

# CITY AND BOROUGH OF WRANGELL

## Wrangell Water Treatment Plant Project

### Addendum No. 2

June 30, 2023

(40 pages)

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The information in this Addendum modifies and changes the original bidding contract documents. In case of conflicts between this Addendum and previously issued documents, this Addendum shall take precedence.

**The Pre-Bid meeting will be held Thursday, July 6<sup>th</sup>, 2023 at 11:30 am.** Bidders are strongly encouraged to attend. Contact Brita Mjos at [bmjos@dowl.com](mailto:bmjos@dowl.com) with questions.

### **Questions Received From Interested Parties/Bidders**

**Question 1:** Is an estimate available for the Wrangell Water Treatment Plant bid solicitation?

**Answer:** The Engineer's estimated construction cost range for this project is \$17 - \$20 Million.

**Question 2:** Could you please send dial in info for pre-bid meeting on July 6<sup>th</sup>?

**Answer:** To call in to the pre-bid meeting, please use the Microsoft Teams Meeting link:

### Microsoft Teams meeting

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 239 580 684 86

Passcode: KstQYz

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

[+1 907-302-2852,,378288447#](tel:+19073022852378288447) United States, Anchorage

Phone Conference ID: 378 288 447#

[Find a local number](#) | [Reset PIN](#)

**Question 3:** We are interested in bidding on this project as a subcontractor. How would we purchase plans and specifications?

**Answer:** The project bid documents are available at <https://www.wrangell.com/rfps>

**Question 4:** There is little to no reference to a Fire Alarm system other than reference in the specs for sprinkler bell to tie to the FACP, type of wire to use on FA system, and a symbol of E sheets for FACP but nowhere on the prints or specs does it specify what kind, if any system and coverage is to be provided. Please advise.

**Answer:** See the attached Specification 28 31 13 – Fire Detection and Alarm Systems, and revisions to Specification 21 13 00 – Fire Suppression Sprinkler Systems.

**Question 5:** The Lighting Schedule shows (2) fixture types not found in the plans anywhere else, EM light and 'D' fixture. Furthermore, the Admin Building and Backwash basin drawings do not show any work being done to the lighting, so I assumed the lighting will remain as is. Please confirm.

**Answer:** The EM and D fixtures are not required for this project. Protect and preserve the existing lighting in the Admin Building during demolition. Existing lighting in Admin building and Backwash basin to remain in place and reused.

**Question 6:** Where are the network enclosures to be mounted? The location is not shown on prints.

**Answer:** 10-NP-01 is located in the Filtration building electrical room, Sheet E-17. Mount top of enclosure at 6 feet. 10-NP-02 is located in the Admin building electrical room, Sheet E-28. Mount top of enclosure at 6 feet.

**Question 7:** Sheet E2, notes 5 & 6 direct to demolish items but nowhere do we have cross reference to quantities, sizes or routing of said electrical equipment. Please provide details.

**Answer:** Reference design drawings and specifications in their entirety, including Demolition Sheets, to obtain the required scope of demolition. Contractor is responsible for completing the demolition in its entirety and to the extent required to complete the new construction.

**Question 8:** Conduit Schedule (E06) contradicts conductor schedules (E12 – E15). Which of these Schedules takes precedence?

**Answer:** Updated drawings will be issued in a forthcoming addendum to correct the discrepancies between Sheet E6 and E12 – E15. Contractor to verify all conductors' sizes and insulation ratings to ensure code compliance.

**Question 9:** Sheet E07 shows T1 being fed by 100A breaker, E10 shows it being fed by 150A breaker. Please clarify what size.

**Answer:** T1 and T2 to be protected by a 100-amp circuit breaker.

**Question 10:** Can you provide designation for which rooms have corrosive environments per electrical requirements?

**Answer:** Rooms with Acidic or Caustic chemicals are to be considered corrosive environments.

**Question 11:** Sheet E8 states 'MCC to be either Square D or Allen Bradley'. The specs state 'MCC to be Allen Bradley or approved equivalent'. Can you confirm that Square D will be an approved MCC manufacturer?

**Answer:** MCC to be Allen Bradley or engineer-approved equivalent.

End of Addendum No. 2

**Attachments:**

1. Revisions to specification 21 13 00 – Fire Suppression Sprinkler Systems
2. Revised sheets in response to Fire Marshal's comments
3. Specification 28 31 13 – Fire Detection and Alarm Systems
4. Amended Specifications Table of Contents

# **Attachment 1**

**Revisions to Specification 21 13 00**

**FIRE SUPPRESSION SPRINKLER SYSTEMS**

## SECTION 21 13 00 – FIRE SUPPRESSION SPRINKLER SYSTEMS

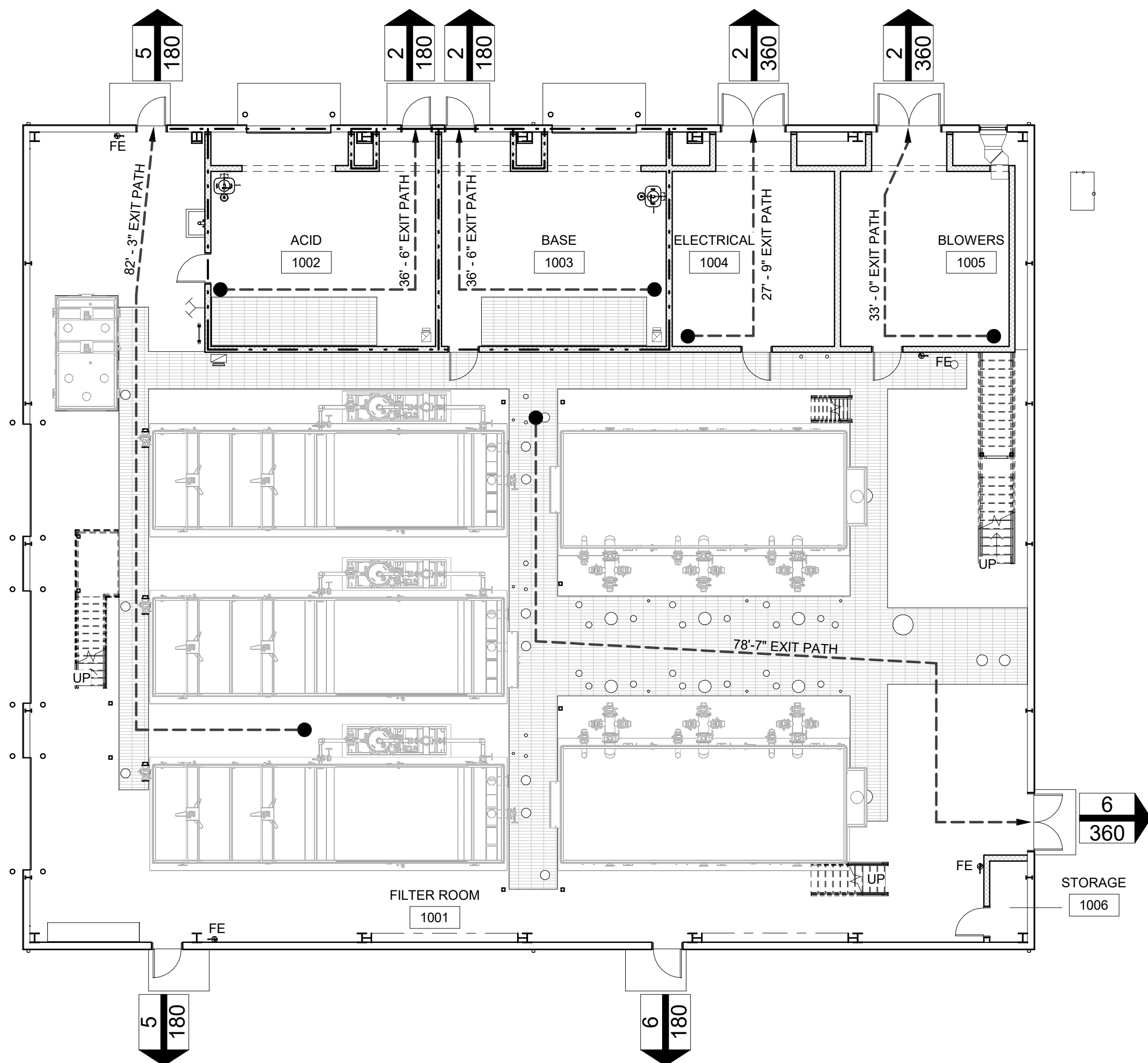
### Article “2.03 GENERAL COMPONENTS”

Delete subparagraph H. in its entirety, and insert the following in its place:

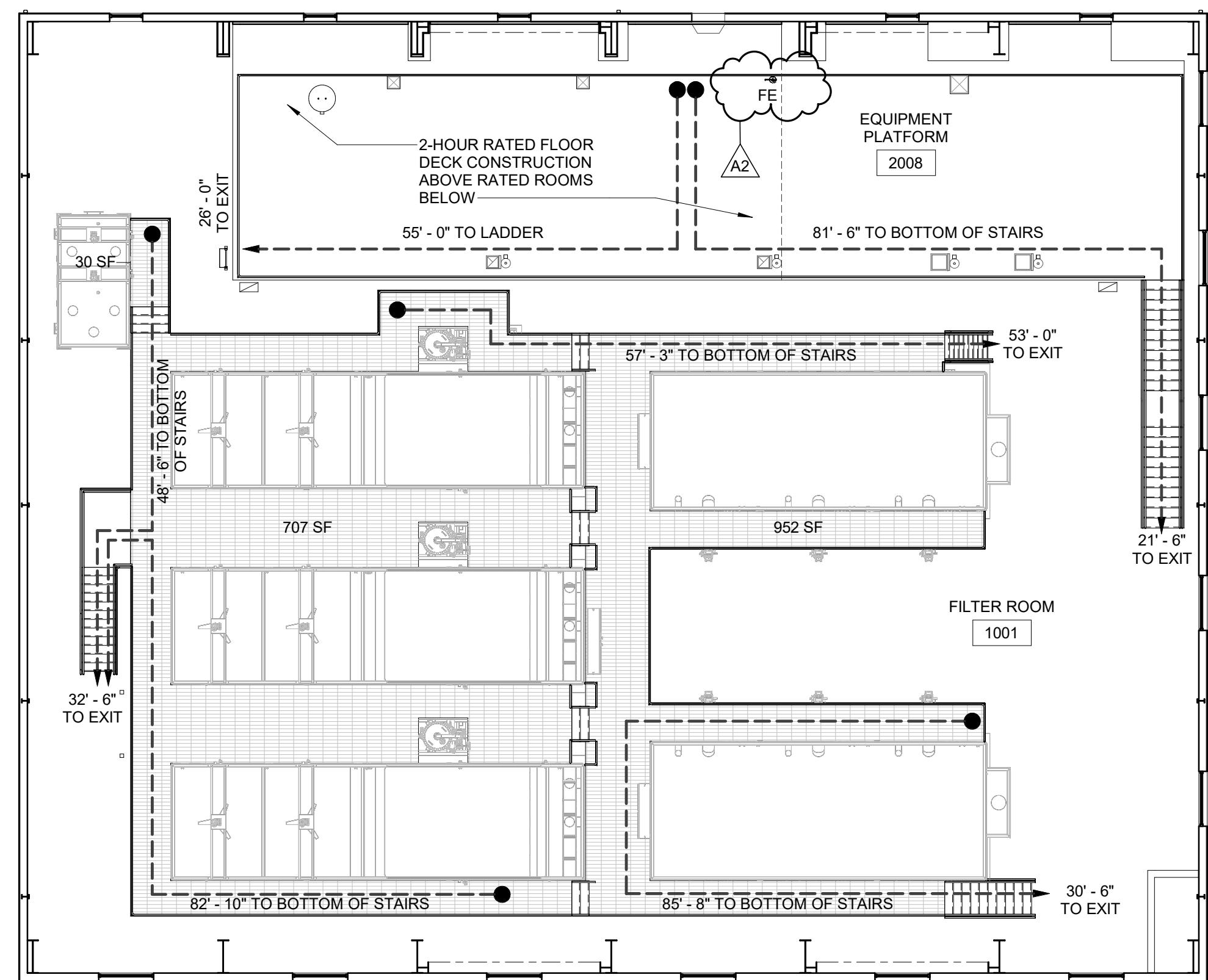
- A. Fire protection backflow preventer:
  - 1. Description: Double check valve type.
  - 2. Construction:
    - a. Sizes 1/2" to 2" (13 mm to 50 mm):
    - b. Sizes 2-1/2" to 10" (64 mm to 250 mm):
      - 1) Double check valve assembly: Consists of 2 independently acting check valves, 2 resilient seated outside OS&Y shutoff valves, and 4 test cocks. At Contractor's option provide approved assembly with butterfly valves instead of OS&Y gate valves.
      - 2) Main body: No threads tapped directly into body, uni-body, and ductile iron-type construction with fused epoxy coating.
      - 3) Coating: AWWA C550; NSF 61 certified.
      - 4)
  - 3. No special tools shall be required for maintenance.
  - 4. Certified in compliance with NSF 61, ASSE 1015, AWWA C510, CSA B64.5, and Foundation for Cross Connection Control and Hydraulic Research at University of Southern California.
  
- B. Water flow and supervisory alarms:
  - 1. Refer to Section 28 31 13.
  - 2. Wire alarms to addressable modules provided by Division 21.
  - 3. Wet pipe system vane-type water flow switches:
    - a. Type: Paddle, with 2 SPDT contacts and adjustable time delay operation.
    - b. Enclosure: NEMA 4 die-cast aluminum with red finish.
    - c. Pipe size: As required by fire protection design and indicated on drawings.
  - 4. Wet pipe system pressure-type water flow switches:
    - a. Type: Pressure with 2 SPDT contacts and adjustable time delay operation.
    - b. Pipe connection: 1/2" (13 mm) male NPT.
    - c. Enclosure: NEMA 4 die-cast aluminum with red finish.
  - 5. Pressure switch:
    - a. Type: pressure switch with 2 SPDT contacts
    - b. Pipe connection: 1/2" (13 mm) male NPT.
    - c. Enclosure: NEMA 4 die-cast aluminum with red finish.
  - 6. Tamper switches:
    - a. Provide supervisory switch for valves for supervision against closure or tampering with valves.
    - b. Materials: Acid-treated cast aluminum housing, nickel-plated parts. Trip rod shall be adjustable length.
    - c. Provide visual switch indicators.
    - d. Provide 2 SPDT contacts.
    - e. Enclosure: NEMA 4X.
  - 7. Alarm bell:
    - a. Location: Exterior of building.
    - b. Provide weatherproof back box.
    - c. Wire alarm bell to fire alarm control panel (FACP) provided by Division 21.
    - d. Finish: Red powder coating
    - e. Voltage: 24 volts dc from FACP.

## **Attachment 2**

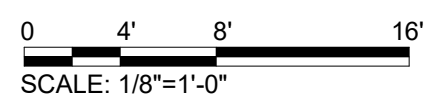
**Revised sheets in response to Fire Marshal's comments**



**GROUND FLOOR EGRESS PLAN**  
SCALE: 3/32" = 1'-0"



**PLATFORM EGRESS PLAN**  
SCALE: 3/32" = 1'-0"



**APPLICABLE BUILDING CODES**

IBC	INTERNATIONAL BUILDING CODE	2021
IFC	INTERNATIONAL FIRE CODE	2021
IMC	INTERNATIONAL MECHANICAL CODE	2021
UPC	UNIFORM PLUMBING CODE	2018
ADA	AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES	2010
NFPA 13	INSTALLATION OF SPRINKLER SYSTEMS	2019
NFPA 70	NATIONAL ELECTRICAL CODE	2017
NFPA 72	NATIONAL FIRE ALARM AND SIGNALING CODE	2019
NFPA 90A	STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS	2018
NFPA 101	LIFE SAFETY CODE	2018

**USE GROUP / OCCUPANCY - Chapter 3 (IBC 2021)**

F-1	MODERATE HAZARD FACTORY INDUSTRIAL	8,307 SF (GROSS AREA)
H-4	HIGH HAZARD GROUP H-4	1,197 SF (GROSS AREA)
	TOTAL BUILDING	9,504 SF (GROSS AREA)

**HEIGHT / STORIES - Chapter 5 (IBC 2021)**

ALLOWABLE HEIGHT (TABLE 504.3):	F-1 @ NS, H-4 @ NS = 55'-0"	DESIGNED HEIGHT:	29' +/-
ALLOWABLE STORIES (TABLE 504.4):	F-1 @ NS = 2 / H-4 @ NS = 3	DESIGNED STORIES:	1

**AREA - Chapter 5 (IBC 2021)**

ALLOWABLE AREA (TABLE 506.2):	F-1 @ NS = 15,500 SQ. FT.	DESIGNED AREA:	8,306 SQ. FT.
	H-4 @ NS = 17,500 SQ. FT.	DESIGNED AREA:	1,197 SQ. FT.

**OCCUPANCY SEPARATION - Chapter 5 - Table 508.4 (IBC 2021)**

SEPARATION OF F-1 @ NS AND H-4 @ S OCCUPANCY = 2 HOUR

**CONSTRUCTION TYPE - Chapter 6 (IBC 2021)**

TYPE IIB

**FIRE RESISTANCE RATINGS - Chapter 6 - Table 601 (IBC 2021)**

STRUCTURAL FRAME	0
BEARING WALLS	0
INTERIOR	0
EXTERIOR	0
NON-BEARING WALLS AND PARTITIONS	0
FLOOR CONSTRUCTION	0
ROOF CONSTRUCTION	0

**EXTERIOR WALL RATINGS - Chapter 7 - Table 705.5 (IBC 2021)**

FIRE SEPARATION DISTANCE	TYPE OF CONSTRUCTION	REQUIRED	DESIGNED
GREATER THAN 30'	IIB	0	0

**FIRE SUPPRESSION - Chapter 9 (IBC 2021)**

903.2.5.1 AN AUTOMATIC SPRINKLER SYSTEM SHALL BE INSTALLED IN GROUP H OCCUPANCIES.

NO SPRINKLERS REQUIRED FOR F-1 OCCUPANCY.

**OCCUPANCY CALCULATIONS - Chapter 10 (Table 1004.5) - IBC 2018**

**OCCUPANT ANALYSIS**

MARK	NAME	AREA	AREA PER OCC	OCC COUNT	COMMENT
1001	FILTER ROOM	4623 SF	300	16	
1002	ACID	449 SF	300	2	
1003	BASE	449 SF	300	2	
1004	ELECTRICAL	325 SF	300	2	
1005	BLOWERS	337 SF	300	2	
1006	STORAGE	35 SF	0	0	
2008	EQUIPMENT PLATFORM	1664 SF	300	6	EQUIPMENT PLATFORM AREA NOT INCLUDED IN BUILDING AREA, NUMBER OF STORIES, OR FIRE AREA PER 2012 IBC 505.3
TOTAL		7883 SF		30	

505.3.1 THE AGGREGATE AREA OF ALL EQUIPMENT PLATFORMS WITHIN A ROOM SHALL BE NOT GREATER THAN TWO-THIRDS OF THE AREA OF THE ROOM IN WHICH THEY ARE LOCATED.

