND 90° WEATHERHOOD WITH MATCHING PAINT TO EXTERIOR
EF-3	GENERAL EXHAUST	BROAN L100MG	100	0.25"	0.9	120/60/1Ø	87 W		1.1	LIGHT SWITCH	CEILING FAN PROVIDE BACKDRAFT DAMPER.
EF-4	GENERAL EXHAUST	BROAN L200L	275	0.25"	3.7	120/60/1Ø	212 W		2.6	LIGHT SWITCH	CEILING FAN PROVIDE BACKDRAFT DAMPER.

LOUVER REGISTER SCHEDULE

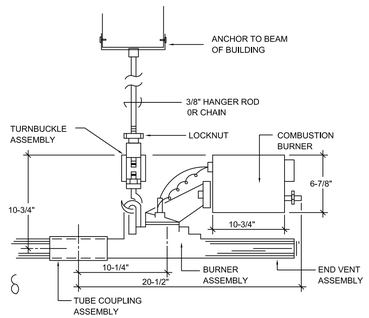
TAG	DESCRIPTION				MANUFACTURER AND MODEL	MATERIAL	COLOR & FINISH	AIRFLOW (CFM)	VELOCITY (FPM)	APD (IN WG)	NOTES
	TYPE/SERVICE	FLANGE	THICKNESS (IN)	SIZE (IN)							
L-1	STATIONARY EXTRUDED LOUVER WITH DRAINABLE BLADES AND 1/4" BIRD SCREEN	YES	4"	30X60 (NOMINAL)	RUSKIN ELF445D	ALUMINUM	VERIFY W/ ARCHITECT	5,525	847	0.06"	FURNISH WITH ELECTRIC MOTORIZED DAMPER, INTERLOCKED WITH EF-1,
L-2	STATIONARY EXTRUDED LOUVER WITH DRAINABLE BLADES AND 1/4" BIRD SCREEN	YES	4"	30X48 (NOMINAL)	RUSKIN ELF445D	ALUMINUM	VERIFY W/ ARCHITECT	4212	829	0.06"	FURNISH WITH ELECTRIC MOTORIZED DAMPER, INTERLOCKED WITH EF-2
L-3	STATIONARY EXTRUDED LOUVER WITH DRAINABLE BLADES AND 1/4" BIRD SCREEN	YES	4"	30X48 (NOMINAL)	RUSKIN ELF445D	ALUMINUM	VERIFY W/ ARCHITECT	4212	829	0.06"	FURNISH WITH ELECTRIC MOTORIZED DAMPER, INTERLOCKED WITH EF-2
L-4	FURNANCE VENTILATION INTAKE STATIONARY EXTRUDED LOUVER WITH DRAINABLE BLADES AND 1/4" BIRD SCREEN	YES	4"	30X30 (NOMINAL)	RUSKIN ELF445D	ALUMINUM	VERIFY W/ ARCHITECT	2240	830	0.125"	FURNISH WITH GRAVITY BACKDRAFT DAMPER

GAS MONITORING SYSTEM

TAG	DESCRIPTION	MANUFACTURER AND MODEL #	ACTIVATION	MOUNTING HEIGHT	ELECTRICAL		NOTES:
					VOLTAGE	M.F.S.	
GC-1	GAS DETECTION SYSTEM CONTROLLER	ARMSTRONG GAS DETECTION MONITOR MODEL AMC-1AD MULTI-DROP GAS MONITOR	RELAYS (2) CONTROL DAMPERS AND (2) EXHAUST FANS AND PROVIDES VISUAL ALARM	48" AFF	120/60/1Ø	15	GAS MONITORING SYSTEM COMPRISED OF (1) GAS MONITOR CONTROLLER AND (6) WIRELESS GAS MONITORS. CONTRACTOR SHALL INCLUDE ALL NECESSARY EQUIPMENT, WIRING, ETC., FOR COMPLETE INSTALLATION AND OPERATION.
GM-1,2,3,4 ZONE 1 GM-5,6,7 ZONE 2	CARBON MONOXIDE AND NITROGEN DIOXIDE GAS SENSOR	AMSTRONG MULTI-DROP GAS SENSOR MODULE MODEL AMC-1222 CARBON MONOXIDE AND NITROGEN DIOXIDE	BOTH NO2 AND CO DETECTION CO SENSOR RELAYS: GC-1 WHEN CO EXCEEDS 25.0 PPM NO2 SENSOR RELAYS GC-1 WHEN NO2 LEVELS EXCEED 3.0 PPM	60" AFF	120/60/1Ø		

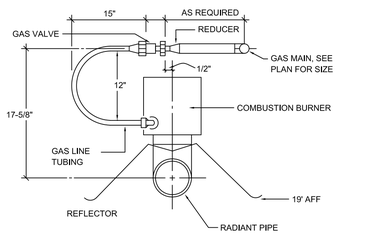
DIFFUSER AND GRILLE SCHEDULE

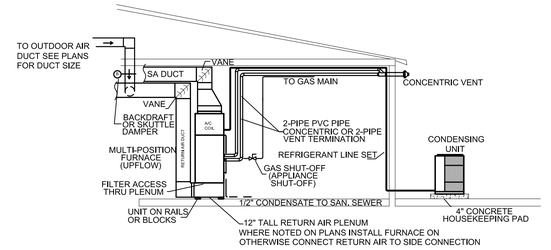
TAG	DESCRIPTION	MANUFACTURER AND MODEL	SIZE (INCHES)	VOLUME DAMPER (TYPE, LOCATION)	MATERIAL	COLOR AND FINISH
SD-1	SUPPLY AIR DIFFUSER 4-WAY THROW, PLAQUE STYLE LAY-IN FRAME	TITUS OMNI	24x24 NECK SIZE ON PLANS	EXTERNAL	STEEL	#26 WHITE
SD-2	SUPPLY AIR DIFFUSER 4-WAY THROW, PLAQUE STYLE LAY-IN FRAME	TITUS OMNI	12x12 NECK SIZE ON PLANS	EXTERNAL	STEEL	#26 WHITE
RG-1	RETURN AIR GRILLE EGGCRATE STYLE STANDARD CORE (1/2"x1/2"x1/2") LAY-IN FRAME	TITUS 50F	24x24	EXTERNAL	ALUMINUM	#26 WHITE #04 MILL (SS)
TG-1	RETURN AIR GRILLE 35° FIXED BLADES, 1/2" SPACING SURFACE MOUNT FRAME	TITUS 355RL	14x8	NONE	STEEL	#26 WHITE



INFRA-RED HEATER INSTALLATION DETAIL

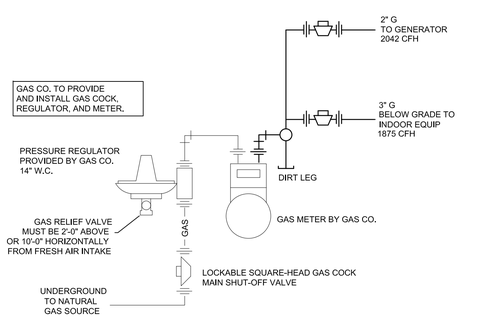
NO SCALE





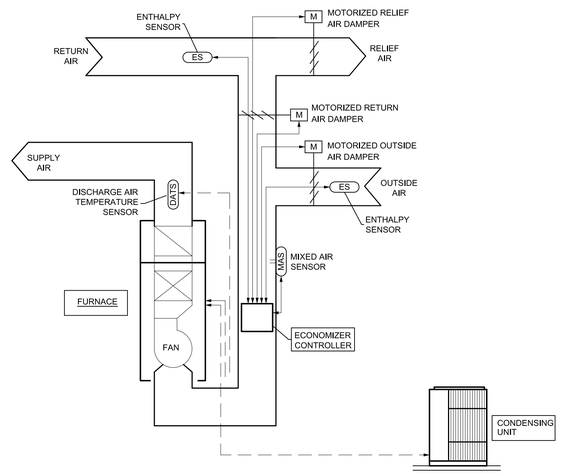
TYPICAL 90%+ EFFICIENT FURNACE DETAIL MULTI-POSITION, VERTICAL UPFLOW

NO SCALE



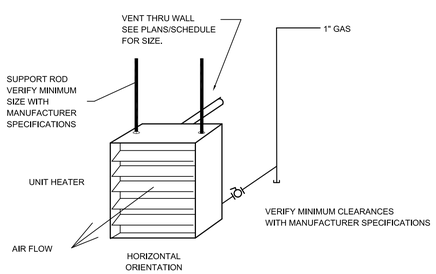
NATURAL GAS METER DETAIL

NO SCALE



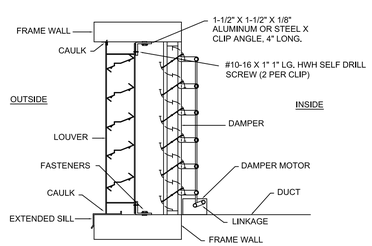
FURNACE F-1 WITH ECONOMIZER CONTROL SCHEMATIC

NO SCALE



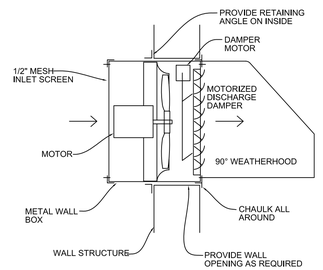
TYPICAL GAS UNIT HEATER DETAIL

NO SCALE



FRESH AIR LOUVER & DAMPER DETAIL

NO SCALE



EXHAUST FAN DETAIL

NO SCALE

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
MECHANICAL SCHEDULES & DETAILS

ENGR. PROJ.# 18101

DRAWN BY: WDH
CHECKED BY: WDH

DATE: 01.28.2021 Bidding & Construction

SHEET NUMBER
M2

TWO (2) 4" UGRD SCH. 40 PVC CONDUITS WITH PULL STRINGS FROM 17"x30" FLUSH GRADE JUNCTION BOX NEAR PROPERTY LINE TO NW CORNER OF MECHANICAL #109 FOR CATV, TELEPHONE, ETC. SERVICES. PROVIDE PULL BOX AT THE PROPERTY LINE, AS REQUIRED. COORDINATE WITH OWNER/IT CONTRACTOR.

ONE (1) 6" UGRD SCH. 80 PVC CONDUIT AND SWEEPS WITH PULL STRING FROM UTILITY POLE TO CT CABINET. COORDINATE WITH GREAT LAKES ENERGY.

CT CABINET AND ELECTRIC METER. SEE RISER DIAGRAM AND DETAIL SHEET SE3.

NOTE:
ALL NON-UTILITY PULL/JUNCTION BOXES SHALL BE PLACED WITHIN THE FENCELINE. COORDINATE FINAL LOCATIONS WITH OWNER/ IT CONTRACTOR.

MTS-EM
SEE RISER DIAGRAM AND DETAIL SHEET SE3.

WELL PUMP
1 HP-208V-1Ø
G2-27,29
3#10, 1#10 E.G.C., 3/4"C

SEWAGE EJ. PUMP
1/2 HP-208V-1Ø
G2-31,33
3#10, 1#10 E.G.C., 3/4"C

HIGH WATER ALARM
COORDINATE FINAL LOCATION & REQUIREMENTS WITH SITE CONTRACTOR. SEE NOTES ON SE2.
2#10, 1#10 E.G.C., 3/4"C

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

ONE (1) 2" UGRD SCH. 40 PVC CONDUIT WITH PULL STRING FROM 17"x30" FLUSH GRADE JUNCTION BOX NEAR CARD READER TO NW CORNER MECHANICAL #109. COORDINATE WITH OWNER/IT CONTRACTOR.

GENERATOR
WITH CONCRETE PAD BY CONCRETE CONTRACTOR.
RECEPTACLE - G1-63
BATTERY CHARGER - G1-63
BLOCK HEATER - G1-65
SEE RISER DIAGRAM
COORDINATE FINAL LOCATION
INCLUDE ALL REQUIRED CONDUITS FOR COMMUNICATIONS TO ATSs, REMOTE E-STOP, REMOTE ANN., ETC.

PROVIDE 17"x30" PULL BOX FOR COMMUNICATIONS CABLING, AS REQUIRED. COORDINATE WITH OWNER/IT CONTRACTOR.

NOTE:
ALL NON-UTILITY PULL/JUNCTION BOXES SHALL BE PLACED WITHIN THE FENCELINE. COORDINATE FINAL LOCATIONS WITH OWNER/ IT CONTRACTOR.

MOTORIZED GATE & LOCAL DISC. SW.
~1 HP-208V-1Ø
G2-10,12
3#6, 1#8 E.G.C., 1"C

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

ONE (1) SECURITY CAMERA WILL BE MOUNTED TO THIS LIGHT POLE. E.C. TO PROVIDE AND INSTALL ONE (1) 1" UGRD CONDUIT WITH 48" SWEEPS AND PULL STRING FROM POLE BASE TO MECH. RM. #109 FOR LOW VOLTAGE CABLING, AND 120V (G1-67) WIRING FOR CAMERA POWER SUPPLY IN LOW VOLTAGE SUPPLIED ENCLOSURE TO BE MOUNTED AT 10'-0" ABOVE TOP OF BASE. COORDINATE WITH LOW VOLTAGE CONTRACTOR, INCLUDING THE INSTALLATION OF THE CAMERAS AND ENCLOSURE TO THE LIGHT POLE.

ONE (1) 2" UGRD SCH. 40 PVC CONDUIT WITH PULL STRING FROM 17"x30" FLUSH GRADE JUNCTION BOX NEAR CARD READER TO NW CORNER MECHANICAL #109. COORDINATE WITH OWNER/IT CONTRACTOR.

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

MOTORIZED GATE & LOCAL DISC. SW.
~1 HP-208V-1Ø
G2-6,8
3#8, 1#8 E.G.C., 1"C

ONE (1) SECURITY CAMERA WILL BE MOUNTED TO THIS LIGHT POLE. E.C. TO PROVIDE AND INSTALL ONE (1) 1" UGRD CONDUIT WITH 48" SWEEPS AND PULL STRING FROM POLE BASE TO MECH. RM. #109 FOR LOW VOLTAGE CABLING, AND 120V (G1-67) WIRING FOR CAMERA POWER SUPPLY IN LOW VOLTAGE SUPPLIED ENCLOSURE TO BE MOUNTED AT 10'-0" ABOVE TOP OF BASE. COORDINATE WITH LOW VOLTAGE CONTRACTOR, INCLUDING THE INSTALLATION OF THE CAMERAS AND ENCLOSURE TO THE LIGHT POLE.

OUTLINE OF MECHANICAL ROOM IN BUILDING.

LOCATION OF SEAL-OFFS FOR FUTURE FUEL ISLAND CONDUITS ENTERING BUILDING.

FIRE SUPPRESSION PIV
VERIFY EXACT LOCATION.

ONE (1) 2" UGRD SCH. 40 PVC CONDUIT WITH PULL STRING FROM 17"x30" FLUSH GRADE JUNCTION BOX NEAR CARD READER TO NW CORNER MECHANICAL #109. COORDINATE WITH OWNER/IT CONTRACTOR.

SEE CIVIL PLANS FOR FULL SITE:
TWO (2) 2" UGRD SCH. 40 PVC CONDUIT WITH PULL STRING FROM METER HOUSE TO NW CORNER MECHANICAL #109. PROVIDE ADDITIONAL PULL BOXES AS REQUIRED. COORDINATE WITH OWNER/IT CONTRACTOR.

PROVIDE 17"x30" PULL BOX FOR COMMUNICATIONS CABLING, AS REQUIRED. COORDINATE WITH OWNER/IT CONTRACTOR.

ONE (1) SECURITY CAMERA WILL BE MOUNTED TO THIS LIGHT POLE. E.C. TO PROVIDE AND INSTALL ONE (1) 1" UGRD CONDUIT WITH 48" SWEEPS AND PULL STRING FROM POLE BASE TO MECH. RM. #109 FOR LOW VOLTAGE CABLING, AND 120V (G1-67) WIRING FOR CAMERA POWER SUPPLY IN LOW VOLTAGE SUPPLIED ENCLOSURE TO BE MOUNTED AT 10'-0" ABOVE TOP OF BASE. COORDINATE WITH LOW VOLTAGE CONTRACTOR, INCLUDING THE INSTALLATION OF THE CAMERAS AND ENCLOSURE TO THE LIGHT POLE.

MOTORIZED GATE & LOCAL DISC. SW.
~1 HP-208V-1Ø
G2-14,16
3#8, 1#8 E.G.C., 1"C

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

2#10, 1#10 E.G.C., 3/4"C TO TIMER SWITCH IN EQUIPMENT STORAGE #101 EM-4

20'-0" FUTURE CLASSIFIED AREA

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

TWO (2) FLUSH GRADE J-BOXES (TIER-22) FOR FUTURE FUEL ISLAND. E.C. TO PROVIDE AND INSTALL ONE (1) J-BOX FOR POWER WITH ONE (1) 2" CONDUIT WITH PULL STRING TO MECHANICAL ROOM #109 PANEL #G2. THE OTHER J-BOX WILL BE FOR LOW VOLTAGE CABLING AND WILL HAVE ONE (1) 2" AND TWO (2) 1" CONDUITS WITH PULL STRINGS AND LARGE SWEEPS TO MECHANICAL ROOM #109. CONDUITS MAY BE SCHEDULE 40 PVC UP TO THE POINT WHERE THEY ENTER THE BUILDING WHERE THEY SHOULD TRANSITION TO GRS AND BE THREADED WITH SEAL-OFFS BEFORE CONTINUING TO THE MECHANICAL ROOM. LABEL BOTH ENDS OF CONDUITS.

NOTE:
ALL NON-UTILITY PULL/JUNCTION BOXES SHALL BE PLACED WITHIN THE FENCELINE. COORDINATE FINAL LOCATIONS WITH OWNER/ IT CONTRACTOR.

2#10, 1#10 E.G.C., 3/4"C THRU LCP-1 RELAY #2 EM-3

G2A-1,3
G2A-2

G2A-1,3
G2A-4

G2A-5,7
G2A-6

PANEL #G2A

G2A-5,7
G2A-8

G2A-9,11
G2A-10

G2A-9,11
G2A-12

MOUNT PANEL #G2A ON A UNI-STRUT RACK. SEE SHEET SE3 FOR DETAIL (SIMILAR TO CT CABINET & METER RACK).

EACH RECEPTACLE & DISCONNECT SWITCH LOCATION SHALL CONSIST OF THE FOLLOWING:
A UNI-STRUT RACK, WITH A WEATHERPROOF DUPLEX RECEPTACLE WITH AN IN-USE METAL COVER, AND A 30A-250V FUSIBLE DISCONNECT SWITCH WITH AN CORD AND A 30A-125/250V TWIST-LOCK WEATHERPROOF RECEPTACLE. SEE DETAIL ON SHEET SE3. (TYPICAL OF 6).

