ADDENDUM TO THE CONTRACT

for the

JNU SAND/CHEM BUILDING & FUELING STATION
Contract No. BE19-037

ADDENDUM NO.: **ONE**

CURRENT DEADLINE FOR BIDS:
August 30, 2018

PREVIOUS ADDENDA: NONE

ISSUED BY: City and Borough of Juneau
ENGINEERING DEPARTMENT
155 South Seward Street
Juneau, Alaska 99801

PREVIOUS DEADLINE FOR BIDS:
August 29, 2018

DATE ADDENDUM ISSUED: **August 16, 2018**

The following items of the contract are modified as herein indicated. All other items remain the same. This is a faxed addendum. A confirming copy will not be mailed to you. This addendum has been issued and is posted online. Please refer to the CBJ Engineering Contracts Division webpage at: http://www.juneau.org/engineering_ftp/contracts/Contracts.php

PROJECT MANUAL:

Item No. 1 SECTION 00 0300 - NOTICE INVITING BIDS. ***Add*** DEADLINE FOR BIDDER QUESTIONS. 4:30pm., August 23, 2018.

Item No. 2 SECTION 00 0300 - NOTICE INVITING BIDS. DEADLINE FOR BIDS.
Change the date of the Deadline for Bids from August 29, 2018, to August 30, 2018. The time remains the same.

Item No. 3 SECTION 01-3250 – SCHEDULE OF VALUES.
Add the following to paragraph 1.2A.1: For civil components of Work, provide estimated quantities of unclassified excavation, subbase course, Excavation of AC and RAP, crushed aggregate base course, and hot mix asphalt.

Item No. 4 SECTION 05 1200 - STRUCTURAL STEEL FRAMING
Delete subparagraph B of section 1.8 - QUALITY ASSURANCE

Item No. 5 SECTION 05 5000 – METAL FABRICATIONS
Revise bollard size to 6” in subparagraph A of section 2.3 – FABRICATE ITEMS.

Item No. 6 SECTION 11 1100 – VEHICLE SERVICE EQUIPMENT
Replace section in its entirety.

Item No. 7 SECTION 11 1113 – COMPRESSED AIR VEHICLE SERVICE EQUIPMENT
Replace section in its entirety.

Item No. 8 SECTION 23 2500 – HVAC WATER TREATMENT
Delete Paragraph 2.1 and ***Replace*** with the following: 2.1 SOLUTION METERING PUMP WITH SOLUTION TANK (ANTIFREEZE FEED TANK) GMT-1

A. Manufacturers:

1. J. L. Wingert Company: www.jlwingert.com.
2. Neptune Chemical Pump Company: www.neptune1.com.
3. Pulsafeeder, Inc: www.pulsa.com.

B. Description: Automatic antifreeze feed package consisting of a polyethylene tank, hinged polyethylene cover, carbon steel frame, lockable NEMA 4X control panel, low level float switch, 1/2HP open motor bronze gear pump with internal pressure relief, pressure switch, pressure relief valve, check valve, PVC plumbing and reinforced butyl rubber hose assemblies. Nominal 55 gallon tank.

C. Gear Pump: Gear pump shall be close coupled with internal pressure relief valve. Gear pump shall be capable of a minimum 3 gallons per minute at 100 PSI. Motor shall be ½ hp, 115 VAC, 1 Phase, 60 Hertz, open drip proof type and be hard wired to pressure control circuit.

D. Pressure Switch: Pressure switch and control circuit shall be designed for pressures as shown below. Pressure switch shall turn on pump on falling pressure and turn off pump on rising pressure. Standard pressure range of 10-45 cut-in, 20-50 cut-out, 10-30 pressure differential.

E. Control Panel: Polycarbonate NEMA 4X lockable control panel shall be of ample size needed for equipment and servicing of electrical components. Wiring diagram shall be color coded for easy trouble shooting. All internal wiring shall be of ample gauge for supply voltage and amp draw, minimum of 16 gage. Controls shall be, but not limited to, main power/disconnect switch and indicator, pump manual/off/auto switch and indicator and red low level indicator. All indicator lights shall be LED and designed for continuous use.

F. Low Level Switch: Stainless steel or polypropylene low level switch with tank fitting shall be interlocked with relay and stop antifreeze feed pump when liquid reaches factory set level. Low level circuit will then turn on RED indicator light and initiate circuit.

G. Additional Features: Audible alarm with silence switch & dry contact.

H. Accessories:

1. Batch Mixer, 1/20 hp, 115 volt TEFC, stainless steel shaft with stainless steel impeller, single C-clamp mount welded to 3-position bracket, control switch.
2. Remote dry contact on low level.

- ***Replace*** paragraph number 2.4 with 2.2
- ***Delete*** paragraph 2.2.A.2 and ***Replace*** with the following: Geothermal Loopfield: Provide and fill new geothermal piping system with propylene glycol for a 30% anti-freeze mixture; approximately 80 gallons of glycol; total system volume of 240 gallons. Provide one (1) spare 50 gallon container of the premixed solution. Store quantity not used in initial fill and steady state operation in storage containers in location directed by Owner.
- ***Delete*** paragraph 2.2.A.3 and ***Replace*** with the following: Radiant/Snowmelt system: Provide and fill Snowmelt piping system with propylene glycol for a 30% anti-freeze mixture; approximately 300 gallons of glycol; total system volume of 900 gallons. Provide three (3) spare 50 gallon containers of the premixed solution. Store quantity not used in initial fill in initial fill and steady state operation in storage containers in location directed by Owner.

Item No. 9 SECTION 32 1724 – HAZARDOUS AREA BARRIERS
Add section in its entirety.

Item No. 10 SECTION 43 2100 – PROCESS PUMPING EQUIPMENT
Add section in its entirety.

Item No. 11 SECTION 43 2200 – BRINE SYSTEM EQUIPMENT
Add section in its entirety.

DRAWINGS:

Item No. 12 SHEET C0200
Revise Note 2 under DEMOLITION NOTES to read "RECYCLED ASPHALT PAVEMENT (RAP) REMOVAL SHALL BE STOCKPILED ON AIRPORT PROPERTY. COORDINATE LOCATION OF STOCKPILE WITH OWNER AND ENGIINEER."

Item No. 13 SHEET C0300
Delete Work Area north of SREB
Revise Note 2 under NOTES FOR WORK AREA 2 to read "THE CONTRACTOR SHALL COORDINATE USE OF STAGING AREAS WITH THE OWNER AND RSA PHASE 2C CONTRACTOR."
Add concrete landing pad (not heated) for swing doors at Gridlines BB (South) and B4 (West)
Add Note 3 to NOTES FOR WORK AREA 2. Note 3 shall read "THE OWNER WILL PROVIDE ALL HAZARD BARRIER MARKERS FOR THIS PROJECT. THE COTNRACTOR SHALL COORDINATE USE AND INSTALLATION OF HAZARD BARRIER MARKERS WITH THE OWNER."

Item No. 14 SHEET C0400
Replace sheet in its entirety.

Item No. 15 SHEET C0500
Revise the finished floor elevation note to FF = 26.05'

Item No. 16 SHEET C0600
Replace sheet in its entirety.

Item No. 17 SHEET C0601
Replace sheet in its entirety.

Item No. 18 SHEET C0602
Replace sheet in its entirety.