1,664 + 945 + 707 + 30 = 3,346 SF EQUIPMENT PLATFORM  
7,166 SF \* 2/3 = 4,777 SF  
3,346 SF < 4,777 SF

**EXIT ACCESS TRAVEL DISTANCE - Chapter 10 - Table 1017.2 (IBC 2021)**

F-1 OCCUPANCY	NON-SPRINKLERED	200 FEET
	FULLY SPRINKLERED	250 FEET
	COMMON PATH OF EGRESS TRAVEL	75 FEET
H-4 OCCUPANCY	NON-SPRINKLERED	NOT PERMITTED
	FULLY SPRINKLERED	175 FEET
	COMMON PATH OF EGRESS TRAVEL	75 FEET

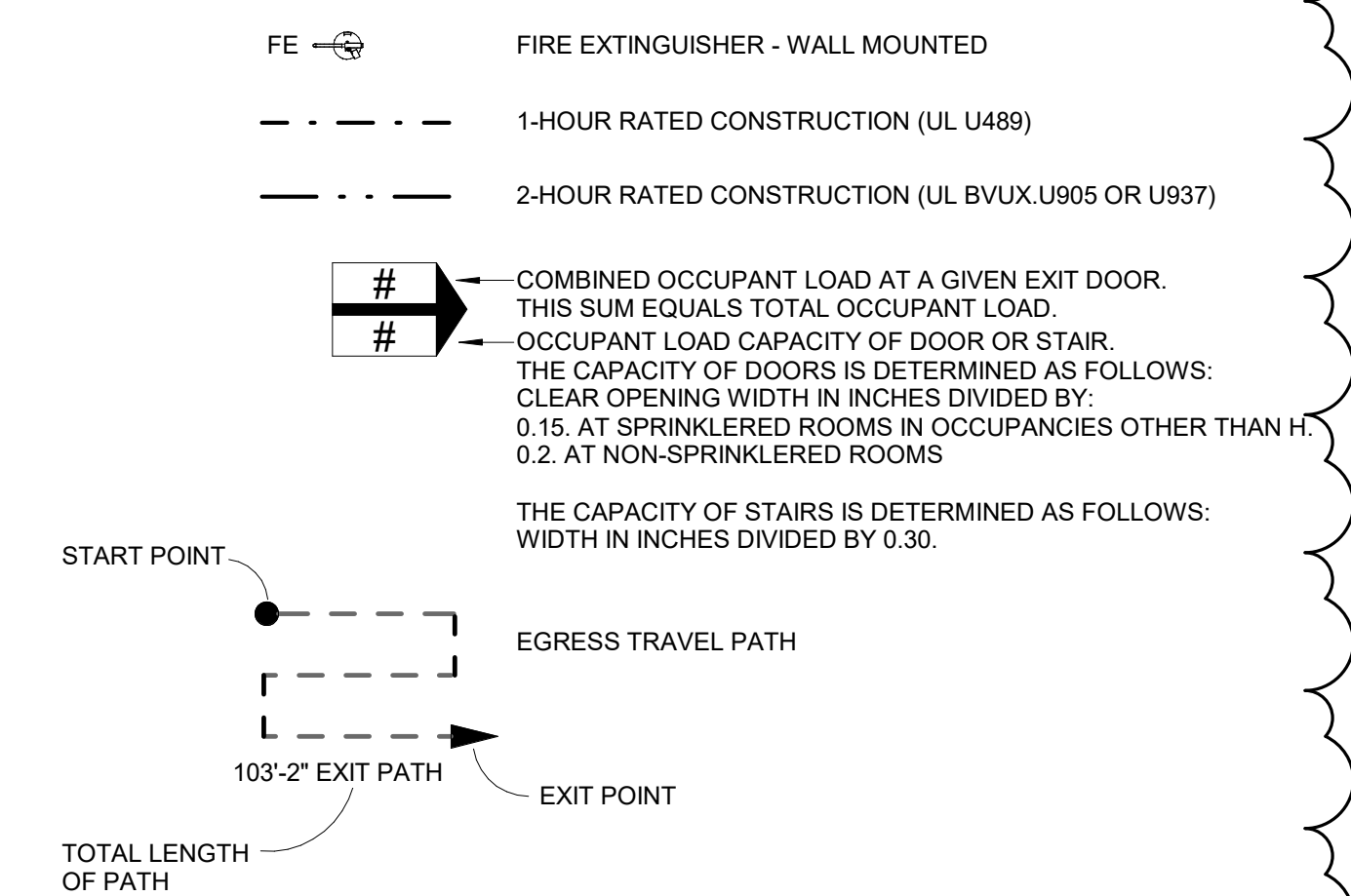
**EXIT WIDTH REQUIREMENTS - Chapter 10 - Section 1005 (IBC 2021)**

	# of Occ.	Inches/Occ.	Min. Width	# of Exits	Min. Width / Exit	Design Width
Door Egress	31	0.2"	6.4"	8	36"	396"
Stair Egress	6	0.3"	1.8"	1	36"	36"

**PLUMBING FIXTURES - Chapter 29 - Table 2902.1 (IBC 2018)**

REQUIRED PLUMBING FIXTURES ARE PROVIDED IN ADJACENT BUILDING - 48'-0" TRAVEL DISTANCE.

**EGRESS LEGEND**



REV	DATE	DESCRIPTION	BY	APP
A2	06/30/2023	Appendix 2		



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WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
**BUILDING CODE AND LIFE SAFETY ANALYSIS**  
SEC. 31, TOWNSHIP 62S, RANGE 84E  
CITY AND BOROUGH OF WRANGELL, ALASKA

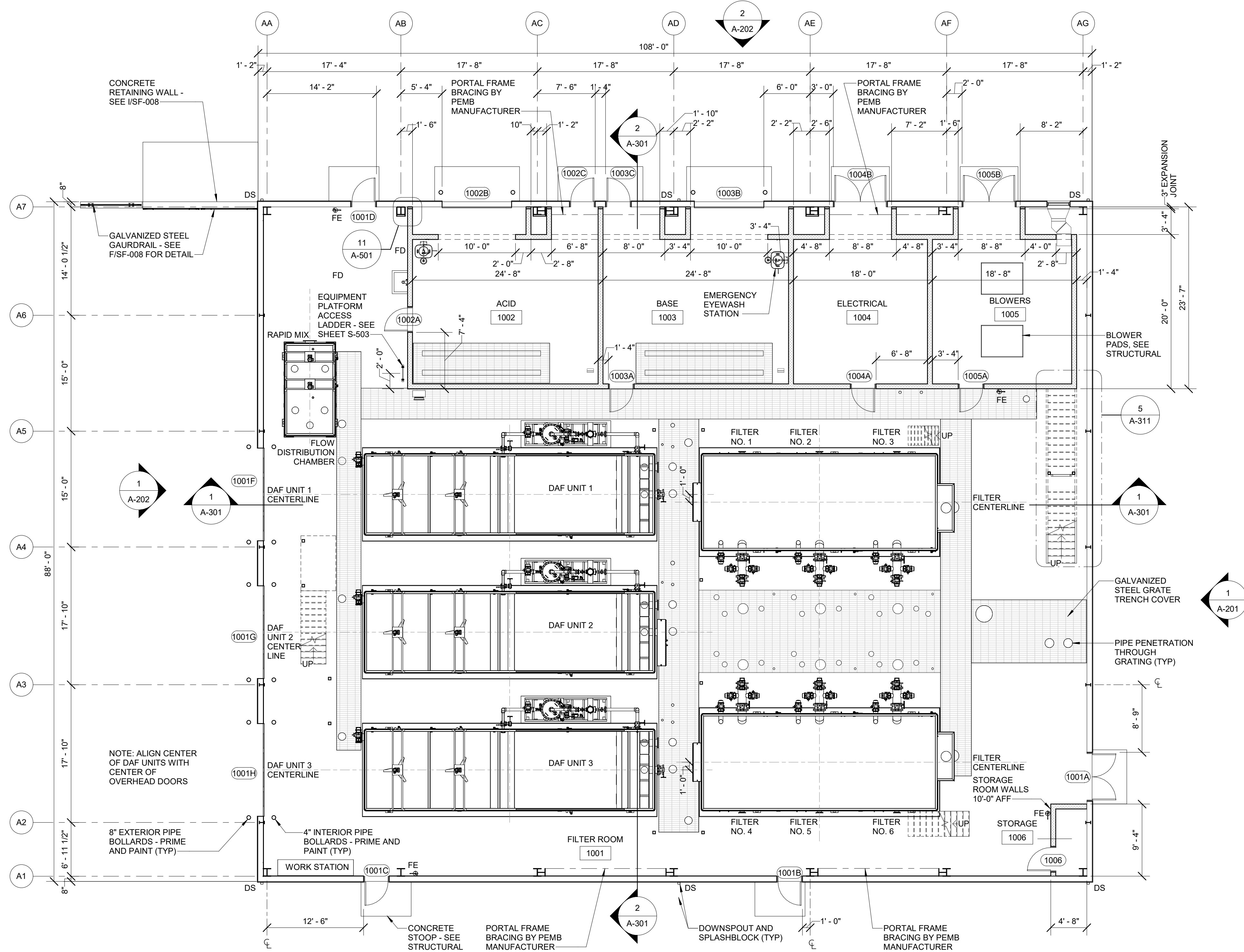
PROJECT 1528.5026.01  
DATE 06/02/2023

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SHEET

**A-100**



BID DOCUMENTS  
AGENCY SUBMITTAL - NOT FOR CONSTRUCTION



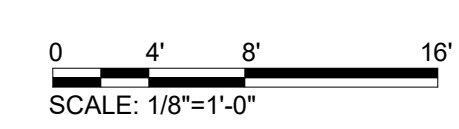
- GENERAL NOTES:**
- COORDINATE BUILDING PLAN WITH SITE PLAN.
  - DIMENSIONS ARE TO FACE OF CMU OR FACE OF STRUCTURAL STEEL UNLESS NOTED OTHERWISE.
  - WALL PENETRATIONS:
    - A. ALLOW FOR EXPANSION WHEN REQUIRED OR AS INDICATED BY OTHER DISCIPLINES.
  - INTERIOR PARTITIONS ARE 8" CMU UNLESS NOTED OTHERWISE. INTERIOR PARTITIONS EXTEND TO BOTTOM OF STRUCTURE UNLESS NOTED OTHERWISE.
  - WHERE FIRE RATING IS REQUIRED, WALLS ARE UL SYSTEM BVUX U905 OR U937. REFERENCE A-100 FOR LOCATION OF RATED WALLS.
  - DOOR RETURN - MINIMUM OF 4" ON HINGE SIDE.
  - FLOOR DRAINS - NOT ALL FLOOR DRAINS ARE SHOWN ON ARCHITECTURAL PLANS. SEE PLUMBING DRAWINGS FOR LOCATION AND TYPE OF FLOOR DRAINS.
  - FOR FIRE RATING, SEE SHEET A-100.
  - SEAL PENETRATIONS THROUGH FIRE RATED CONSTRUCTION WITH APPROPRIATE FIRE SAFING / SEALANT.
  - SEAL PENETRATIONS THROUGH EXTERIOR WALLS FOR AN AIRWATER TIGHT CONSTRUCTION.
  - SIDEWALK, DOOR PADS AND STEPS, PAVEMENT GRADES AND ELEVATIONS MUST BE COORDINATED WITH CIVIL DRAWINGS.
  - DIMENSIONS TO CMU ARE NOMINAL MASONRY DIMENSIONS UNLESS NOTED OTHERWISE.
  - BUILDING ELEVATION 100'-0" = SITE ELEVATION 260'-0".

REV	DATE	DESCRIPTION	BY	M/JP
A2	06/30/2023	Appendix 2		



WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
**GROUND FLOOR PLAN**  
SEC. 31, TOWNSHIP 62S, RANGE 94E  
CITY AND BOROUGH OF WRANGELL, ALASKA

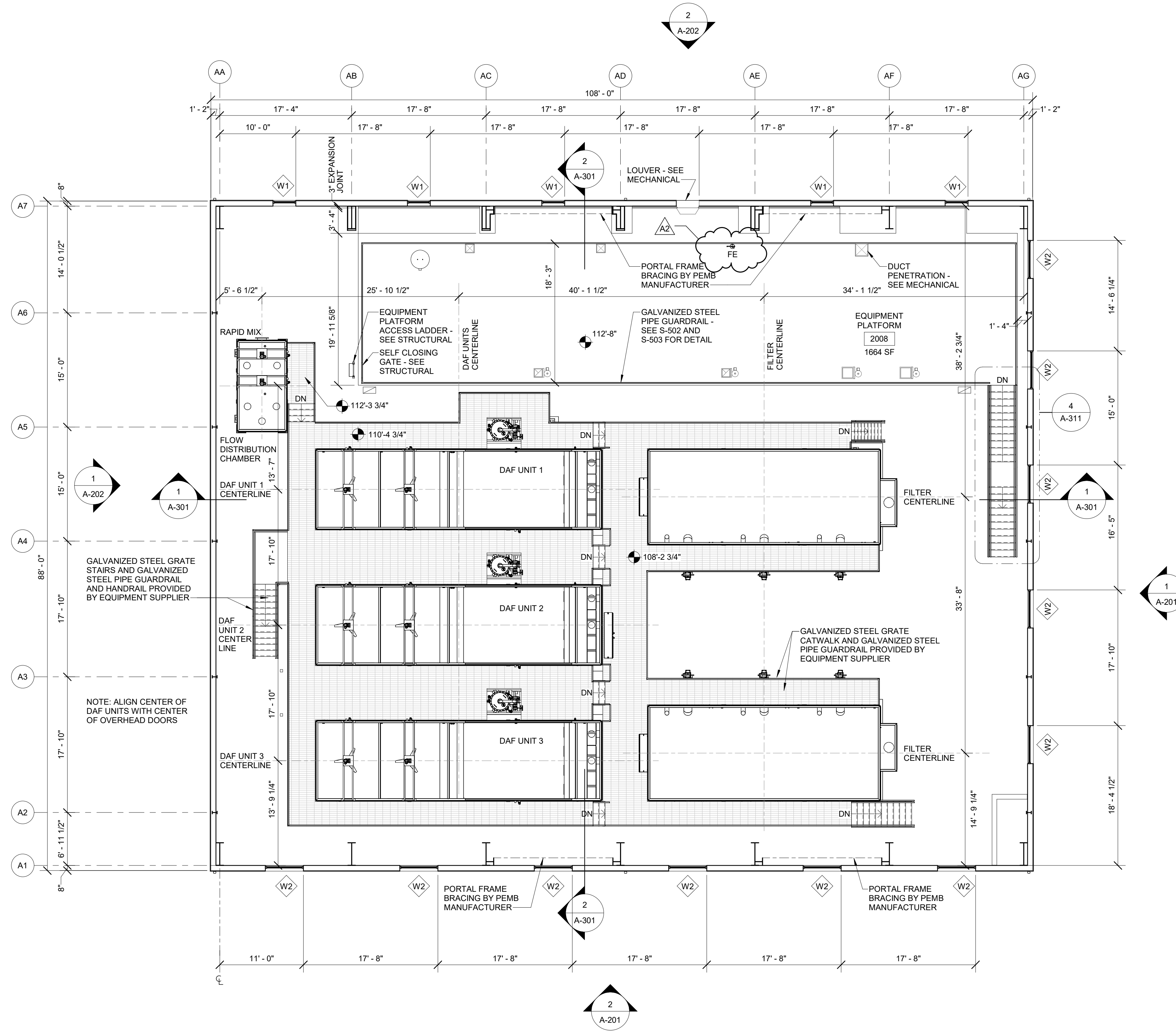
**GROUND FLOOR PLAN**  
SCALE: 1/8" = 1'-0"



BID DOCUMENTS  
AGENCY SUBMITTAL - NOT FOR CONSTRUCTION

PROJECT	1528.5026.01
DATE	06/02/2023
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A-101



**PLATFORM PLAN**  
SCALE: 1/8" = 1'-0"

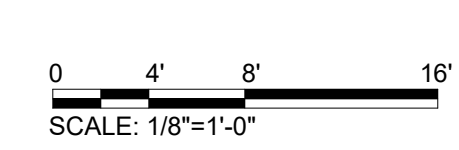
- GENERAL NOTES:**
- DIMENSIONS ARE TO FACE OF CMU OR FACE OF STRUCTURAL STEEL UNLESS NOTED OTHERWISE.
  - WALL PENETRATIONS:
    - ALLOW FOR EXPANSION WHEN REQUIRED OR AS INDICATED BY OTHER DISCIPLINES.
  - INTERIOR PARTITIONS ARE 8" CMU UNLESS NOTED OTHERWISE. INTERIOR PARTITIONS EXTEND TO BOTTOM OF STRUCTURE UNLESS NOTED OTHERWISE.
  - DOOR RETURN - MINIMUM OF 4" ON HINGE SIDE.
  - FLOOR DRAINS: NOT ALL FLOOR DRAINS ARE SHOWN ON ARCHITECTURAL PLANS. SEE PLUMBING DRAWINGS FOR LOCATION AND TYPE OF FLOOR DRAINS.
  - FOR FIRE RATING, SEE SHEET A-100.
  - SEAL PENETRATIONS THROUGH FIRE RATED CONSTRUCTION WITH APPROPRIATE FIRE SAFING / SEALANT.
  - SEAL PENETRATIONS THROUGH EXTERIOR WALLS FOR AN AIRWATER TIGHT CONSTRUCTION.
  - BUILDING ELEVATION 100'-0" = SITE ELEVATION 260'-0".