1 ELECTRICAL SITE PLAN – NORTH
SCALE: 1" = 30'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

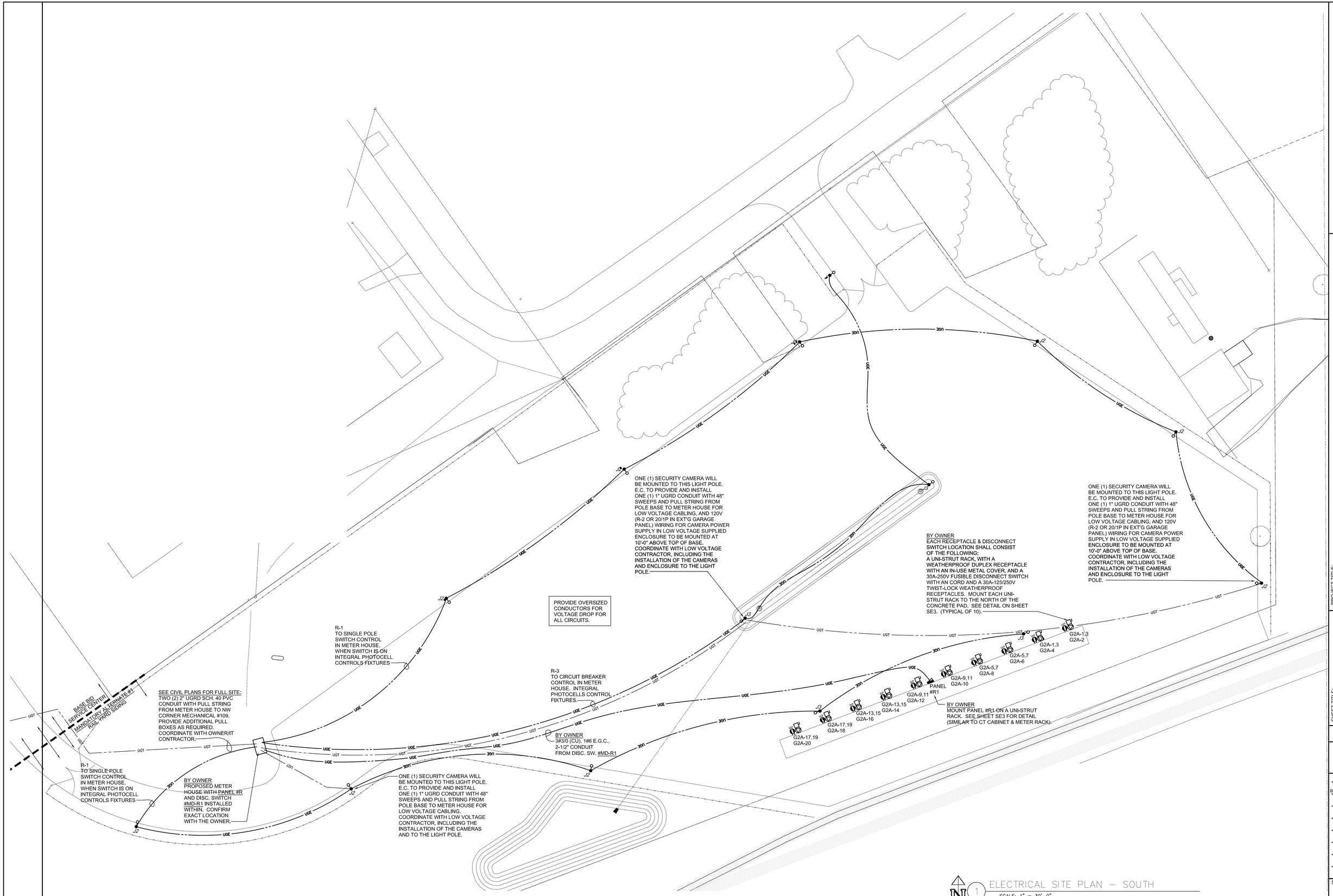
SHEET TITLE:
ELECTRICAL
SITE PLAN - NORTH

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
SE1



1 ELECTRICAL SITE PLAN – SOUTH
SCALE: 1" = 30'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL
SITE PLAN - SOUTH

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
SE2

HIGH WATER ALARM NOTES:

1. PROVIDE AND INSTALL AN ALUMINUM NEMA 4, 12"x12" ENCLOSURE MOUNTED ON A UNI-STRUT SUPPORT STRUCTURE. THE ENCLOSURE WILL HOUSE A NEW DUPLEX GFCI RECEPTACLE AND THE 'NIGHT-EYE' ALARM SYSTEM. THE NEW DUPLEX GFCI RECEPTACLE SHALL USE THE CONDUCTORS AND CONDUIT AS SHOWN, AND BE CONNECTED TO 20A/1P CIRCUIT BREAKER, G1-61. SITE CONTRACTOR. COORDINATE WITH THE SITE CONTRACTOR. IN ADDITION, INCLUDE ANOTHER WEATHERPROOF DUPLEX RECEPTACLE INSTALLED BELOW THE ENCLOSURE FOR GENERAL PURPOSES. USE G1-61. THE 'NIGHT-EYE' ALARM SYSTEM, FLOATS, ETC. SHALL BE INSTALLED BY THE SITE CONTRACTOR. COORDINATE WITH THE SITE CONTRACTOR.

BY OWNER

PANEL #R — 200A MCB, 120/240V-1Ø-3W; SQ.D NQ - SURFACE MTD.

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	20/1	YARD LIGHTING - SWITCHED	1243	A	450	SECURITY CAMERAS	20/1	2
3	20/1	YARD LIGHTING - AUTO	339	B	---	SPARE	20/1	4
5	20/1	LIGHTS - METER HOUSE	---	A	---	SPARE	20/1	6
7	20/1	RECEPTACLES - METER HOUSE	---	B	---	SPARE	20/1	8
9	20/1	SPARE	---	A	---	SPACE	--	10
11	20/1	SPARE	---	B	---	SPACE	--	12
13	--	SPACE	---	A	---	SPACE	--	14
15	--	SPACE	---	B	---	SPACE	--	16
17	--	SPACE	---	A	---	SPACE	--	18
19	--	SPACE	---	B	---	SPACE	--	20
21	--	SPACE	---	A	---	SPACE	--	22
23	--	SPACE	---	B	---	SPACE	--	24
25	--	SPACE	---	A	---	SPACE	--	26
27	--	SPACE	---	B	---	SPACE	--	28
29	--	SPACE	---	A	---	SPACE	--	30

LIGHTS	1977.5	VA		
RECEPTS.	450	VA	TOTAL CALCULATED LOAD:	
MOTORS	0	VA	2.4	kVA
MISC	0	VA	10.1	A

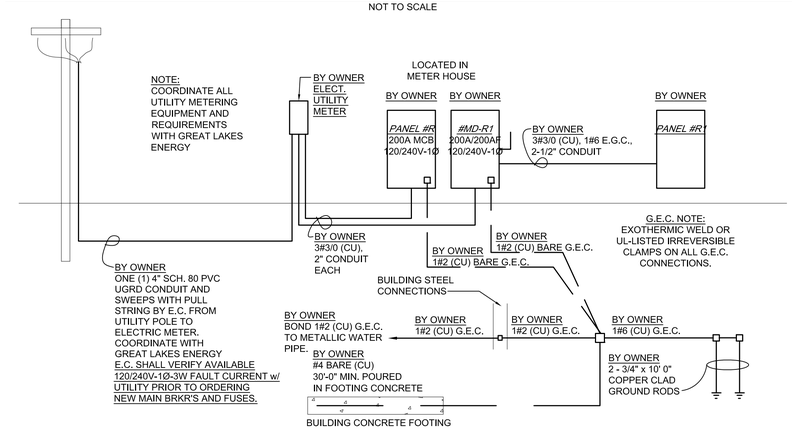
PANEL #R1 — 200A MCB, 120/240V-1Ø-3W; SQ.D NQ - SURFACE MTD.; NEMA 3R

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	30/2*	RECEPTACLES - CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	2
3	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	4
5	30/2*	RECEPTACLES -CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	6
7	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	8
9	30/2*	RECEPTACLES -CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	10
11	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	12
13	30/2*	RECEPTACLES -CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	14
15	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	16
17	30/2*	RECEPTACLES -CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	18
19	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	20
21	--	SPACE	---	A	---	SPACE	--	22
23	--	SPACE	---	B	---	SPACE	--	24
25	--	SPACE	---	A	---	SPACE	--	26
27	--	SPACE	---	B	---	SPACE	--	28
29	--	SPACE	---	A	---	SPACE	--	30

LIGHTS	0	VA		
RECEPTS.	9300	VA	TOTAL CALCULATED LOAD:	
MOTORS	0	VA	9.3	kVA
MISC	0	VA	38.8	A

ELECTRICAL RISER DIAGRAM - RAIL YARD

NOT TO SCALE



NOTES:

1. PROPOSED FLUSH-GRADE JUNCTION BOX IN UNPAVED AREAS SHALL BE STANDARD JUNCTION BOX QUAZITE #PT1730BA18, 17"x30" POLYMER CONCRETE BOX WITH OPEN BOTTOM, UL-LISTED, TIER-8 APPLICATION, AND STANDARD GREY FINISH AND #PT1730CA0012 STANDARD COVER WITH 'COMMUNICATIONS' LABEL, OR #PT1730CA0017 STANDARD COVER WITH 'ELECTRIC' LABEL. JUNCTION BOXES SHALL BE PROVIDED WHERE NECESSARY, FOR EASE OF CONDUCTOR PULLING, TO LIMIT THE NUMBER OF CONDUIT BENDS TO LESS THAN 360°. ETC. JUNCTION BOXES SHALL BE PLACED IN UNPAVED AREAS AND INSIDE THE FENCED AREA. PROVIDE TIER-22 COVERS FOR GRAVEL AREAS.
2. ALL SITE COMMUNICATIONS CONDUITS SHALL BE PROVIDED WITH 48" SWEEPS.

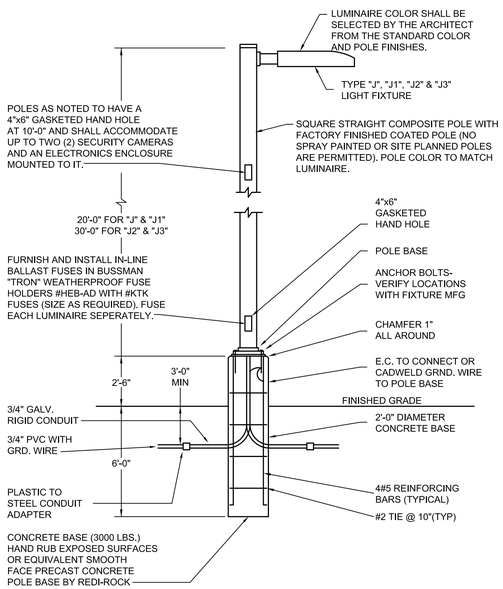
EXTERIOR LIGHTING CONTROL: SEQUENCE OF OPERATIONS

1. AUTOMATIC ON: LUMINAIRES TO TURN ON VIA INTEGRATED PHOTOCELLS WHEN NATURAL LIGHT LEVELS DROP BELOW A PRE-PROGRAMMED LEVEL.
2. PARTIAL OFF: LUMINAIRES TO REDUCE TO 50% OUTPUT VIA INTEGRATED MOTION DETECTORS AFTER THIRTY (30) MINUTES OF INACTIVITY.
3. AUTOMATIC FULL OFF: LUMINAIRES TO TURN OFF VIA INTEGRATED PHOTOCELLS WHEN NATURAL LIGHT LEVELS EXCEED A PRE-PROGRAMMED LEVEL.

TYPE "J", "J1", "J2" & "J3" LIGHT FIXTURE & CONCRETE BASE DETAIL

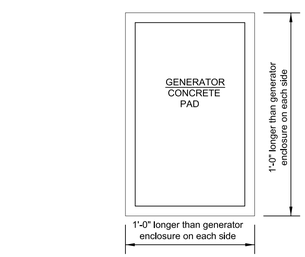
NO SCALE

PROVIDE FLUSH GRADE JUNCTION BOX AT BASE OF POLE, AS REQUIRED.

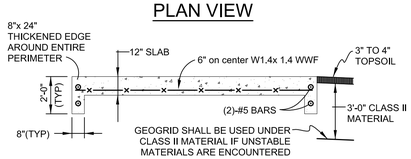


ELECTRICAL EQUIPMENT & GENERATOR CONCRETE PAD DETAILS

NOT TO SCALE

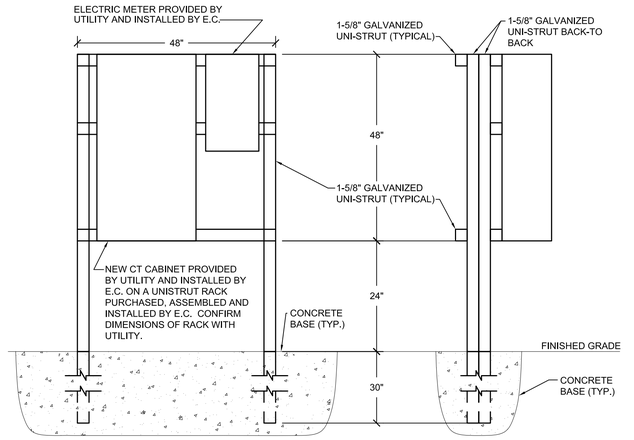


PLAN VIEW

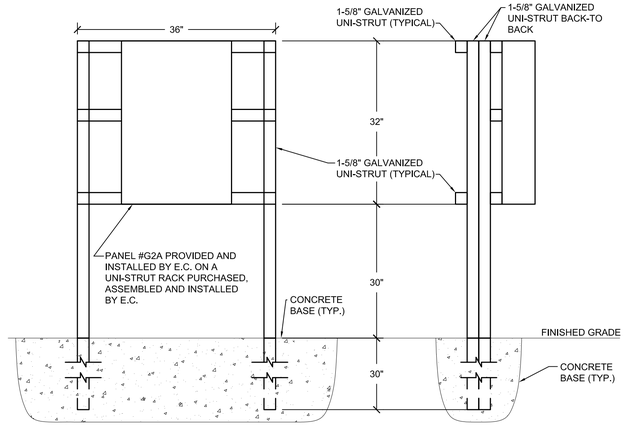


SECTION VIEW

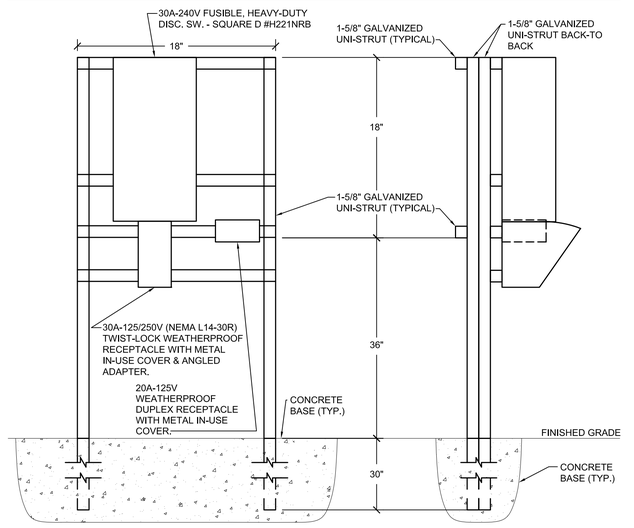
ELECTRICAL CT CABINET & METER DETAIL



PANEL#G2A DETAIL



RECEPTACLE & DISCONNECT SWITCH DETAIL



830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL SITE DETAILS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
SE3

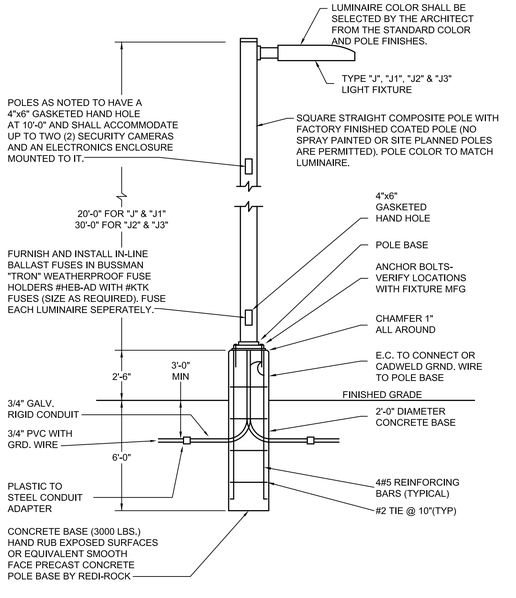
Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	BF	Manufacturer & Catalog Number	Pole Height	Fixture Mounting Ht.	LED Color Temp.
●—○	5	Type J	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GLEON-AF-02-LED-E1-SL2	20'	22'-6"	4000K
●—○	2	Type J1	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GLEON-AF-02-LED-E1-5WQ	20'	22'-6"	4000K
▱	20	Type H	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GWC-AF-02-LED-E1-T2-600	n/a	15'-0" or 20'-0"	4000K
▱	6	Type H1	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GWC-AF-01-LED-E1-T2-600	n/a	8'-6" or 10"	4000K

Lighting Calculation Summary					
Project: WOLVERINE POWER - REED CITY SERVICE CENTER					
Label	Avg	Max	Min	Avg/Min	Max/Min
Site	0.3 fc	13.9 fc	0.00 fc	n/a	n/a
Parking Lot & Drive	1.2 fc	13.9 fc	0.00 fc	n/a	n/a

TYPE "J", "J1", "J2" & "J3" LIGHT FIXTURE & CONCRETE BASE DETAIL

NO SCALE

PROVIDE FLUSH GRADE JUNCTION BOX AT BASE OF POLE, AS REQUIRED.



1 ELECTRICAL SITE LIGHTING CALCULATIONS

SCALE: 1" = 30'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL SITE LIGHTING CALCULATIONS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021 Bidding & Construction

SHEET NUMBER
SLC1

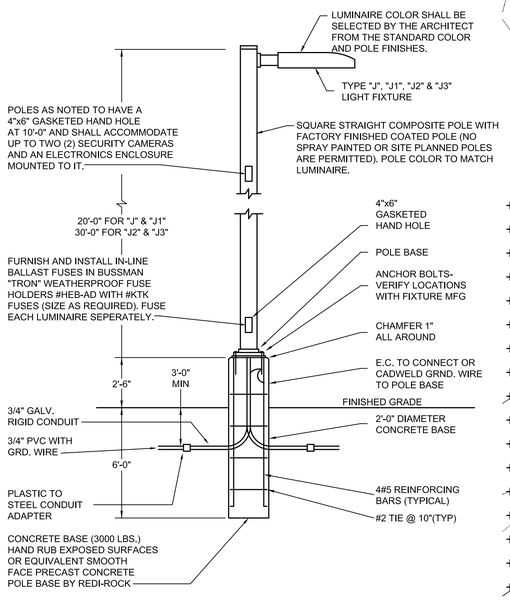
Luminaire Schedule									
Symbol	Qty	Label	Arrangement	LLF	BF	Manufacturer & Catalog Number	Pole Height	Fixture Mounting Ht.	LED Color Temp.
●—○	1	Type J	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GLEON-AF-02-LED-E1-SL2	20'	22'-6"	4000K
●—○	9	Type J2	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GLEON-AF-02-LED-E1-SL4	30'	32'-6"	4000K
●—○	4	Type J3	SINGLE	0.850	1.000	COOPER LIGHTING - McGRAW-EDISON GLEON-AF-02-LED-E1-5WQ	30'	32'-6"	4000K

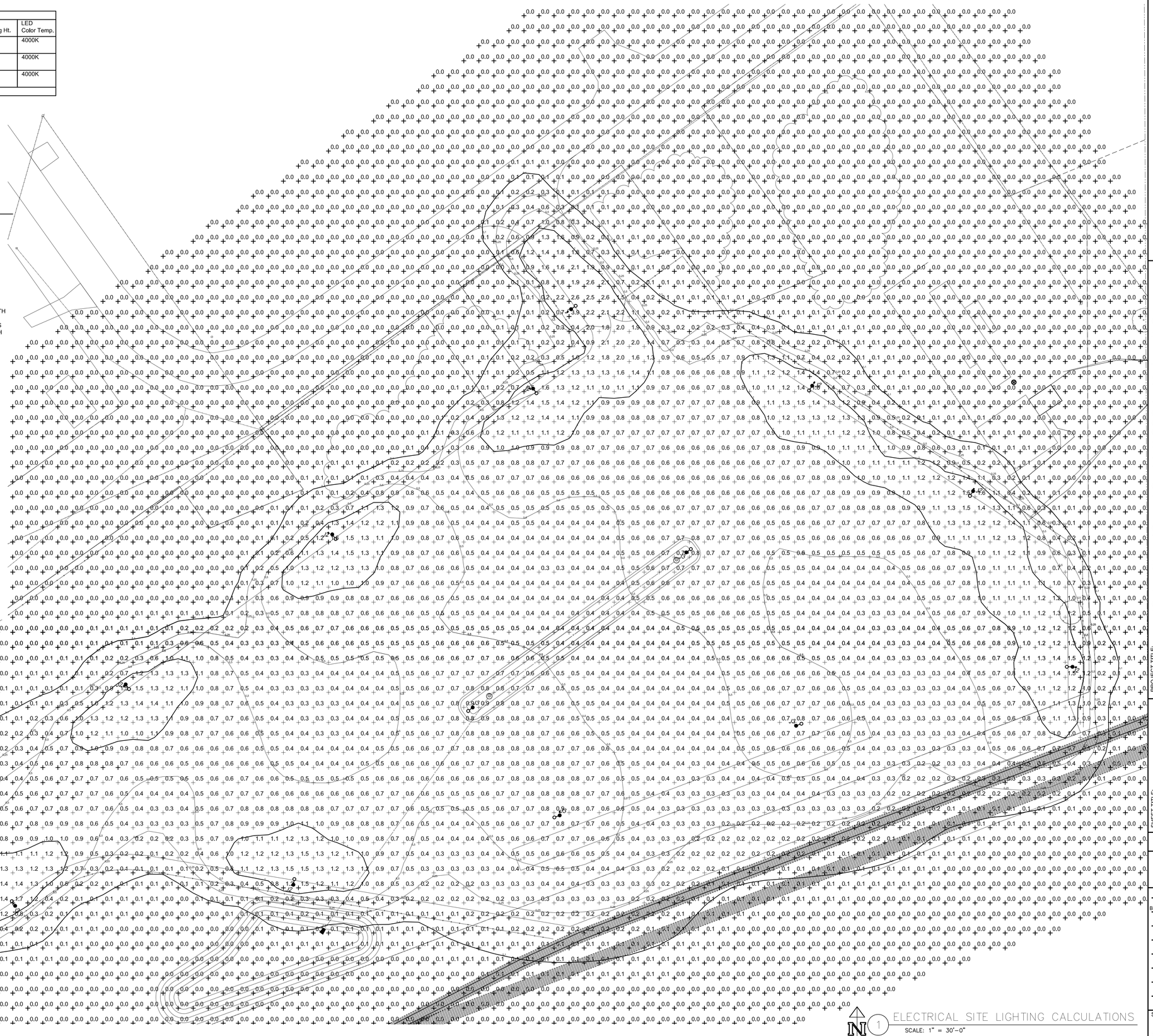
Lighting Calculation Summary					
Project: WOLVERINE POWER - REED CITY SERVICE CENTER					
Label	Avg	Max	Min	Avg/Min	Max/Min
Site	0.2 fc	3.9 fc	0.00 fc	n/a	n/a
Rail Yard	0.6 fc	2.2 fc	0.1 fc	6.0	22.0

TYPE "J", "J1", "J2" & "J3" LIGHT FIXTURE & CONCRETE BASE DETAIL

NO SCALE

PROVIDE FLUSH GRADE JUNCTION BOX AT BASE OF POLE, AS REQUIRED.