Item No. 19 SHEET C0702
Delete detail 4/C0702 – Exterior Concrete Bollard – Elevation View in its entirety

Item No. 20 SHEET C0800
Replace sheet in its entirety.

Item No. 21 SHEET C0900
Revise Note 1 to read "CONTRACTOR SHALL FIELD VERIFY STRIPING LAYOUT WITH OWNER AND ENGINEER PRIOR TO APPLICATION"

Item No. 22 SHEET C1000
Delete this sheet in its entirety.

Item No. 23 SHEET S1-21
Replace sheet in its entirety.

Item No. 24 SHEET S2-00
Replace sheet in its entirety.

Item No. 25 SHEET S2-10
Replace sheet in its entirety.

Item No. 26 SHEET S2-20
Add callout for Mechanical Rm lid framing between near grid BA

Item No. 27 SHEET S3-21
Replace in its entirety.

Item No. 28 SHEET S3-22
Replace in its entirety.

Item No. 29 SHEET S3-31
Replace in its entirety.

Item No. 30 SHEET S3-32
Replace in its entirety.

Item No. 31 SHEET S4-11
Replace in its entirety.

Item No. 32 SHEET S4-31
Replace in its entirety.

Item No. 33 SHEET S5-10
Replace in its entirety.

Item No. 34 SHEET S5-11
Add new sheet in its entirety.

Item No. 35 SHEET A0201
Add acoustic batt insulation to interior wall assembly at column line B4.
Extend housekeeping pad at compressor to include dryer (see sheet Q0100).
Add north arrow at bottom of page.

Item No. 36 SHEET A0211
Replace in its entirety.

Item No. 37 SHEET A0401 Delete sign numbers on vertical lift door. Signage by Owner.

Item No. 38 SHEET A0402
Delete sign numbers on vertical lift door. Signage by Owner.
Relocate rain leader overflow outlet to west elevation; coordinate with Sheet M0111.

Item No. 39 SHEET A0601
Replace in its entirety.

Item No. 40 SHEET 5/A01010
Replace in its entirety.

Item No. 41 SHEET A01012
Replace in its entirety.

Item No. 42 SHEET Q0001
Replace in its entirety.

Item No. 43 SHEET Q0100
Replace in its entirety.

Item No. 44 SHEET Q0300
Replace in its entirety.

Item No. 45 SHEET Q0500
Replace in its entirety.

Item No. 46 SHEET M0002
Replace in its entirety.

Item No. 47 SHEET M0111
Replace in its entirety.

Item No. 48 SHEET M0120
Replace in its entirety.

Item No. 49 SHEET M0301
Replace in its entirety.

Item No. 50 SHEET E0100
Add special receptacle to the "POWER" legend per image below.

Item No. 51 SHEET E0101
Replace in its entirety.

Item No. 52 SHEET E0201
Replace in its entirety.

Item No. 53 SHEET E0202
Replace in its entirety.

Item No. 54 SHEET E0203
Replace in its entirety.

Item No. 55 SHEET E0204
Replace in its entirety.

By: _____
Greg Smith,
Contract Administrator

Total number of pages contained within this Addendum: 71

SECTION 11 1100 - VEHICLE SERVICE EQUIPMENT

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

A. Equipment items as listed below by Equipment Identifier:
   1. 7327 Storage tank, 12,000 gallon, polyethylene (Ref. Part 2.01)

B. Roughing-in installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation.

1.2 RELATED SECTIONS

A. Section 11 11 13 - Air Compressors and Dryers

1.3 QUALITY ASSURANCE

A. Manufacturer's Representative:
   1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out, and start up.
   2. Training: Provide a qualified manufacturer's representative to provide training to Owner's maintenance personnel in operation and maintenance of specified equipment.

1.4 SUBMITTALS

A. Product Data:
   1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
   2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

B. Operations and Maintenance Manual:
   1. Submit Operations and Maintenance Manuals in accordance with Division 1- General Requirements of these specifications.
   2. Provide complete parts, operating, and maintenance manual covering equipment at time of installation.
   3. Description of system and components.
   4. Schematic diagrams of electrical, plumbing, and compressed air system.
   5. Manufacturer's printed operating instructions.
   6. Printed listing of periodic preventive maintenance items and recommended frequency to validate warranties. Failure to provide maintenance information shall indicate that preventive maintenance is not a condition for validation of warranties.

C. Shop Drawings: Submit Shop Drawings in accordance with of Division 1 - General Requirements of these specifications.

1.5 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, by model number, including drawing changes and construction, shall be at the expense of the Contractor.

C. Substitution Approval: Prior to delivery or installation, submittals for each equipment item by Equipment Identifier shall be provided in accordance with Division 1 - General Requirements. Acceptance shall be based on the technical requirements herein as determined by Owner and Architect.

1.6 WARRANTY

A. Warrant work specified herein for one year from substantial completion against defects in materials, functions, and workmanship.

B. Warranty shall include materials and labor necessary to correct defects.

C. Defects shall include, but not be limited to noisy, rough or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish. Defects shall not include damage due to neglect, misuse, or situations resulting from non-performance of a manufacturer's recommended preventive maintenance schedule.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid and/or dusty conditions.

B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Equipment Identifier of this specification.

C. Provide equipment and material specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.8 LABELING

A. Manufacturer shall securely attach in a prominent location, on each major item of equipment, a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

C. Provide air receivers meeting requirements of ASME Code for Unfired Pressure Vessels and carry ASME approval stamp.

PART 2 - PRODUCTS

2.1 TANK, POLYETHYLENE, 12,000 GALLON

Equipment Identifier: 7327

A. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish minimum acceptable standards of quality, features, performance, and construction.

a. Norwesco
b. St. Bonifacius, MN (888) 686-8265
c. Model No.: 43919 with assessories

2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers may be considered as equal.

a. Assmann Corp, Garrett, IN (260) 357-3181
b. Plas-Tanks, Hamilton, OK (513) 942-3800

B. Capacities/Dimensions:
1. Overall dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	141 dia	---	193

2. Fill opening: Three inch
3. Weight:
   a. Empty weight: 2,407 pounds
   b. Filled weight: 102,490 pounds
4. Capacity: 12,000 gallons

C. Features/Performance/Construction:
1. Aboveground tank complies with FDA Standards 21 CFR 177.1520 (1) 3.1 and 3.2.
2. The components of the system shall be assembled and tested at the factory and shall be covered under warranty.
3. The aboveground, single wall tank shall be equipped with an 8 inch threaded-vented man way with an 8 inch access.
4. Tank shall be constructed of PBA FREE polyethylene and be UV stabilized for long-term outdoor use.
5. Includes 22 inch man way and three inch stainless steel outlet, three inch polyethylene outlet.
6. High level sensor which will shut off storage tank fill pumps and activate audible and strobe alarms.
7. Low level sensor which will shut off storage tank fill pumps and activate audible and strobe alarms.
8. Tank shall be equipment with site glass and (2) two 3 inch testing ports.
9. Tanks shall be equipped with safety ladder and cage.

D. Finish: Durable plastic in manufacturer's standard colors

PART 3 - EXECUTION

3.1 INSPECTION

A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.