REV	DATE	DESCRIPTION	BY
A2	06/30/2023	Addenda 2	MJP



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WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
**PLATFORM PLAN**  
SEC. 31, TOWNSHIP 62S, RANGE 64E  
CITY AND BOROUGH OF WRANGELL, ALASKA



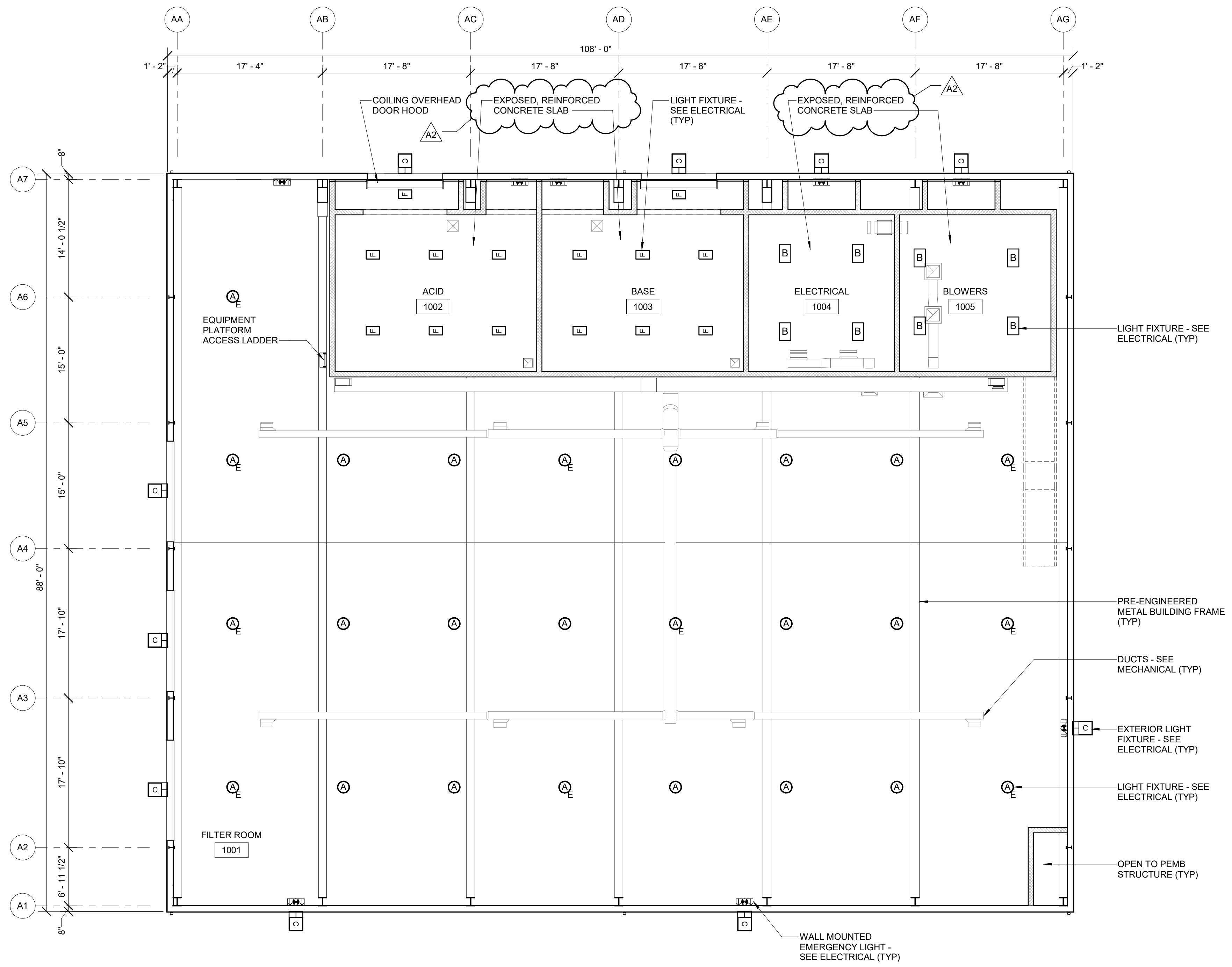
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AGENCY SUBMITTAL - NOT FOR CONSTRUCTION

PROJECT 1528.5026.01  
DATE 06/02/2023

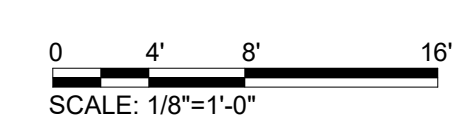
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A-102





**GROUND FLOOR REFLECTED CEILING PLAN**  
SCALE: 1/8" = 1'-0"



**RCP NOTES:**

1. REFLECTED CEILING PLAN SHOWN FOR LAYOUT AND COORDINATION PURPOSES ONLY. COORDINATE MECHANICAL, ELECTRICAL, AND FIRE PROTECTION CEILING MOUNTED UTILITIES WITH RESPECTIVE DISCIPLINE DRAWINGS.
2. EQUALLY SPACE LIGHT FIXTURES IN BOTH DIRECTIONS UNLESS NOTED OTHERWISE ON ELECTRICAL DRAWINGS.
3. REFERENCE ROOM FINISH SCHEDULE FOR CEILING TYPES AND HEIGHTS.
4. EQUIPMENT AND CATWALK HIDDEN IN THIS VIEW FOR CLARITY.

REV	DATE	DESCRIPTION	BY
A2	06/30/2023	Addenda 2	MJP



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WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
**REFLECTED CEILING PLAN**  
SEC. 31, TOWNSHIP 62S, RANGE 64E  
CITY AND BOROUGH OF WRANGELL, ALASKA

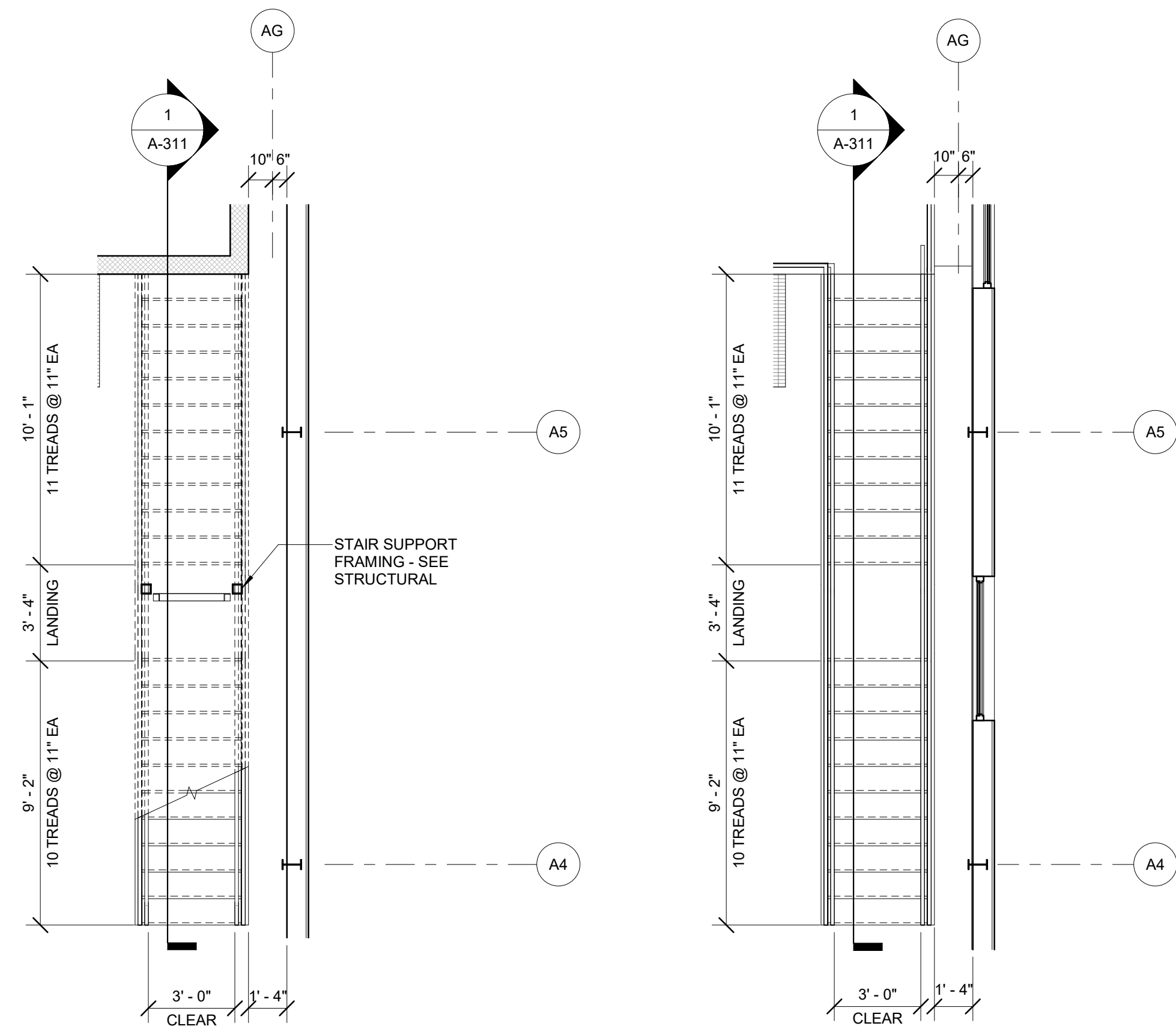


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DATE 06/02/2023

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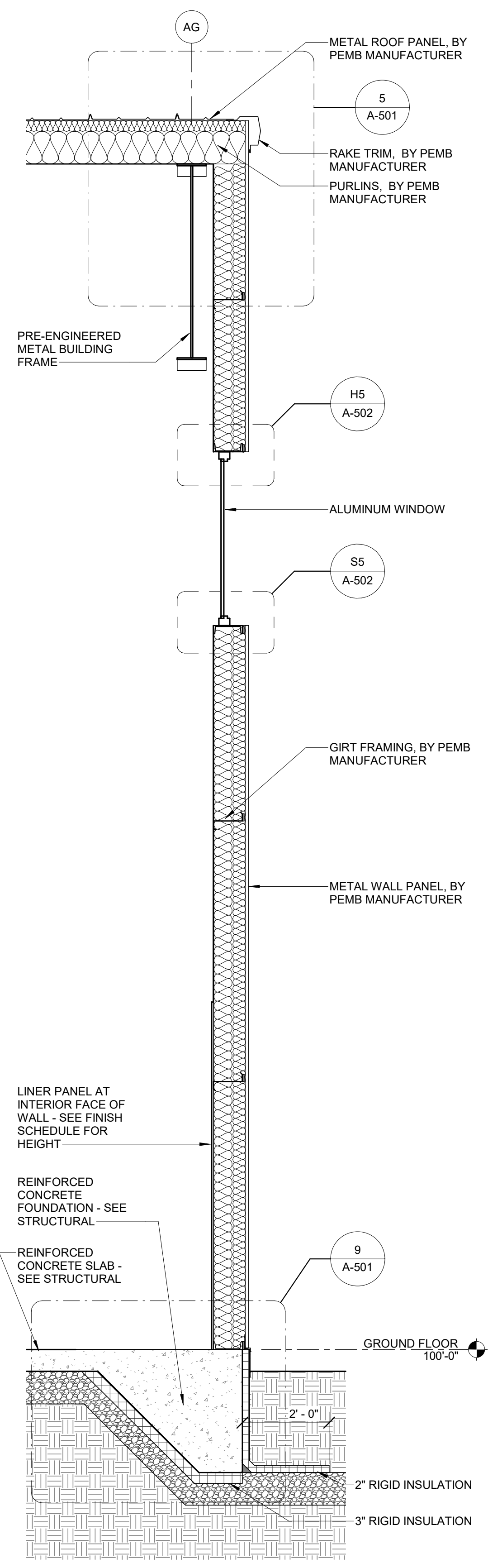
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**BID DOCUMENTS**  
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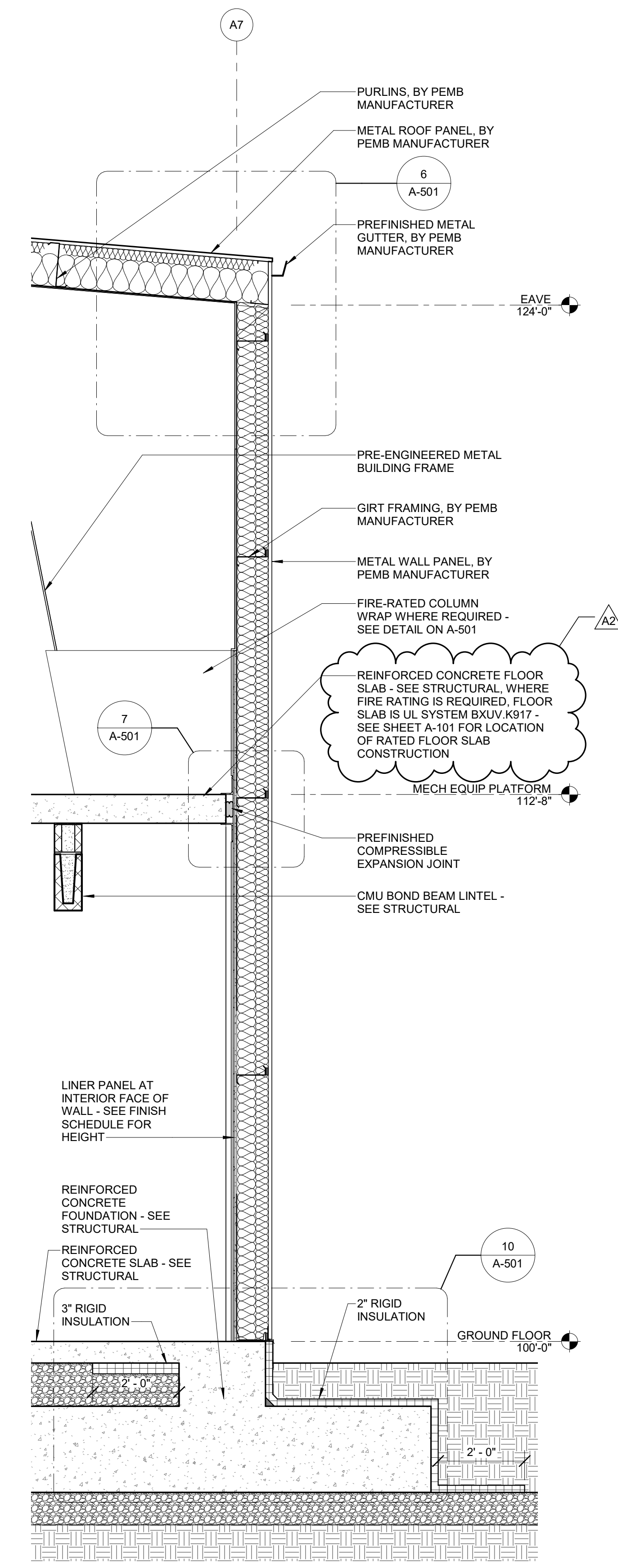


**GROUND FLOOR STAIR PLAN 5-A-311**  
SCALE: 1/4" = 1'-0" A-101

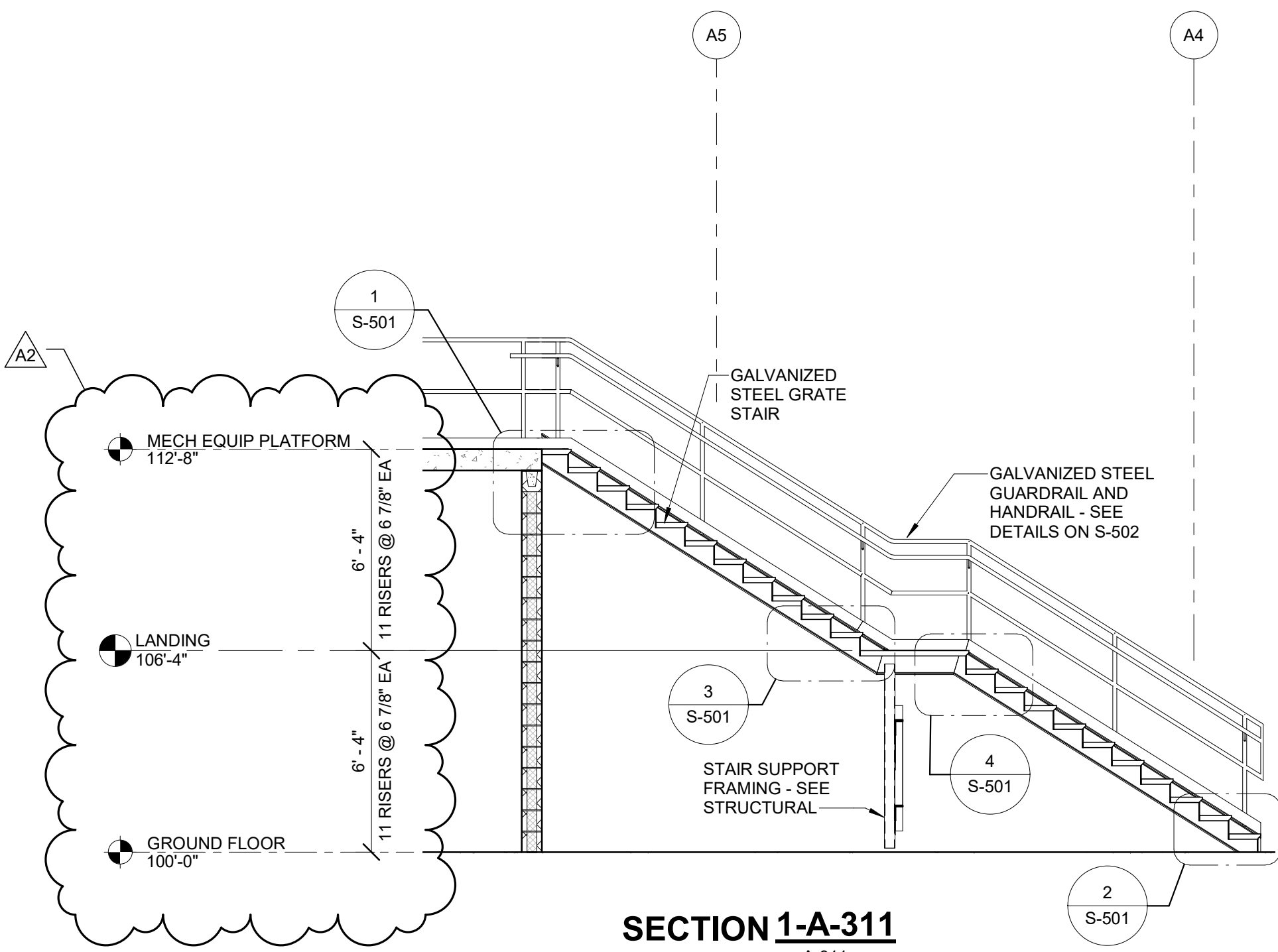
**PLATFORM LEVEL STAIR PLAN 4-A-311**  
SCALE: 1/4" = 1'-0" A-102



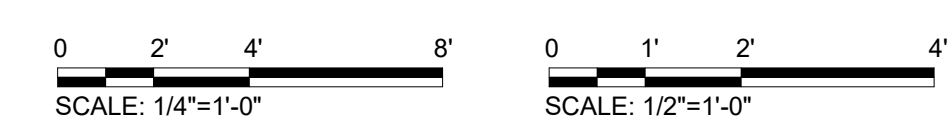
**SECTION 2-A-311**  
SCALE: 1/2" = 1'-0" A-301



**SECTION 3-A-311**  
SCALE: 1/2" = 1'-0" A-301



**SECTION 1-A-311**  
SCALE: 1/4" = 1'-0" A-311



**BID DOCUMENTS**  
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REV	DATE	DESCRIPTION	BY
A2	06/30/2023	Appendix 2	MJP