1 ELECTRICAL SITE LIGHTING CALCULATIONS

SCALE: 1" = 30'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL SITE LIGHTING CALCULATIONS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021 Bidding & Construction

SHEET NUMBER
SLC2

ABBREVIATIONS

1-21	PANEL 1, CIRCUIT 21	KW	KILOWATTS
A	AMPERES	L	LIGHTING SYSTEM DEVICE
AC	ABOVE COUNTER	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCB	MAIN CIRCUIT BREAKER
AFG	ABOVE FINISH GRADE	MDP	MAIN DISTRIBUTION PANEL
BC	BELOW COUNTER	MLO	MAIN LUG ONLY
C	CONDUIT	MM	MULTIMEDIA OUTLETS (HI & LOW RECEPT. & LOW VOLT. OUTLETS)
C/B, CB	CIRCUIT BREAKER	NL	NIGHT LIGHT
DF	DRINK'G FOUNTAIN/H20 COOLER	NTS	NOT TO SCALE
DWG	DRAWING	P	PUMP
E	EXISTING TO REMAIN	PNL	PANEL
EC	ELECTRICAL CONTRACTOR	PS	PRIMARY SWITCH
EF	EXHAUST FAN	PT	PRIMARY TRANSFORMER
EGC	EQUIPMENT GROUNDING CONDUCTOR	PVC	POLYVINYL CHLORIDE
EH	ELECTRIC HEATER	Q	QUAD-PLEX (DOUBLE DUPLEX)
EMT	ELECTRICAL METALLIC TUBING	RGS	RIGID GALVANIZED STEEL
ERV	ENERGY RECOVERY VENTILATOR	S	SOUND SYSTEM DEVICE
E-R	EXISTING TO BE RELOCATED	TR	TAMPER RESISTANT
ETR	EXISTING TO REMAIN	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
EWC	ELECTRIC WATER COOLER	UGRD	UNDERGROUND
EWH	ELECTRIC WATER HEATER	UON	UNLESS OTHERWISE NOTED
G	GROUND	V	VOLT
GEC	GROUNDING ELECTRODE CONDUCTOR	VFD	VARIABLE FREQUENCY DRIVE
GFI	GROUND FAULT CIRCUIT INTERRUPTER	W	WIRE
GTD	GENERATOR TRANSFER DEVICE	WG	WIREGUARD
HOR	HORIZONTAL	WP	WEATHERPROOF
KCMIL	THOUSAND CIRCULAR MILS	XFMR	TRANSFORMER
KVA	KILOVOLT-AMPERES		

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	NOTES
S	20 AMP SINGLE POLE SWITCH DECORATOR STYLE	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S_V	PASSIVE INFRARED VACANCY SENSOR SWITCH (GREENGATE #OSW-P-08-01-120-X)	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED PROGRAM AS A VACANCY SENSOR
S_{VD}	PASSIVE INFRARED VACANCY SENSOR 0-10V DIMMER SWITCH (GREENGATE #OSW-P-010-X)	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED PROGRAM AS A VACANCY SENSOR
S_T	ELECTRONIC PROGRAMMABLE TIMER SWITCH, (GREENGATE #TSW-MV-W)	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
S_D	0-10V, 1200W 120V DIMMER SWITCH (GREENGATE #SF10P-XX)	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
ES	ENTRY CONTROL SWITCH, SEE LIGHTING DIAGRAM	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
MS	ROOM CONTROLLER WALL STATION, SEE LIGHTING DIAGRAM	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
X	OCCUPANCY SENSOR, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
PP	OCCUPANCY SENSOR POWER PACK (GREENGATE #SP20-MV)	CONNECT TO OCC. SENSORS (PER MANUFACTURER)
X	2'x2' FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	1'x4' FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	ROUND FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
X	EXIT SIGN, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
	DUPLEX OUTLET - 20 AMP	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	DUPLEX OUTLET - 20 AMP - GROUND FAULT	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
DF	DUPLEX OUTLET - 20 AMP - GROUND FAULT - DEAD FRONT	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
WP	WR GFCI DUPLEX OUTLET WITH WEATHER PROOF IN-USE COVER	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	30A OR 50A -125/250V 3-POLE, 4-WIRE OR 30A-250V 2-POLE, 3-WIRE (NEMA 6-30R; PRESSURE WASHER) OR 50A-250V 2-POLE, 3-WIRE (NEAM 6-50R; WELDER) GROUNDING OUTLET	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED THE WELDER RECEPTACLE'S GROUND SHALL BE AT THE BOTTOM THE PRESSURE WASHER RECEPTACLE'S GROUND SHALL BE PLACED AT THE TOP.
	OVERHEAD DOOR MOTOR CONTROLS	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	SINGLE-PHASE SPECIAL PURPOSE OUTLET, AS NOTED	REFER TO SHOP DRAWINGS FOR CONNECTION REQUIREMENTS
	THREE-PHASE SPECIAL PURPOSE OUTLET, AS NOTED	REFER TO SHOP DRAWINGS FOR CONNECTION REQUIREMENTS
J	JUNCTION BOX	
	3Ø BRANCH CIRCUIT PANELS (120/208V-3Ø-4W)	REFER TO SPECIFICATIONS AND RISER DIAGRAM.
	OVERHEAD ELECTRICAL CONDUIT, SIZED AS SHOWN	OHE
	UNDERGROUND ELECTRICAL CONDUIT, SIZED AS SHOWN	UGE
	OVERHEAD TELEPHONE CONDUIT, SIZED AS SHOWN	OHT
	UNDERGROUND TELEPHONE CONDUIT, SIZED AS SHOWN	UGT

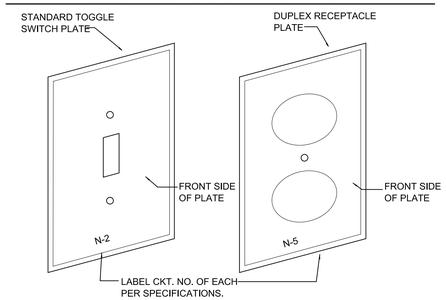
SYMBOL	DESCRIPTION	NOTES
	SINGLE-PHASE MOTOR, AS SPECIFIED	
	THREE-PHASE MOTOR, AS SPECIFIED	
	SINGLE-PHASE FUSED OR NON-FUSED DISCONNECT	
	SINGLE-PHASE MANUAL STARTER OR COMB. DISC./STARTER	
	THREE-PHASE FUSED OR NON-FUSED DISCONNECT	
	THREE-PHASE MANUAL STARTER OR COMB. DISC./STARTER	
S_M	MOTOR TOGGLE SWITCH WITH THERMAL OVERLOAD AND LOCKOUT	SQUARE D #CLASS 2510 FGJ5P (SINGLE POLE)
	TELEPHONE BACKBOARD	
	LOW VOLTAGE OUTLET	E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 16" AFF AND 1" CONDUIT HOMERUN TO NW CORNER OF MECHANICAL ROOM #109
W	WIRELESS ACCESS POINT OUTLET	E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ THE CEILING AND 1" CONDUIT HOMERUN TO NW CORNER OF MECHANICAL ROOM #109
TV	TELEVISION OUTLET	E.C. TO PROVIDE AND INSTALL TWO (2) 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 72" AFF (SURFACE MOUNTED BOXES AND NO PLASTER RING ON THE 3-HOUR FIRE RATED WALL). ONE (1) FOR A DUPLEX RECEPTACLE AND ONE (1) WITH A 1" CONDUIT HOMERUN TO NW CORNER OF MECH. RM. #109.
TV D	TELEVISION OUTLET 'DISH'	E.C. TO PROVIDE AND INSTALL TWO (2) 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 72" AFF (SURFACE MOUNTED BOXES AND NO PLASTER RING ON THE 3-HOUR FIRE RATED WALL). ONE (1) FOR A DUPLEX RECEPTACLE AND ONE (1) WITH A 1" CONDUIT HOMERUN TO NW CORNER OF MECH. RM. #109.
TV P	TELEVISION OUTLET 'PROJECTION'	E.C. TO PROVIDE AND INSTALL TWO (2) 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 72" AFF (SURFACE MOUNTED BOXES AND NO PLASTER RING ON THE 3-HOUR FIRE RATED WALL). ONE (1) FOR A DUPLEX RECEPTACLE AND ONE (1) WITH A 1" CONDUIT HOMERUN TO NW CORNER OF MECHANICAL ROOM #109 AND 1-1/4" CONDUIT STUBBED TO 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING AT 16" AFF DIRECTLY BELOW 'TV' OUTLET.
R	CARD READER OUTLET	E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX WITH 2" DEEP PLASTER RING @ 44" AFF AND 3/4" CONDUIT STUBBED TO LOCATION AS SHOWN ON ELECTRICAL/SECURITY DETAIL ON THIS SHEET.
ES	ELECTRIC STRIKE	E.C. TO PROVIDE AND INSTALL 3/4" EMT CONDUIT STUB AND PULL STRING FROM DOOR FRAME TO LOCATION AS SHOWN ON ELECTRICAL/ SECURITY DETAIL ON THIS SHEET.
REX	REQUEST TO EXIT	E.C. TO PROVIDE AND INSTALL A SINGLE GANG BOX MOUNTED HORIZONTALLY ABOVE THE CENTER OF THE DOOR FRAME WITH A A 3/4" EMT CONDUIT STUB AND PULL STRING TO LOCATION AS SHOWN ON ELECTRICAL/SECURITY DETAIL ON THIS SHEET.
C	CAMERA OUTLET	E.C. TO PROVIDE AND INSTALL 4" SQ. x 2-1/8" DEEP BOX @ 16'-0" AFF, UNLESS OTHERWISE NOTED, AND 3/4" CONDUIT HOMERUN TO NW CORNER OF MECHANICAL ROOM #109
FAP	FIRE ALARM CONTROL PANEL	MOUNT @ 44" A.F.F.
RA	FIRE ALARM REMOTE ANNUNCIATOR	MOUNT @ 44" A.F.F.
F	FIRE ALARM PULL STATION	MOUNT @ 44" A.F.F.
	FIRE ALARM WALL MOUNTED AUDIBLE/VISUAL DEVICE	MOUNT @ MIN. 80", MAX. 96" A.F.F.
S_D	FIRE ALARM SMOKE DETECTOR	
T_S	FIRE SUPPRESSION TAMPER SWITCH	SUPPLIED BY OTHERS
S_P	FIRE SUPPRESSION FLOW SWITCH	SUPPLIED BY OTHERS

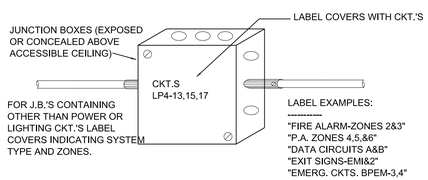
WIRE SIZE REQUIREMENTS

NOTE:
BASED ON A MAXIMUM OF 3.6-VOLT DROP (3%) ON 120V CIRCUITS.
WIRES FOR RUNS OVER 100'-0" SHALL BE DETERMINED ON THIS
A MAXIMUM OF A 3% DROP ALLOWED.

BRANCH CIRCUIT AMPS	LENGTH OF RUN - FROM PANEL TO FIRST CONNECTION - FEET								
AMPS	50'	60'	70'	80'	90'	100'	110'	120'	130'
15	#12	#12	#12	#10	#10	#10	#10	#10	#8
20	#12	#10	#10	#10	#10	#8	#8	#8	#8
30	#10	#10	#8	#8	#8	#6	#6	#6	#6

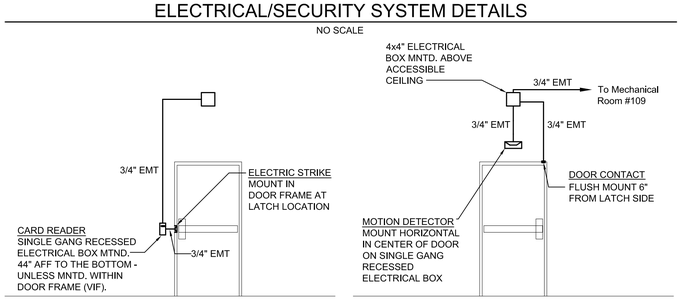
ELECTRICAL IDENTIFICATION





ELECTRICAL/SECURITY SYSTEM DETAILS

NO SCALE



830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL
SCHEDULES & DETAILS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
E0

NOTES:

1. CAUTION !!!!!!!!
   E.C. SHALL VERIFY ALL ROUGH-IN ELEVATIONS, LOCATIONS AND/OR HEIGHTS OF ALL LIGHT FIXTURES, RECEPTACLE OUTLETS, T.V., COMPUTER, CLOCK OUTLETS, ETC. WITH ARCHITECT/ENGINEER. FAILURE TO DO SO WILL REQUIRE E.C. TO RELOCATE RESPECTIVE ITEMS AT THE E.C.'S EXPENSE.

   COMMUNICATION OUTLET LOCATIONS SHALL BE COORDINATED WITH OWNER AND OWNER FURNITURE PLAN.

2. ALL OF THE LIGHTS ARE CONNECTED TO THE GENERATOR THROUGH ATS-EM AND PANEL #EM AND SHALL OPERATE AT LOSS OF NORMAL POWER.

   ALL CONDUIT AND CONDUCTORS FOR THE EMERGENCY LIGHTING SYSTEM SHALL COMPLY WITH NEC ARTICLES 700 & 701, AS REQUIRED.

3. CONNECT ALL EXIT SIGNS AHEAD OF THE LOCAL AREA LIGHTING'S CONTROL DEVICE (i.e., HAVING A DIRECT (HOT) CONNECTION TO THE BATTERY).

4. FEEDS TO NEW POWER, LIGHTING, LOW VOLTAGE AND FIRE ALARM DEVICES SHALL BE ATTEMPTED IN EVERY WAY TO BE INSTALLED FLUSH-MOUNT (RECESSED BEHIND THE WALL/CEILING SURFACE).

   THERE SHALL BE NO EXPOSED CONDUITS AND BOXES, EXCEPT IN MECH. ROOMS, AND IN THE EQUIPMENT STORAGE #101 & #102 AS NOTED IN NOTE #11 BELOW.

5. COORDINATE LOCATIONS AND MOUNTING HEIGHTS OF LIGHT FIXTURES WITH THE INTERIOR ELEVATIONS AND REFLECTED CEILING PLANS.

6. ALL PENDANT MOUNTED FIXTURES SHALL BE SECURELY HUNG FROM BUILDING STRUCTURE.

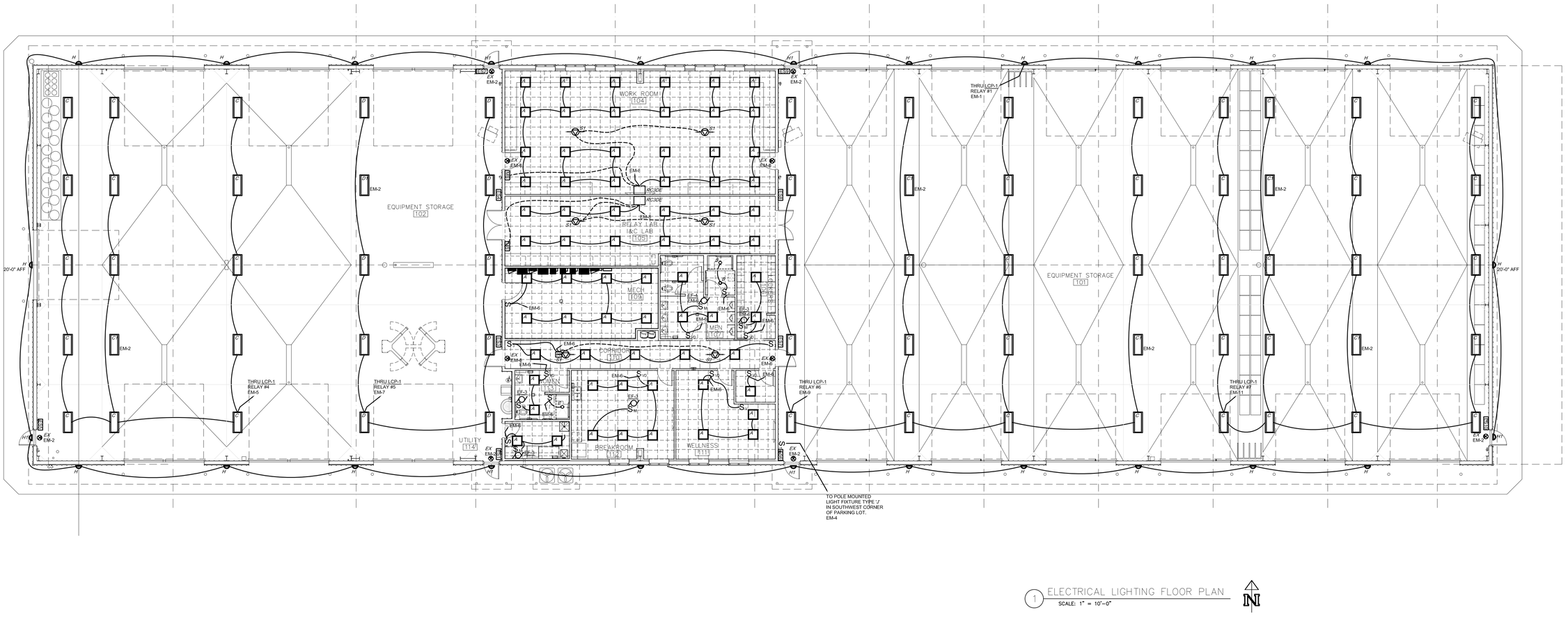
7. PROVIDE KEVLAR PULL STRINGS IN ALL SPARE CONDUITS.