B. Inspect equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all equipment items and specified accessories.

3.2 INSTALLATION

A. Perform work under direct supervision of Foreman of Construction Superintendent with authority to coordinate installation of scheduled equipment with Architect.

B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:
1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
3. Anchorage: Attach equipment as detailed or directed by Architect or designated representative. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces.
4. Fluid storage tanks:

a. Tank shall be seismically braced and anchored to meet all local, state, and federal codes and provisions.

C. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with specifications in the presence of the Architect or designated representative using acceptance procedures provided by the manufacturer. Testing report shall be submitted to the Architect or designated representative.

3.4 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing and installation debris from job site.

D. Notify Architect or designated representative when installation and cleanup is 100% complete and ready for final observation (punchlist).

END OF SECTION 11 1100

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

A. Equipment items as listed below by Equipment Identifier:

1. 8088 Compressor, air, reciprocating, duplex 10 HP, horizontal receiver, large (Ref. Part 2.1)
2. 8515 Dryer, air, refrigerated, non-cycling, 100 CFM (Ref. Part 2.2)

B. Roughing-in, installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation.

C. Piping, wiring, and switching between equipment and utilities.

1.2 REFERENCES

A. ASME Code for Unfired Pressure Vessels

1.3 DEFINITIONS

A. Actual Air: Air delivered at air-compressor outlet. Flow rate is compressed air delivered and measured in acfm.

B. Standard Air: Free air at 68 deg and 1 atmosphere (before compression or expansion and measured in scfm).

1.4 QUALITY ASSURANCE

A. Experience: Equipment shall be produced by a manufacturer of established reputation with a minimum of five years experience supplying specified equipment.

1.5 STANDARD AND REGULATORY REQUIREMENTS

A. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic, fire, and racking codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

1.6 SUBMITTALS

A. Product Data:

1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page. Include certified data for each unit and accessory system indicating the following:
    a. Air compressor performance curves at summer design condition
    b. Intercooler performance at summer design condition
    c. Air dryer performance at 38 degrees F, dew point at 175 PSIG
3. Indicate components, assembly, dimensions, weights and loadings, required clearances, location and size of field connections, intake air filter outline, blow-off silencer outline, main motor drive data, aftercoolers, control panel, and electrical pneumatic schematics.
4. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show which specific items, parts and accessories are being submitted for the project product data review.

Non-marked or generic product data submittals with no marks indicating specific items, parts and accessories shall be a cause for rejection.

B. Shop Drawings:

1. Submit Shop Drawings in accordance with of Division 1 - General Requirements of these specifications.
2. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.
3. Include plans, elevations, sections, and [mounting] details.
4. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
5. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
6. Include diagrams for power, signal, and control wiring.

C. Operations and Maintenance Manual:

1. Assemble and provide copies of manual 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.
2. Submit Operations and Maintenance Manuals in accordance with Division 1- General Requirements of these specifications.
3. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:

    a. Description of system and components.
    b. Schematic diagrams of electrical, plumbing and compressed air systems.
    c. Manufacturer’s printed operating instructions.
    d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information shall indicate that preventive maintenance is not a condition for validation of warranties.
    e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

1.7 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For air compressors, accessories, and components from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculations.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Field quality-control reports.

1.8 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, by model number, including drawing changes and construction, shall be at the expense of the Contractor.

C. Substitution Approval: Prior to delivery or installation, submittals for each equipment item by Equipment Identifier shall be provided in accordance with Division 1 - General Requirements. Acceptance shall be based on the technical requirements herein as determined by Owner and Architect.

1.9 WARRANTY

A. Warrant work specified herein for at least one year from substantial completion against defects in materials, functions, and workmanship.

B. Warranty shall include materials and labor necessary to correct defects.

C. Defects shall include, but not be limited to noisy, rough or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish. Defects shall not include damage due to neglect, misuse, or situations resulting from non-performance of a manufacturer's recommended preventive maintenance schedule.

1.10 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid and/or dusty conditions.

1. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Equipment Identifier of this specification.

B. Provide equipment and material specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.11 LABELING

A. Manufacturer shall securely attach in a prominent location, on each major item of equipment, a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

C. Provide air receivers meeting requirements of ASME Code for Unfired Pressure Vessels and carry ASME approval stamp.

1.12 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design compressed-air equipment mounting.

B. Seismic Performance: Air compressors and accessories shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the air compressor, dryer and receiver shall remain in place without separation of any parts when subjected to the seismic forces specified."
2. Component Importance Factor: 1.0.

1.13 GENERAL REQUIREMENTS FOR AIR COMPRESSORS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Description: Factory-assembled, -wired, -piped, and -tested; electric-motor-driven; air-cooled; continuous-duty air compressors, dryers**,** and receivers that deliver air of quality equal to intake air.

C. Control Panels: Automatic control station with load control and protection functions. Comply with NEMA ICS 2 and UL 508.

1. Enclosure: NEMA ICS 6, Type 12 control panel unless otherwise indicated.

2. Motor Controllers: Full-voltage, combination-magnetic type with under-voltage release feature and motor-circuit-protector-type disconnecting means and short-circuit protective device.
3. Control Voltage: 120-V ac or less, using integral control power transformer.
4. Motor Overload Protection: Overload relay in each phase.
5. Starting Devices: Hand-off-automatic selector switch in cover of control panel, plus pilot device for automatic control.
6. Automatic control switches to alternate lead-lag air compressors for duplex air compressors.
7. Instrumentation: Include discharge-air and receiver pressure gages, air-filter maintenance indicator, hour meter, air-compressor discharge-air and coolant temperature gages, and control transformer.

D. Receivers: Steel tank constructed according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

1. Pressure Rating: At least as high as highest discharge pressure of connected air compressors (200 PSI minimum) and bearing appropriate code symbols.
2. Interior Finish: Corrosion-resistant coating.
3. Exterior Finish: Epoxy coating.
4. Accessories: Include safety valve, pressure gauge, automatic drain, and pressure regulator

PART 2 - PRODUCTS

2.1 COMPRESSOR, AIR, RECIPROCATING, DUPLEX 10 HP, HORIZONTAL RECEIVER, LARGE Equipment Identifier: 8088

A. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.

a. Champion
b. Princeton, IL (866) 276-3440
c. Model No.: HR10D-25 with accessories, advantage product

2. Alternate manufacturers: *Contingent upon compliance with these specifications* and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, *may* be considered as equal.

a. Ingersoll Rand, Davidson, NC (704) 655-4000
b. Quincy Compressor, Bay Minette, AL (251) 937-5900

B. General Description: Provide duplex compressor unit consisting of air-cooled motor compressors (10 HP), air receiver, after cooler, pressure reducing station, spring isolators, and operating controls.