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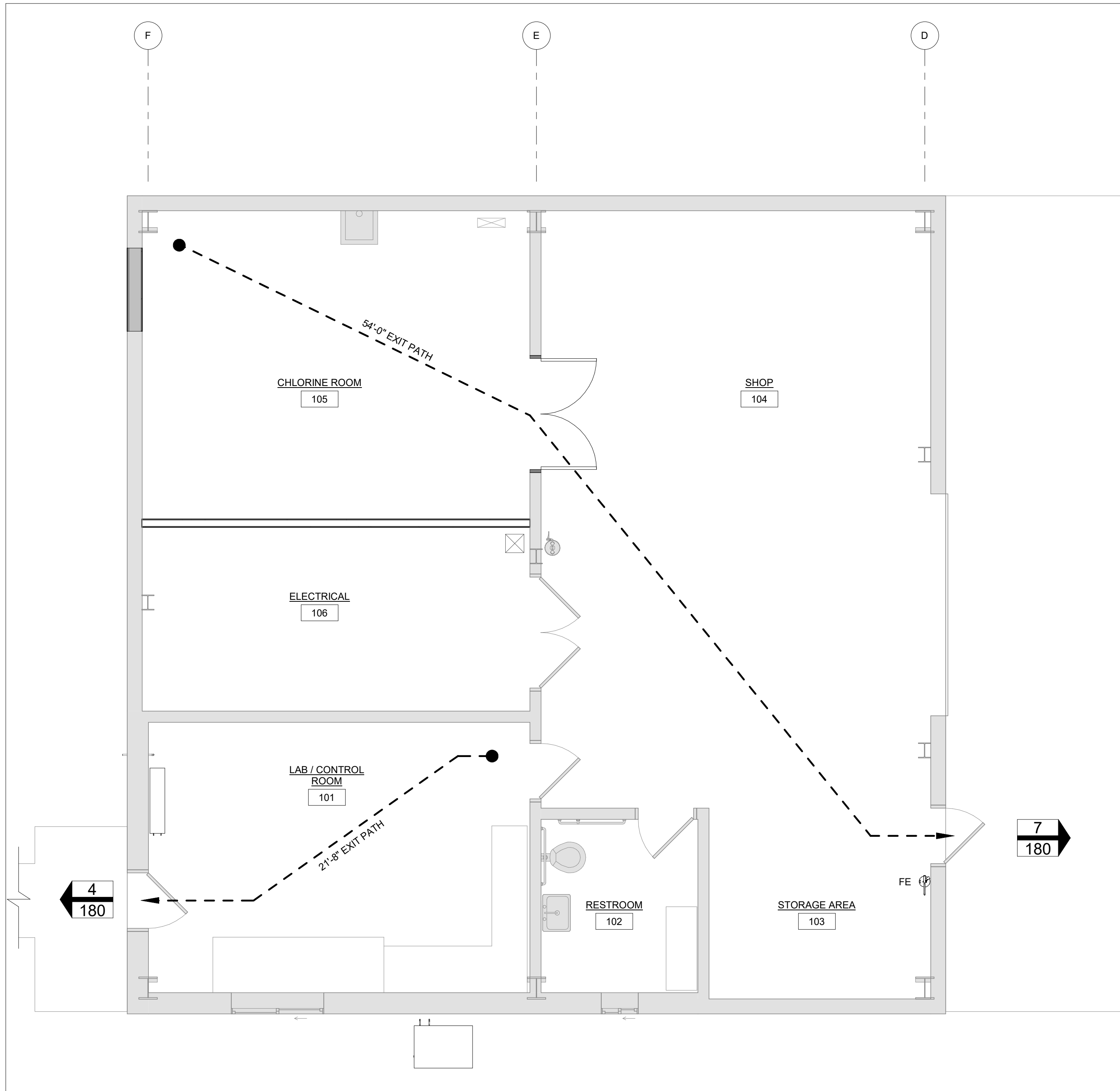
**WRANGELL WATER TREATMENT PLANT IMPROVEMENTS**  
**WRANGELL, ALASKA**  
**WALL SECTIONS**

SEC. 31, TOWNSHIP 62S, RANGE 94E  
CITY AND BOROUGH OF WRANGELL, ALASKA

PROJECT 1528.5026.01  
DATE 06/02/2023

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**A-311**



**CONTROL BUILDING EGRESS PLAN**  
SCALE: 1/4" = 1'-0"



**APPLICABLE BUILDING CODES**

IBC	INTERNATIONAL BUILDING CODE	2021
IFC	INTERNATIONAL FIRE CODE	2021
IMC	INTERNATIONAL MECHANICAL CODE	2021
UPC	UNIFORM PLUMBING CODE	2018
ADA	AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES	2010
NFPA 13	INSTALLATION OF SPRINKLER SYSTEMS	2019
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NFPA 72	NATIONAL FIRE ALARM AND SIGNALING CODE	2019
NFPA 90A	STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATING SYSTEMS	2018
NFPA 101	LIFE SAFETY CODE	2018

**USE GROUP / OCCUPANCY - Chapter 3 (IBC 2021)**

F-2 LOW-HAZARD FACTORY INDUSTRIAL ENTIRE BUILDING 1,943 SF (GROSS AREA)

**CONSTRUCTION TYPE - Chapter 6 (IBC 2021)**

TYPE IIB

**FIRE SUPPRESSION - Chapter 9 (IBC 2021)**

NO SPRINKLERS REQUIRED FOR F-2 OCCUPANCY.

**HEIGHT / STORIES - Chapter 5 (IBC 2021)**

ALLOWABLE HEIGHT (TABLE 504.3): F-2 @ NS = 55'-0" DESIGNED HEIGHT: 14' +/-  
DESIGNED STORIES: 1

**AREA - Chapter 5 (IBC 2021)**

ALLOWABLE AREA (TABLE 506.2): F-2 @ NS = 23,000 SQ. FT. DESIGNED AREA: 1,943 SQ. FT.

**FIRE RESISTANCE RATINGS - Chapter 6 - Table 601 (IBC 2021)**

STRUCTURAL FRAME	0
BEARING WALLS	0
INTERIOR	0
EXTERIOR	0
NON-BEARING WALLS AND PARTITIONS	0
FLOOR CONSTRUCTION	0
ROOF CONSTRUCTION	0

**EXTERIOR WALL RATINGS - Chapter 6 - Table 602 (IBC 2021)**

FIRE SEPARATION DISTANCE BETWEEN 10' AND 30'	TYPE OF CONSTRUCTION	REQUIRED	DESIGNED
	IIB	0	0

**OCCUPANCY CALCULATIONS - Chapter 10 (Tables 1004.5) - IBC 2021**

OCCUPANT ANALYSIS					
MARK	NAME	AREA	AREA PER OCC	OCC COUNT	COMMENT
101	LAB / CONTROL ROOM	302 SF	100	4	
102	RESTROOM	79 SF	0		
103	STORAGE AREA	124 SF	300	1	
104	SHOP	681 SF	300	3	
105	CHLORINE ROOM	350 SF	300	2	
106	ELECTRICAL	209 SF	300	1	
107	PIPE GALLERY	775 SF			
TOTAL		2520 SF		11	

**EXIT ACCESS TRAVEL DISTANCE - Chapter 10 - Table 1017.2 (IBC 2021)**

F-2 OCCUPANCY	NON-SPRINKLERED	200 FEET
	FULLY SPRINKLERED	250 FEET
	COMMON PATH OF EGRESS TRAVEL	75 FEET

**EXIT WIDTH REQUIREMENTS - Chapter 10 - Section 1005 (IBC 2021)**

Door Egress	# of Occ.	Inches/Occ.	Min. Width	# of Exits	Min. Width / Exit	Design Width
	11	0.2"	2.2"	2	36"	72"

**PLUMBING FIXTURES - Chapter 29 - Table 2902.1 (IBC 2021)**

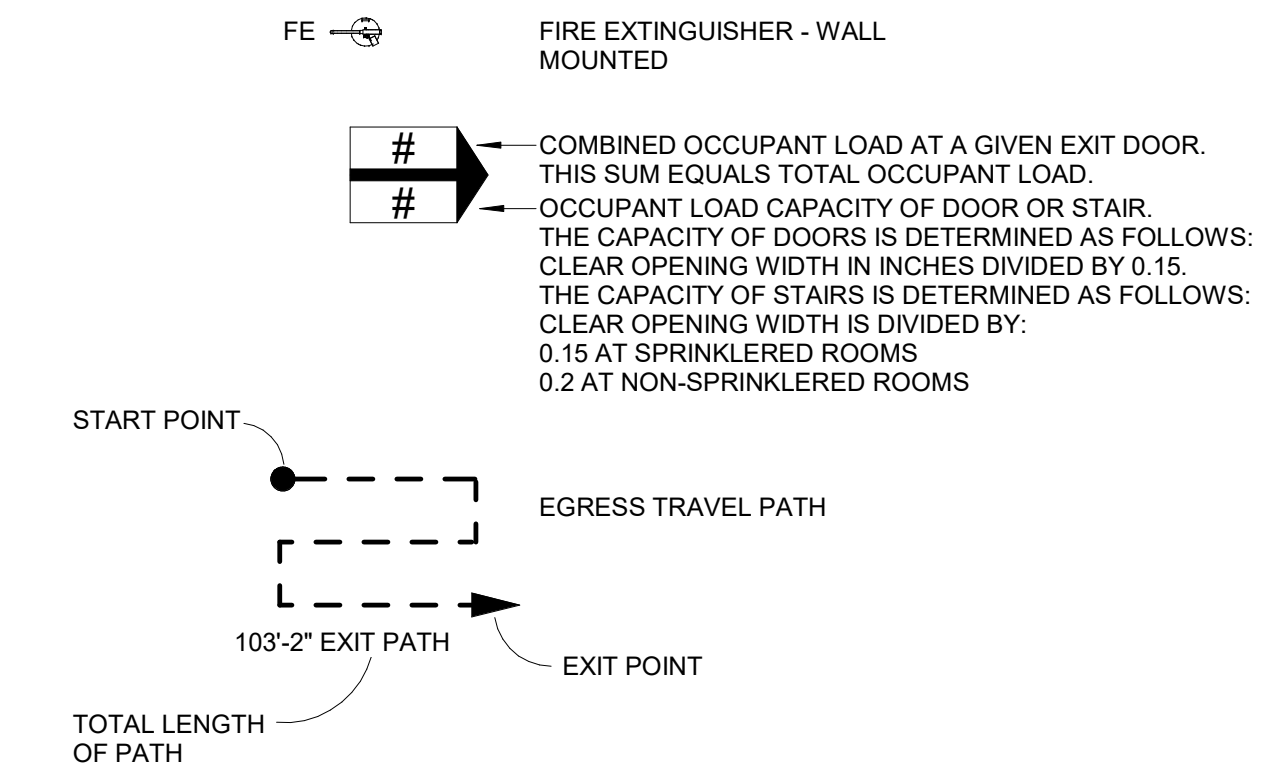
OCCUPANTS FROM AN ADJACENT BUILDING WILL BE INCLUDED IN THE FIXTURE COUNTS FOR THE PLUMBING FIXTURE COUNTS IN THIS BUILDING.

30 OCCUPANTS FROM THE NEW FILTER BUILDING ARE INCLUDED IN THIS CALCULATION.

2902.1.1 EXCEPTION - THE TOTAL OCCUPANT LOAD SHALL NOT BE REQUIRED TO BE DIVIDED IN HALF WHERE APPROVED STATISTICAL DATA INDICATE A DISTRIBUTION OF THE SEXES OTHER THAN 50 PERCENT OF EACH SEX.

PLUMBING FIXTURE COUNT										
FIXTURE USER	WATER CLOSETS			URINALS		LAVATORIES			DRINKING FOUNTAINS	
	REQUIRED	EXISTING	NEW	REQUIRED	EXISTING	REQUIRED	EXISTING	NEW	REQUIRED	EXISTING
MALE: 41	1	1	0	0	0	0	1	1	0	
FEMALE: 0	0	0	0				0	0	0	
COMBINED	1	1	0				1	1	0	1 1

**EGRESS LEGEND**



REVISIONS	
REV	DESCRIPTION
A2	06/30/2023 Addenda 2



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WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
**CONTROL BUILDING CODE AND LIFE SAFETY ANALYSIS**  
SEC. 31, TOWNSHIP 62S, RANGE 94E  
CITY AND BOROUGH OF WRANGELL, ALASKA

PROJECT 1528.5026.01  
DATE 06/02/2023



BID DOCUMENTS  
AGENCY SUBMITTAL - NOT FOR CONSTRUCTION

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SHEET  
**AD-100**

### STRUCTURAL DESIGN CRITERIA:

- BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC) 2021, PUBLISHED BY INTERNATIONAL CODE COUNCIL, INC.
- ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES; PUBLISHED BY AMERICAN SOCIETY OF CIVIL ENGINEERS.
- STEEL DESIGN CODE: AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN (ASD), 341-16 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS; PUBLISHED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
- CONCRETE DESIGN CODE: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-19; PUBLISHED BY AMERICAN CONCRETE INSTITUTE.
- MASONRY DESIGN CODE: TMS 602-16, SPECIFICATION FOR MASONRY STRUCTURES; PUBLISHED BY THE MASONRY SOCIETY.
- STRUCTURAL STEEL: SEE SPECIFICATION.
- CONCRETE COMPRESSIVE STRENGTH: 4000 PSI AT 28 DAYS.
- MASONRY COMPRESSIVE STRENGTH (fm): 2000 PSI.
- REINFORCING STEEL: ASTM A706, GRADE 60.
- EQUIPMENT PLATFORM LIVE LOADS:
  - UNIFORM LIVE LOAD: 125 PSF
- PEMB ROOF LIVE LOAD: 20 PSF
- PEMB ROOF SNOW LOAD:
  - RISK CATEGORY: III
  - SNOW IMPORTANCE FACTOR (I): 1.1
  - GROUND SNOW LOAD (Pg): 60 PSF
  - SNOW EXPOSURE FACTOR (Ce): 1.1
  - THERMAL FACTOR (Ct): 1.1
  - FLAT ROOF SNOW LOAD (rs): 55 PSF
- PEMB WIND DESIGN DATA:
  - RISK CATEGORY: III
  - BASIC WIND SPEED (3 SEC GUST): 147 MPH
  - WIND EXPOSURE: D
  - BUILDING ENCLOSURE: ENCLOSED
  - GUST EFFECT FACTOR: 0.85
  - TOPOGRAPHIC FACTOR (Kzt): 1.00
  - INTERNAL PRESSURE COEFFICIENT (GCpi): + 0.18, - 0.18

- EARTHQUAKE DESIGN DATA:
  - RISK CATEGORY: III
  - SEISMIC IMPORTANCE FACTOR (I): 1.25
  - SHORT PERIOD SPECTRAL RESPONSE ACCELERATION (Ss): 0.249
  - 1 SECOND SPECTRAL RESPONSE ACCELERATION (S1): 0.255
  - SITE CLASS: C
  - SHORT PERIOD SPECTRAL RESPONSE PARAMETER (Sps): 0.216
  - 1 SECOND SPECTRAL RESPONSE PARAMETER (Sp1): 0.255
  - SEISMIC DESIGN CATEGORY (SDC): D
  - ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE
  - EQUIPMENT PLATFORM SEISMIC DESIGN PARAMETERS:
    - BASIC SEISMIC-FORCE-RESISTING SYSTEM: SPECIAL MASONRY REINFORCED SHEAR WALLS
    - RESPONSE MODIFICATION FACTOR (R): 5
    - SEISMIC RESPONSE COEFFICIENT (Cs): 0.054
    - DESIGN BASE SHEAR (V): 21.5 K
- FLOOD DESIGN DATA:
  - FLOOD HAZARD AREA: NONE
- SYSTEMS AND COMPONENTS REQUIRING SPECIAL INSPECTION:
  - EQUIPMENT PLATFORM CONCRETE SLAB
  - MASONRY WALLS

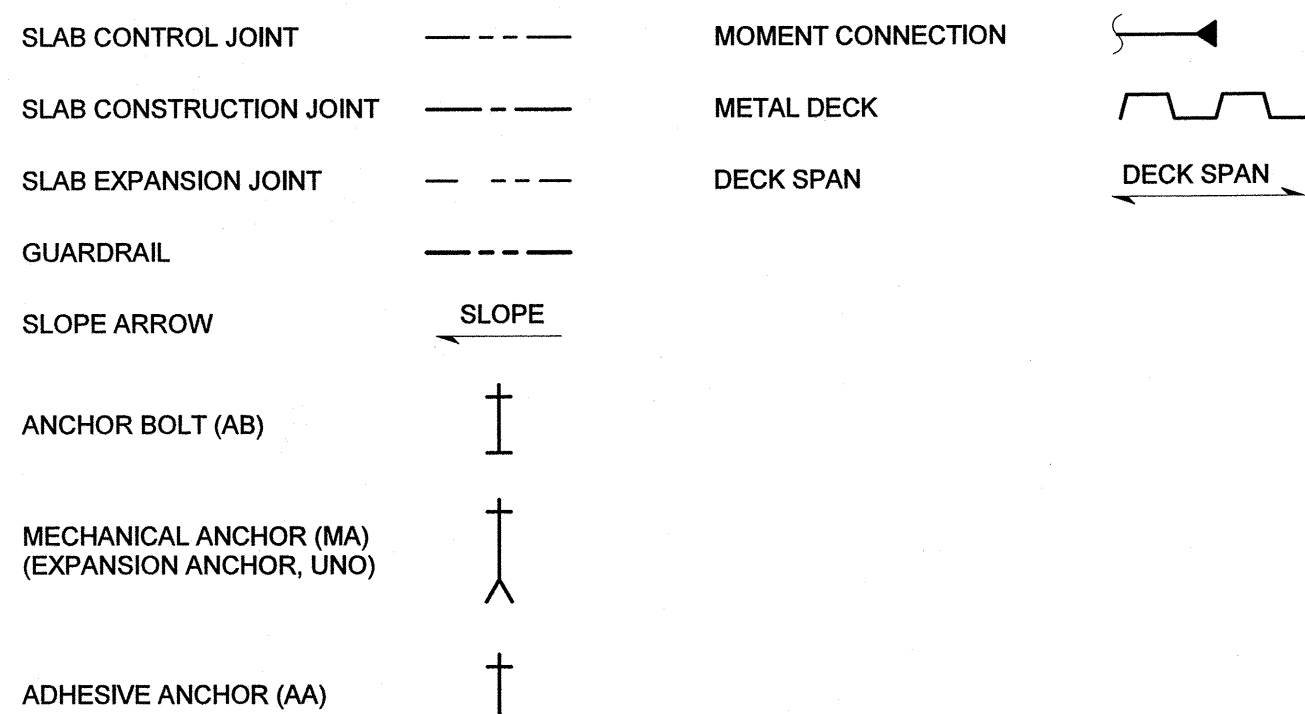
### BUILDING STABILITY:

- THE BUILDING STEEL STRUCTURE IS NOT A SELF-SUPPORTING FRAME. THE FOLLOWING COMPONENTS OF THE BUILDING STRUCTURE FORM A PART OF THE BUILDING LATERAL STABILITY SYSTEM. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AS REQUIRED FOR LATERAL STABILITY UNTIL THESE COMPONENTS ARE COMPLETELY INSTALLED AND CONCRETE (WHERE APPLICABLE) HAS ACHIEVED DESIGN STRENGTH:
  - ROOF DECKS WHICH FUNCTION AS HORIZONTAL DIAPHRAGMS.
- BUILDING CMU WALLS ARE NOT SELF-SUPPORTING WALLS. THE FOLLOWING COMPONENTS OF THE BUILDING STRUCTURE FORM A PART OF THE WALL LATERAL STABILITY SYSTEM. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AS REQUIRED FOR LATERAL STABILITY UNTIL THESE COMPONENTS ARE COMPLETELY INSTALLED:
  - BUILDING LATERAL STABILITY SYSTEM.
  - PERPENDICULAR CONNECTED CMU WALLS.
  - ROOM CEILING SLABS WHICH FUNCTION AS HORIZONTAL DIAPHRAGMS.