8. E.C. SHALL COORDINATE FEEDER ROUTING WITH PLUMBING, MECHANICAL AND LOW VOLTAGE CONTRACTORS.

9. ANY NEW CONDUIT PENETRATIONS THROUGH WALLS SHALL BE APPROPRIATELY FIRE-STOPPED, SMOKE-STOPPED OR CAULKED WHEN PENETRATION SIZE EXCEEDS CONDUIT SIZE OR AS WORK SCOPES NOTE.

10. E.C. SHALL COORDINATE PROPER PLACEMENT OF OCCUPANCY SENSORS MOUNTED IN THE CEILING WITH THE MANUFACTURERS REPRESENTATIVE.

11. EQUIPMENT STORAGE #101 & #102 NOTES:
    A. THE AREAS ARE CONSIDERED 'MINOR REPAIR GARAGES' PER ARTICLE 511 OF THE 2017 NEC AND ARE THEREFORE UNCLASSIFIED.
    B. HOWEVER, ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE LOCATED AND INSTALLED ABOVE 18" AFF.
    C. ALL CONDUIT FEEDS TO ELECTRICAL EQUIPMENT AND DEVICES MAY BE FROM ABOVE OR FROM UNDERGROUND. IF THE CONDUIT FEEDS ARE FROM ABOVE THE CONDUITS MAY BE SURFACE MOUNTED. IF THE CONDUIT FEEDS ARE FROM UNDERGROUND THE CONDUITS SHALL BE RECESSED WITHIN THE WALL CAVITY. IN EITHER INSTALLATION METHOD THE DEVICES SHALL BE SURFACE MOUNTED AND COORDINATED WITH THE CORRUGATED METAL WALL PANELS.
    D. THE LOCATION OF THE OVERHEAD DOOR MOTOR CONTROLS AND POWER CONNECTION LOCATIONS SHALL BE COORDINATED WITH THE DOOR SUPPLIER/ INSTALLER.
    E. ALL CONDUIT, BOXES AND EQUIPMENT INSTALLED ABOVE THE VEHICLE LIFT AREAS SHALL BE HELD TIGHT TO THE CEILING DECK.



1 ELECTRICAL LIGHTING FLOOR PLAN
SCALE: 1" = 10'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL
LIGHTING FLOOR PLANS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
E1L

NOTES:

1. CAUTION !!!!!!!
   E.C. SHALL VERIFY ALL ROUGH-IN ELEVATIONS, LOCATIONS AND/OR HEIGHTS OF ALL LIGHT FIXTURES, RECEPTACLE OUTLETS, T.V., COMPUTER, CLOCK OUTLETS, ETC. WITH ARCHITECT/ENGINEER. FAILURE TO DO SO WILL REQUIRE E.C. TO RELOCATE RESPECTIVE ITEMS AT THE E.C.'S EXPENSE.

   COMMUNICATION OUTLET LOCATIONS SHALL BE COORDINATED WITH OWNER AND OWNER FURNITURE PLAN.

2. FEEDS TO NEW POWER, LIGHTING, LOW VOLTAGE AND FIRE ALARM DEVICES SHALL BE ATTEMPTED IN EVERY WAY TO BE INSTALLED FLUSH-MOUNT (RECESSED BEHIND THE WALL/CEILING SURFACE).

   THERE SHALL BE NO EXPOSED CONDUITS AND BOXES, EXCEPT IN MECH. ROOMS, AND IN THE EQUIPMENT STORAGE #101 & #102 AS NOTED IN NOTE #9 BELOW.

3. PROVIDE KEVLAR PULL STRINGS IN ALL SPARE CONDUITS.

4. E.C. SHALL COORDINATE FEEDER ROUTING WITH PLUMBING, MECHANICAL AND LOW VOLTAGE CONTRACTORS.

5. ANY NEW CONDUIT PENETRATIONS THROUGH WALLS SHALL BE APPROPRIATELY FIRE-STOPPED, SMOKE-STOPPED OR CAULKED WHEN PENETRATION SIZE EXCEEDS CONDUIT SIZE OR AS WORK SCOPES NOTE.

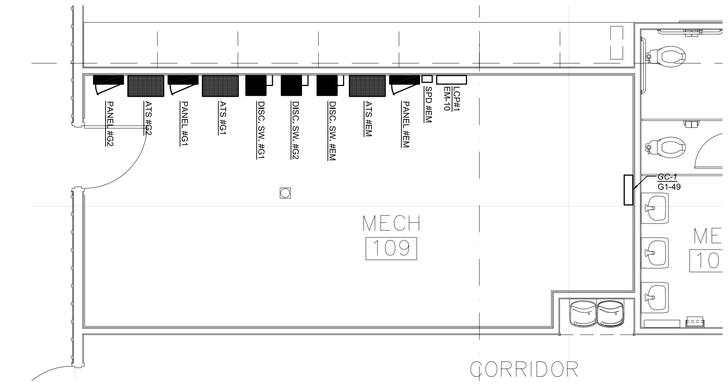
6. COORDINATE LOCATION OF SLEEVES ABOVE THE CEILING FOR DATA, TELEPHONE/ PAGING, TELEVISION, SECURITY, AND CLOCK SYSTEMS WITH THE OWNER.

7. COORDINATE CONDUIT SLEEVES WITHIN THE WALLS FOR DATA, TELEPHONE/ PAGING, TELEVISION, SECURITY, AND CLOCK SYSTEMS WITH THE OWNER. IN MECHANICAL ROOM #109, THE CONDUIT STUBS FOR LOW VOLTAGE OUTLETS, WIRELESS ACCESS POINTS, TELEVISION OUTLETS, CARD READER OUTLETS, ELECTRIC STRIKES AND CAMERA OUTLETS IF FED FROM UNDERGROUND SHALL EXTEND TO 36" AFF (PVC IS ACCEPTABLE), AND IF FED FROM ABOVE THE CEILING SHALL EXTEND TO NO LOWER THAN 7'-6" AFF (EMT IS ACCEPTABLE). ALL STUBS SHALL HAVE PULL STRINGS, BUSHINGS ON THE ENDS, & BE PROPERLY SUPPORTED.

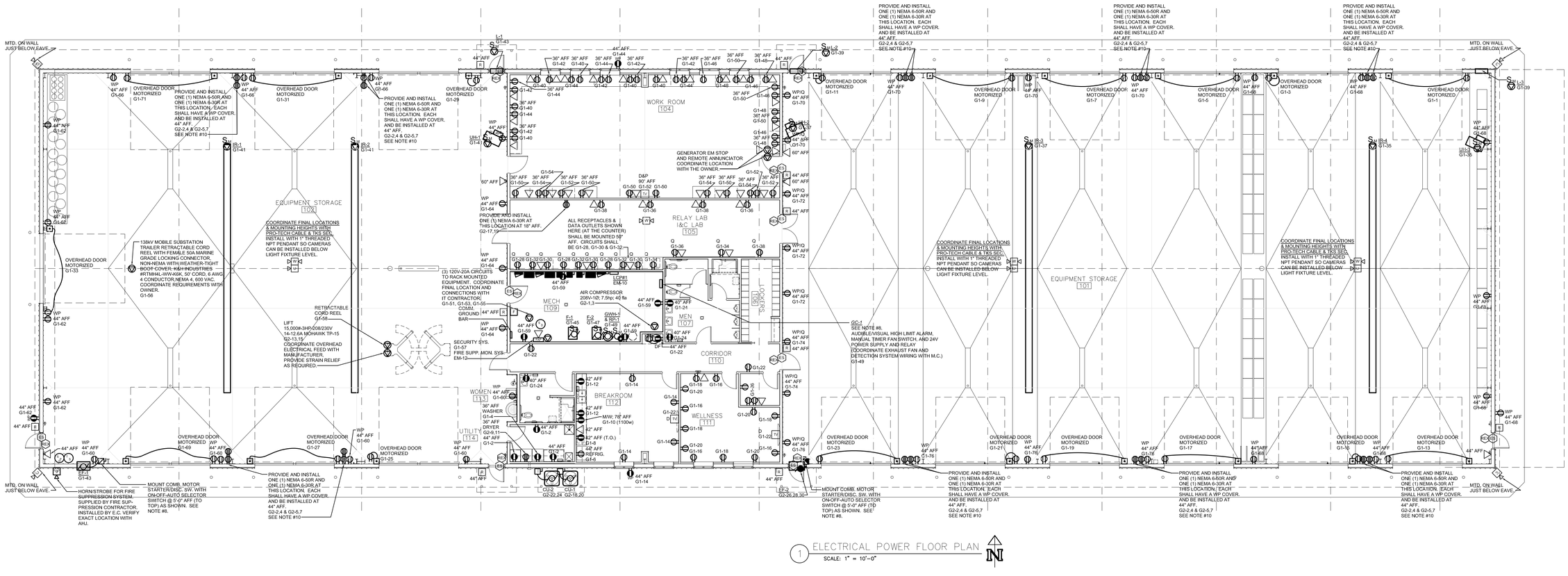
8. EQUIPMENT STORAGE GAS DETECTION SYSTEMS:
   COORDINATE WITH M.C. TO CONTROL THE EQUIPMENT STORAGE EXHAUST FANS AND LOUVERS WITH THE GAS DETECTION CONTROLLERS, THE HUMIDSTAT, OR THE MANUAL TIMER SWITCH AS SHOWN.

9. EQUIPMENT STORAGE #101 & #102 NOTES:
   A. THE AREAS ARE CONSIDERED 'MINOR REPAIR GARAGES' PER ARTICLE 511 OF THE 2017 NEC AND ARE THEREFORE UNCLASSIFIED.
   B. HOWEVER, ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE LOCATED AND INSTALLED ABOVE 18" AFF.
   C. ALL CONDUIT FEEDS TO ELECTRICAL EQUIPMENT AND DEVICES MAY BE FROM ABOVE OR FROM UNDERGROUND. IF THE CONDUIT FEEDS ARE FROM ABOVE THE CONDUITS MAY BE SURFACE MOUNTED. IF THE CONDUIT FEEDS ARE FROM UNDERGROUND THE CONDUITS SHALL BE RECESSED WITHIN THE WALL CAVITY. IN EITHER INSTALLATION METHOD THE DEVICES SHALL BE SURFACE MOUNTED AND COORDINATED WITH THE CORRUGATED METAL WALL PANELS.
   D. THE LOCATION OF THE OVERHEAD DOOR MOTOR CONTROLS AND POWER CONNECTION LOCATIONS SHALL BE COORDINATED WITH THE DOOR SUPPLIER/ INSTALLER.
   E. ALL CONDUIT, BOXES AND EQUIPMENT INSTALLED ABOVE THE VEHICLE LIFT AREAS SHALL BE HELD TIGHT TO THE CEILING DECK.

10. WHEN INSTALLING THE WELDER AND PRESSURE WASHER RECEPTACLES; PLACE THE GROUND PRONG DOWN ON THE WELDER RECEPTACLES, AND THE GROUND PRONG UP ON THE PRESSURE WASHER RECEPTACLES.



1 ENLARGED MECHANICAL ROOM ELECTRICAL POWER FLOOR PLAN
SCALE: 1" = 1/4"-0"



1 ELECTRICAL POWER FLOOR PLAN
SCALE: 1" = 10'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL
POWER FLOOR PLANS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
E1P

PANEL #G1

400A MLO, 120/208V-3Ø-4W
SQ.D NQ - SURFACE MTD.

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	A	540	RECEPTACLES - 114	20/1	2
3	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	B	1500	RECEPTACLES - 114 - WASHER	20/1	4
5	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	C	1200	RECEPTACLES - 112 - REFRIGERATOR	20/1 G	6
7	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	A	1800	RECEPTACLES - 112 - TOASTER OVEN	20/1	8
9	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	B	1100	RECEPTACLES - 112 - MICROWAVE	20/1	10
11	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	C	360	RECEPTACLES - 112 - COUNTER	20/1	12
13	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	A	900	RECEPTACLES - 112 SOUTH, EXTERIOR	20/1	14
15	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	B	720	RECEPTACLES - 111	20/1	16
17	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	C	720	RECEPTACLES - 111	20/1	18
19	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	A	720	RECEPTACLES - 111	20/1	20
21	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	B	1055	RECEPTACLES - 110,111 (TV), 112 (TV)	20/1	22
23	20/1 G	OVERHEAD MOTORIZED DOOR - 101	1200	C	540	RECEPTACLES - 107,113	20/1	24
25	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	A	540	RECEPTACLES - 108	20/1	26
27	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	B	1080	RECEPTACLES - 105 SOUTH	20/1	28
29	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	C	1080	RECEPTACLES - 105 SOUTH	20/1	30
31	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	A	1080	RECEPTACLES - 105 SOUTH	20/1	32
33	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	B	720	RECEPTACLES - 105 SOUTH & NORTH	20/1	34
35	20/1	IR-4, UH-3 - 101	1314	C	720	RECEPTACLES - 105 SOUTH & NORTH	20/1	36
37	20/1	IR-3, UH-2 - 101	1314	A	720	RECEPTACLES - 105 SOUTH & NORTH	20/1	38
39	20/1	L-2, L-3 - 101	200	B	1080	RECEPTACLES - 104 NORTH	20/1	40
41	20/1	IR-2, IR-1, UH-1 - 102	1806	C	1080	RECEPTACLES - 104 NORTH	20/1	42
43	25/1	EF-1, L-1 - 102	1750	A	1080	RECEPTACLES - 104 NORTH	20/1	44
45	20/1	F-1 - 109	1656	B	1080	RECEPTACLES - 104 NORTH	20/1	46
47	20/1	F-2 - 109	1219	C	900	RECEPTACLES - 104 NORTH	20/1	48
49	20/1	GWH-1, RP-1 & GC-1 - 109	800	A	900	RECEPTACLES - 104 SOUTH	20/1	50
51	20/1	COMMUNICATIONS RACK - 109	1500	B	900	RECEPTACLES - 104 SOUTH	20/1	52
53	20/1	COMMUNICATIONS RACK - 109	1500	C	720	RECEPTACLES - 104 SOUTH	20/1	54
55	20/1	COMMUNICATIONS RACK - 109	1500	A	3000	RECEPTACLE - 102 - CORD REEL 138kV	50/1 G	56
57	20/1	SECURITY SYSTEM - 109	1500	B	360	RECEPTACLES - 102 - CORD REEL	20/1 G	58
59	20/1	RECEPTACLES - 109	720	C	900	RECEPTACLES - 102 SOUTH	20/1 G	60
61	20/1	HIGH WATER ALARM LIGHT	300	A	900	RECEPTACLES - 102 WEST	20/1 G	62
63	20/1	GENERATOR BATTERY CHARGER	1200	B	720	RECEPTACLES - 102 EAST	20/1 G	64
65	20/1	GENERATOR BLOCK HEATER	1500	C	540	RECEPTACLES - 102 NORTH	20/1 G	66
67	20/1	POLE MOUNTED CAMERA POWER	450	A	1440	RECEPTACLES - 101 EAST, EXTERIOR	20/1 G	68
69	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	B	900	RECEPTACLES - 101 NORTHWEST	20/1 G	70
71	20/1 G	OVERHEAD MOTORIZED DOOR - 102	1200	C	540	RECEPTACLES - 101 WEST CENTRAL	20/1 G	72
73	20/1	SPARE	---	A	360	RECEPTACLES - 101 SOUTHWEST	20/1 G	74
75	20/1	SPARE	---	B	720	RECEPTACLES - 101 SOUTHWEST	20/1 G	76
77	20/1	SPARE	---	C	---	SPARE	20/1	78
79	20/1	SPARE	---	A	---	SPARE	20/1	80
81	--	SPACE	---	B	---	SPACE	--	82
83	--	SPACE	---	C	---	SPACE	--	84

LIGHTS	0	VA	
RECEPTS.	64735	VA	TOTAL CALCULATED LOAD:
MOTORS	10059	VA	78.2 kVA
MISC	3450	VA	217.2 A

PANEL #EM

100A MLO, 120/208V-3Ø-4W
SQ.D NQ - SURFACE MTD.

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	20/1-L	LIGHTS - EXTERIOR BLDG. MTD. (RLY 1)	1524	A	531	EXITS & MOTION LIGHTS (#101/#102)	20/1	2
3	20/1-L	LIGHTS - POLE MOUNTED (RELAY 2)	678	B	113	LIGHT - SE POLE MTD. ON TIMER SWITCH	20/1	4
5	20/1-L	LIGHTS - #102 WEST (RLY 4)	994	C	1706	LIGHTS - 106-114	20/1	6
7	20/1-L	LIGHTS - #102 EAST & CENTER (RELAY 5)	1314	A	1058	LIGHTS - 104, 105	20/1	8
9	20/1-L	LIGHTS - #101 WEST (RELAY 6)	1278	B	500	LIGHTING CONTROL PANEL	20/1	10
11	20/1-L	LIGHTS - #101 EAST (RELAY 7)	1278	C	1000	FIRE SUPPRESSION MONITORING	20/1	12
13	20/1	SPARE	---	A	---	SPARE	20/1	14
15	20/1	SPARE	---	B	---	SPARE	20/1	16
17	20/1	SPARE	---	C	---	SPARE	20/1	18
19	--	SPACE	---	A	---	SPACE	--	20
21	--	SPACE	---	B	---	SPACE	--	22
23	--	SPACE	---	C	---	SPACE	--	24
25	--	SPACE	---	A				26
27	--	SPACE	---	B	---	SPD #EM	30/3	28
29	--	SPACE	---	C				30

LIGHTS	13092.63	VA	
RECEPTS.	0	VA	TOTAL CALCULATED LOAD:
MOTORS	0	VA	14.6 kVA
MISC	1500	VA	40.5 A

PANEL #G2A

100A MLO, 120/208V-3Ø-4W
SQ.D NQ - SURFACE MTD.; NEMA 3R

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	30/2*	RECEPTACLES - CIRCUIT	1500	A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	2
3	GFCI	BREAKER/HEATER		B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	4
5	30/2*	RECEPTACLES -CIRCUIT	1500	C	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	6
7	GFCI	BREAKER/HEATER		A	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	8
9	30/2*	RECEPTACLES -CIRCUIT	1500	B	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	10
11	GFCI	BREAKER/HEATER		C	180	RECEPT.-CIRCUIT BREAKER/HEATER	20/1	12
13	20/1	SPARE	---	A	---	SPARE	20/1	14
15	20/1	SPARE	---	B	---	SPARE	20/1	16
17	20/1	SPARE	---	C	---	SPARE	20/1	18
19	--	SPACE	---	A	---	SPACE	--	20
21	--	SPACE	---	B	---	SPACE	--	22
23	--	SPACE	---	C	---	SPACE	--	24
25	--	SPACE	---	A	---	SPACE	--	26
27	--	SPACE	---	B	---	SPACE	--	28
29	--	SPACE	---	C	---	SPACE	--	30

LIGHTS	0	VA	
RECEPTS.	5580	VA	TOTAL CALCULATED LOAD:
MOTORS	0	VA	5.6 kVA
MISC	0	VA	15.5 A

(A) DENOTES ARC FAULT CIRCUIT INTERRUPTER (AFCI) CIRCUIT BREAKER REQUIRED.
(B) DENOTES BREAKER LOCK REQUIRED ON CIRCUIT BREAKER.
(E) DENOTES 30mA GROUND FAULT EQUIPMENT PROTECTION (GFEP) CIRCUIT BREAKER REQUIRED.
(G) DENOTES GROUND FAULT CIRCUIT INTERRUPTER (GFCI) CIRCUIT BREAKER REQUIRED.
(L) DENOTES CIRCUIT REQUIRED TO PASS THRU LIGHTING CONTROL PANEL.
(S) DENOTES CIRCUIT BREAKER WILL REQUIRE SHUNT-TRIP OR TO BE RUN THROUGH SHUNT-TRIP CONTACTOR.
* DENOTES ESTIMATED LOAD AND CIRCUIT BREAKER SIZE. E.C. SHALL CONFIRM EXACT REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ORDERING CIRCUIT BREAKERS.