C. Capacities/Dimensions:

1. Overall dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	88	33	62

2. Receiver: 250 gallons
3. Speed: 740 RPM @ 175 psi; 810 RPM @ 125 psi
4. Displacement: 43.1 CFM each @ 175 psi; 47.3 CFM each @ 125 psi
5. Bore diameters: 4-5/8 and 2-1/2 inches
6. Stroke: 3 inches
7. Number of cylinders: 4
8. Output valve: 3/4 inch NPT(F)
9. Boltdown dimensions:
    a. Length: 55 inches
    b. Width: 27-1/2 inches
    c. Weight (approximate): 1,725 pounds

D. Features/Performance/Construction:

1. Compressor construction:
    a. Construct compressor unit with cast iron housing and head, heat treated forged steel or ductile iron shaft, aluminum alloy connection rods, aluminum pistons with lubricated carbon steel rings, high-strength alloy suction and discharge valves. Statically and dynamically balance rotating parts.
    b. Mount motor and compressor on one-piece ribbed cast iron or welded steel base with provision for V-belt adjustment.
2. After cooler (Champion No. ACAC), one each:
    a. Provide air compressor with air after cooler suitable for operation under 135 PSIG working pressure.
    b. Provide a belt guard style after cooler mounted on the compressor belt guard, with automatic condensate trap and automatic float drain.
    c. After cooler capacity to cool discharge air to within 25 degrees Fahrenheit of ambient air temperature with compressors operating at specified capacity.
3. Air receiver:
    a. Provide a horizontal receiver stamped ASME rated for working pressure of 200 PSIG. Flange or screw inlet and outlet connections, welded steel construction.
    b. Fittings to include adjustable pressure regulator, safety valve, pressure gauge, drain cock, and automatic pneumatic tank drain (Champion No. ATD-P, one each).
4. Pressure reducing valve:
    a. Provide pressure reducing stations complete with automatic reducing valve and bypass, and low pressure side relief valve and gauge.
    b. Compressor shall be provided with automatic start/stop capacity controls. In addition, provide centrifugal unloading to ensure for an unloaded compressor at start-up.
        1) Valve capacity suitable to reduce compressor pressure from 50 PSI to 180 PSI. Pressure reducing valve to be adjustable upward from reduced pressure.
            a) Provide valves with bronze or semi-steel bodies with stainless steel springs, stems, and seats.
        2) Provide condensate filter (Champion No. CFL100A).
        3) Provide vibration isolators (Champion No. VI) one each.
        4) Provide low level oil monitor (Champion No. LOLM) two each.

E. Controls:

1. Pressure switch to cutout at 100 PSI with minimum differential of 20 PSI.

F. Accessories:

1. Condensate filter: Champion No. CFL100A (one each)
2. Vibration isolators: Champion No. VI (one each)
3. Air-cooled after coolers: Champion No. ACAC (one each)
4. Automatic tank drain: Champion No. ATD-P (one each)
5. Low level oil monitor: Champion No. LOLM (two each)

G. Utility Requirements:

1. Electrical:

a. Connection Requirements — Unit

Voltage	460
Phase	3
HP	20
Amps	20

b. Connection Type: Provide single fusible disconnect (one per motor)

H. Finish: Durable enamel in manufacturer's standard color.

2.2 DRYER, AIR, REFRIGERATED, NON-CYCLING, 100 CFM
Equipment Identifier: 8515

A. Manufacturer's Reference:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish minimal acceptable standards of quality, features, performance, and construction.

a. Champion
b. Princeton, IL (815) 875-3321
c. Model No.: CRN100 with Option F

2. Reference Equipment Drawings
3. Alternate manufacturers: *Contingent upon compliance with these specifications* and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, *may* be considered as equal.

a. Ingersoll Rand, Davidson, NC (704) 896-4000
b. Quincy Compressor, Quincy, IL (217) 222-7000

B. Capacities/Dimensions:

1. Overall dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	20	29	38

2. Capacity:

   a. 38 degrees F: 100 CFM

3. Drain connection: 1 inch NPT(F)
4. Air connection: 1 inch NPT(M)
5. Maximum working pressure: 250 PSIG (Level 2 controller standard)
6. Weight: 251 pounds

C. Features/Performance/Construction:

1. Provide refrigerated air dryer of self-contained mechanical refrigeration type complete with heat exchanger, refrigeration compressor, moisture removal trap, internal wiring and piping, and full refrigerant charge.
2. Provide air inlet and outlet connections at same level and factory insulated.
3. Heat exchangers to consist of air-to-air and refrigerant-to-air coils. Provide centrifugal type moisture separator located at discharge of heat exchanger. Provide heat exchangers with automatic control system to bypass refrigeration system on low or no load condition.
4. Refrigeration unit of hermetically sealed type to operate continuously to maintain specified 38 degree F dew point. House unit in steel cabinet provided with access door and panel for maintenance and inspection.
5. Panel mounted gauges: Provide air inlet temperature gauge, air outlet pressure gauge, refrigerant suction pressure and refrigerant head pressure.
6. High temperature alarm shall be included with dry contacts.

   a. Coalescing oil filter: Provide Grade E cold coalescing oil removal filter. Oil filter shall extract oils and aerosols from supply air stream down to 0.008 PPM and solids down to 0.01 microns. Dedicated drain trap shall be provided. Unit shall include internal automatic drain.
   b. Particulate filter: Provide air line filter capable of filtering particulates down to 1 micron and 1 PPM. Unit shall include internal automatic drain
   c. Provide maintenance kit with separator element, drain, drain tube, hose fastener, wave spring, head O-ring, lube packet, and service reminder detail.
   d. Provide coalescing maintenance kit with filter elements, electric drain rebuild kit, drain tube, hose fastener, head O-rings, lube packet, and service reminder decal.
   e. Provide seismic bracing and anchorage to meet any local, state, and national codes and provisions.

D. Controls:

1. I-Controller Level 1: Provide controls with On/Off switch, power-on light, pneumatic, pilot operated drain trap.

E. Accessories:

1.	Oil Remover: Champion No. CFL100E15A
2.	Particulate filter: Champion No. CFL100C15A
3.	Panel mounted gauges
4.	High temperature alarm
5.	Coalescing maintenance kit: Champion No. CRNMK425 (one each)
6.	Maintenance kit: Champion No. CRNMK225 (one each)
7.	I-Controller, Level 1

F. Utilities requirements:

1. Electrical:

a. Connection Requirements — Unit

Voltage	120
Phase	1
HP	1/2
Amps	10.2

b. Connection Type — Provide standard grounded receptacle

G. Finish: Durable enamel in manufacturer's standard color

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.

B. Check equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all equipment items and specified accessories.

3.2 INSTALLATION

A. Perform work under direct supervision of Foreman of Construction Superintendent with authority to coordinate installation of scheduled equipment with Architect.

B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:

1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
3. Anchorage: Attach equipment as detailed or directed by Architect or designated representative. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces. Install compressed-air equipment to allow maximum headroom unless specific mounting heights are indicated.

4. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
5. Install equipment to allow right of way for piping installed at required slope.
6. Install the following devices on compressed-air equipment:
    a. Thermometer, Pressure Gauge, and Safety Valve: Install on each compressed-air receiver.
    b. Pressure Regulators: Install downstream from air compressors, dryers, and filter assemblies.
    c. Drain Valves: Install on after-coolers, receivers, and dryers. Discharge condensate over nearest floor drain.

C. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve(s) if required.

D. Connect piping to equipment with moving parts, except safety relief valve connections, with flexible connectors of materials suitable for service.

E. Connect compressed air and fluid tappings with shutoff valve and union or flange at each connection.

F. Install piping from safety relief valves to nearest floor drain.

G. Install electrical devices furnished with equipment but not specified to be factory mounted.

H. Ground equipment according to Division 26.

I. Install control wiring, in conduit, to field-mounted electrical devices. Connect wiring according to Division 26.

3.4 IDENTIFICATION

A. Identify compressed-air equipment system components. Comply with requirements for identification specified in Division 22.