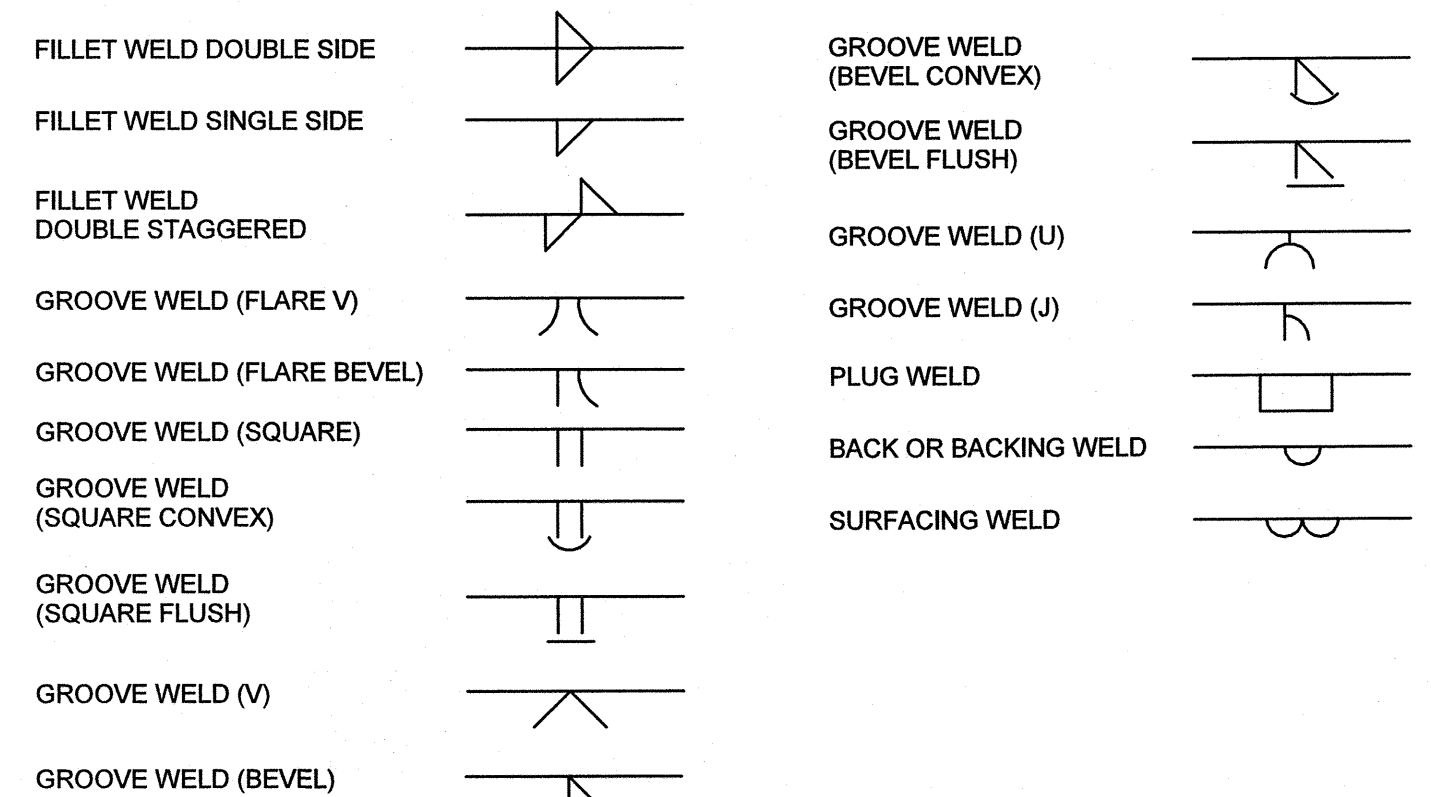
### FIELD MEASUREMENT NOTES:

- ALL DIMENSIONS OF EXISTING CONSTRUCTION ARE APPROXIMATE; CONTRACTOR SHALL MAKE ALL NECESSARY FIELD MEASUREMENTS OF EXISTING STRUCTURES, BREECING AND EQUIPMENT TO VERIFY DIMENSIONS SHOWN ON DRAWINGS AND TO PROVIDE DIMENSIONS NOT SHOWN, PRIOR TO FABRICATION. COSTS FOR MODIFICATIONS OF NEW CONSTRUCTION, DUE TO LACK OF CONFIRMATION OF DIMENSIONS BY FIELD MEASUREMENTS SHALL BE BORNE BY CONTRACTOR.
- CONTRACTOR'S STRUCTURAL STEEL DETAILER SHALL MAKE NECESSARY FIELD MEASUREMENTS OF EXISTING STRUCTURAL STEEL CONNECTIONS TO ENSURE NEW CONNECTION DETAILS SHOWN ON SHOP DRAWINGS ARE COMPATIBLE WITH EXISTING CONNECTIONS AND ARE CONSTRUCTIBLE AS DETAILED.

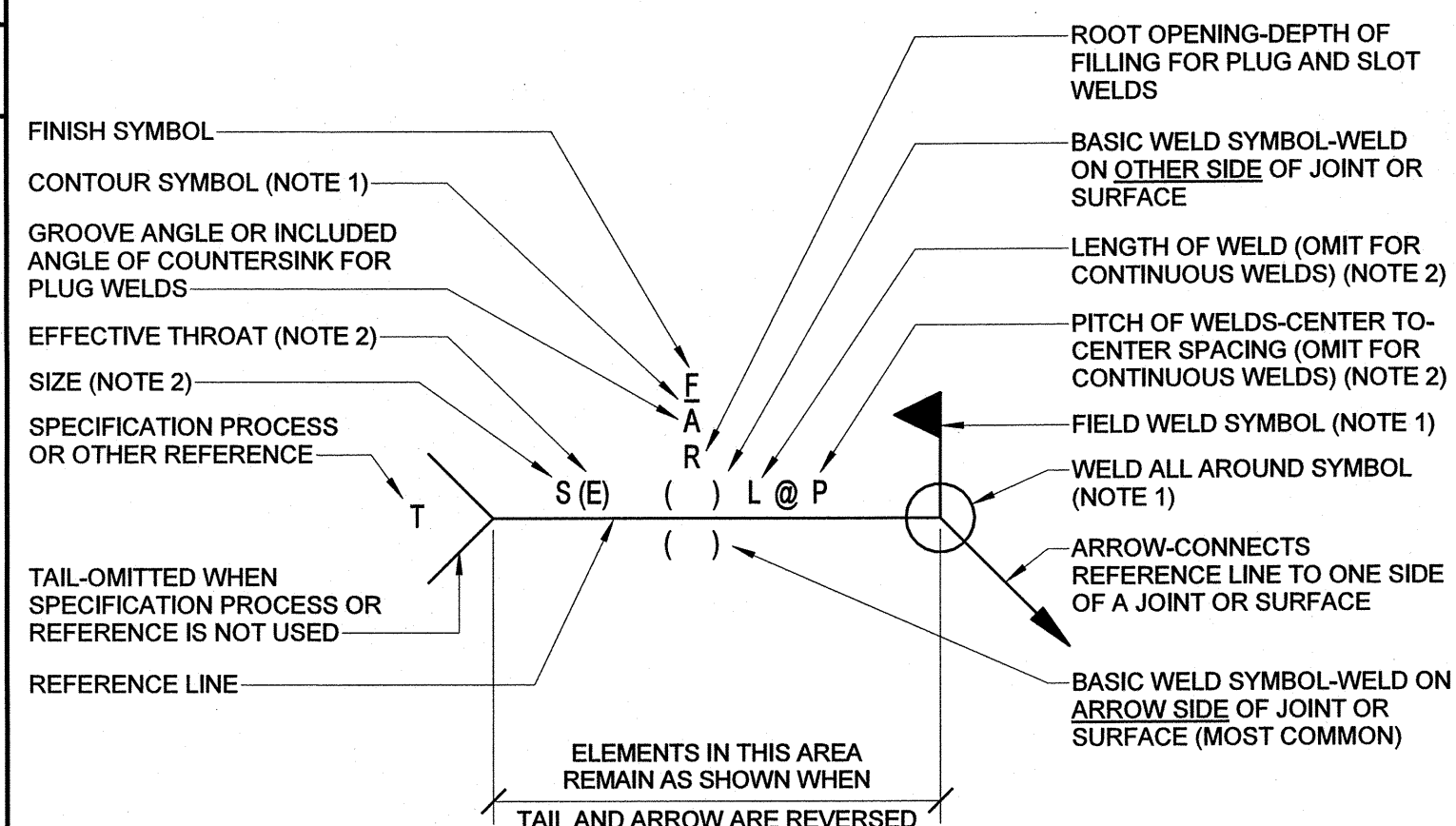
### GENERAL STRUCTURAL SYMBOLS:



### WELD SYMBOLS:



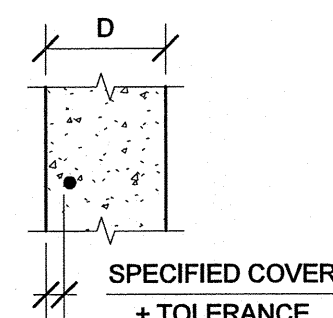
### LOCATION OF ELEMENTS OF A WELDING SYMBOL:



- NOTES:
- SUPPLEMENTARY SYMBOL.
  - SHOWN ON SAME SIDE OF REFERENCE LINE AS THE WELD SYMBOL. IF "WELD BOTH SIDES", DIMENSIONS ARE REQUIRED ON BOTH SYMBOLS, EVEN IF SAME DIMENSIONS.

### REINFORCING STEEL NOTES:

- CONFORM WITH ACI 318 AND ACI STANDARD FOR "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
- REINFORCING SHALL BE CONTINUOUS AROUND ALL CORNERS UNLESS SHOWN OTHERWISE.
- SHIFT REINFORCING BARS TO CLEAR ANCHOR BOLTS AND EMBEDDED ITEMS; OBTAIN ENGINEER'S APPROVAL AND ADD EXTRA REINFORCING BAR IF REQUESTED BY ENGINEER. CUTTING OF REINFORCING BARS NOT PERMITTED.
- REINFORCING SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS UNLESS SHOWN OTHERWISE.
- LOCATE SPLICES WHERE SHOWN. WHERE NO SPLICES ARE SHOWN, TOP REINFORCING IN SLABS AND BEAMS MAY BE SPLICED IN MIDDLE ONE-HALF OF SPAN BETWEEN SUPPORTS AND BOTTOM REINFORCING MAY BE SPLICED OVER OR NEAR SUPPORTS.
- CONCRETE REINFORCEMENT SHALL BE PLACED WITHIN FOLLOWING TOLERANCE RELATIVE TO FORMED OR UNFORMED CONCRETE SURFACE:



SPECIFIED COVER	TOLERANCE	
	D ≤ 12"	D > 12"
3/4"	-1/8", +1/4"	-1/8", +3/8"
1"	+/-1/4"	-1/4", +3/8"
1 1/2" OR GREATER	+/-3/8"	-3/8", +1/2"

NOTE: TOLERANCES APPLY ONLY AT LOCAL ANOMALIES. SIZE CHAIRS AND SPACERS FOR SPECIFIED COVER.

### MASONRY NOTES:

- CELL (VERTICAL) REINFORCEMENT:
  - MATERIAL: DEFORMED BARS CONFORMING TO SPECIFICATIONS. BAR SIZE: #5@48" OC FOR 8" CMU UNLESS NOTED OTHERWISE.
  - REINFORCED CELL HORIZONTAL SPACING: 4'-0" MAXIMUM. PLACE ADDITIONAL CELL REINFORCEMENT AS FOLLOWS:
    - IN CELL IMMEDIATELY ON EACH SIDE OF CONTROL AND EXPANSION JOINTS.
    - IN TWO ADJACENT CELLS LOCATED IMMEDIATELY ON EACH SIDE OF OPENINGS.
    - AT ALL CORNER CELLS.
    - AT ALL OTHER LOCATIONS WHERE NOTED ON DRAWINGS.
  - LAP REINFORCING BARS AS FOLLOWS:
 

REINFORCING BAR LAP/DEVELOPMENT LENGTH $l_d$ IN 8" CMU (INCHES)						
BAR SIZE	#3	#4	#5	#6	#7	#8
BAR LOCATED WITH MINIMUM COVER	19	34	45	54	63	72
BAR LOCATED IN CENTER OF FULLY GROUTED CELL	12	14	21	39	53	72

$f_y = 60,000$  PSI,  $f_m = 2000$  PSI
- REINFORCING SHALL EXTEND FULL HEIGHT OF WALL EXCEPT WHERE INDICATED OTHERWISE OR WHERE INTERRUPTED BY WALL OPENINGS.
- EACH REINFORCED CELL FOR INTERIOR MASONRY WALL SHALL HAVE A #5 DOWEL CAST IN SLAB.
- EACH REINFORCED CELL SHALL BE GROUTED FULL AND PROPERLY CONSOLIDATED.
- BOND BEAM REINFORCEMENT:
  - 2-#5 BARS, UNLESS NOTED OTHERWISE.
- REFERENCE SPECIFICATION SECTION 04 22 00.
- ALL MASONRY CONSTRUCTION SHALL CONFORM TO THE LATEST NCMA "SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF LOAD-BEARING CONCRETE MASONRY" AND BUILDING CODE REQUIREMENTS FOR CONCRETE MASONRY STRUCTURES.
- SIZE OF CONCRETE MASONRY UNITS SHALL BE 16" LONG BY 8" HIGH NORMAL FACE DIMENSIONS, UNO PROVIDE SPECIAL SHAPES AS REQUIRED. UNITS SHALL BE HOLLOW - ASTM C90 GRADE N.
- ALL MASONRY SHALL CONFORM TO THE FOLLOWING DESIGNATIONS, UNO
  - CONCRETE MASONRY UNITS: ASTM C-90 TYPE-1 fm = 2000 psi
  - MORTAR: ASTM C-270 TYPE-S
  - REINFORCING: ASTM A-706 Fy = 60,000 psi
- CORES CONTAINING VERTICAL REINFORCING, BOLTS OR ANCHORS WILL BE GROUTED SOLID WITH CORE FILL CONCRETE. FILLING CORES WITH MORTAR IS NOT ACCEPTABLE. REINFORCING SHALL BE PLACED PRIOR TO GROUTING.
- GROUT CORES IN 4'-0" MAXIMUM LIFTS UNLESS CLEAN-OUTS ARE PROVIDED, IN WHICH CASE 8'-0" MAXIMUM LIFTS MAY BE USED.
- LAY ALL WALLS IN RUNNING BOND UNLESS SPECIFICALLY SHOWN OTHERWISE ON THE DRAWINGS.
- HOLES CUT IN CMU WALLS FOR PIPING, CONDUIT, ETC. SHALL MISS ALL VERTICAL AND HORIZONTAL REINFORCING. HOLLOW AREAS IN BLOCKS AND SPACES BETWEEN PIPING, CONDUIT, ETC. SHALL BE COMPLETELY FILLED WITH GROUT AND PROPERLY SEALED WITH APPROVED SEALANT. ALUMINUM PIPING OR CONDUIT MAY NOT BE EMBEDDED IN ANY CONCRETE, BRICK OR CONCRETE BLOCK, BUT MAY BE SLEEVED.

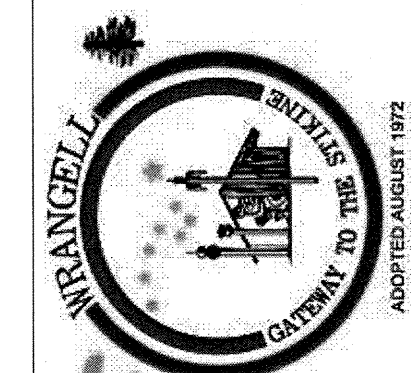
### POST-INSTALLED ANCHORS NOTES:

- POST-INSTALLED ANCHORS ARE TO BE OF TYPE, DIAMETER, AND EMBEDMENT AS INDICATED ON THE DRAWINGS.
- ADHESIVE ANCHORS SHALL BE SUPPLIED AS AN ENTIRE SYSTEM.
- ADHESIVE ANCHORS SHALL BE INSTALLED BY QUALIFIED AND TRAINED PERSONNEL.
- POST-INSTALLED ANCHORS INSTALLATION PROCEDURES SHALL FOLLOW THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII).
- POST-INSTALLED ANCHORS SHALL BE INSTALLED IN HOLES DRILLED WITH A ROTARY IMPACT HAMMER DRILL OR ROCK DRILL. DIAMOND CORE DRILLING IS NOT PERMITTED.
- POST-INSTALLED ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH (FC) OF 2,500 PSI.
- ADHESIVE ANCHORS SHALL NOT BE INSTALLED PRIOR TO THE CONCRETE CURING FOR 21 DAYS. CONCRETE SHALL BE DRY AND HAVE A MINIMUM TEMPERATURE AT THE TIME OF ADHESIVE ANCHOR INSTALLATION IN ACCORDANCE TO THE MPII.
- WHERE EXISTING CONCRETE REINFORCING CONFLICTS WITH POST-INSTALLED ANCHORS, THE ENGINEER OF RECORD MUST GIVE WRITTEN PERMISSION BEFORE CUTTING EXISTING REBAR.

### GENERAL NOTES:

- ALL SYMBOLS SHOWN ON THIS LEGEND MAY NOT APPEAR ON THIS SET OF DRAWINGS.
- FOR CONCRETE NOTES AND ADDITIONAL REINFORCING NOTES SEE SF001.
- FOR GENERAL LEGEND AND ABBREVIATIONS, SEE "GG" DRAWINGS.