PANEL #G2

225A MLO, 120/208V-3Ø-4W
SQ.D NQ - SURFACE MTD.

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	60/2*	AIR COMPRESSOR (7.5 HP)	9200	A	9600	RECEPTACLES - (7) WELDER	50/2	2
3				B			GFCI	4
5	30/2*	RECEPTACLES - (7) PRESSURE WASHER	4600	C	1595	MOTORIZED GATE - WEST (1 HP)	15/2	6
7	GFCI	(5 HP)		A				8
9	30/2	RECEPTACLES - DRYER	5000	B	1595	MOTORIZED GATE - EAST (1 HP)	15/2	10
11	GFCI			C				12
13	20/2*	RECEPTACLES - LIFT #1	2200	A	1595	MOTORIZED GATE - SOUTH (1 HP)	15/2	14
15	GFCI			B				16
17	30/2	RECEPTACLE - 105	5000	C	5425	CU-1 - EXTERIOR	50/2	18
19				A				20
21				B	4393	CU-2 - EXTERIOR	45/2	22
23	100/3	PANEL #G2A	5580	C				24
25				A				26
27	15/2*	WELL PUMP (1 HP)	1664	B	2486	EF-2 (1.5 HP)	15/3	28
29				C				30
31	15/2*	SEWAGE EJECTOR PUMP (1/2 HP)	1019	A	---	SPARE	20/1	32
33				B	---	SPARE	20/1	34
35	20/1	SPARE	---	C	---	SPARE	20/1	36
37	20/1	SPARE	---	A	---	SPACE	--	38
39	20/1	SPARE	---	B	---	SPACE	--	40
41	--	SPACE	---	C	---	SPACE	--	42

LIGHTS	0	VA	
RECEPTS.	31980	VA	TOTAL CALCULATED LOAD:
MOTORS	28971.64	VA	61.0 kVA
MISC	0	VA	169.2 A

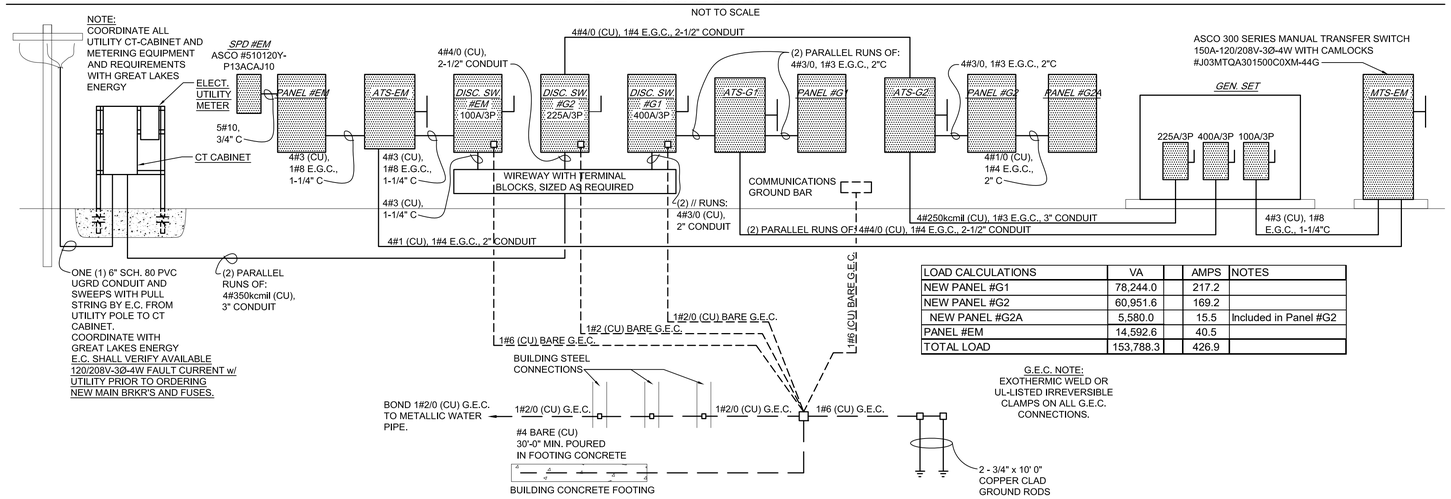
(A) DENOTES ARC FAULT CIRCUIT INTERRUPTER (AFCI) CIRCUIT BREAKER REQUIRED.
(B) DENOTES BREAKER LOCK REQUIRED ON CIRCUIT BREAKER.
(E) DENOTES 30mA GROUND FAULT EQUIPMENT PROTECTION (GFEP) CIRCUIT BREAKER REQUIRED.
(G) DENOTES GROUND FAULT CIRCUIT INTERRUPTER (GFCI) CIRCUIT BREAKER REQUIRED.
(L) DENOTES CIRCUIT REQUIRED TO PASS THRU LIGHTING CONTROL PANEL.
(S) DENOTES CIRCUIT BREAKER WILL REQUIRE SHUNT-TRIP OR TO BE RUN THROUGH SHUNT-TRIP CONTACTOR.
* DENOTES ESTIMATED LOAD AND CIRCUIT BREAKER SIZE. E.C. SHALL CONFIRM EXACT REQUIREMENTS WITH SHOP DRAWINGS PRIOR TO ORDERING CIRCUIT BREAKERS.

GENERATOR LOAD LIST

Location	Room	Fed From	Equipment Description	Quantity	HP	Volts	Phase	Amps	Load	Continuous/Intermittent	Normally In Service	Step	Comments
WPSC-Elmira	various	EM	LED Lighting			120	1	108.33	14600.0	Cont	Y	1	
WPSC-Elmira	various	G1	Overhead Motorized Door	19	1/2	120	1	9.80	22344.0	Int	Y	2	Include five motors operating at the same time
WPSC-Elmira	various	G1	Receptacles	a lot		120	1	461.67	55400.0	Int	Y	2	Include 50% load in calculation
WPSC-Elmira	various	G1	Infrared Tube Heaters	4		120	1	2.30	1104.0	Int	Y	2	
WPSC-Elmira	various	G1	Unit Heaters	3		120	1	10.45	3762.0	Int	Y	2	
WPSC-Elmira	various	G1	Furnace	2		120	1	14.40	3456.0	Int	Y	2	
WPSC-Elmira	102	G1	Exhaust Fan 1	1	3/4	120	1	13.80	1656.0	Int	N	2	
WPSC-Elmira	various	G1	Gas Monitoring System & GWH-1	1		120	1	7.00	840.0	Int	Y	2	
WPSC-Elmira	Generator	G1	Generator Battery Charger	1		120	1	10.00	1200.0	Cont	Y	2	
WPSC-Elmira	Mech. Rm	G2	Air Compressor	1	7 1/2	208	1	40.00	8320.0	Int	Y	3	
WPSC-Elmira	various	G2	pressure washer	1	5	208	1	28.00	5824.0	Int	N	3	
WPSC-Elmira	various	G2	welder	1		208	1	45.00	9360.0	Int	N	3	
WPSC-Elmira	Laundry	G2	Dryer	1		208	1	25.00	5200.0	Int	N	3	
WPSC-Elmira	102	G2	Vehicle Lift	1		208	1	11.00	2288.0	Int	N	3	
WPSC-Elmira	Site	G2	Well Pump	1	1	208	1	8.00	1664.0	Int	N	3	
WPSC-Elmira	Site	G2	Motorlized Gate	3	1	208	1	8.00	4992.0	Int	N	3	Include two motors operating at the same time
WPSC-Elmira	Site	G2	Condensing Unit 1	1		208	1	32.60	6780.8	Int	N	3	
WPSC-Elmira	Site	G2	Condensing Unit 2	1		208	1	26.40	5491.2	Int	N	3	
WPSC-Elmira	Site	G2	Receptacles - Ckt. Brkr/Heater	3		208	1	8.00	4992.0	Cont	Y	3	
WPSC-Elmira	Site	G2	Receptacles - Ckt. Brkr/Heater	6		120	1	1.50	1080.0	Cont	Y	3	
WPSC-Elmira	101	G2	Exhaust Fan 2	1	1 1/2	208	3	6.90	2485.8	Int	N	3	
WPSC-Elmira	Site	G2	Sewage Ejector	1	1/2	208	1	4.90	1019.2	Int	N	3	
WPSC-Elmira	Site	G2	Future Fuel Island (pumps, etc.)	2	2	208	1	50.00	10400.0	Int	N	3	
EM Amps & Load	40.53		14600.0	Step #1									
at 208V 3 phase	**Amps**		**Watts**										
G1 Amps & Load	249.15		89762.0	Step #2									
at 208V 3 phase	**Amps**		**Watts**										
G2 Amps & Load	162.32		58477.8	Step #3									
at 208V 3 phase	**Amps**		**Watts**										
Total Amps & Load	452.00		162839.8										
at 208V 3 phase	**Amps**		**Watts**										

ELECTRICAL RISER DIAGRAM

NOT TO SCALE



LOAD CALCULATIONS	VA		AMPS	NOTES
NEW PANEL #G1	78,244.0		217.2	
NEW PANEL #G2	60,951.6		169.2	
NEW PANEL #G2A	5,580.0		15.5	Included in Panel #G2
PANEL #EM	14,592.6		40.5	
TOTAL LOAD	153,788.3		426.9	

G.E.C. NOTE:
EXOTHERMIC WELD OR UL-LISTED IRREVERSIBLE CLAMPS ON ALL G.E.C. CONNECTIONS.

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

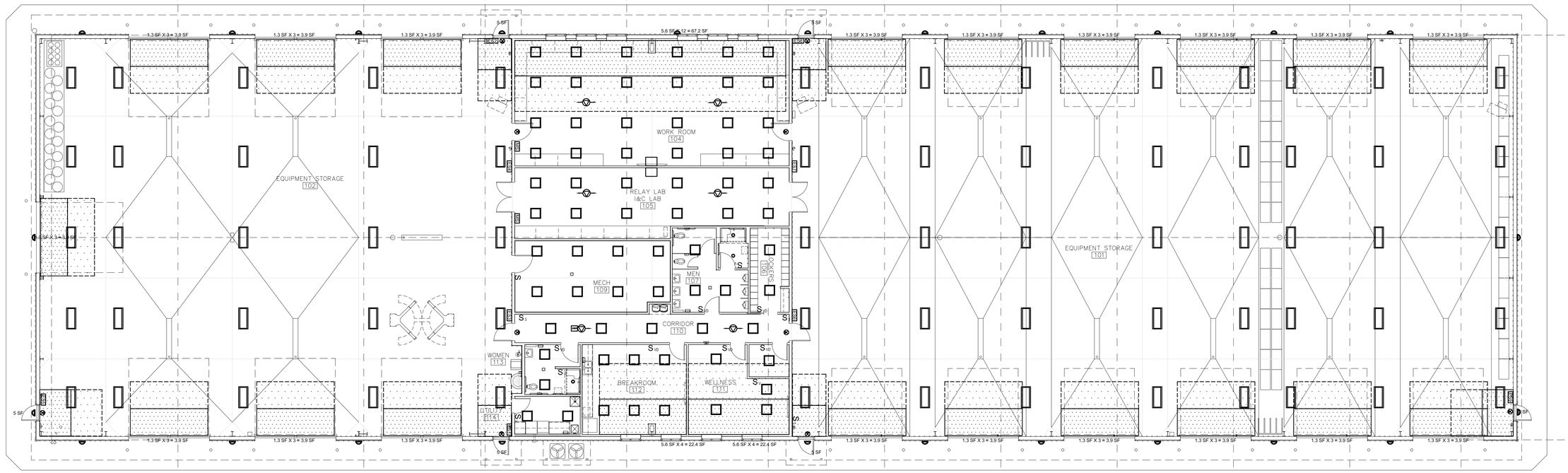
SHEET TITLE:
ELECTRICAL SCHEDULES & DETAILS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
E2



1 ELECTRICAL LIGHTING CONTROLS FLOOR PLAN
SCALE: 1" = 10'-0"

LIGHT FIXTURE SCHEDULE

Type	Mount	Description	Lumen	Temp	CRI	Watts	Volt	Dim	Manufacturer	Catalog #	Notes
A	Recessed	2x2 Troffer w/ frosted acrylic lens	3,567	4000K	85	29.4	120-277	0-10V	Metalux	22CZ-LD5-34-UNV-L840-CD1-U	
B	Recessed	Wet Location, IC Rated LED Downlight	1,000	4000K	90	13.5	120V	ELV	Halo	H750ICAT-RL560WH9940	
C	Surface	20" X 48" LED High Bay	12,067	4000K	80	71	120-277	0-10V	Metalux	HBLED-LD5-12HE-W-AI-UNV-L840-ED1-U	Suspended level with floor and @ +/-2" from bottom of the beam. See Architectural Elevations for Fixture Heights
C1	Surface	20" X 48" LED High Bay with 360° motion sensor	12,067	4000K	80	71	120-277	0-10V	Metalux	HBLED-LD5-12HE-W-AI-UNV-L840-ED1-MS360(120V)-U	Suspended level with floor and @ +/-2" from bottom of the beam. See Architectural Elevations for Fixture Heights
D	Surface	20" X 48" LED High Bay	23,577	4000K	80	146	120-277	0-10V	Metalux	HBLED-LD5-24HE-W-AI-UNV-L840-ED2-U	Suspended level with floor and @ +/-2" from bottom of the beam. See Architectural Elevations for Fixture Heights
D1	Surface	20" X 48" LED High Bay with 360° motion sensor	23,577	4000K	80	146	120-277	0-10V	Metalux	HBLED-LD5-24HE-W-AI-UNV-L840-ED2-MS360(120V)-U	Suspended level with floor and @ +/-2" from bottom of the beam. See Architectural Elevations for Fixture Heights
EX	Surface	Single Face White LED Exit, Red Letters w/EM Battery	NA	NA	NA	1	120-277	ND	Sure-Lites	APC7	Red letters with white housing
H	Ext. Wall	LED Wall Pack	8,031	4000K	80	66	120-277	ND	McGraw-Edison	GWC-AF-02-LED-E1-T2-xx-600-MS/DIM-L20	xx denotes standard finish as selected by the Architect. See Architectural Elevations for Fixture Heights. Install with a shallow depth surface mounted box, with finish to match the siding, and provide additional support (backing) due to exterior siding being ribbed. The final location of the fixtures shall be coordinated with the ribs of the siding. Fixture to dim a minimum of 30% after 15 minutes of inactivity.
H1	Ext. Wall	LED Wall Pack	4,110	4000K	80	34	120-277	ND	McGraw-Edison	GWC-AF-01-LED-E1-T2-xx-600-MS/DIM-L20	xx denotes standard finish as selected by the Architect. See Architectural Elevations for Fixture Heights. Similar notes as Type H. Fixture to dim a minimum of 30% after 15 minutes of inactivity.
J	Pole/Arm	LED Shoebox with 5" Composite Pole	11,931	4000K	80	113	120-277	ND	McGraw-Edison & Shakespeare	GLEON-AF-02-LED-E1-SL2-xx-MS/DIM-L40 & SS5A-20-xx-19	xx denotes standard finish as selected by the Architect. Provide one (1) remote configuration tool (for the project) to program the type H, H1, J and J1 light fixtures. Fixture to dim a minimum of 50% after 15 minutes of inactivity. Include hand-hole at base of pole, and at 10'-0". Pole will also have one (1) or two (2) cameras mounted to it. See sheet SE1 and SE2 for notes.
J1	Pole/Arm	LED Shoebox with 5" Composite Pole	12,794	4000K	80	113	120-277	ND	McGraw-Edison & Shakespeare	GLEON-AF-02-LED-E1-5WQ-xx-MS/DIM-L40 & SS5A-20-xx-19	xx denotes standard finish as selected by the architect. Fixture to dim a minimum of 50% after 15 minutes of inactivity. Include hand-hole at base of pole, and at 10'-0". Pole will also have one (1) or two (2) cameras mounted to it. See sheet SE1 and SE2 for notes.
J2	Pole/Arm	LED Shoebox with 5" Composite Pole	11,572	4000K	80	113	120-277	ND	McGraw-Edison & Shakespeare	GLEON-AF-02-LED-E1-SL4-xx-MS/DIM-L40 & SS5A-30-xx-19	xx denotes standard finish as selected by the architect. Fixture to dim a minimum of 50% after 15 minutes of inactivity. Include hand-hole at base of pole, and at 10'-0". Pole will also have one (1) or two (2) cameras mounted to it. See sheet SE1 and SE2 for notes.
J3	Pole/Arm	LED Shoebox with 5" Composite Pole	12,794	4000K	80	113	120-277	ND	McGraw-Edison & Shakespeare	GLEON-AF-02-LED-E1-5WQ-xx-MS/DIM-L40 & SS5A-30-xx-19	xx denotes standard finish as selected by the architect. Fixture to dim a minimum of 50% after 15 minutes of inactivity. Include hand-hole at base of pole, and at 10'-0". Pole will also have one (1) or two (2) cameras mounted to it. See sheet SE1 and SE2 for notes.
S1	Ceiling	Passive Infrared occupancy sensor - 1500 SF	N/A	N/A	N/A	N/A	120	N/A	Greengate	OAC-P-1500	Include power pack, as required
RC3DE	Surface	3-Relay, Dimming Room Controller with Emergency	N/A	N/A	N/A	N/A	120-277	0-10V	Greengate	RC3DE	Include occupancy sensors, and wall stations as noted

LIGHTING CONTROL OPERATION REQUIREMENTS

ROOM	REQUIRED CONTROL*	ORDER OF OPERATIONS	NOTES
Work Room #104, Relay Lab #105, Lockers #106, Office #108	A,B/C,D,E,H	1,2,5,6,8	Daylight harvest is not required because load in areas is less than 300W
Wellness #111, Break/Meeting #112	A,B/C,D,E,H	2,5,6,8	Daylight harvest is not required because load in areas is less than 300W
Equipment Storage #101, Equipment Storage #102	A,B/C,D,E,H/I	1,2,4,5,6,8,10	Daylight harvest is not required because load in areas is less than 300W
Mechanical #109	A	2,10	
Men's #107, Women's #113	H	3,8	
Utility #114	A,H/I	2,8	
Corridor #110	A,G,H/I	3,8,10	

*Requirements listed as X/Y indicate that either X or Y are required, but not both.