3.5 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing and installation debris from job site.

D. Notify Architect or designated representative for final acceptance.

3.6 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Check for lubricating oil in lubricated-type equipment.
3. Check belt drives for proper tension.
4. Verify that air-compressor inlet filters and piping are clear.
5. Check for equipment vibration-control supports and flexible pipe connectors and verify that equipment is properly attached to substrate.
6. Check safety valves for correct settings. Ensure that settings are higher than air-compressor discharge pressure, but not higher than rating of system components.

7. Check for proper seismic restraints.
8. Drain receiver tank(s).
9. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
10. Test and adjust controls and safeties.

B. Prepare written report documenting testing procedures and results.

3.7 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with specifications in the presence of the Architect or designated representative using acceptance procedures provided by the manufacturer. Startup and testing report shall be submitted to the Architect or designated representative.

1. Replace damaged and malfunctioning controls and equipment.
2. Test and adjust controls and safeties.
3. Testing Certification: Certify that specified tests, inspections, and procedures have been performed and certify report results. Include the following:

a. Inspections performed.
b. Procedures used.
c. Test methods used.
d. Results of tests.

B. Components shall be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 11 1113

SECTION 32 1724 - HAZARDOUS AREA BARRIERS

PART 1 - DESCRIPTION

670-1.1 Provide barriers for use on the project under subsection 70-09, Barricades, Warning Signs and Hazard Markings. Provide each barrier complete with two flasher units and two flags in accordance with the dimensions, design, and details shown on the Plans. Haul and place barriers as shown on the Plans or as directed by the Engineer. Relocate barriers as conditions warrant.

When used during periods of darkness, such barricades, warning signs and hazard markings shall be suitably illuminated. Barricades shall be spaced not more than 25 feet apart.

Provide additional flasher units and flags, when specified, for use on Owner-supplied barriers.

The Owner will provide all Hazard Area Barriers as needed for this project. The Contractor shall coordinate use and installation of airport-owned barricades with the Owner.

PART 2 - MATERIALS

670-2.1 Use materials that conform to the following:

a. **Hazard Marker Barrier, Plastic.** Provide 10 inch x 10 inch by 8 foot nominal dimension portable water-ballast barriers made from high impact, safety orange and white, UV-resistant, high density polyethylene (HDPE) plastic. Provide barriers with pre-molded flag staff and flasher bracket attachment holes. Provide barriers that are designed as a modular system to allow assembly/disassembly and nesting for compact storage, and to permit the option of physically bolting multiple barriers together to provide a continuous barrier wall. Provide 6-inch x 72-inch reflective striping panel for attachment to one side of each barrier.

670-2.2 Flag. Provide two heavy vinyl coated nylon, 18 inch x 18 inch flags with an integral diagonal metal or plastic stay to make the flags self-supporting. Provide flags in color fluorescent orange and mounted on a ¾ inch x 30-inch staff.

670-2.3 Flasher Unit. Provide two battery-operated omnidirectional flashing red lights. Provide flasher units with mounting bracket designed for the appropriate barrier type.

a. **Flasher Unit for Plastic Barrier.**

Composition	High impact, polycarbonate plastic lens and base
Flashing Rate	60 flashes per minute
Brightness	6000 mcd
LED	Total of 3 red
Photo Cell	Allows for solar light to automatically shut off in higher level light conditions and turn on in lower light conditions

PART 3 - CONSTRUCTION REQUIREMENTS

670-3.1 GENERAL. On the top side and at opposite ends of each barrier, mount one flag and one flasher unit per manufacturer's instructions. Tether flag to the barrier.

a. **Hazard Marker Barrier, Plastic.** Fill barriers with water for ballast in accordance with manufacturer's recommendations. When shown on the plans or directed by the Engineer, interlock barrier units using manufacturer recommended connectors to form a continuous wall separating the hazardous work area from aircraft movement areas. Adhere reflective striping panels to one

side of each barrier. Fasten one (1) light and (1) flag to each new barrier, and to each Owner-supplied barrier.

670-3.2 DELIVERY. Deliver hazard marker barriers, flasher units, and flags to the project site prior to commencing work within the Air Operations Area.

670-3.3 STORAGE. Following completion of the project, remove flasher units and flags from the barriers. Barriers, flasher units, and flags are the property of the State. Drain plastic barriers. Deliver to a location on the Airport designated by the Engineer.

PART 4 - METHOD OF MEASUREMENT

670-4.1 Hazard marker barriers, complete with two flags and two flasher units will be measured by the number of units furnished and accepted.

SECTION 43 21 00 – PROCESS PUMPING EQUIPMENT

PART 1 - GENERAL

1.1 The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.2 WORK INCLUDED

A. Equipment items as listed below by Equipment Identifier:
   1. 9485 Pumps, duplex, brine transfer system (Ref. Part 2.01)
   2. 9487 Pumps, duplex, brine transfer system (Ref. Part 2.02)

B. Roughing-in, installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation.

C. Piping, wiring, and switching between equipment and utilities.

1.3 RELATED SECTIONS

A. Section 11 11 00 – Vehicle Service Equipment

B. Section 23 05 13 – Common Motor Requirements

C. Section 23 05 48 – Vibration and Seismic Controls for Piping and Equipment

D. Section 26 06 00 – Electrical Basis Requirements

1.4 REFERENCES

A. American National Standards/Hydraulic Institute (ANSI/HI)

   1. ANSI/HI Table 9.6.3 – Rotodynamic (Centrifugal and Vertical) Pumps – Guideline for Allowable Operating Region
   2. ANSI/HI Table 9.6.4 - Rotodynamic Pumps for Vibration Measurements and Allowable Values
   3. ANSI/HI Table 9.6.6 - Rotodynamic Pumps for Pump Piping
   4. ANSI/HI Table 14.6 - Rotodynamic Pumps for Hydraulic Performance Acceptance Tests

B. National Electrical Manufacturers Association (NEMA)

   1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

C. Underwriters Laboratories Inc. (UL)
   1. UL 778 – Motor Operated Water Pumps

1.5 DEFINITIONS

A. The abbreviations used in this section are defined as follows:
   1. AOR: Allowable Operating Range.
   2. BEP: Best Efficiency Point.
   3. IPS: Iron Pipe Size.
   4. NPSH3: Net Positive Suction Head for 3 percent head loss.
   5. POR: Preferred Operating Range.
   6. TDH: Total Dynamic Head.

7. TEFC: Totally Enclosed Fan Cooled.
8. VFD: Variable Frequency Drive.

B. PERFORMANCE REQUIREMENTS

1. Provide pumps to operate at system fluid temperatures of 35-100 degrees F without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

1.6 QUALITY ASSURANCE

A. Experience: Equipment shall be produced by a manufacturer of established reputation with a minimum of five years experience supplying specified equipment.

B. Manufacturer's Representative:

1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out, and start up.
2. Training: Provide a qualified manufacturer's representative to provide training to Owner's maintenance personnel in operation and maintenance of specified equipment.

C. Coordinate all mechanical seal systems to ensure pump and seal compatibility.

1.7 STANDARD AND REGULATORY REQUIREMENTS

A. Equipment indicated within this specification section shall comply with all applicable national, state and local codes and regulations, including seismic, fire, and racking codes and regulations. Additional, more specific compliance requirements may be listed under individual equipment headings.