REV	DATE	DESCRIPTION	BY	DB
A2	06/03/2023	Appendix 2		



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WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
 WRANGELL, ALASKA  
**STRUCTURAL NOTES AND LEGEND**  
**SHEET 1**  
 SEC. 31, TOWNSHIP 62S, RANGE 84E  
 CITY AND BOROUGH OF WRANGELL, ALASKA



PROJECT 1528.5026.01  
 DATE 06/02/2023

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S-001

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# STRUCTURAL GENERAL NOTES:

1. APPLICABLE SPECIFICATIONS AND CODES  
CONSTRUCTION AND DESIGN SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION, AND WITH THE LATEST EDITION OF THE APPLICABLE SPECIFICATIONS AND THE REQUIREMENTS NOTED AS FOLLOWS.
2. SPECIAL INSPECTION
  - a. SOILS – TABLE 1705.6 OF THE IBC
    - i. PERIODIC INSPECTION OF FOUNDATION SOIL BEARING CAPACITY, DEPTH, FILL MATERIALS CLASSIFICATION AND SUBGRADE PREPARATION AND COMPACTION.
    - ii. FULL TIME INSPECTION OF ENGINEERED FILL PLACEMENT AND COMPACTION.
  - b. CONCRETE – TABLE 1705.3 OF THE IBC
    - i. PERIODIC INSPECTION OF REINFORCEMENT BEFORE CONCRETE IS PLACED.
    - ii. FULL TIME INSPECTION OF ANCHOR RODS AND OTHER EMBEDDED ITEMS AS IDENTIFIED HEREIN.
    - iii. FULL TIME INSPECTION DURING PLACEMENT OF CONCRETE INCLUDING THE TAKING OF TEST SPECIMENS, SLUMP AND AIR CONTENT MEASUREMENT. INSPECTION AND TESTING SHALL BE LIMITED TO STRUCTURAL REINFORCED CONCRETE WITH TESTING FREQUENCY IN ACCORDANCE WITH THE PROJECT TECHNICAL SPECIFICATIONS.
  - c. STEEL – AISC 360 FOR STRUCTURAL STEEL, IBC SECTION 1705.2 FOR STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL (COLD-FORMED STEEL, REBAR, ETC.)
    - i. FULL TIME INSPECTION FOR HIGH-STRENGTH BOLTING FOR SLIP CRITICAL CONNECTIONS PER AISC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
    - ii. PERIODIC INSPECTION FOR HIGH STRENGTH BOLTING FOR BEARING TYPE CONNECTIONS PER AISC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
    - iii. FULL TIME INSPECTION OF COMPLETE AND PARTIAL PENETRATION GROVE WELDS, MULTI-PASS FILLET WELDS AND SINGLE PASS FILLET WELDS GREATER THAN 5/16" IN ACCORDANCE WITH AWS D1.1.
    - iv. PERIODIC INSPECTION OF FRAME JOINT DETAILS FOR COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.
3. DESIGN LOADS
  - a. DESIGN LOADS AND LOAD APPLICATIONS SHALL BE IN ACCORDANCE WITH IBC.
  - b. UNIFORM FLOOR LIVE LOADS
    - i. ALL FLOOR AREAS, UNLESS OTHERWISE INDICATED 125 PSF
  - c. ROOF LOADS
    - i. MINIMUM ROOF SNOW LOAD 55 PSF
    - ii. DRIFT SURCHARGE LOADS IN ACCORDANCE WITH ASCE 7
      - (a) BASIC GROUND SNOW LOAD 60 PSF
      - (b) IMPORTANCE FACTOR I = 1.10
  - d. WIND LOADS IN ACCORDANCE WITH CHAPTER 26 OF ASCE 7
    - i. OCCUPANCY OR RISK CATEGORY III
    - ii. BASIC WIND SPEED (3-SEC GUST) 147 MPH
    - iii. EXPOSURE CATEGORY D
  - e. SEISMIC LOADS
    - i. IMPORTANCE FACTOR I = 1.25
    - ii. MAPPED SPECTRAL RESPONSE  $S_s$  0.249
    - iii. MAPPED SPECTRAL RESPONSE  $S_1$  0.255
    - iv. SITE CLASS C
    - v. SPECTRAL RESPONSE COEFFICIENT  $S_{DS}$  0.216
    - vi. SPECTRAL RESPONSE COEFFICIENT  $S_{D1}$  0.255
    - vii. SEISMIC DESIGN CATEGORY D
  - f. SPECIAL LOADS
    - i. MECHANICAL EQUIPMENT LOADS ACTUAL OPERATING LOADS
  - g. ADDITIONAL LOADS REFERENCED ON THE DRAWINGS.
4. CONSTRUCTION LOADS  
STRUCTURES HAVE BEEN DESIGNED FOR DEAD LOADS AND THE DESIGN LOADS NOTED ABOVE. PROVIDE TEMPORARY BRACING, SHORING OR OTHER SUPPLEMENTAL SUPPORT DURING CONSTRUCTION AS NECESSARY TO PROTECT THE STRUCTURES FROM EXCESSIVE CONSTRUCTION LOADS.
5. FOUNDATIONS
  - a. FOUNDATION DESIGN CRITERIA
    - i. MAXIMUM ALLOWABLE SOIL BEARING PRESSURE - 5,000 PSF
    - ii. LATERAL SOIL PRESSURE 60 PCF EQUIVALENT FLUID PRESSURE (AT-REST)
    - iii. DESIGN FROST DEPTH BELOW EXTERIOR GRADE - 2 FEET FOR WARM BUILDINGS AND 3 FEET FOR COLD STORAGE
  - b. AVOID EXCESSIVE WETTING OR DRYING OF THE FOUNDATION EXCAVATIONS DURING CONSTRUCTION.
6. CONCRETE
  - a. CONCRETE CONSTRUCTION SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318).
  - b. DETAILING, FABRICATION AND PLACEMENT OF REINFORCEMENT SHALL CONFORM TO DETAILS AND DETAILING OF CONCRETE REINFORCEMENT (ACI 315).
  - c. MATERIALS
    - i. CONCRETE
      - (a) STRUCTURAL CAST - IN - PLACE  $f_c = 4,000$  PSI
      - (b) EXTERIOR WALKS, CURBS, RAMPS  $f_c = 4,000$  PSI
    - ii. REINFORCING MATERIALS
      - (a) REINFORCING BARS ASTM A615, GRADE 60
      - (b) WELDED WIRE FABRIC ASTM A185, FURNISH IN SHEETS ONLY
    - iii. POST-INSTALLED ANCHOR OR REBAR DOWEL ADHESIVE
      - (a) HILTI HIT HY-200 OR HIT-RE 500 V3
  - d. ALL BENT REINFORCING BARS SHALL BE SHOP FABRICATED ONLY. REBENDING OR WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS AUTHORIZED BY ENGINEER.
  - e. END HOOKS IN REINFORCING BARS, SHOWN ON THE DRAWINGS BUT NOT DIMENSIONED, SHALL CONFORM TO ACI 318.
  - f. CONCRETE COVER OVER REINFORCEMENT SHALL BE 2" CLEAR, EXCEPT FOR THE FOLLOWING, UNLESS OTHERWISE NOTED.
    - i. CONCRETE PLACED AGAINST AND PERMANENTLY IN CONTACT WITH EARTH 3" CLEAR
    - ii. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH OR WATER
      - (a) BEAMS, COLUMNS 1 1/2" CLEAR
      - (b) WALLS 1 1/2" CLEAR

- g. REINFORCEMENT SPLICES NOT PERMITTED EXCEPT AS DETAILED OR AUTHORIZED BY THE ENGINEER. LAP REINFORCING BARS THE FOLLOWING MINIMUMS AT ALL SPLICES, CORNERS AND INTERSECTIONS, UNLESS OTHERWISE INDICATED. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BAR.

BAR SIZE	REG BARS	TOP BARS
#3	1'-3"	1'-7"
#4	1'-9"	2'-3"
#5	2'-0"	2'-9"
#6	2'-5"	3'-3"
#7	3'-6"	4'-9"
#8	4'-0"	5'-2"
#9	4'-6"	5'-10"
#10	5'-1"	6'-7"

- h. LAP WELDED WIRE FABRIC ONE FULL MESH AT SPLICES.
  - i. STAGGER ADJACENT REINFORCEMENT LAP SPLICES IN WALLS 18" MINIMUM.
  - j. PROVIDE BAR SUPPORTS TO PROPERLY SECURE AND SUPPORT REINFORCING BARS AND WELDED WIRE FABRIC AT POSITIONS SHOWN ON THE DRAWINGS. IN ADDITION TO NORMAL ACCESSORIES PROVIDE #5 STANDEES AT 36" O.C. TO SUPPORT TOP REINFORCEMENT IN BASE SLABS, AND #3 U OR Z SHAPE SPACERS AT 72" O.C. EACH WAY IN WALLS WITH TWO CURTAINS OF REINFORCEMENT.
  - k. DOWELS, PIPES AND OTHER INSTALLED MATERIALS AND ACCESSORIES SHALL BE HELD SECURELY IN POSITION DURING CONCRETE PLACEMENT.
  - l. REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY PIPE, PIPE FLANGE OR METAL PART EMBEDDED IN CONCRETE. PROVIDE 2" CLEARANCE IN ALL CASES UNLESS OTHERWISE INDICATED. NO EMBEDDED ITEM SHALL BE SUSPENDED FROM, SUPPORTED BY, OR BRACED IN PLACE FROM THE STRUCTURAL REINFORCEMENT.
  - m. LOCATE CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS OR AS AUTHORIZED BY THE ENGINEER. SLABS, JOISTS AND BEAMS SHALL NOT HAVE JOINTS IN A HORIZONTAL PLANE EXCEPT WHERE DETAILED ON DRAWINGS.
  - n. THOROUGHLY CLEAN BY MECHANICAL SCARIFICATION ALL KEYWAYS AND CONSTRUCTION JOINTS PRIOR TO PLACING CONCRETE IN ADJACENT POUR.
  - o. PROTECT ALL PROJECTING WATERSTOPS FROM DAMAGE AND EXPOSURE DURING CONSTRUCTION. FIRMLY TIE ALL ENDS AND EDGES OF WATERSTOPS AT 18" MAXIMUM TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT.
  - p. BEGIN SPACING OF BARS WHICH PARALLEL CONSTRUCTION AND EXPANSION JOINTS 2" CLEAR EACH SIDE OF JOINT.
  - q. UNLESS OTHERWISE SHOWN, PLACE 2-#5 (1 EACH FACE) WITH 2-0" PROJECTIONS AROUND ALL OPENINGS IN CONCRETE WALLS OR SLABS.
  - r. PROVIDE AN ADDITIONAL 500 LINEAL FEET EACH OF #4 AND #5 REINFORCING BARS FOR USE AS DIRECTED DURING CONSTRUCTION.
  - s. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4", UNLESS OTHERWISE INDICATED.
7. SLABS ON GRADE
    - a. SLAB ON GRADE CONTROL JOINTS ARE DENOTED "CJ" ON DRAWINGS. SLAB ON GRADE CONSTRUCTION JOINTS ARE DENOTED "CONST JT." AT CONTRACTOR'S OPTION CONSTRUCTION JOINTS MAY BE SUBSTITUTED FOR CONTROL JOINTS.
    - b. LOCATE WELDED WIRE FABRIC 1 1/2" CLEAR FROM TOP OF SLAB.
    - c. PROVIDE 1-#4 X 4'-0" PARALLEL TO EDGE OF SLAB OPPOSITE THE END OF ALL DISCONTINUED SLAB JOINTS, AND 1-#4 X 4'-0" DIAGONAL BAR AT ALL REENTRANT CORNERS. PLACE BARS MID-DEPTH IN SLAB AND 2" CLEAR FROM EDGE OR CORNER.
    - d. SLOPE BOTTOM SURFACE OF SLABS AS NECESSARY TO MAINTAIN MINIMUM THICKNESS NOTED ON DRAWINGS FOR ALL SLABS WITH SLOPING TOP SURFACE OR DEPRESSION FOR TILE.
  8. STRUCTURAL STEEL
    - a. STRUCTURAL STEEL CONSTRUCTION SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS.
    - b. MATERIAL
      - i. STRUCTURAL STEEL W-SHAPES ASTM A992, GRADE 50
      - ii. STRUCTURAL STEEL PLATES, BARS, ANGLES, AND CHANNELS ASTM A36
      - iii. HOLLOW STRUCTURAL STEEL ASTM A500, GRADE B
      - iv. STEEL PIPE ASTM A53, GRADE B
      - v. HIGH - STRENGTH BOLTS ASTM F3125, GRADE A325
      - vi. ANCHOR RODS ASTM F1554
      - vii. HEADED ANCHOR STUDS (HAS) ASTM A108, TYPE B
    - c. ALL STRUCTURAL STEEL BOLTED CONNECTIONS SHALL BE SNUG-TIGHTENED, 3/4" DIAMETER A325 - N BOLTS WITH STANDARD HOLES, UNLESS OTHERWISE NOTED.
    - d. ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE - STEEL (AWS D1.1) AND SHALL BE PERFORMED BY WELDERS QUALIFIED BY THE APPROPRIATE AWS TEST FOR THE WELDING PERFORMED.
  9. EQUIPMENT INSTALLATION
    - a. ALL OPENINGS SHOWN SHALL BE VERIFIED, AND ALL STRUCTURAL DIMENSIONS AND DETAILS PERTAINING TO EQUIPMENT INSTALLATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE ACTUAL EQUIPMENT FURNISHED.
    - b. EQUIPMENT SUPPORTS, ANCHORAGES AND OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO PLACING CONCRETE.
  10. ARCHITECTURAL ELEVATION 100'-0" = CIVIL ELEVATION 260.00' FOR THE NEW FILTER BUILDING. THE ELEVATIONS SHOWN AT THE PIPE GALLERY ADDITION ARE BASED ON EXISTING PLAN ELEVATIONS LISTED IN THE RECORD DRAWINGS FOR THAT STRUCTURE.

SIEVE SIZE	PERCENT FINER	SIEVE SIZE	PERCENT FINER
3"	100*	1"	100%
1 1/2"	70-100	3/4"	90% TO 100%
3/4"	30-100	3/8"	20% TO 55%
1/2"	25-100	#4	0% TO 10%
NO. 4	20-49	#8	0% TO 5%
NO. 40	0-25		
NO. 200	0-6		
0.02mm	0-3		

STRUCTURAL FILL GRADATION  
CRUSHED STONE

DRAIN GRAVEL GRADATION  
CRUSHED STONE

REV	DATE	DESCRIPTION
1	6/30/2023	ADDENDA 2



**DOWL**  
www.dowl.com  
222 N. 32nd Street, #700  
Billings, Montana 59101  
406-656-6399

WRANGELL WATER TREATMENT PLANT IMPROVEMENTS  
WRANGELL, ALASKA  
STRUCTURAL FOUNDATION NOTES

PROJECT 1528.50206.01  
DATE 05/02/2023

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SHEET

SF-001

## **Attachment 3**

**Specification 28 31 13 – Fire Detection and Alarm Systems**

## SECTION 28 31 13 – FIRE DETECTION AND ALARM SYSTEMS

### PART 1 GENERAL

#### 1.01 REQUIREMENTS INCLUDE

- A. Provide complete fire detection and alarm system design, equipment, and installation thereof for filtration building. Fire alarm panel to have required panel and voice amplifier.
- B. See building code and life safety analysis on drawings for applicable codes, use group and occupancy. Design shall place required initiating and notification equipment in these spaces to meet the full intent of all governing codes listed. Design to also include required interface requirements for shutdown functions of HVAC equipment and input to programmable logic controller (PLC) system provided by electrical contractor for alarm, trouble, and supervisory signal.
- C. Provide connection of new fire alarm panel to a central reporting station as defined by NFPA 72 for 24 hour reporting of alarm signaling. Owner to provide preferred approved Central Reporting Station contact information. Transmission of signal shall be with cellular means, or as directed by owner with approved method required by code.
- D. Authority Having Jurisdiction (AHJ) shall provide to contractor approval of design prior to purchase or installation of system. Contractor and vendor shall be responsible for providing this coordination and have AHJ sign approved design drawings as being reviewed.
- E. Systems shall be designed and installed to meet all requirements of the following codes. If local codes are more stringent than those as shown below, the more stringent codes must be applied
  - 1. International Building Code (IBC)
  - 2. International Fire Code (IFC)
  - 3. National Fire Protection Association (NFPA):
    - a. NFPA 70 - National Electrical Code
    - b. NFPA 70E - Standard for Electrical Safety in Workplace
    - c. NFPA 72 - National Fire Alarm Code
    - d. NFPA 101 - Life Safety Code
    - e. NFPA 170 - Standard for Fire Safety and Emergency Symbols
  - 4. All work shall comply with latest edition of National Electrical Code (NEC) and National Electrical Safety Code (NESC).
  - 5. International Building Code, provide required temporary electrical and communication services during construction of facility as required. If occupancy is granted and then additional work is required on system that makes system non-operable, contractor shall provide fire watch if required but not anticipated.
- F. Contractor to verify all ceiling types, spacing, and wall construction with architectural drawings at time of construction for approved installation means and methods.
- G. All wiring installation shall be surface mounted and routed in red conduit system marked at boxes. Use PVC or fiberglass conduit properly supported with stainless steel hardware in chemical room. Back boxes for devices shall also be painted red. Where conduit is subject to physical damage (8' and below in electrical/piping room), rigid galvanized steel (RGS) conduit shall be used and also painted red.

## 1.02 SUBMITTAL PROCEDURES

- A. It shall be the shared responsibility of Contractor and equipment provider to make sure that initial submittals have above submittal requirements provided and approved by local AHJ prior to submittals to engineer for review. Submittals shall be prepared by a NICET Level 3 or 4 individual.
- B. Submittal will only be reviewed by Engineer for meeting criteria specified. Quantities of devices and equipment are responsibility of Contractor and equipment provider to include. Contractor shall verify device and equipment requirement quantities at time of installation in accordance with addendums, drawings revisions, field conditions, and change orders at time of installation.
- C. Final construction set of engineer reviewed submittals shall be provided by contractor to local AHJ office for review and approval before installation can begin. This set of documents shall be submitted to Engineer and Owner to record.

## 1.03 ACTION SUBMITTALS

- A. Shop Drawings:
  - 1. Assembly Drawing showing arrangement and connections to equipment to be prepared by contractor and vendor.
  - 2. Address tags per device are required.
  - 3. Coordinated system schematic and wiring drawings of equipment.
  - 4. Actual candela ratings of strobe devices and wattage tap setting of speaker for each device.
  - 5. System Bill of Materials list, indicating quantity, description, part and specific model numbers for components of fire alarm and detection system. Actual option numbers if applicable must be provided.
  - 6. Coordinated system schematic drawings and wiring diagrams detailing point to point connections for equipment, control circuits and alarm devices.
- B. Product Data:
  - 1. Materials list specific to project, including devices, panels with all options clearly shown, and wire.
  - 2. Generic catalog information will not be approved. Submittals must have specific model numbers highlighted or designated.
- C. Design submittals:
  - 1. Computations verifying size of battery being proposed and voltage drop with size of wiring specifically shown. Computations verifying battery size being proposed, allowing for minimum of 25% future system expansion.
  - 2. Quantity of 120V circuits and associated device callouts. Final 120V circuit quantity and ampacity per circuit required for power supplies/amplifiers to power strobe and speaker combinations.
  - 3. Plan layout drawings. AutoCAD files will be provided by Engineer to vendor to do layouts as required upon request.
- D. Instruction manuals, including:
  - 1. Nameplate information and shop order numbers for central control panels.
  - 2. List of recommended spare parts.



#### 1.04 CLOSEOUT SUBMITTALS

##### A. Record Documentation:

1. At completion of project final record "as-built" drawings shall be provided to have routings clearly shown, specific address assignments/device, and final circuit computations for each location and panel.
2. Final testing results shall be performed by an independent third party to verify intelligibility and required decibel (dBA) levels are met above the ambient dBA level in each space.
3. Provide final Record Drawings within 4 weeks after acceptance of complete system.

##### B. Upon completion, submit Certificate of Completion in accordance with NFPA 72 to Owner.

##### C. Maintenance manuals: 4 copies of maintenance manuals shall be turned over for review to contract monitor one work week prior to date of final acceptance. Each manual will include as a minimum:

1. Copy of as-built drawings.
2. Copy of technical sheets on all equipment installed. Individual model number of components installed in control panel and field system shall be highlighted on technical sheets.
3. Internal schematic diagrams of all installed equipment, to include interface devices.
4. Copy of all software required for installing, maintaining, modifying, programming, repair, and troubleshoot installed fire system control equipment, including license and future updates to software.
5. Copy of programmer's guide or manual.
6. Physical copy of logic program.
7. Copy of troubleshooting manual or guide.
8. Technical explanation of complete system.
9. List of recommended spare cards and parts for future repairs, local source for equipment and parts with current price list.
10. Copy of test procedures list to be used at final acceptance.
11. Drawing of conduit layout, with physical wiring layout by color codes.
12. Copy of NFPA standards by which fire alarm system was installed.

#### 1.05 MAINTENANCE MATERIALS

- ##### A. Spare parts: 2 of each type, pull stations, each type of addressable modules, audible devices, speaker/strobe, and any special devices installed in system.

#### 1.06 QUALITY ASSURANCE

- ##### A. Fire alarm system site-wide and components shall be listed as product of single fire alarm system manufacturer under appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear UL 864 label and FM approved. Mass Notification System (MNS) shall be UL 2572. Control equipment shall be listed under UL Category UOJZ as single control unit. Partial listing not acceptable.
- ##### B. Panels and peripheral devices shall display manufacturer's name on each component unless approved by manufacturer. Manufacturer shall have an approved manufacturers list for certain equipment specified to work with equipment and provide with submittal.