REQUIRED CONTROL LEGEND		
LABEL	REQUIREMENT	ASHRAE 2013 REF
A	Local control	9.4.1.1[a]
B	Restricted to manual ON	9.4.1.1[b]
C	Restricted to partial automatic ON	9.4.1.1[c]
D	Bilevel lighting control	9.4.1.1[d]
E	Daylight control for sidelighting	9.4.1.1[e]
F	Daylight control for toplighting	9.4.1.1[f]
G	Automatic partial OFF	9.4.1.1[g]
H	Automatic full OFF	9.4.1.1[h]
I	Scheduled shutoff	9.4.1.1[i]

ORDER OF OPERATIONS LEGEND	
LABEL	DESCRIPTION
1	Automatic partial on to 50%
2	Manual on to 100%
3	Automatic full on to 100%
4	Manual bilevel control from wallstation
5	Manual dimming from wallstation
6	Automatic daylight dimming in sidelighted areas
7	Automatic partial off to at least 50% after 20 min of inactivity
8	Automatic full off after 20 min of inactivity
9	Automatic full off scheduled at close of business hours
10	Manual full off

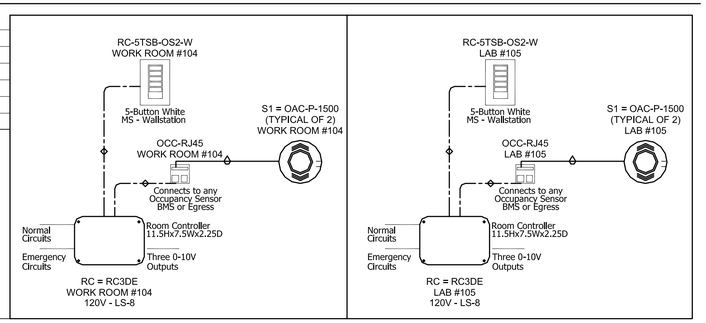
ROOM CONTROLLER DETAILS - WORK ROOM #104 & LAB #105

Cables

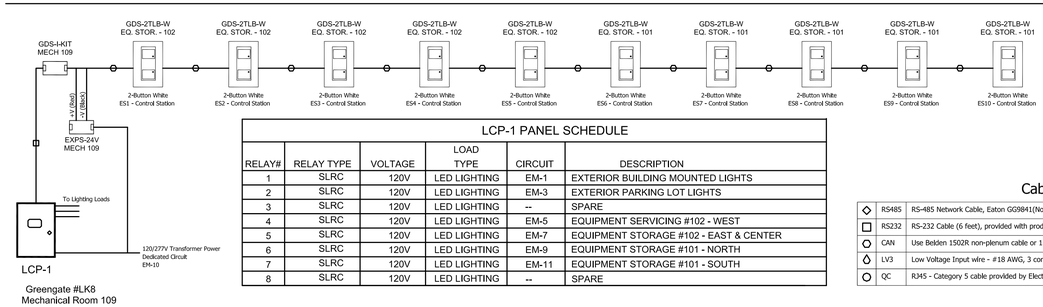
◇	RS485	RS-485 Network Cable, Eaton GG9841(Non Plenum), Eaton GG89841(Plenum) or equivalent
□	RS232	RS-232 Cable (6 feet), provided with product
○	CAN	Use Belden 1502R non-plenum cable or 1502P plenum cable.
◇	LV3	Low Voltage Input wire - #18 AWG, 3 conductor wire
○	QC	RJ45 - Category 5 cable provided by Electrical Contractor

WORK ROOM #104 & LAB #105 SEQUENCE OF OPERATIONS:

LIGHTING MANUAL CONTROLS
- TOP OR DOMINANT BUTTON HALF LIGHTS (SETS LIGHTS TO 50% OR LESS)
- FULL LIGHTS
- RAISE
- LOWER
- ALL OFF



LIGHTING CONTROL PANEL #1 DETAILS



LCP-1 PANEL SCHEDULE

RELAY#	RELAY TYPE	VOLTAGE	LOAD TYPE	CIRCUIT	DESCRIPTION
1	SLRC	120V	LED LIGHTING	EM-1	EXTERIOR BUILDING MOUNTED LIGHTS
2	SLRC	120V	LED LIGHTING	EM-3	EXTERIOR PARKING LOT LIGHTS
3	SLRC	120V	LED LIGHTING	--	SPARE
4	SLRC	120V	LED LIGHTING	EM-5	EQUIPMENT SERVICING #102 - WEST
5	SLRC	120V	LED LIGHTING	EM-7	EQUIPMENT STORAGE #102 - EAST & CENTER
6	SLRC	120V	LED LIGHTING	EM-9	EQUIPMENT STORAGE #101 - NORTH
7	SLRC	120V	LED LIGHTING	EM-11	EQUIPMENT STORAGE #101 - SOUTH
8	SLRC	120V	LED LIGHTING	--	SPARE

Cables

◇	RS485	RS-485 Network Cable, Eaton GG9841(Non Plenum), Eaton GG89841(Plenum) or equivalent
□	RS232	RS-232 Cable (6 feet), provided with product
○	CAN	Use Belden 1502R non-plenum cable or 1502P plenum cable.
◇	LV3	Low Voltage Input wire - #18 AWG, 3 conductor wire
○	QC	RJ45 - Category 5 cable provided by Electrical Contractor

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
SERVICE CENTER BUILDING
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
ELECTRICAL LIGHTING SCHEDULES & DETAILS

ENGR. PROJ.# 18101

DRAWN BY: JAV
CHECKED BY: JAV

DATE: 01.28.2021
Bidding & Construction

SHEET NUMBER
E3

ABBREVIATIONS

1-21	PANEL 1, CIRCUIT 21	KW	KILOWATTS
A	AMPERES	L	LIGHTING SYSTEM DEVICE
AC	ABOVE COUNTER	MC	MECHANICAL CONTRACTOR
AFF	ABOVE FINISH FLOOR	MCB	MAIN CIRCUIT BREAKER
AFG	ABOVE FINISH GRADE	MDP	MAIN DISTRIBUTION PANEL
BC	BELOW COUNTER	MLO	MAIN LUG ONLY
C	CONDUIT	MM	MULTIMEDIA OUTLETS (HI & LOW RECEPT. & LOW VOLT. OUTLETS)
C/B, CB	CIRCUIT BREAKER	NL	NIGHT LIGHT
DF	DRINK'G FOUNTAIN/H20 COOLER	NTS	NOT TO SCALE
DWG	DRAWING	P	PUMP
E	EXISTING TO REMAIN	PNL	PANEL
EC	ELECTRICAL CONTRACTOR	PS	PRIMARY SWITCH
EF	EXHAUST FAN	PT	PRIMARY TRANSFORMER
EGC	EQUIPMENT GROUNDING CONDUCTOR	PVC	POLYVINYL CHLORIDE
EH	ELECTRIC HEATER	Q	QUAD-PLEX (DOUBLE DUPLEX)
EMT	ELECTRICAL METALLIC TUBING	RGS	RIGID GALVANIZED STEEL
ERV	ENERGY RECOVERY VENTILATOR	S	SOUND SYSTEM DEVICE
E-R	EXISTING TO BE RELOCATED	TR	TAMPER RESISTANT
ETR	EXISTING TO REMAIN	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
EWC	ELECTRIC WATER COOLER	UGRD	UNDERGROUND
EWH	ELECTRIC WATER HEATER	UON	UNLESS OTHERWISE NOTED
G	GROUND	V	VOLT
GEC	GROUNDING ELECTRODE CONDUCTOR	VFD	VARIABLE FREQUENCY DRIVE
GFI	GROUND FAULT CIRCUIT INTERRUPTER	W	WIRE
GTD	GENERATOR TRANSFER DEVICE	WG	WIREGUARD
HOR	HORIZONTAL	WP	WEATHERPROOF
KCMIL	THOUSAND CIRCULAR MILS	XFMR	TRANSFORMER
KVA	KILOVOLT-AMPERES		

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION	NOTES
S	20 AMP SINGLE POLE SWITCH DECORATOR STYLE	MOUNT @ 44" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
X	1'x4' FIXTURE, TYPE X	SEE LIGHTING FIXTURE SCHEDULE FOR TYPES
	DUPLEX OUTLET - 20 AMP - GROUND FAULT	MOUNT @ 16" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
WP	WR GFCI DUPLEX OUTLET WITH WEATHER PROOF IN-USE COVER	MOUNT @ 24" A.F.F. TO BOTTOM OF BOX, UNLESS OTHERWISE NOTED
	SINGLE-PHASE SPECIAL PURPOSE OUTLET, AS NOTED	REFER TO SHOP DRAWINGS FOR CONNECTION REQUIREMENTS
	SINGLE-PHASE MOTOR, AS SPECIFIED	
	SINGLE-PHASE FUSED OR NON-FUSED DISCONNECT	
SM	MOTOR TOGGLE SWITCH WITH THERMAL OVERLOAD AND LOCKOUT	SQUARE D #CLASS 2510 FGJ5P (SINGLE POLE)
J	JUNCTION BOX	
	3Ø BRANCH CIRCUIT PANELS (120/208V-3Ø-4W)	REFER TO SPECIFICATIONS AND RISER DIAGRAM.
FAP	FIRE ALARM CONTROL PANEL	MOUNT @ 44" A.F.F.
RA	FIRE ALARM REMOTE ANNUNCIATOR	MOUNT @ 44" A.F.F.
F	FIRE ALARM PULL STATION	MOUNT @ 44" A.F.F.
	FIRE ALARM WALL MOUNTED AUDIBLE/VISUAL DEVICE	MOUNT @ MIN. 80", MAX. 96" A.F.F.
SD	FIRE ALARM SMOKE DETECTOR	
TS	FIRE SUPPRESSION TAMPER SWITCH	SUPPLIED BY OTHERS
SP	FIRE SUPPRESSION FLOW SWITCH	SUPPLIED BY OTHERS
	OVERHEAD ELECTRICAL CONDUIT, SIZED AS SHOWN	OHE
	UNDERGROUND ELECTRICAL CONDUIT, SIZED AS SHOWN	UGE
	OVERHEAD TELEPHONE CONDUIT, SIZED AS SHOWN	OHT
	UNDERGROUND TELEPHONE CONDUIT, SIZED AS SHOWN	UGT

PANEL #PH

100A MCB, 120/240V-1Ø-3W
SQ.D NQ - SURFACE MTD.

CIR.	CB/P	DESCRIPTION	LOAD	P	LOAD	DESCRIPTION	CB/P	CIR.
1	15/2*	WELL PUMP (2 HP)	2880	A	62	LIGHTS - INTERIOR & EXTERIOR	20/1	2
3				B	360	RECEPTACLES - INTERIOR & EXTERIOR	20/1	4
5	35/2	ELECTRIC HEATER	7500	A	1000	FIRE PUMP BATTERY CHARGER & LOUVE	20/1	6
7				B	---	SPARE	20/1	8
9	15/2*	FUTURE WELL PUMP (2 HP)	2880	A	1000	FIRE SUPPRESSION MONITORING SYS.	20/1 B	10
11				B	---	SPARE	20/1	12
13	25/2*	JOCKEY PUMP (2 HP)	2880	A	---	SPARE	20/1	14
15				B	---	SPACE	--	16
17	--	SPACE	---	A	---	SPACE	--	18
19	--	SPACE	---	B	---	SPACE	--	20

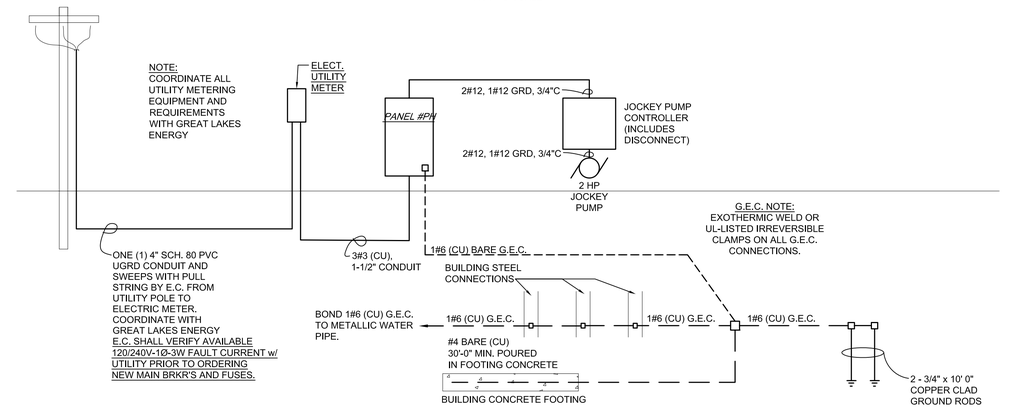
LIGHTS	77.5	VA		
RECEPTS.	360	VA	TOTAL CALCULATED LOAD:	
MOTORS	5760	VA	15.7	kVA
MISC	9500	VA	65.4	A

FIRE PUMP NOTES

1. FIRE PUMP CONTROLLER TO BE LOCKABLE IN THE CLOSED POSITION, PROVIDE A PLACARD INDICATING THE LOCATION OF KEY.
2. ALL CONTROL VALVES FOR SPRINKLER RISER TO BE SUPERVISED BY THE BUILDING FIRE ALARM SYSTEM.
3. CONNECT FLOW DETECTOR & PRESSURE ALARM SWITCH TO BUILDING FIRE ALARM SYSTEM.
4. THE FIRE PUMP CONTROLLER SHALL BE SUPERVISED BY THE BUILDING FIRE ALARM SYSTEM. THE FUNCTIONS TO BE SUPERVISED SHALL BE PUMP RUNNING, PUMP OFF, PHASE REVERSAL, PHASE LOSS, WATER TANK LEVEL, DIESEL TANK LEVEL, DIESEL FIRE PUMP BATTERIES, AND BUILDING TEMPERATURE.

ELECTRICAL RISER DIAGRAM

NOT TO SCALE



WIRE SIZE REQUIREMENTS

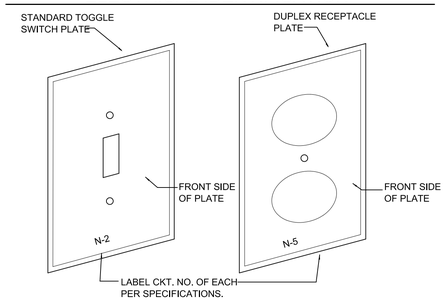
NOTE:
BASED ON A MAXIMUM OF 3.6-VOLT DROP (3%) ON 120V CIRCUITS.
WIRES FOR RUNS OVER 100'-0" SHALL BE DETERMINED ON THIS A MAXIMUM OF A 3% DROP ALLOWED.

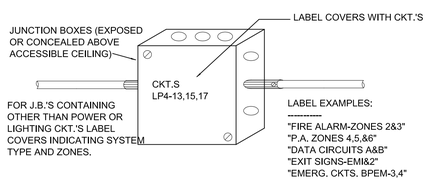
BRANCH CIRCUIT AMPS	LENGTH OF RUN - FROM PANEL TO FIRST CONNECTION - FEET								
AMPS	50'	60'	70'	80'	90'	100'	110'	120'	130'
15	#12	#12	#12	#10	#10	#10	#10	#10	#8
20	#12	#10	#10	#10	#10	#8	#8	#8	#8
30	#10	#10	#8	#8	#8	#6	#6	#6	#6

NOTES:

1. CAUTION !!!!!!!!
   E.C. SHALL VERIFY ALL ROUGH-IN ELEVATIONS, LOCATIONS AND/OR HEIGHTS OF ALL LIGHT FIXTURES, RECEPTACLE OUTLETS, T.V., COMPUTER, CLOCK OUTLETS, ETC. WITH ARCHITECT/ENGINEER. FAILURE TO DO SO WILL REQUIRE E.C. TO RELOCATE RESPECTIVE ITEMS AT THE E.C.'S EXPENSE.
2. PROVIDE KEVLAR PULL STRINGS IN ALL SPARE CONDUITS.
3. E.C. SHALL COORDINATE FEEDER ROUTING WITH PLUMBING, MECHANICAL AND LOW VOLTAGE CONTRACTORS.
4. ANY NEW CONDUIT PENETRATIONS THROUGH WALLS SHALL BE APPROPRIATELY FIRE-STOPPED, SMOKE-STOPPED OR CAULKED WHEN PENETRATION SIZE EXCEEDS CONDUIT SIZE OR AS WORK SCOPES NOTE.

ELECTRICAL IDENTIFICATION





LIGHT FIXTURE SCHEDULE

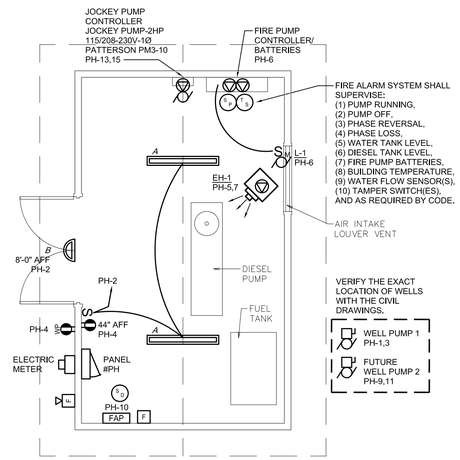
Type	Mount	Description	Lumen	Temp	CRI	Watts	Volt	Dim	Manufacturer	Catalog #	Notes
A	Surface	4' LED Semi-Frost Striplight	3,463	4000K	80	25	120-277	0-10V	Metalux	4SNLED-LD5-34SL-LN-UNV-L840-CD1-U	
B	Ext. Wall	LED Wall Pack	1,327	3000K	70+	12	120-277	No Dim	Lumark	XTOR-1B-Y-xx-PCI	xx Denotes standard finish as selected by the Architect. Includes integral photocell

LOUVER REGISTER SCHEDULE

TAG	DESCRIPTION				MANUFACTURER AND MODEL	MATERIAL	COLOR & FINISH	AIRFLOW (CFM)	VELOCITY (FPM)	APD (IN WG)	NOTES
	TYPE/SERVICE	FLANGE	THICKNESS (IN)	SIZE (IN)							
L-1	STATIONARY EXTRUDED LOUVER WITH DRAINABLE BLADES AND 1/4" BIRD SCREEN	YES	4"	12X12 (NOMINAL)	RUSKIN ELF445D	ALUMINUM	VERIFY W/ ARCHITECT	182	550	0.06"	FURNISH WITH ELECTRIC MOTORIZED DAMPER, INTERLOCKED WITH DIESEL PUMP

ELECTRIC UNIT HEATER SCHEDULE

TAG	LOCATION	MANUFACTURER AND MODEL	AIRFLOW (CFM)	DIMENSIONS (IN.)			ELECTRICAL DATA		CONTROL DATA	NOTES:
				W	H	D	VOLTAGE	WATTS		
EH-1	PUMP HOUSE	MODINE MODEL HER-75	530	16-7/8	20-7/8	20-1/4	240/60/1	7500	BUILT-IN THERMOSTAT	CONTRACTOR TO PROVIDE ALL NECESSARY MOUNTING HARDWARE, STRUT, HANGERS, ETC. FURNISH WITH BACKDRAFT DAMPER



1 MECHANICAL & ELECTRICAL FLOOR PLAN
SCALE: 1/4" = 1'-0"

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com
nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
PUMP HOUSE
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3N - R05W)
WARNER TOWNSHIP, ANTRIM COUNTY