1.8 BUY AMERICAN COMPLIANCE

1. The Contractor shall comply with the applicable Buy American requirements set forth in 41 U.S.C. 8301-8305 and the applicable regulations in 49 C.F.R. Part 661, as amended. If the Contractor procures any capital items with Federal funds, it is the Contractor's responsibility to obtain the Buy American certification required under such regulations.
2. Reference Division 1 for Buy American compliance.

1.9 SUBMITTALS

A. Product Data:

1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.
3. Technical data including:
   a. Performance data and curves with flow (gpm), head (FT), horsepower, hydraulic efficiency, rotating speed (rpm), AOR, BEP, POR, NPSH3 requirements, minimum bowl submergence requirements for vertical mixed flow, axial and turbine pumps.
   b. NPSHA should be at least one of the following whichever is greater, NPSH3 + 10 FT or the ration of NPSHA/NPSH3 = 1.5.
   c. Pump accessory data.
   d. Bearing supports, shafting details and lubrication provisions.
      1) Bearing life calculations.
      2) Critical speed calculations.
      3) Solids passage information.

4. All Product Data submittals shall identify proposed project specific items marked by arrow, circle, underline, reproducible highlight, or other markings clearly discernable by the reviewer, to show

which specific items, parts and accessories are being submitted for the project product data review. Non-marked or generic product data submittals with no marks indicating specific items, parts and accessories shall be a cause for rejection.

B. Shop Drawings:
   1. Submit Shop Drawings in accordance with of Division 1 - General Requirements of these specifications.
   2. Submitted shop drawings shall be project specific and shall include a minimum 1/8 inch to 1 foot scaled (or larger standard architectural imperial scale), dimensioned, graphical representation of the size, orientation, and location for the submitted equipment. The drawings shall further include dimensions from structural elements or architectural grid lines, operational clearances, locations of any utility service connection points, mounting requirements, and structural supports required for the submitted equipment.
   3. Include plans, elevations, sections, and mounting details.
   4. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   5. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
   6. Include diagrams for power, signal, and control wiring.

C. Operations and Maintenance Manual:
   1. Assemble and provide copies of manual 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method. Provide copies per provisions of Division 1 - General Requirements.
   2. Submit Operations and Maintenance Manuals in accordance with Division 1- General Requirements of these specifications.
   3. Provide a Complete parts list, operating instructions, and maintenance manual covering equipment at time of installation including, but not limited to:
      a. Description of system and components.
      b. Schematic diagrams of electrical, plumbing and compressed air systems.
      c. Manufacturer’s printed operating instructions.
      d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information shall indicate that preventive maintenance is not a condition for validation of warranties.
      e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity and local parts and service source.

1.10 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For pumps, accessories, and components from manufacturer.
   a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculations.
   b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   c. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
   2. Field quality-control reports.

B. Certifications: Provide a written statement that manufacturer's equipment has been installed properly, started up and is ready for operation by Owner's personnel.

1.11 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, by model number, including drawing changes and construction, shall be at the expense of the Contractor.

C. Substitution Approval: Prior to delivery or installation, submittals for each equipment item by Equipment Identifier shall be provided in accordance with Division 1 - General Requirements. Acceptance shall be based on the technical requirements herein as determined by Owner and Architect.

1.12 WARRANTY

A. Warrant work specified herein for at least one year from substantial completion against defects in materials, functions, and workmanship.

B. Warranty shall include materials and labor necessary to correct defects.

C. Defects shall include, but not be limited to noisy, rough or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish. Defects shall not include damage due to neglect, misuse, or situations resulting from non-performance of a manufacturer's recommended preventive maintenance schedule.

1.13 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid and/or dusty conditions.
   a. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Equipment Identifier of this specification.
   b. Provide equipment and material specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.14 LABELING

A. Manufacturer shall securely attach in a prominent location, on each major item of equipment, a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

C. Provide air receivers meeting requirements of ASME Code for Unfired Pressure Vessels and carry ASME approval stamp.

1.15 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design equipment mounting.

B. Seismic Performance: Pumps and accessories shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the system" shall remain in place without separation of any parts when subjected to the seismic forces specified and the unit shall be fully operational after the seismic event."
   2. Component Importance Factor: 1.0.

1.16 GENERAL REQUIREMENTS FOR PUMPS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Description: Factory-assembled, -wired, -piped, and -tested; electric-motor-driven;

C. Control Panels: Automatic control station with load control and protection functions. Comply with NEMA ICS 2 and UL 508.
1. Enclosure: NEMA ICS 6, Type 4X control panel unless otherwise indicated.
2. Motor Controllers: Full-voltage, combination-magnetic type with undervoltage release feature and motor-circuit-protector-type disconnecting means and short-circuit protective device.
3. Control Voltage: 120-V ac or less, using integral control power transformer.
4. Motor Overload Protection: Overload relay in each phase.
5. Starting Devices: Hand-off selector switch in cover of control panel, plus pilot device for automatic control.
6. Automatic control switches to alternate lead-lag pumps for duplex pumps.
7. Instrumentation: Include discharge pressure gages, hour meter, temperature gages, and control transformer.
8. Emergency shut off switch.

PART 2 - PRODUCTS

2.1 PUMPS, DUPLEX, BRINE TRANSFER SYSTEM
Equipment Identifier: 9485

A. Manufacturer's Reference:
1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish minimal acceptable standards of quality, features, performance, and construction.

a. DXP Enterprises
b. Commerce City, CO 303.430.0521
c. Model No.: Pump Works 3x3x13 PWA-SP

2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, may be considered as equal.

a. Marlo, Inc Racine, WI 262.681.1300
b. Henderson Products Manchester, IA 563.927.2828

B. Capacities/Dimensions:

1. Overall dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	111	54	60

2. Weight: 2500 pounds
3. Capacity: 200 gallons per minute
4. Total dynamic head: 42 feet of head
5. Pump inlet: 4 inches
6. Pump discharge: 4 inches
7. Pump speed: 1185 rpm
8. Self-priming: Up to 8feet of lift (minimum)
9. Pump motor selection shall be non-overloading.