- C. Complete installation and equipment shall conform to applicable sections of codes as stated in 1.01 and UL requirements.
- D. Wiring shall be in strict compliance with all provisions of NEC Article 760.35 (B), Power-Limited Fire Alarm Circuits. If required, may be reclassified as non-power limited if wired in accordance with NEC Article 760.35 (A).
- E. Complete installation shall be within guidelines of latest edition of International Building Code.
- F. Control equipment shall have transient protection devices complying with UL 864 requirements. Copper circuiting leaving interior of facility to remote location device shall have proper isolation and transient protection.
- G. Contractor qualifications:
  - 1. Minimum of 5 years documented fire alarm installations.
  - 2. Able to provide parts and labor to expand system specified, if so requested, for period of 5 years from date of acceptance.
- H. Manufacturer qualification
  - 1. Manufacturer of equipment shall have produced similar equipment for minimum period of 5 years.
  - 2. Fire alarm system shall be manufactured by ISO 9001 certified company and meet requirements of BS EN9001: ANSI/ASQC Q9001.
  - 3. Manufacturer's authorized service representative: Competent, factory-trained engineer or NICET-certified technician (minimum Level II Fire Alarm Systems) on Site to guide final checkout and to ensure system integrity.
  - 4. When requested by Engineer, provide acceptable list of similar fire alarm installations complying with requirements of this specification.
- I. Regulatory requirements:
  - 1. Fire alarm system shall comply with requirements of NFPA 72 except as modified and supplemented by this specification. System shall be electrically supervised and monitor integrity of conductors.
  - 2. Fire alarm control panel shall meet UL 864 (control units).
  - 3. System and its components shall be UL-listed under appropriate UL testing standard as listed herein for fire alarm applications and installation shall be in compliance with UL listing.
  - 4. Complete installation shall conform to latest edition of applicable sections of NFPA 12B, 13, 13A, 15, 16, 17, 17A, 70, 70E, 71, 72, 90A, 101, and state and local building codes and requirements.

#### 1.07 COORDINATION

- A. Electrical work shall be coordinated through general contractor, Engineer, and Owner in writing at least 14 days prior to any planned power or communications outages if effecting operation or occupancy of building.
- B. Coordinate equipment locations prior to any rough-ins.

#### 1.08 ENVIRONMENTAL CONDITIONS

- A. Contractor to verify with site visit for wiring to be concealed or surface mounted in conduit.

B. All wiring to be in metal conduit system and installation comply with any seismic requirements for area.

#### 1.09 WARRANTY

A. Work performed and material and equipment furnished under this contract shall be free from defects and shall remain so for period of at least 1 year from date of acceptance. Manufacturer shall also be able to provide an additional 5 years of service minimum for all parts on system.

#### 1.10 MEASUREMENT AND PAYMENT

A. Include all material, equipment, labor, and associated work necessary to complete the work described in this Section in the Lump Sum Bid on the Proposal for the 2016 Army Post Road Aquifer Storage and Recovery Well – Well House and Piping Project.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Simplex 4007 panel with 4003 amplifier pre-recorded and live MNS voice capability.

B. Notifier Onyx series.

C. Honeywell ECC series.

#### 2.02 SYSTEM DESCRIPTION

A. Fire alarm system shall include all wiring as required for full specific addressable communication ability between panel and space provisions in panel for communication media card for any future fire alarm panel network connections at site if required.

B. Provide microphone input for live notification message in amplifier cabinet.

C. Use closed-loop initiating device circuits with individual device addressability and full supervision, individual notification appliance circuit supervision, incoming and standby power supervision. Include control panel, manual pull stations (fire alarm boxes), automatic smoke detector, audible/visual devices, wiring, connections to devices, outlet boxes, junction boxes, and other necessary materials.

#### 2.03 DESIGN REQUIREMENTS

A. Primary power: 120 volts, 60 Hz, single-phase, electrically supervised.

1. Fire alarm control panel shall have front cover engraved plastic nameplate indicating location of branch circuit breaker serving control panel. Circuit breaker shall be painted red and shall be labeled "Fire Alarm Circuit Control" in circuit breaker panel directory. Provide red locking clip on breakers serving related fire alarm equipment.

2. Control equipment shall have transient protection devices complying with UL 864 requirements.

3. 120 volt input circuit shall be protected by surge suppression device to have peak surge current per phase of 60 kA and system of 180 kA.

B. Low-voltage power: 24 volts dc, solid-state, closed-circuit, electrically supervised.

- C. Signal Line Circuits shall contain Class B independently supervised initiation circuits so fault in any one zone or device shall not affect other zones or devices. Alarm activation of initiation circuit shall not prevent subsequent alarm operation of other initiation circuits. These signal line circuits shall only be loaded to 75% of allowed devices.
- D. Notification circuits shall contain Class B individually supervised and fused notification appliance circuits for speakers, and strobe flashing alarm lamps. Disarrangement conditions of circuit shall not affect operation of other circuits. These notification circuits shall only be loaded to 75% of allowed devices.per wiring provided.
- E. Amplifier and power supplies shall be sized for 50 percent future load and supported by computations and specific catalog numbers.
- F. Act of manually operating fire alarm pull station, automatic operating of smoke detectors, or individual addressable module interfaces, shall cause following functions:
  - 1. Readout of specific device at both main fire alarm panel and annunciator.
  - 2. Visual indication at central fire alarm control panel of loop or room initiating alarm.
  - 3. Activate fire alarm speaker/strobe signal devices specified to be activated until system has been restored to normal.
  - 4. Provide transmission of signals to PLC system with contact closures from panel.
  - 5. Provide for transmission of signal to remote central reporting station with cellular means as directed by owner.
  - 6. Shut down functions based on sequence of operation matrix on mechanical drawings and hardwired shutdown interface to associated HVAC equipment.
- G. Wire break or ground on fire detection loop circuit, operation of alarm silence switch shall cause "Trouble" signal and lamp to be activated.
- H. On restoration of system, trouble signal shall remain energized until trouble signal silence switch is restored to normal.
- I. Power outage shall cause system to operate by means of 24 hours on board batteries as specified herein.
- J. Fire alarm control panel and manual pull stations shall have pin tumbler type lock and shall be keyed alike.
- K. Each panel location shall have smoke detector located directly in front and above same panel.
- L. Provide system ground for earth detection and lightning protection. Connection shall be made to approved, dedicated earth ground in accordance with NFPA 780.

#### 2.04 PERFORMANCE REQUIREMENTS

- A. Fire alarm control panel shall allow for loading or editing special instructions and operating sequences as required for each specific device. System shall be capable of on-site programming to accommodate and facilitate expansion, building parameter changes, or changes as required by local codes. Software operations shall be stored in nonvolatile programmable memory within fire alarm control panel. Loss of primary and secondary power shall not erase instructions stored in memory.

- B. Resident software shall allow for full configuration of initiating circuits so additional hardware shall not be necessary to accommodate changes in, for instance, sensing of normally open contact devices to sensing of normally closed contact devices, or from sensing of normally open contact devices to sensing a combination of current limited and noncurrent limited devices on same circuit and being able to differentiate between two, or changing from non-verification circuit to verification circuit or vice-versa.
- C. Notification appliance circuits shall be individually configurable on-site.
- D. Hard-wired initiation and control circuits shall be individually configurable, on-site, in any combination, to provide initiating circuit, notification circuit, or auxiliary control circuit operation.
- E. System type: Coded supervised system with addressable initiating devices.
- F. Configure control panel with spare address points available for 25% additional devices on each loop.

## 2.05 FIRE ALARM DETECTION AND CONTROL PANEL

- A. Control panel: Solid-state, microprocessor-based, and addressable.
  - 1. Construction: Modular.
  - 2. Panel shall display primary controls and displays essential to operation during fire alarm condition.
  - 3. Keypad/keyboard shall only be used for maintenance purposes.
  - 4. Local audible device shall sound during "Alarm," "Trouble," or "Supervisory" condition. Audible device shall sound differently during each condition to distinguish one condition from another without having to view panel.
  - 5. Equip cabinet(s) with locks and door panel(s) suitable to display system information.
  - 6. Mounting: Surface.
- B. Primary controls visible at front access panel:
  - 1. Alphanumeric character liquid crystal display on panels. 4100 transponder panel does not have LCD readout.
  - 2. Individual red system alarm LED.
  - 3. Individual yellow supervisory service LED.
  - 4. Individual yellow trouble LED.
  - 5. Green "Power On" LED.
  - 6. Alarm acknowledge key.
  - 7. Supervisory acknowledge key.
  - 8. Trouble acknowledge key and ring back.
  - 9. Alarm silence key.
  - 10. System reset key.
- C. Secondary control switches and LEDs:
  - 1. City disconnect/switch.
  - 2. Manual evacuation (drill).
  - 3. Door holder release bypass.
- D. Control panel shall provide:
  - 1. Setting of time and date.
  - 2. LED testing.

3. Alarm, trouble, and abnormal condition listing.
  4. Enabling and disabling of each monitor point separately.
  5. Activation and deactivation of each control point separately.
  6. Changing operator access levels.
  7. Walk test enable.
  8. Running diagnostic functions.
  9. Displaying software revision level.
  10. Displaying historical logs.
  11. Displaying card status.
  12. Point listing.
  13. Milliammeter to indicate supervisory current.
  14. Auxiliary relays: As necessary to perform functions specified or shown on drawings.
- E. Provide following lists for maintenance purposes:
1. Points list by address.
  2. Monitor point list.
  3. Signal/speaker list.
  4. Auxiliary control list.
  5. Feedback point list.
  6. Pseudo point list.
  7. LED/switch status list.
  8. Alphanumeric display shall display following information relative to abnormal condition of a point in system:
  9. Initiating device custom location label.
  10. Type of device (i.e. smoke, pull station).
  11. Point status (i.e. alarm, trouble).
- F. History logging:
1. System shall be capable of logging and storing events in alarm log and events in trouble log. Events shall be stored in battery-protected random access memory. Each recorded event shall include time and date event occurrence.
  2. Historical alarm log events:
    - a. Alarms.
    - b. Alarm acknowledgment.
    - c. Alarm silence.
    - d. System reset.
    - e. Alarm historical log cleared.
  3. Historical trouble log events:
    - a. Trouble conditions.
    - b. Supervisory alarms.
    - c. Trouble acknowledgment.
    - d. Supervisory acknowledgment.
    - e. Alarm Verification tallies.
    - f. Walk test results.
    - g. Trouble historical log cleared.
- G. Silent walk test with history logging:
1. System shall be capable of being tested by one person. While in testing mode, alarm activation of initiating device circuit shall be silently logged as alarm condition in historical data file. Panel shall automatically reset after logging of alarm through signal line circuit.

2. Momentary disconnection of initiating or indicating device circuit shall be silently logged as trouble condition in historical data file. Panel shall automatically reset after logging of trouble condition through signal line circuit.
- H. Access levels:
1. Provide access levels with Level 4 being highest. Level 1 actions shall not require passcode. Passcodes shall consist of up to 10 digits. Changes to passcodes shall only be made by authorized personnel.
  2. If an invalid code is inputted, operator shall be allowed up to 3 chances to enter valid code. After 3 unsuccessful tries, operator shall no longer be in menu option.
  3. Access to level shall only allow operator to perform actions within that level plus actions of lower levels, not higher levels.
- I. Back-up batteries:
1. Size: 24-hour standby operation, with 5 minutes of alarm capability.
  2. Type: Maintenance-free, lead-calcium, rechargeable.
  3. Supervise system batteries so low battery condition or disconnection of battery shall be audibly and visibly indicated at control panel.
  4. Automatic battery charger: Size to recharge fully discharged batteries to 70% of full charge in 12 hours maximum; high rate and charger failure LED indicators, and fuse protection.
- J. RS-232-C output:
1. Control panel shall be capable of operating remote CRTs and/or printers.
  2. Use data amplifiers to increase CRT or printer line distance.
  3. Each RS-232-C port shall only communicate with one keyboard.
  4. Control panel shall support multiple RS-232-C ports.
- K. Fire alarm control system network:
1. Each panel shall operate as proprietary local system with ability for fully supervised data communication to a second building fire alarm panel in future if required.
  2. CPU shall monitor all alarm, trouble, and supervisory signals of fire alarm control panel.
  3. System shall communicate required information by cellular means to central reporting system and to PLC system.
- L. Analog initiating device programming and monitoring:
1. Type: Smoke density measuring devices having no self-contained alarm set point (fixed threshold). Alarm decision for each device shall be determined by control panel. Control panel shall determine condition of each device by comparing device value to stored value.
  2. Control panel shall maintain moving average of devices smoke chamber value to automatically compensate (move threshold) for dust and dirty conditions that could affect detection operations. System shall automatically maintain constant smoke obscuration sensitivity for each device by compensating for environmental factors. Photoelectric device smoke obscuration sensitivity shall be adjustable to within 0.3% of either limit of UL window (0.5% to 4.0%) to compensate for any environment.
  3. Control panel shall automatically indicate when individual device needs cleaning. If "Dirty Device" is left unattended, it shall in no way decrease amount of smoke obscuration necessary for system alarm activation.
  4. Control panel shall continuously perform automatic self-test routine on each device which will functionally check device electronics and ensure accuracy of values being

transmitted to control panel. Device failing test shall indicate trouble condition with device location at control panel.

5. Operator at control panel, having proper access level, shall have capability to manually access following information for each device:
  - a. Primary status.
  - b. Device type.
  - c. Present average value.
  - d. Present sensitivity selected.
  - e. Peak detection values.
  - f. Sensor range (normal, dirty, etc.).
  - g. Values shall be in "percent of smoke obscuration" format so no interpretation is required by operator.
6. Operator at control panel, having proper access level, shall have capability to manually control following for each device:
  - a. Clear peak detection values.
  - b. Enable or disable point.
  - c. Clear verification tally.
  - d. Control device relay driver output.
7. Control panel shall have capability of being programmed to automatically change sensitivity settings of each device based on time-of-day and day-of-week. Provide various sensitivity settings available for each device.
8. Control panel shall have capability of being programmed for pre-alarm or 2-stage function. Function shall allow indication to occur when, for example, 3% sensor reaches threshold of 1.5% smoke obscuration.
9. At least 256 individually identified sensors per SLC loop with minimum 1 loops per panel, as well as conventional initiating device and notification appliance circuits shall be supported within single control panel.
10. For increased smoke detection assurance, provide individually addressed smoke devices with alarm verification. Only verified alarm shall initiate alarm sequence operation.
11. Provide sync. Modules as required for strobes in each panel.

M. Supervise fire alarm panel cover removal.

1. Contacts: 24 volts dc, Form C.
2. Provide mounting hardware.

2.06 ADDRESSABLE INITIATING DEVICES

A. Photoelectric detector head:

1. Type: 2% light obscuration sensing, twist-lock base, LED source and silicon photodiode target, alarm LED, 360° smoke entry with insect screen, magnetic test switch. Plug-in unit, mounted to twist-lock base.
2. Detector shall fit into base common with both heat detector and ionization detector.
3. Unit shall be compatible with other addressable detectors, addressable manual stations, and addressable zone adaptor modules on same circuit.
4. Detector shall also fit into nonaddressable base capable of being monitored by addressable zone adaptor module.
5. Base of detector shall provide 24 volts dc power from fire alarm control panel.

B. Addressable pull stations (manual fire alarm boxes):

1. Type: Non-coded, double-action with NO contacts.
2. Operation: Push in and pull lever down to sound alarm.
3. Mounting: Semi-recessed.



4. Key lock test and reset.
5. Construction: Lexan or cast aluminum, red satin baked enamel, white lettering.
6. Keyed to match control panel.
7. Pull station containing electronics that communicate station status (alarm, normal) to control panel over 2 wires that also provide power to pull station. Other characteristics shall be similar to pull stations specified above.
8. Address shall be set on each station.
9. Station shall mechanically latch upon operation and remain latched until manually reset by opening with key common to all system locks.
10. Stations using Allen wrenches or special tools to reset, not acceptable.
11. Provide explosionproof devices with intrinsically safe, isolated barrier modules where required on Drawings.

#### 2.07 ANALOG INITIATING DEVICES AND ADDRESSABLE DEVICE BASES

- A. Addressable smoke devices: Photoelectric type shall communicate actual smoke chamber values to system control panel. Chambers shall also be self-adjusting for dirt build up to maintain programmed obscuration ratings.
- B. Addressable temperature devices shall sense within temperature range of 32°F to 190°F.
  1. Control panel shall be capable of sensing either set point of 135°F, or rate-of-rise of 15°F per minute for fire sensing.
  2. Set point may be chosen within stated range.
- C. Each device base shall contain LED that will flash each time it is scanned by control panel. LED on device base shall turn on steady indicating abnormal condition.
- D. For analog initiating devices and associated bases, provide shielded twisted pair for communication and for 24-volt dc power from control panel.
- E. Each device shall contain test switch to provide for easy alarm testing at sensor location.
- F. Each sensor shall be scanned by control panel for its type identification to prevent inadvertent substitution of another sensor type. Trouble condition shall occur until proper type is installed or programmed device type is changed at control panel.
- G. Device electronics shall be immune from false alarms caused by EMI and RFI.

#### 2.08 INDIVIDUAL ADDRESSABLE MODULES (IAM)

- A. Provide IAMs for interfacing normally open, direct-contact devices to addressable signaling line circuit. Include tamper, flow, and pressure switches, and others. Multi point IAMs are approved with integral addressable output functions and interposing relays.
- B. Mounting: Surface or flush, standard electric outlet box with cover plates.
- C. Power: 24 volts dc from fire alarm panel for control IAMs only require separate 2/C #14 for 24VDC. SLC is a #16TSP operating from fire alarm control panel. All cables to be listed for fire alarm use.
- D. Type 1 - Monitor IAM:
  1. Use: For conventional 2-wire smoke detector and/or contact device monitoring with Class B (NFPA 72 initiating device circuit) wiring supervision.

2. Addressable device module shall monitor status of zone consisting of N/O or N/C contact devices
  3. Supervision of initiating device circuit wiring: Class B.
  4. Unit shall communicate zone status (normal, alarm, trouble) to control panel.
- E. Type 2 - Control IAM:
1. Use: For device control with Class B wiring supervision.
  2. Each module shall be available in Class B supervision version. Wiring shall be supervised by end-of-line device.
  3. IAM shall communicate supervised wiring status (normal, trouble) to fire alarm control panel and shall receive command to control relay from fire alarm control panel.
  4. Non-supervised control: DPDT relay switching for loads up to 120 volts ac. Provide replaceable 2-ampere fuse, one on each common leg of relay.
  5. Provide fire alarm isolation relays as required for higher amperage loads such as Air Products MR series relays.
- F. Mount addressable modules in 4" square (101.6 mm square), 2-1/8" (54 mm) deep electrical box with cover. Locate adjacent to first device being monitored and box shall be painted red with actual address on cover.
- G. IAM shall be supervised and identified by address at control panel. If IAM becomes nonoperational, tampered with, or removed, discrete trouble signal, unique to device, shall be transmitted to, and annunciated at, control panel.
- H. IAM shall be capable of being programmed for its "address" location on addressable device. IAM shall be compatible with addressable manual stations and addressable detectors on same addressable circuit.
- I. IAM failure will not hinder operation of other system devices.
- J. Notification appliance circuit (NAC) module (if required):
1. Provide 4 fully supervised Class B notification circuits. Expansion circuit board shall allow expansion to eight circuits per module.
  2. NAC capacity shall be 2.0 amperes maximum per circuit and 8.0 amperes maximum per module.
  3. Module shall not affect other module circuits in any way during short circuit condition.
  4. Module shall provide 8 green "On/Off" LEDs and 8 yellow "Trouble" LEDs.
  5. Module shall provide momentary switch per circuit that may be used to manually turn particular circuit on or off or to disable circuit.
  6. Each notification circuit shall include custom label inserted to identify each circuit location. Labels shall be created using standard typewriter or word processor.
  7. NAC module shall be provided with removable wiring terminal blocks for ease of installation and service. Terminal strips shall be UL-listed for use with up to 12 AWG wire.
  8. Each circuit shall be capable of, through system programming, deactivating upon depression of signal silence switch.
  9. NAC module shall be capable of synchronizing strobes and shall support selective signal silencing.