SHEET TITLE:
MECHANICAL/ELECTRICAL FLOOR PLAN, SCHEDULES & DETAILS

ENGR. PROJ.# 18101

DRAWN BY: WDH/JAV
CHECKED BY: WDH/JAV

DATE: 01.28.2021 Bidding & Construction

SHEET NUMBER
ME1

ELECTRICAL SPECIFICATIONS

SECTION	
260000 BASIC ELECTRICAL REQUIREMENTS	1. PRIOR TO SUBMITTING A PROPOSAL, BIDDER SHALL HAVE VISITED THE CONSTRUCTION SITE. HE SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH HE WILL HAVE TO OPERATE AND WHICH WILL IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT. NO SUBSEQUENT ALLOWANCE WILL BE MADE IN THIS CONNECTION ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART. 2. ELECTRICAL WORK SHALL COMPLY WITH THE LATEST ENFORCEABLE EDITION OF THE N.E.C., LOCAL AND STATE CODES, ORDINANCES, REGULATIONS, INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), AND ADA GUIDELINES WITH THE LOCAL CODE AUTHORITIES HAVING JURISDICTION. 3. ELECTRICAL CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF ELECTRICAL WORK, THE ELECTRICAL CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTION AND APPROVALS. 4. THE CONTRACTOR SHALL EMPLOY QUALIFIED AND EXPERIENCED WORKMEN FOR THIS WORK. 5. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT ELECTRIC UTILITY COMPANIES SERVICE POINTS AND PRIMARY SERVICE CONDUIT, ROUTING, AND SIZE WITH UTILITY COMPANY SERVICE PLANNERS/ENGINEERS PRIOR TO BEGINNING WORK. FAULT CURRENT WAS NOT AVAILABLE AT THE TIME OF DRAWING CREATION. E.C. SHALL COORDINATE WITH GREAT LAKES ENERGY THE CIRCUIT BREAKER AIC RATINGS WITH THE AVAILABLE FAULT CURRENT. 6. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL NEW ELECTRICAL UNDERGROUND WORK WITH EXISTING AND NEW UTILITIES PRIOR TO INSTALLATION. CONTACT MISS-DIG AT '811 7. ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER HIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER. SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AT NO EXPENSE TO THE OWNER. 8. THE ELECTRICAL CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO (2) HOURS OF TRAINING AS NECESSARY TO THE OWNER ON THE LIGHTING CONTROLS AND ALL OTHER ELECTRICAL EQUIPMENT AND/OR DEVICES. 9. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL OPERATING AND MAINTENANCE INSTRUCTION MANUALS, CERTIFICATES OF INSPECTION, TEST REPORTS, SPARE PARTS, AND RECORD DRAWINGS (AS-BUILTS) TO THE OWNER PRIOR TO CLOSEOUT. DOCUMENT ALL CHANGES ON FINAL AS-BUILT DRAWINGS AS REQUIRED. FINAL PAYMENT WILL ONLY BE MADE AFTER THE FINAL PUNCH LIST COMPLETION AND RECEIPT OF THE ABOVE CLOSEOUT DOCUMENTATION. 10. **THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE OWNER TO COMPLETE THE NECESSARY DOCUMENTATION FOR ELIGIBLE ENERGY REBATES FROM THE ELECTRICAL UTILITY AS A RESULT OF THIS PROJECT.** 11. ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCES BETWEEN HIS WORK AND THE WORK OF OTHER BUILDING TRADES. IF ANY DISCREPANCIES OCCUR, CONSULT WITH THE ENGINEER AND/OR OWNER BEFORE CONTINUING. 12. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR THE PROPER RESTORATION OF ALL EXISTING SURFACES REQUIRING PATCHING, PLASTERING, PAINTING AND/OR REPAIR DUE TO THE INSTALLATION OF ELECTRICAL WORK UNDER THE TERMS OF THIS SPECIFICATION. CLOSE ALL OPENINGS, REPAIR ALL SURFACES, ETC. AS REQUIRED. 13. CUTTING AND/OR PATCHING THAT MAY BE REQUIRED FOR THE INSTALLATION OF THE ELECTRICAL SYSTEM(S) SHALL BE DONE AND/OR REPAIRED BY THE ELECTRICAL CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE DONE WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT. 14. THE ELECTRICAL CONTRACTOR SHALL PERIODICALLY REMOVE FROM THE SITE ALL DEBRIS AND RUBBISH ACCUMULATING AS A RESULT OF THE ELECTRICAL INSTALLATION. UPON COMPLETION OF THE PROJECT, HE SHALL DISPOSE OF ALL DEBRIS AND RUBBISH AND SHALL LEAVE ALL AREAS CLEAN. THE INTERIORS OF ALL CABINETS, PULL BOXES, AND EQUIPMENT ENCLOSURES SHALL BE FREE OF ANY DEBRIS. 15. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND SHALL WORK WITH EXISTING SYSTEMS IN AN "AS FOUND" CONDITION. 16. DRAWINGS ARE DIAGRAMMATIC ONLY AND SHOW OBSERVATIONS FROM CASUAL FIELD INVESTIGATIONS AND EXISTING DRAWINGS. FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND MOUNTING LOCATIONS. NOTIFY ENGINEER IF ANY DISCREPANCIES ARE FOUND THAT AFFECT THE WORK TO BE PERFORMED, PRIOR TO PROCEEDING. 17. ELECTRICAL JOINTS WILL BE PERMITTED ONLY IN JUNCTION AND OUTLET BOXES. ALL JOINTS SHALL BE FIRMLY BONDED TOGETHER AND TAPED OR SHALL BE MADE WITH MECHANICAL CONNECTORS. 18. ELECTRICAL MATERIALS SHALL BE NEW, AND BEAR THE "UL" LABEL OR LISTING. 19. WITHIN THIRTY (30) DAYS AFTER THE ELECTRICAL CONTRACTOR HAS BEEN NOTIFIED TO PROCEED WITH THE WORK, HE SHALL SUBMIT TO THE OWNER EIGHT (8) HARD COPIES OR ONE (1) ELECTRONIC (PDF) COPY OF EACH OF THE FOLLOWING DRAWINGS AND DATA SHEETS FOR REVIEW. ALL EQUIPMENT FOR WHICH SHOP DRAWINGS ARE BEING SUBMITTED SHALL NOT BE ORDERED UNTIL APPROVED DRAWINGS HAVE BEEN RETURNED. SUCH SUBMITTALS SHALL INCLUDE: * WIRING DEVICES * LIGHT FIXTURES AND LIGHTING CONTROLS * DISTRIBUTION EQUIPMENT, INCLUDING DISCONNECT SWITCHES, MOTOR TOGGLE SWITCHES, PANELBOARDS, ETC. 20. BRANCH CIRCUIT WIRE SHALL BE COPPER, RATED 75°C, MINIMUM SIZE #12 AWG, AND BE: (A) TYPE 'MC', 'AC' CABLE (6 FT. MAXIMUM UNLESS OTHERWISE NOTED OR APPROVED BY THE ARCHITECT/ENGINEER/OWNER) TO BE USED FOR FINAL CONNECTIONS TO LIGHT FIXTURES AND PLUMBING.MECHANICAL HVAC EQUIPMENT FROM THE DISCONNECT SWITCH TO THE EQUIPMENT, AND (B) TYPE "THHN", "THWN OR "THWN-2" AND INSTALLED IN CONDUIT (EMT, FOR INDOOR USE; SCHEDULE 40 PVC OR SCHEDULE 80 PVC, WHERE SUBJECT TO DAMAGE, FOR INDOOR WET LOCATIONS, AND SCHEDULE 40 PVC OR RMC FOR OUTDOOR USE, MINIMUM SIZE 1/2", OR (C) UNLESS OTHERWISE NOTED OR REQUIRED BY CODE. FEEDERS AND SECONDARY SERVICE CONDUCTORS SHALL BE STRANDED COPPER WITH 600 VOLT INSULATION, RATED 90°C, AND BE: (A) TYPE "THHN", "THWN" OR "THWN-2" AND BE INSTALLED IN EMT OR PVC CONDUIT, MINIMUM SIZE 1/2" (B) UNLESS OTHERWISE NOTED OR REQUIRED BY CODE INTERIOR MOTOR CONNECTIONS SHALL BE TYPE "MC" OR "AC" CABLE OR LIQUID TITE FLEXIBLE CONDUIT (BOTH WITH A 6FT. MAXIMUM LENGTH). ALL WIRE AND CABLE SHALL BE NEW AND SHALL BE DELIVERED TO PROJECT IN UNBROKEN AND UNDAMAGED CARTONS AND/OR REELS. ALL NEW BRANCH WIRING SHALL BE COLOR CODED BY THE FOLLOWING VOLTAGE SYSTEMS AND LABELED AT THEIR SOURCE PER 2014 NEC SECTION #210.5: <u>120/208V-3Ø-4W SYSTEM:</u> ØA - BLACK ØB - RED ØC - BLUE NEUTRAL - WHITE E.G.C. - GREEN <u>277/480V-3Ø-4W SYSTEM:</u> ØA - BROWN ØB - ORANGE ØC - YELLOW NEUTRAL - GRAY E.G.C. - GREEN 21. <u>ALL CONDUIT AND JUNCTION BOXES SHALL BE APPROPRIATELY MARKED WITH THE CIRCUITS THEY CONTAIN AND A DESIGNATION THAT IT IS CONTAINING ELECTRICAL CONDUCTORS.</u> 22. UNDERGROUND CONDUIT TO BE SCHEDULE 40 PVC OR SCHEDULE 80 PVC WHERE SUBJECT TO PHYSICAL DAMAGE. 23. FUSES SHALL BE "UL" LISTED, DUAL-ELEMENT AS MANUFACTURED BY BUSSMAN CO., OR APPROVED EQUAL (200,000 AIC). 24. SWITCHES SHALL BE RATED 20A, 120/277V, COMMERCIAL SPECIFICATION GRADE, SINGLE, DOUBLE-POLE, THREE-WAY, ETC. AS INDICATED, AND EQUAL TO HUBBELL, GE, LEVITON, COOPER, ARROW-HART OR P&S. 25. RECEPTACLES SHALL BE RATED 20A, 125AMP, COMMERCIAL GRADE GROUNDED TYPE (NEMA 5-20R), EQUAL TO HUBBELL, GE, LEVITON, COOPER, ARROW-HART OR P&S. <u>ALL RECEPTACLES IN THE SLEEPING ROOMS ARE TO BE TAMPER-RESISTANT. ALL RECEPTACLES FED FROM THE GENERATOR PANEL SHALL BE RED IN COLOR.</u> 26. PLATES FOR SWITCHES AND RECEPTACLES SHALL BE BRUSHED STAINLESS STEEL. <u>COORDINATE DEVICE COLOR WITH OWNER/ARCHITECT.</u> 27. ALL LIGHT FIXTURES HAVE BEEN SELECTED BY THE ENGINEER FOR THE BASIS OF DESIGN AND APPEARANCE. ALTERNATE FIXTURE MANUFACTURERS MUST SUBMIT FIXTURE APPROVAL SUBMITTAL A MINIMUM OF 10 DAYS PRIOR TO THE BID DUE DATE FOR THE ENGINEER TO REVIEW. 28. PROJECT HAS BEEN DESIGNED TO COMPLY WITH AUTOMATIC LIGHTING SHUTOFF REQUIREMENTS OF ASHRAE 90.1-2013. AUTOMATIC LIGHTING CONTROLS SHALL BE PROVIDED AS SHOWN PER THE FLOOR PLANS AND SPECIFICATIONS. ASHRAE LIGHTING DOCUMENTATION CAN BE PROVIDED BY THE ENGINEER UPON REQUEST. 29. LIGHTING IN MECHANICAL ROOMS IS DIAGRAMMATIC INDICATING TYPE, QUANTITY AND GENERAL CIRCUIT OF FIXTURES. MODIFY LOCATIONS AND MOUNT TO SUIT CONDITIONS, ALLOWING CLEARANCE FOR EQUIPMENT, PIPING AND DUCTWORK. 30. DISCONNECT SWITCHES SHALL BE RATED 250V, OR 600V, FUSED OR NON-FUSED AS NOTED, HEAVY-DUTY, NEMA-1, FOR INDOOR USE, AND NEMA-3R FOR OUTDOOR USE BY SQUARE D OR SIMILAR. 31. SINGLE PHASE MOTOR STARTERS SHALL HAVE MANUAL TOGGLE SWITCH WITH THERMAL OVERLOADS AND PILOT LIGHT, SURFACE OR FLUSH MOUNTED AS NOTED BY SQUARE D CLASS 2510 OR SIMILAR. 32. PANELBOARDS SHALL BE RATED 120/240V, 1 PHASE, 3W, AS NOTED WITH PLUG-IN/BOLT-ON TYPE BRANCH CIRCUIT BREAKERS RATED A MINIMUM OF 10,000 A.I.C. (VERIFY WITH UTILITY & SEE NOTE #5). PANELBOARDS SHALL BE SIMILAR TO SQUARE D, TYPE QO SERIES, AS NOTED IN THE PANEL SCHEDULES. 33. A FIRE ALARM SIGNALING SYSTEM SHALL CONSIST OF ALL LABOR, EQUIPMENT, MATERIALS AND SERVICES TO FURNISH AND INSTALL SMOKE DETECTOR(S), CONTROL PANEL(S), INITIATING, MONITORING, CONTROL, SUPERVISORY AND NOTIFICATION DEVICES, INCLUDING BUT NOT LIMITED TO CONTROL AND MONITORING OF THE FIRE PUMP CONTROLLER, ALL SUPPRESSION SYSTEM WATER FLOR AND TAMPER SWITCHES, TANK FLOATS, LOW TEMPERATURE SENSORS, AND OTHER EQUIPMENT AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS, FOR THE FIRE ALARM SYSTEM, AS WELL AS ALL MISCELLANEOUS ANNUNCIATORS/ALARMS, HARDWARE, SOFTWARE AND EQUIPMENT FOR A COMPLETE, OPERATIONAL AND APPROVED SYSTEM. THE FIRE PUMP CONTROLLER, TANK FLOATS AND OTHER FIRE SUPPRESSION DEVICES ARE TO BE PROVIDED BY OTHER CONTRACTORS. IT SHALL BE COMPLETE WITH ALL NECESSARY HARDWARE, SOFTWARE, MEMORY AND MONITORING EQUIPMENT FOR AN OFF-SITE CENTRAL MONITORING AGENCY. THE SYSTEM SHALL BE INSTALLED AND SATISFY ALL APPLICABLE CODES, INCLUDING BUT NOT LIMITED TO NFPA 72 AND 101, NEC, AND ALL LOCAL CODES. THE BASIS OF DESIGN FOR THE MATERIALS USED FOR THIS SYSTEM ARE THOSE OF EDWARDS SYSTEMS TECHNOLOGY (EST), AND CONSTITUTE THE TYPE AND QUALITY OF EQUIPMENT TO BE FURNISHED. THE LOW TEMPERATURE SENSOR SHALL BE WINLAND ELECTRONICS MTA-1. THE SYSTEM SHALL BE INSTALLED AND FULLY TESTED UNDER THE SUPERVISION OF A TRAINED MANUFACTURER'S REPRESENTATIVE. THE SYSTEM SHALL BE DEMONSTRATED TO PERFORM ALL OF THE FUNCTIONS AS SPECIFIED. TEST EACH INDIVIDUAL SYSTEM OPERATION ON A CIRCUIT BY CIRCUIT BASIS FOR ITS COMPLETE OPERATION. THE CONTRACTOR SHALL PROVIDE THE SERVICES OF THE MANUFACTURER'S TRAINED REPRESENTATIVE FOR A PERIOD OF TWO (2) HOURS TO INSTRUCT THE OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE ENTIRE SYSTEM. <u>THE INSTALLING COMPANY SHALL PREPARE AND SUBMIT APPROPRIATE PLANS AND DOCUMENTATION FOR PLAN REVIEW(S) TO THE AUTHORITY(IES) HAVING JURISDICTION. ALL ASSOCIATED PLAN REVIEW FEES SHALL BE INCLUDED.</u> 34. FIRE CAULKING REQUIRED WHERE ANY PENETRATIONS ARE MADE THROUGH FIRE RATED WALLS, BY, E.C. 35. PROVIDE AN UPDATED, AND ACCURATE PANEL SCHEDULE FOR THE ELECTRICAL PANEL(S) THAT ARE AFFECTED BY THE WORK IN THIS PROJECT. DOCUMENT ALL CHANGES ON FINAL AS-BUILT DRAWINGS AS REQUIRED. 36. ALL NEW EQUIPMENT (DISCONNECTS, VARIABLE FREQUENCY DRIVES (VFD), ETC.) IDENTIFICATION SHALL BE APPROPRIATELY IDENTIFIED.

MECHANICAL SPECIFICATIONS

SECTION	
23 00 00 BASIC MECHANICAL REQUIREMENTS	1. ALL WORK TO BE DONE AND MATERIALS FURNISHED COMPLYING WITH APPLICABLE LAWS AND REGULATIONS, INCLUDING THE 2015 MICHIGAN MECHANICAL CODE (M.M.C.), ASHRAE 90.1-2013 "ENERGY STANDARDS FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS", ASHRAE 62.1-2013 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY", 2015 INTERNATIONAL PLUMBING CODE (M.P.C.), CURRENTLY ENFORCED MICHIGAN BUILDING CODE (M.B.C.), AND LOCAL, STATE, AND FEDERAL FIRE SAFETY CODES (NFPA). 2. ALL MATERIALS USED SHALL BE NEW AND UNDAMAGED. 3. ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH CURRENT CONSTRUCTION INDUSTRY STANDARDS AND WORKMANSHIP. 4. LABEL PIPING AND EQUIPMENT USING PROFESSIONAL MARKERS PER ASME A13.1-1996: 4.1. PROVIDE PROFESSIONAL PIPE STICKERS ON ALL NEW PIPING 1" AND GREATER IDENTIFYING TYPE AND DIRECTION OF FLOW. 5. PROVIDE PROFESSIONAL ENGRAVED PLASTIC EQUIPMENT NAMEPLATES FOR ALL HVAC EQUIPMENT IDENTIFYING EQUIPMENT TAG AND NUMBER. SEE PLANS FOR EQUIPMENT TAG NUMBERS 6. FURNISH ALL ACCESS DOORS (RATED OR NON-RATED AS REQUIRED) WHERE VALVES OR EQUIPMENT ARE CONCEALED BEHIND A NON-ACCESSIBLE CEILING OR WALL. FURNISH ACCESS DOORS TO GENERAL CONTRACTOR FOR INSTALLATION. 7. FURNISH STEEL SLEEVES WHERE PIPES PENETRATE RATED WALLS. PROVIDE FIRESTOPPING MATERIALS AND SYSTEM TO MAINTAIN THE REQUIRED RATING OF THE WALL PENETRATED. PROVIDE SHOP DRAWINGS SHOWING LISTING AND RATING OF FIRESTOPPING MATERIALS. 8. AT SUBSTANTIAL COMPLETION OF CONSTRUCTION, FURNISH AS-BUILT PLANS TO ARCH/ENGINEER FOR APPROVAL BEFORE THEY ARE TURNED OVER TO THE OWNER. 9. THE CONTRACTOR SHALL ARRANGE TO MEET AND INSTRUCT THE OWNER IN THE USE AND MAINTENANCE OF SYSTEMS AND EQUIPMENT. THIS INSTRUCTION SHALL BE FOR A MINIMUM OF (4) HOURS. AN ADDITIONAL (2) HOURS OF INSTRUCTION FOR THE OWNER WILL BE GIVEN IN THE OPERATION OF THE TEMPERATURE CONTROLS BY THE INSTALLER OF THE TEMPERATURE CONTROLS. 10. ALL MANUFACTURED EQUIPMENT, ACCESSORIES AND MATERIALS SHALL BE USED AS INTENDED BY THE MANUFACTURER, IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS. 11. THE CONTRACTOR SHALL PROVIDE, IN ADDITION TO ANY OTHER WARRANTIES SPECIFIED, A ONE (1) YEAR FULL LABOR AND MATERIAL WARRANTY ON ALL WORKMANSHIP, MATERIAL AND EQUIPMENT FURNISHED FOR THIS PROJECT. 12. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL OPENINGS AND REQUIRED LINTELS NEEDED FOR THE GENERAL CONTRACTOR FOR THE INSTALLATION OF MECHANICAL EQUIPMENT. 13. SAWCUTS, LINTELS, HEADERS, AND STRUCTURAL MODIFICATIONS TO THE BUILDING STRUCTURE NEEDED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT SHALL BE APPROVED BY THE GENERAL CONTRACTOR, BEFORE INSTALLATION. 14. IN GENERAL, OPENINGS AND REQUIRED LINTELS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING DETAILS AND TEMPLATES OF ALL OPENINGS NECESSARY FOR MECHANICAL EQUIPMENT INSTALLATION INCLUDING: HOUSING, ACCESS DOORS, INSPECTION DOORS, AND PASSAGEWAYS FOR MECHANICAL EQUIPMENT. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SEALING CRACKS AND FINISHING ROUGH EDGES LEFT FOLLOWING MECHANICAL INSTALLATION. 15. THE USE OF THE MECHANICAL EQUIPMENT FOR HEATING, COOLING, OR DRYING DURING CONSTRUCTION IS PROHIBITED, UNLESS APPROVED BY WRITTEN DOCUMENTATION BY THE OWNER. 16. APPROVED EQUALS: MECHANICAL EQUIPMENT MANUFACTURED BY A COMPANY OTHER THAN THAT WHICH WAS SPECIFIED IN THE SCHEDULE MAY BE SUBSTITUTED BY APPROVED SHOP DRAWINGS CONTINENT UPON MEETING THE DESIGN, APPEARANCE, AND FUNCTIONAL STANDARDS ESTABLISHED BY THE ORIGINALLY SPECIFIED ITEM(S). THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING DIMENSIONS, CLEARANCES, ASSEMBLY, FIT, ETC. OF THE APPROVED EQUAL(S) AND THEIR AFFECT ON OTHER EQUIPMENT FIT AND OPERATION. THE MECH. CONTRACTOR IS LIABLE FOR ANY ADDED COSTS TO HIMSELF OR OTHERS CAUSED BY THE APPROVED EQUALS. 17. SUBMITTALS 17.1. FURNISH SHOP DRAWINGS TO ARCH/ENGINEER FOR APPROVAL PRIOR TO PLACING DELIVERY ORDERS. PROVIDE SHOP DRAWINGS OF ALL MANUFACTURED EQUIPMENT AND MATERIALS EXCEPT PIPE, PIPE FITTINGS, AND GALVANIZED DUCTWORK. 17.2. AT SUBSTANTIAL COMPLETION OF CONSTRUCTION, FURNISH AS-BUILT PLANS TO ARCH/ENGINEER FOR APPROVAL, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, APPROVED AS-BUILT PLANS SHALL BE PROVIDED TO THE BUILDING OWNER. RECORD DRAWINGS SHALL INCLUDE, AS A MINIMUM, THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES. 17.3. AN OPERATING MANUAL AND MAINTENANCE MANUAL SHALL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF SYSTEM ACCEPTANCE. THESE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT THE MINIMUM: 17.3.1. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. 17.3.2. OPERATION AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. 17.3.3. NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY. 17.3.4. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR IN PROGRAMMING COMMENTS. 17.3.5. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET POINTS.