C. Features/Performance/Construction:

1. Pump Construction:
   a. Casing: Stainless steel, with threaded gage tappings at inlet and outlet companion-flange connections. Casing shall be capable of Class 150, flanges shall be Class 300. Casing shall be capable of retaining liquid, sufficient enough to allow for self-priming startup without additional air separation, valves or other special priming devices.
   b. Impeller: 316L stainless steel; statically and dynamically balanced, keyed to shaft, and secured with a locking cap screw.
   c. Pump Shaft: Shaft shall be standard solid shaft design and minimum material of ASTM A276, 316L stainless steel.
   d. Seal Chamber/Stuffing Box: Stainless steel single with dual hard faces. Provide seal chamber splash guards and shaft guards. Pump shall have fully OSHA compliant coupling guard.
   e. Pump Bearings: Oil lubricated; thrust type. Radial and thrust bearding fits shall be AGMA Class K-5 with a minimum life (L10) of two years and 10 year average life in accordance with ANSI B73.1
2. Motor: Single speed and resiliently mounted to pump casing.
   a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   b. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors for system environment.
   c. Enclosure: Totally enclosed, fan cooled**.**
   d. Enclosure Materials: Rolled steel.
   e. Motor Bearings: Permanently lubricated ball bearings.
   f. Efficiency: Premium efficient
   g. NEMA Design: 4X
   h. Service Factor: 1.25
3. Pump specialty fittings:
   a. Bronze startup and stainless-steel permanent strainers.
   b. Stainless-steel straightening vanes.
   c. Drain plug.
   d. Factory-fabricated support.
4. Lifting eye bolts or lugs.
5. Plugged gage cock connection at suction and discharge nozzles.
6. Tapped and plugged openings for casing and bearing housing vents and drains.
7. Connection:

a. Male x female coupling to pump
b. Male x female coupling to tank
c. Male x female coupling to truck
d. Flexible PVC, rigid PVC helix with synthetic braiding, smooth bore, corrugated O.D.:
    1) Minimum size: 4 inch ID
    2) Minimum pressure ratings:
    3) Working pressure: 80 psi
    4) Vacuum rating: 28 inch Hg
    5) Length: 100 feet (minimum)
e. Non-potable water to shut-off valve
f. Equip Flexible PVC with dry break nozzle.
g. Mounting:
    1) To pump or pipe flange with stainless steel bracket.
    2) Maximum distance from non-potable water to shut-off valve to isolate tank and seal tank to pump seal, 2 feet each direction.

D. Controls: Provide integrated controls on skid.

E. Finish: Durable enamel in manufacturer's standard color.

F. Accessories:

1. Epoxy coated steel frame
2. Schedule 80 CPVC manifold with valving
3. Variable frequency starter
4. Line reactors, enclosed
5. Maintenance kit

G. Utilities:

1. Electrical:

a. Connection Requirements

	Pump	Pump	Controls
Voltage	460	460	120
Phase	3	3	1
HP	10	10	---
Amps	14	14	---

b. Connection Type ---

2.2 PUMPS, DUPLEX, BRINE TRANSFER SYSTEM
Equipment Identifier: 9487

A. Manufacturer's Reference:
1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish minimal acceptable standards of quality, features, performance, and construction.

a. DXP Enterprises
b. Commerce City, CO 303.430.0521
c. Model No.: Pump Works 3x3x13 PWA-SP

2. Alternate manufacturers: Contingent upon compliance with these specifications and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, may be considered as equal.

a. Marlo, Inc Racine, WI 262.681.1300
b. Henderson Products Manchester, IA 563.927.2828

B. Capacities/Dimensions:
1. Overall dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	111	54	60

2. Weight: 2500 pounds
3. Capacity: 200 gallons per minute
4. Total dynamic head: 42 feet of head
5. Pump inlet: 3 inches
6. Pump discharge: 3 inches
7. Pump speed: 1185 rpm
8. Self-priming: Up to 8feet of lift (minimum)
9. Pump motor selection shall be non-overloading.

C. Features/Performance/Construction:
1. Pump Construction:
   a. Casing: Stainless steel, with threaded gage tappings at inlet and outlet companion-flange connections. Casing shall be capable of Class 150, flanges shall be Class 300. Casing shall be capable of retaining liquid, sufficient enough to allow for self-priming startup without additional air separation, valves or other special priming devices.
   b. Impeller: 316L stainless steel; statically and dynamically balanced, keyed to shaft, and secured with a locking cap screw.
   c. Pump Shaft: Shaft shall be standard solid shaft design and minimum material of ASTM A276, 316L stainless steel.
   d. Seal Chamber/Stuffing Box: Stainless steel single with dual hard faces. Provide seal chamber splash guards and shaft guards. Pump shall have fully OSHA compliant coupling guard.

e. Pump Bearings: Oil lubricated; thrust type. Radial and thrust bearding fits shall be AGMA Class K-5 with a minimum life (L10) of two years and 10 year average life in accordance with ANSI B73.1

2. Motor: Single speed and resiliently mounted to pump casing.
   a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   b. Comply with NEMA designation, temperature rating, service factor, and efficiency requirements for motors for system environment.
   c. Enclosure: Totally enclosed, fan cooled**.**
   d. Enclosure Materials: Rolled steel.
   e. Motor Bearings: Permanently lubricated ball bearings.
   f. Efficiency: Premium efficient
   g. NEMA Design: 4X
   h. Service Factor: 1.25
3. Pump specialty fittings:
   a. Bronze startup and stainless-steel permanent strainers.
   b. Stainless-steel straightening vanes.
   c. Drain plug.
   d. Factory-fabricated support.
4. Lifting eye bolts or lugs.
5. Plugged gage cock connection at suction and discharge nozzles.
6. Tapped and plugged openings for casing and bearing housing vents and drains.
7. Connection:

   a. Male x female coupling to pump
   b. Male x female coupling to tank
   c. Male x female coupling to truck
   d. Flexible PVC, rigid PVC helix with synthetic braiding, smooth bore, corrugated O.D.:
      1) Minimum size: 3 inch ID
      2) Minimum pressure ratings:
      3) Working pressure: 80 psi
      4) Vacuum rating: 28 inch Hg
      5) Length: 100 feet (minimum)
   e. Non-potable water to shut-off valve
   f. Mounting:
      1) To pump or pipe flange with stainless steel bracket.
      2) Maximum distance from non-potable water to shut-off valve to isolate tank and seal tank to pump seal, 2 feet each direction.

D. Controls: Provide integrated controls on skid.

E. Finish: Durable enamel in manufacturer's standard color.

F. Accessories:

1. Epoxy coated steel frame
2. Schedule 80 CPVC manifold with valving
3. Variable frequency starter
4. Line reactors, enclosed
5. Maintenance kit

G. Utilities:

1. Electrical:

a. Connection Requirements

	Pump	Pump	Controls
Voltage	460	460	120
Phase	3	3	1
HP	10	10	---
Amps	14	14	---

b. Connection Type ---

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.

B. Check equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all equipment items and specified accessories.

3.2 INSTALLATION

A. Perform work under direct supervision of Foreman of Construction Superintendent with authority to coordinate installation of scheduled equipment with Project Manager.

B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:
1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
3. Anchorage: Attach equipment as detailed or directed by Project Manager or designated representative. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces. Install compressed-air equipment to allow maximum headroom unless specific mounting heights are indicated.
4. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
5. Install equipment to allow right of way for piping installed at required slope.

C. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Connect piping to equipment with moving parts with flexible connectors of materials suitable for service.

D. Install long radius reducing elbows or reducers between pump and piping. Support piping adjacent to pump so no weight is carried on pump casings. For close coupled or base mounted pumps, install supports under elbows on pump suction and discharge line sizes 4 inches and over.

E. Provide line sized shut-off valve and strainer**,** pump suction fitting on pump suction, and line sized and shut-off valve on pump discharge.

F. Provide air cock and drain connection on horizontal pump casings.

G. Provide drains for bases and seals.

H. Install electrical devices furnished with equipment but not specified to be factory mounted.

I. Ground equipment according to Division 26.

J. Install control wiring, in conduit, to field-mounted electrical devices. Connect wiring according to Division 26.

3.4 IDENTIFICATION

A. Identify pump equipment system components. Comply with requirements for identification specified in Division 23.

3.5 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing and installation debris from job site.