- K. Isolator module (if required):
  1. Provide module to automatically isolate wire-to-wire short circuits on SLC Class A or Class B branch. Isolator module shall limit number of modules or detectors that may be rendered inoperative by short circuit fault on SLC segment or branch. When applicable, provide at least one isolator module for each floor or protected zone of building.
  2. If wire-to-wire short occurs, isolator module shall automatically open-circuit (disconnect) SLC. When short circuit condition is corrected, isolator module shall automatically reconnect isolated section.
  3. Isolator module shall not require address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset isolator module after normal operation.
  4. Isolator module shall provide single LED that shall flash to indicate that isolator is operational and shall illuminate steadily to indicate that short circuit condition has been detected and isolated.
  
- L. Fire alarm relays:
  1. Provide for general purpose switching of components interfaced to FACP, including but not limited to, HVAC units and electric passenger elevator controls.
  2. UL-listed. UL recognized relays shall be rated at 10,000,000 mechanical operations.
  3. In accordance with NFPA 72, UL-listed relay connected to fire alarm system and used to initiate control of protected premises fire safety functions shall be located within 3'-0" (1 m) of controlled circuit or appliance.
  4. Each relay shall contain red LED which shall illuminate when coil is energized.
  5. 24 volt dc, 2-wire from fire alarm control panel or associated addressable relay module.
  6. Relays shall provide SPDT 10-ampere contact.
  7. Manufacturer: Air Products and Controls MR Series.

## 2.09 INDICATING DEVICES

- A. Dual emergency communication appliance:
  1. Strobe: Amber color "Alert" on top and Clear "Fire" lens on bottom. (Xenon type) or as provided by manufacturer. Single clear "Alert" may be used if approved by AHJ.
  2. Mounting: Wall.
  3. Power supply: 24 volts dc from fire alarm control panel.
  4. Lamp shall provide 2-wire connection.
  5. Legend: Lettering visible from 180° field-of-view.
  6. Provide light output as required for space per code with a minimum of 15 candela and 60 flashes per minute rate. Each strobe shall have intensity selectable up to 110 candela.
  7. Standards: UL-listed, FM-approved, and meeting ADA requirements.
  8. Red enclosure.
  9. Provide corrosion resistant devices in chemical room and weatherproof for outside of door existing building.
  
- B. Speaker
  1. Type: 24-volt or 70.7-volt with tap settings at 1/4-watt, 1/2-watt, 1-watt, or 2-watt. Interior modular type with grilles. Allow for full 2 watt rating per speaker and field set taps as required.
  2. Contractor and vendor to take ambient decibel levels while process is in operation prior to placement of speakers for providing proper quantities of speakers and tap settings. Contractor and vendor to be responsible for speaker aiming and placements to meet intelligibility requirements.
  3. Mounting:

- a. Exposed conduit: Surface box mounted.
  - b. Finished areas: Flush mounted, with back box.
  - 4. Output: 80 dBA for 1/4-watt speaker and 88dBA for 2-watt speaker at 10'-0".
  - 5. Power supply: From fire alarm control panel or NAC panel.
  - 6. T-tapping of signal device conductors to signal circuit conductors not acceptable.
  - 7. Suitable for use within combination audio/visual unit.
  - 8. Standards: UL 464 listed, FM-approved and meeting ADA requirements.
  - 9. Red enclosure.
- C. Visual flashing lamps (xenon strobe):
- 1. Type: Solid-state, synchronized with internal reflector and pyramidal lens.
  - 2. Mounting: Wall.
  - 3. Power supply: 24 volts dc from fire alarm control panel.
  - 4. Lamp shall provide 2-wire connection.
  - 5. Candela field adjustable from 15 to 110.
  - 6. Legend: "Fire" lettering visible from 180° field-of-view.
  - 7. Unit shall be of stand-alone type or be incorporated as part of horn unit.
  - 8. Standards: UL-listed, FM-approved, and meeting ADA requirements.
- D. Audio/visual alarm indicating appliance:
- 1. Where applicable a common enclosure may be used for fire alarm speaker and visual alarm devices.
  - 2. Design to speaker, alert strobe, and fire strobe as combined unit or separate strobes.
  - 3. Front panel or bezel, may be inverted so lens is below audible device.
  - 4. Standards: UL-listed and meeting ADA requirements.
  - 5. Provide weatherproof models at each side of exterior of building by an egress door.
- E. Outdoor, weatherproof audio/visual alarm indicating appliance.
- 1. Common enclosure for outdoor, weatherproof fire alarm audible and visual alarm devices. Visual portion of device shall incorporate Xenon flash tube enclosed in rugged Lexan lens and shall meet requirements of UL Standard 1638.
  - 2. Strobe portion shall be rated for 75 candela on axis at -31°F (-35°C) and 180 candela at 77°F (25°C).
  - 3. Audible portion shall meet requirements of UL Standard 464 and shall provide 8 field-selectable alarm signals. Alarm signals shall consist of
    - a. Horn.
    - b. Bell.
    - c. March Time.
    - d. Code 3 Horn.
    - e. Code 3 Tone.
    - f. Slow Whoop.
    - g. Siren.
    - h. Hi/Lo.
  - 4. Audible portion shall supply 2 output sound levels, standard and high dBA. Range of dBA shall be 75 to 94 dBA.
  - 5. Device shall have extended temperature range of -31°F (-35°C) to 150°F (66°C) that shall satisfy any outdoor, severe environmental application.
  - 6. T-tapping of signal device conductors to signal circuit conductors not acceptable.
  - 7. Field wiring connections shall be in/out using terminals that accept 12 to 18 AWG wiring.
  - 8. Install device using only manufacturer's recommended back box with weatherproof seal.

9. Power supply: 24-volt dc from FACP or NAC panel.
10. Standards: UL listed and FM-approved.

## 2.10 WIRING

- A. Wiring shall meet or exceed requirements of NEC 760-35. Direct current wiring shall be color coded black and red. Wiring shall be installed in metal conduit in accordance with Section 26 05 00. Conduit fill shall not exceed 40%.
- B. 24-volt dc initiating device/signal line circuit (SLC) circuits: Copper, Type FPLR, No. 16 AWG minimum twisted shielded pair, 300 volts minimum insulation, suitable for 105°C.
- C. Notification appliance circuits:
  1. Speaker circuit: #14 or 16 TSP as required.
  2. Strobe circuits: 2/C #12 or #14 per strobe circuit.
  3. Each circuit shall have 25% spare capacity based on connected load value.
- D. Low-voltage initiating and indicating wiring shall be plenum-rated cable in areas even when installed in conduit. 120-volt ac circuits for panel source power shall be THWN in conduit where allowed as specified in Section 26 05 00 in finished areas. Process areas shall require rigid galvanized steel (RGS) conduit.
- E. Unless concealed or above accessible ceiling, all vertical and horizontal wiring exposed to public shall be installed in a rigid conduit as specified above.
- F. Cabling shall not be exposed in any area and must be in a complete metal raceway system.
- G. Fire alarm conduits: Conduit is required paint 6" on each side of junction boxes red to indicate fire alarm circuit and label FACP on junction box cover.

## PART 3 EXECUTION

### 3.01 SITE VERIFICATION

- A. Contractor shall verify site conditions prior to installation to verify proper raceway and back box requirements.

### 3.02 INSTALLATION

- A. Arrangement and routing of circuits shall be at Contractor's discretion in accordance with generally accepted good practices and requirements of NFPA 70.
- B. Install in accordance with ADA and UL 1971 guidelines, NEC Article 760, NFPA 72, local and state codes and as recommended by manufacturer. Consult manufacturer's installation manuals for wiring diagrams, schematics, physical equipment sizes, mounting type/style etc., before beginning system installation.
- C. Equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place. Fasteners and supports shall be adequate to support required load.
- D. Conduit, junction boxes, conduit supports and hangers may be exposed in unfinished areas.

- E. Do not install smoke detectors prior to system programming and test period. If construction is ongoing during this period, detection devices shall be covered with plastic bags after installation to maintain cleanliness. Remove before testing system.
- F. Fire detection and alarm system devices, control panel shall be surface mounted when located in unfinished areas.
- G. Manual fire alarm boxes shall be suitable for surface mounting. Manual pull stations shall be installed not less than 42" (1067 mm), and not more than 48" (122 mm) to top of device throw above finished floor.
- H. Junction boxes shall be sprayed red and labeled "Fire Alarm." Wiring color code shall be maintained throughout installation.
- I. Installation of equipment and devices that pertain to other work in contract shall be closely coordinated with appropriate trades.
- J. Install conduit, conductors and related items in accordance with Section 26 05 00.
- K. Install wire between control panel and remote devices in separate conduit system. Label system pull boxes and junction boxes.
- L. Provide fire stopping around conduit/raceway penetrating walls, floors, or ceilings.

### 3.03 CONDUIT AND WIRE

- A. Conduit:
  1. Install wiring in separate, dedicated conduit or raceway. Conduit fill shall not exceed 40% of interior cross sectional area where 3 or more cables are contained within single conduit.
  2. Cable shall be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in conduit, junction box or raceway containing conductors, NEC Article 760.
  3. Wiring for 24-volt dc control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in same conduit as initiating and signaling line circuits. Provide circuits with transient suppression devices and design system to permit simultaneous operation of circuits without interference or loss of signals.
  4. Conduit shall not enter fire alarm control panel or other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by manufacturer.
- B. Mixed category circuitry not permitted except on signaling line circuits connected to intelligent reporting devices.
- C. Connect FACP to separate, dedicated branch circuit, maximum 20 amperes. Label circuit at main power distribution panel as "FIRE ALARM." Fire alarm control panel primary power wiring shall be 12 AWG.

### 3.04 FIELD QUALITY CONTROL

- A. Completed fire alarm system shall be fully tested in accordance with NFPA 72, Chapter 10, in presence of Owner's Representative and local fire marshal. Upon completion of successful test, Contractor shall so certify in writing to Owner.

- B. Correct deficiencies observed during final test at no cost to Owner until equipment operates properly.
- C. Before energizing cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
- D. Open initiating device circuits and verify that trouble signal actuates.
- E. Open and short signaling line circuits and verify that trouble signal actuates.
- F. Open and short notification appliance circuits and verify that trouble signal actuates.
- G. Ground circuits and verify response of trouble signals.
- H. Check presence and audibility of tone at alarm notification devices.
- I. Check installation, supervision, and operation of intelligent smoke detectors using walk test.
- J. Each separate alarm condition that system is required to detect shall be introduced on system. Verify proper receipt and proper processing of signal at FACP and correct activation of control points.
- K. When system is equipped with optional features, refer to manufacturer's operation and maintenance manual to determine proper testing procedures. Verify controls performed by individually addressed or grouped devices, perform sensitivity monitoring, verify functionality, and other similar optional features.

### 3.05 DEMONSTRATION

- A. At final inspection, manufacturer's authorized service representative shall demonstrate that system functions properly in every respect.

### 3.06 MANUFACTURER'S FIELD SERVICES

- A. Technically supervise, participate during adjustments and tests of system, and perform system demonstration.
- B. Provide necessary on-site supervision during installation.
- C. Software modifications:
  1. Perform system software modifications, upgrades or changes. Response time of technician to site shall not exceed 4 hours.
  2. Provide hardware, software, programming tools and documentation necessary to modify fire alarm system on site. Modification may include addition and deletion of devices, circuits, changes to system operation and custom label changes for devices. System structure and software shall place no limit on type or extent of software modifications on-site.

### 3.07 INSTRUCTION

- A. Instruction shall be provided as required for operating system. Hands-on demonstrations of operation of system components and entire system including program changes and functions shall be provided. Instruction shall be a minimum of 8 hours and shall be conducted at

Owner's convenience by factory-trained, authorized representative of manufacturer, possessing minimum NICET Level II certification (Fire Alarm Systems).

- B. Contractor and/or systems manufacturer's representatives shall provide Owner with minimum of 2 Engineer-approved operations and maintenance manuals which shall include typewritten "Sequence of Operation" for fire alarm system.

### 3.08 MAINTENANCE AND INSTALLATION VERIFICATION

- A. Complete maintenance and repair service for fire alarm system shall be available from factory-trained authorized representative (minimum NICET Level II Fire Alarm Systems certification) of manufacturer of major equipment for period of 5 years after expiration of warranty.
- B. Maintenance and testing shall be performed on semi-annual basis, or as required by authority having jurisdiction. Provide preventive maintenance schedule describing protocol for preventive maintenance. Schedule shall include:
  - 1. Systematic examination, adjustment and cleaning of detectors, manual fire alarm stations, control panels, power supplies, relays, and accessories of fire alarm system.
  - 2. Each circuit in fire alarm system shall be tested semiannually.
  - 3. Each smoke detector shall be tested in accordance with requirements of NFPA 72 Chapter 10.
- C. Completed fire alarm system test shall be completed at each building after additional devices and equipment have been installed and programmed.
- D. Each system shall be fully tested in accordance with NFPA 72. Testing shall be completed by third party independent certified testing group, not involved with installation of system, system installer, or electrical contractor.
- E. Testing shall be scheduled with Owner. Test shall be performed in presence of Owner's Representative and local fire marshal. Testing shall be coordinated minimum of 2 weeks prior to evening test session.
- F. Upon completion of successful test, Contractor shall provide completed results in accordance with NFPA 72 and certify in writing to Owner.
- G. System deficiencies shall be corrected before final testing. Final testing shall only need to be verification that system is operating properly and to verify intelligibility of MNS messaging. Deficiencies observed during test shall be corrected at no cost to Owner.
- H. Wiring systems are responsibility of Contractor and equipment provider to verify that proper terminations have been made for copper cabling. Proper signal strength is responsibility of equipment provider and contractor. Provide signal strength amplifiers at no additional cost to Contract.
- I. Detection devices shall be covered with plastic bags after installation to maintain cleanliness. Remove before testing system.

END OF SECTION

- 1) Chad M. Finn
- 2) Allen G. Poppe



DATA SHEETS FIRE ALARM AND DETECTION SYSTEM		Equipment Name: xxxxxx	
		Tag No.: xxx-#####	REV. #
DESCRIPTION	UNITS	SPEC DATA	VENDOR DATA
Manufacturer	N/A		
Catalog/Serial No.	N/A		
Site Environmental Conditions			
Ambient Temperature	°F		
Altitude	ft		
Hazardous Area	Y/N		
FIRE ALARM CONTROL PANEL (FACP)	Surface or Semi-Flush		
Conventional, Hardwired	Y/N		
Addressable	Y/N		
Network or Stand Alone	Network or Stand-Alone		
If network, number of nodes	#		
Network connection	Wire/Fiber/RF		
Class/Style of circuits			
Initiating Device Circuits:	Y/N		
Class	A or B		
Notification Appliance Circuits:	Y/N		
Class	A or B		
Signaling Line Circuits:	Y/N		
Class	A or B		
Style	4, 6, or 7		
Transient Voltage Surge Suppression	Y/N		
Fire Alarm Graphic Command Center	Y/N		
Pre-Action Release	Y/N		
Voice System	Y/N		
Smoke Control	Y/N		
Notification Appliance Circuit Expansion Panel (NAC)	Y/N		
Fire Alarm Annunciator Panel (FAAP)	Y/N		
CRT or Printer	CRT or Printer		
Digital Alarm Communicator Transmitter (DACT)	Y/N		
Radio Frequency Transceiver with antenna	Y/N		
DDC or BAS interface	Y/N		
CONVENTIONAL, HARDWIRED INITIATING DEVICES			
Flame Detector	Y/N		
UV	Y/N		
IR	Y/N		
Combination UV/IR	Y/N		
Projected Beam Detector	Y/N		

DATA SHEETS FIRE ALARM AND DETECTION SYSTEM		Equipment Name: xxxxxx	
		Tag No.: xxx-#####	REV. #
DESCRIPTION	UNITS	SPEC DATA	VENDOR DATA
Smoke Sensor with Base	Y/N		
Photoelectric	Y/N		
Ionization	Y/N		
Photoelectric Duct Smoke Sensor	Y/N		
Remote Test Station	Y/N		
Combination Smoke/Heat Sensor with Base	Y/N		
Heat Sensor with Base	Y/N		
Fixed Temperature/degrees Fahrenheit	Y/N °F		
Rate-of- Rise	Y/N		
Combination Fixed Temperature and Rate-of-Rise	Y/N		
Manual Pull Station	Y/N		
Sprinkler Water Flow Switch	Y/N		
Sprinkler Tamper Switch	Y/N		
Post Indicating Valve	Y/N		
Knox Box	Y/N		
ADDRESSABLE INITIATING DEVICES			
Photoelectric Smoke Sensor with Base	Y/N		
Ionization Smoke Sensor with Base	Y/N		
Thermal Sensor with Base	Y/N		
Fixed Temperature/degrees Fahrenheit	Y/N °F		
Rate-of-Rise	Y/N		
Combination Fixed Temperature and Rate-of-Rise	Y/N °F		
Combination Smoke/Thermal Sensor	Y/N		
Photoelectric Duct Smoke Sensor	Y/N		
Remote Test Station	Y/N		
Manual Pull Station	Y/N		
Addressable Monitor Module	Y/N		
Flame Detector	Y/N		
Projected Beam Detector	Y/N		
Conventional, Hardwired Detectors	Y/N		
Sprinkler Water Flow Switch	Y/N		
Sprinkler Tamper Switch	Y/N		
Post Indicating Valve	Y/N		
Knox Box	Y/N		
Exhaust Hood	Y/N		
Addressable Control Module	Y/N		
Elevator Recall	Y/N		
Elevator Shunt Trip Breaker	Y/N		
Elevator Hoistway Shutter	Y/N		

DATA SHEETS FIRE ALARM AND DETECTION SYSTEM		Equipment Name: xxxxxx	
		Tag No.: xxx-#####	REV. #
DESCRIPTION	UNITS	SPEC DATA	VENDOR DATA
Smoke/Fire Dampers	Y/N		
120 VAC Door Holders	Y/N		
INDICATING DEVICES			
Mini-Horns/Electronic Sounders	Y/N		
Horns	Y/N		
Horn Speakers	Y/N		
Bells	Y/N		
Chimes	Y/N		
Speakers	Y/N		
Audible/visual devices (cd rating of strobe)	Y/N cd		
Outdoor, Weatherproof, Audible/visual (cd rating of strobe)	Y/N cd		
Visual only (cd rating of strobe)	Y/N cd		
MISCELLANEOUS DEVICES			
Fire Alarm Relays	Y/N		
24 VDC Electromagnetic Door Holders	Y/N		

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ACI2 – Cast Iron Soil Pipe, DWV  
ACS2 - Type E or S Carbon Steel, ASME Class 150  
ACU1 – Hard Drawn Copper, ASME Class 125  
ACU2 – Soft Annealed Copper, ASME Class 125  
ACU3 – Hand Drawn Copper, ASME Class 159  
ACU4 – Copper Drainage Tube, DWV  
AGS3 – Galvanized Carbon Steel DWV  
APE5 – PEX Tubing, 150 psig at 73°F  
APV1 – PVC Pipe, DWV  
APV3 – CPVC Pipe

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