830 Cottageview Dr., Suite 102
Traverse City, MI 49684
P 231.933.0510 F 231.933.3215
W www.nealisengineering.com

nealis ENGINEERING
MECHANICAL - ELECTRICAL - PLUMBING

PROJECT TITLE:
WOLVERINE POWER SUPPLY COOPERATIVE, INC.
PUMP HOUSE
HIGHWAY M-32, ELMIRA, MI (PART OF SE 1/4, SECT 24, T3IN - RO5W)
WARNER TOWNSHIP, ANTRIM COUNTY

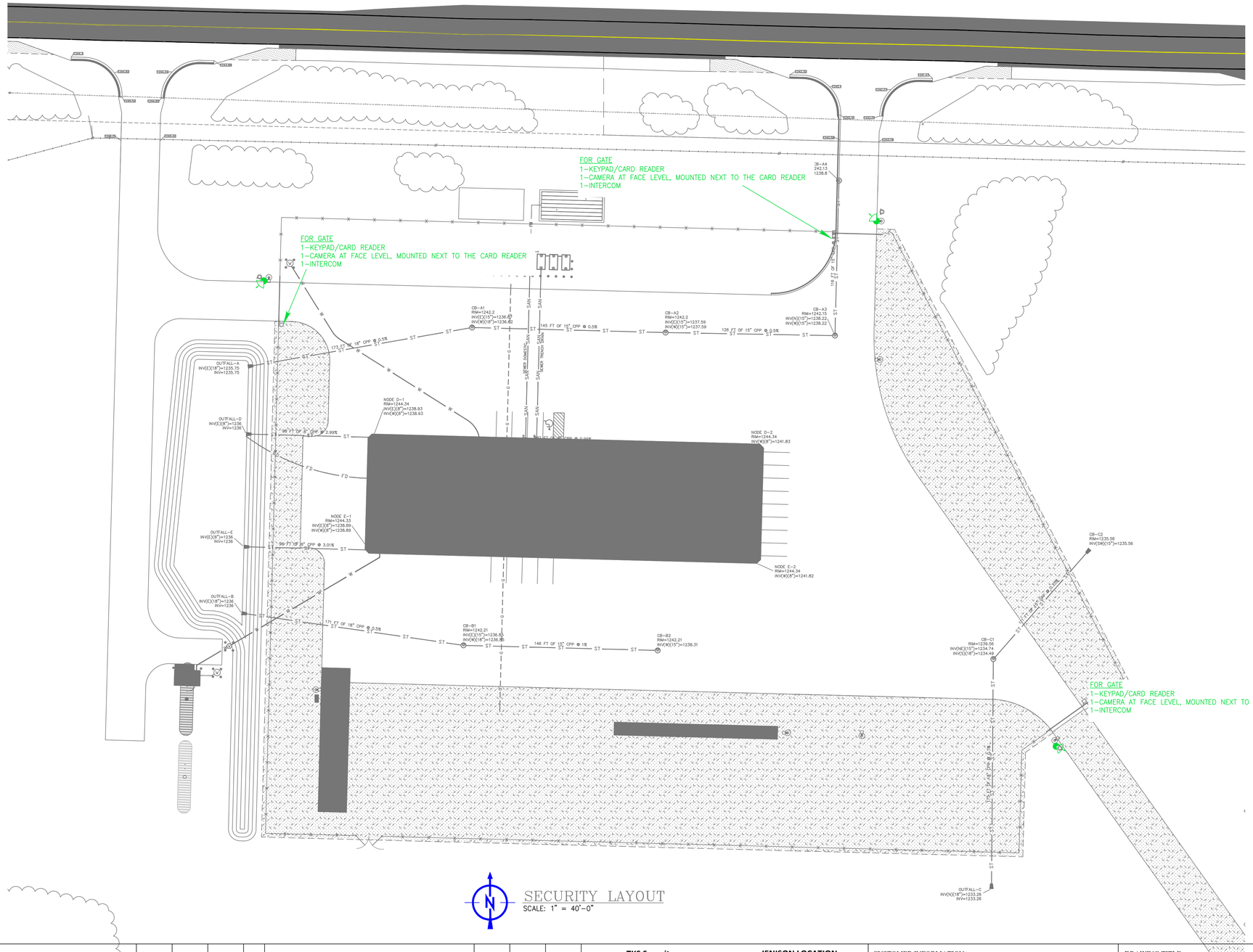
SHEET TITLE:
MECHANICAL/ELECTRICAL SPECIFICATIONS

ENGR. PROJ.#
18101

DRAWN BY:
WDH/JAV
CHECKED BY:
WDH/JAV

DATE:
01.28.2021
Bidding & Construction

SHEET NUMBER
ME2



SECURITY LAYOUT
SCALE: 1" = 40'-0"

VIDEO SYSTEM		WIRE PART #	WIRE DESC.	FOOTAGE
	CAMERA			
	PANORAMIC/MULTI-LENS CAMERA			
NVR	NETWORK VIDEO RECORDER			
AVR	ARCHIVER			
SW	NETWORK SWITCH			
	ACCESS CONTROL (PACS)			
ACP	ACCESS CONTROL PANEL			
K	KEYPAD ONLY			
KCR	KEYPAD/CARD READER			
CR	CARD READER			
DC	DOOR CONTACT/POSITION SWITCH			
RX	REQUEST-TO-EXIT PIR			
ES	ELECTRONIC STRIKE			
	INTRUSION/ALARM SYSTEM			
BAP	BURGLAR ALARM PANEL			
KPD	KEYPAD			
DC	DOOR CONACT/POSITION SWITCH			
M	MOTION DETECTOR - 360			
HU	HOLD-UP BUTTON			
GB	GLASSBREAK DETECTOR			

NOTES

EACH CAMERA REQUIRES FIBER FROM THE MDF TO THE CAMERA LOCATION. 110 VOLT AC POWER REQUIRED AT THE CAMERA POLE, TO BE COORDINATED WITH THE ELECTRICIAN.

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECKED	REV	DESCRIPTION	DATE	DRAWN	CHECKED
A	ISSUED FOR INTERNAL REVIEW	02/01/21	EASTLING	BYRNES					

TKS Security
(888) 595-1115 - phone
(888) 502-1651 - fax
www.gotks.com
MI Alarm License# 3601206063
MI Fire Alarm License # 5103347
MI BFS Certification # A-1158

JENISON LOCATION
7050 12th Ave
Jenison, MI 49428

TRAVERSE CITY LOCATION
2397 Traversefield Dr #200
Traverse City, MI 49686

CUSTOMER INFORMATION
WOLVERINE POWER CO-OP ALPINE POWER PLANT
7432 M-32
ELMIRA, MI 49730

DRAWING TITLE
ELMIRA PLANT
SECURITY LAYOUT
SITE PLAN

ISSUE
ISSUED FOR REVIEW

SCALE:	DATE:	DRAWING BY:	CHECKED BY
1" = 40'-0"	02/01/21	EASTLING	BYRNES

CURRENT DRAWING NO.
20TKS022-SC1

SHT NO.
001



SECURITY LAYOUT
SCALE: 1" = 40'-0"

VIDEO SYSTEM		WIRE PART #	WIRE DESC.	FOOTAGE
	CAMERA			
	PANORAMIC/MULTI-LENS CAMERA			
NVR	NETWORK VIDEO RECORDER			
AVR	ARCHIVER			
SW	NETWORK SWITCH			
	ACCESS CONTROL (PACS)			
ACP	ACCESS CONTROL PANEL			
K	KEYPAD ONLY			
KCR	KEYPAD/CARD READER			
CR	CARD READER			
DC	DOOR CONTACT/POSITION SWITCH			
RX	REQUEST-TO-EXIT PIR			
ES	ELECTRONIC STRIKE			
	INTRUSION/ALARM SYSTEM			
BAP	BURGLAR ALARM PANEL			
KP	KEYPAD			
DC	DOOR CONACT/POSITION SWITCH			
M	MOTION DETECTOR - 360			
HU	HOLD-UP BUTTON			
GB	GLASSBREAK DETECTOR			

NOTES

EACH CAMERA REQUIRES FIBER FROM THE MDF TO THE CAMERA LOCATION. 110 VOLT AC POWER REQUIRED AT THE CAMERA POLE, TO BE COORDINATED WITH THE ELECTRICIAN.

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECKED	REV	DESCRIPTION	DATE	DRAWN	CHECKED
A	ISSUED FOR INTERNAL REVIEW	01/29/21	EASTLING	BYRNES					

TKS Security
(888) 595-1115 - phone
(888) 502-1651 - fax
www.gotks.com
MI Alarm License# 3601206063
MI Fire Alarm License # 5103347
MI BFS Certification # A-1158

JENISON LOCATION
7050 12th Ave
Jenison, MI 49428

TRAVERSE CITY LOCATION
2397 Traversefield Dr #200
Traverse City, MI 49686

CUSTOMER INFORMATION
WOLVERINE POWER CO-OP ALPINE POWER PLANT
7432 M-32
ELMIRA, MI 49730

DRAWING TITLE
ELMIRA PLANT
SECURITY LAYOUT
SITE PLAN

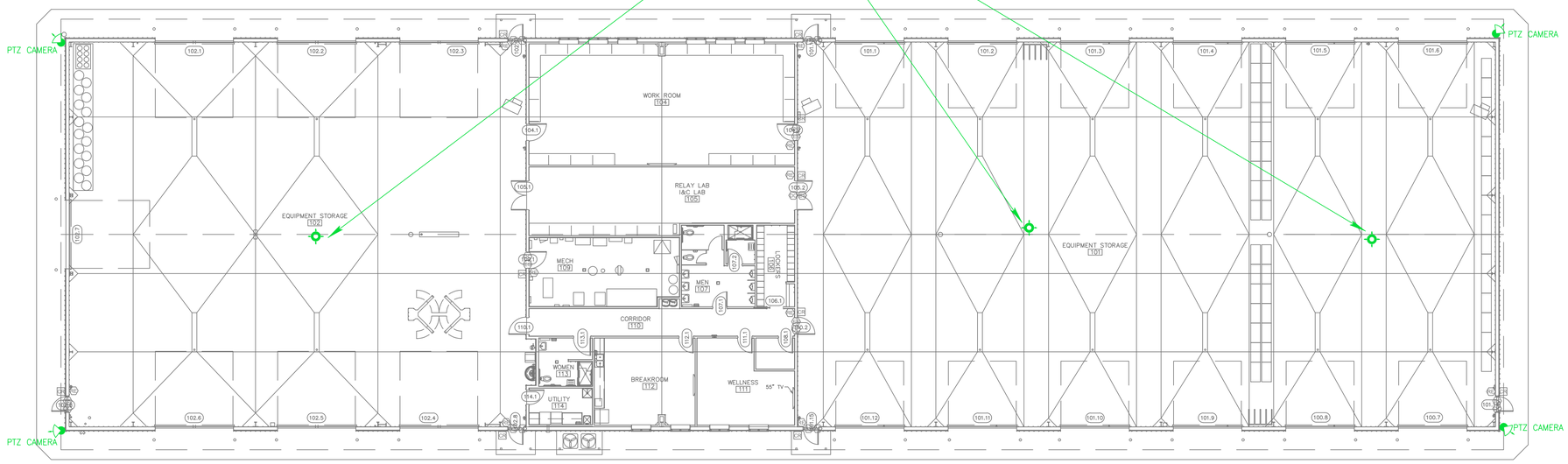
ISSUE
ISSUED FOR REVIEW

SCALE:	DATE:	DRAWING BY:	CHECKED BY
1" = 40'-0"	01/29/21	EASTLING	BYRNES

CURRENT DRAWING NO. 20TKS022-SC1
SHT NO. 002

VIDEO SYSTEM		WIRE PART #	WIRE DESC.	FOOTAGE
	CAMERA			
	PANORAMIC/MULTI-LENS CAMERA			
NVR	NETWORK VIDEO RECORDER			
AVR	ARCHIVER			
SW	NETWORK SWITCH			
	ACCESS CONTROL (PACS)			
ACP	ACCESS CONTROL PANEL			
K	KEYPAD ONLY			
KCR	KEYPAD/CARD READER			
CR	CARD READER			
DC	DOOR CONTACT/POSITION SWITCH			
RX	REQUEST-TO-EXIT PIR			
ES	ELECTRONIC STRIKE			
	INTRUSION/ALARM SYSTEM			
BAP	BURGLAR ALARM PANEL			
KP	KEYPAD			
DC	DOOR CONACT/POSITION SWITCH			
M	MOTION DETECTOR - 360			
HU	HOLD-UP BUTTON			
GB	GLASSBREAK DETECTOR			

FIELD LOCATE ALL INDOOR PANORAMIC CAMERAS TO BE LOCATED BELOW LIGHTING AND HEATERS. CLEAN LINE-OF-VIEW.



SECURITY LAYOUT
SCALE: 5/64" = 1'-0"

REVISIONS											
A	ISSUED FOR INTERNAL REVIEW	12/07/20	EASTLING	BYRNES							
REV	DESCRIPTION	DATE	DRAWN	CHECKED	REV	DESCRIPTION	DATE	DRAWN	CHECKED		

TKS Security
(888) 595-1115 - phone
(888) 502-1651 - fax
www.gotks.com
MI Alarm License# 3601206063
MI Fire Alarm License # 5103347
MI BFS Certification # A-1158

JENISON LOCATION
7050 12th Ave
Jenison, MI 49428

TRAVERSE CITY LOCATION
2397 Traversefield Dr #200
Traverse City, MI 49686

CUSTOMER INFORMATION
WOLVERINE POWER CO-OP ALPINE POWER PLANT
7432 M-32
ELMIRA, MI 49730

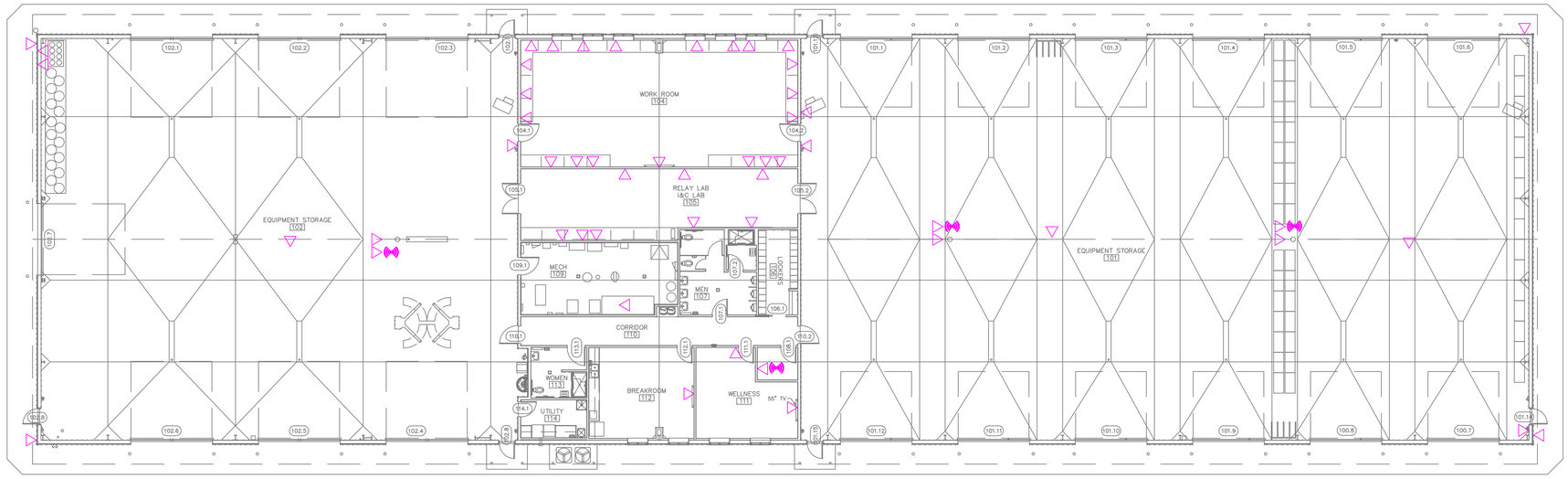
DRAWING TITLE
ELMIRA PLANT
SECURITY LAYOUT
1ST FLOOR

ISSUE
ISSUED FOR REVIEW

SCALE:	DATE:	DRAWING BY:	CHECKED BY
5/64" = 1'-0"	12/07/20	EASTLING	BYRNES

CURRENT DRAWING NO. 20TKS022-SC1
SHT NO. 003

DATA/PHONE SYSTEM		WIRE PART #	WIRE DESC.	FOOTAGE
▽	DUEL CAT6 DATA DROP			
⋈	DUAL CAT6 ACCESS POINT (WAP)			



DATA LAYOUT
SCALE: 5/64" = 1'-0"

REVISIONS										
A	ISSUED FOR INTERNAL REVIEW	01/04/20	EASTLING	BYRNES						
REV	DESCRIPTION	DATE	DRAWN	CHECKED	REV	DESCRIPTION	DATE	DRAWN	CHECKED	

TKS Security
(888) 595-1115 - phone
(888) 502-1651 - fax
www.gotks.com
MI Alarm License# 3601206063
MI Fire Alarm License # 5103347
MI BFS Certification # A-1158

JENISON LOCATION
7050 12th Ave
Jenison, MI 49428

TRAVERSE CITY LOCATION
2397 Traversefield Dr #200
Traverse City, MI 49686

CUSTOMER INFORMATION
WOLVERINE POWER CO-OP ALPINE POWER PLANT
7432 M-32
ELMIRA, MI 49730

DRAWING TITLE
ELMIRA PLANT
DATA LAYOUT
1ST FLOOR

ISSUE
ISSUED FOR REVIEW

SCALE:	DATE:	DRAWING BY:	CHECKED BY
5/64" = 1'-0"	01/04/20	EASTLING	BYRNES

CURRENT DRAWING NO. 20TKS022-SC1
SHT NO. 004