D. Notify Project Manager or designated representative for final acceptance.

3.6 STARTUP SERVICE

A. Engage a service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Check, align, and certify alignment of base mounted pumps prior to start-up.
   3. Lubricate pumps prior to startup.
   4. Check for equipment vibration-control supports and flexible pipe connectors and verify that equipment is properly attached to substrate.
   5. Check for proper seismic restraints.
   6. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
   7. Test and adjust controls and safeties.

B. Prepare written report documenting testing procedures and results.

3.7 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with specifications in the presence of the Project Manager or designated representative using acceptance procedures provided by the manufacturer. Startup and testing report shall be submitted to the Project Manager or designated representative.

1. Replace damaged and malfunctioning controls and equipment.
2. Test and adjust controls and safeties.
3. Testing Certification: Certify that specified tests, inspections, and procedures have been performed and certify report results. Include the following:
   a. Inspections performed.
   b. Procedures used.
   c. Test methods used.
   d. Results of tests.

B. Components shall be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.8 TRAINING

A. Direct the technical representative to provide specified hours of training to designated Owner's maintenance personnel in operation and maintenance of the following equipment. Coordinate, with Owner, training schedule and list of personnel to be trained.
   1. 9485 Pumps, duplex, brine transfer system; 2 hours (minimum)
   2. 9487 Pumps, duplex, brine transfer system; 2 hours (minimum)

B. Obtain, from technical representative, a list of Owner's personnel trained in equipment operations and maintenance.

C. Provide a Windows compatible movie file format recording on DVD disk of the training session. The DVD training movie can be of a live session or a produced training video.

END OF SECTION 43 21 00

SECTION 43 22 00 - BRINE SYSTEM EQUIPMENT

PART 1 - GENERAL

The General Provisions of the Contract, including General and Special Conditions and the requirements of Division 1, apply to the Work in this Section.

1.1 WORK INCLUDED

A. Equipment items as listed below by Equipment Identifier:
   1. 7250 Tank, brine mixing, 8,000 (Ref. Part 2.01)

B. Conduit, wiring, and switching between aerator, mixing and pumping system components per manufacturer's job specific drawings.

1.2 REFERENCES

A. American Ladder Institute (ALI):
   1. ALI A14.3, Ladders - Fixed - Safety Requirements - with Interpretation letter: 4/28/2014.

B. American National Standards Institute (ANSI):
   1. ANSI B16.5 - Pipe Flanges and Flanged Fittings.

C. ASTM International (ASTM):
   1. ASTM D1998 - Standard Specification for Polyethylene Upright Storage Tanks

1.3 QUALITY ASSURANCE

A. Manufacturer's Representative:
   1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out, and start up.
   2. Training: Provide a qualified manufacturer's representative to provide training to Owner's maintenance personnel in operation and maintenance of specified equipment.

1.4 Buy American Compliance

A. The Contractor shall comply with the applicable Buy American requirements set forth in 41 U.S.C. 8301-8305 and the applicable regulations in 49 C.F.R. Part 661, as amended. If the Contractor procures any capital items with Federal funds, it is the Contractor's responsibility to obtain the Buy American certification required under such regulations.

B. Reference Division 1 for Buy American compliance.

1.5 SUBMITTALS

A. Product Data:
   1. Submit Product Data in accordance with Division 1 - General Requirements of these specifications.
   2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.
   3. Product technical and shop drawing data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
      c. Complete information on basic materials including chemical resistance charts.
      d. Sizes of all major tank components.
      e. Details on openings lay-out.
      f. Details on field assembly and installation.
      g. Fitting locations.

B. Operations and Maintenance Manual:
   1. Submit Operations and Maintenance Manuals in accordance with Division 1- General Requirements of these specifications.

2. Provide complete parts, operating, and maintenance manual covering equipment at time of installation.
3. Description of system and components.
4. Schematic diagrams of electrical, plumbing, and compressed air system.
5. Manufacturer's printed operating instructions.
6. Printed listing of periodic preventive maintenance items and recommended frequency to validate warranties. Failure to provide maintenance information shall indicate that preventive maintenance is not a condition for validation of warranties.

1.6 PRODUCT SUBSTITUTIONS

A. Follow requirements specified in Division 1 - General Requirements.

B. Additional costs resulting from substitution of products other than those specified, by model number, including drawing changes and construction, shall be at the expense of the Contractor.

C. Substitution Approval: Prior to delivery or installation, submittals for each equipment item by Equipment Identifier shall be provided in accordance with Division 1 - General Requirements. Acceptance shall be based on the technical requirements herein as determined by Owner and Architect.

1.7 WARRANTY

A. Warrant work specified herein for one year from substantial completion against defects in materials, functions, and workmanship.

B. Warranty shall include materials and labor necessary to correct defects.

C. Defects shall include, but not be limited to noisy, rough or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish. Defects shall not include damage due to neglect, misuse, or situations resulting from non-performance of a manufacturer's recommended preventive maintenance schedule.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid and/or dusty conditions.

B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title and Equipment Identifier of this specification.

C. Provide equipment and material specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.9 LABELING

A. Manufacturer shall securely attach in a prominent location, on each major item of equipment, a non-corrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.

B. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

C. Provide air receivers meeting requirements of ASME Code for Unfired Pressure Vessels and carry ASME approval stamp.

PART 2 - PRODUCTS

2.1 SYSTEM, BRINE MIXING

Equipment Identifier: 7250

A. Manufacturer's Reference:

1. Prime manufacture: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.

a. BrineMaker
b. Signal Hill, CA 800-998-7345
c. Model No.: 8KPT

2. Alternate manufacturers: *Contingent upon compliance with this specification* and documentation requirements set forth in SUBMITTALS, equipment produced by other manufacturers, including the following, *may* be considered as equal.

a. Design Tanks LLC., Sioux Falls, SD 605-965-1600
b. Dultmeter Omaha, NE 800-228-9666

B. Batch Mixing Process:

1. Add 4,000 gallons of water to vessel.
2. Add 4 bags of New Deal product to vessel.
3. Activate mixer and operate for 30 minutes.
4. Add 4 bags of New Deal product to vessel.
5. Activate mixer and continue mixing for 30 minutes.
6. Add water to tank to bring batch to 8,000 gallons.

C. Capacities/Dimensions:

Dimensions (inches)			
	Length	Width	Height
a. Equipment	120 dia	---	192

1. Tank Connections:
   a. Product loading dome inlet: 24 inch offset port with 316 stainless steel hardware and 304 stainless steel cover hardware
   b. Water filling dome inlet: 12 inch offset port with 316 stainless steel hardware and 304 stainless steel cover hardware
   c. Level probe dome inlet: 2 inch, FPT, PVC
   d. Tank outlet to pump inlet: 4 inch, MPT, 316 stainless steel
   e. Top vent: 8 inch, flange, HDPE
   f. Accessories dome ports: 2~2 inch FPT, PVC
   g. Drain: 4 inch, MPT, 316 stainless steel

2. Tank weight:
   a. Empty weight: 2,000 pounds
   b. Filled weight: 68,720 pounds
   c. Capacity: 8,100 gallons

D. Features/Performance/Construction:
1. Aboveground tank complies with FDA Standards 21 CFR 177.1520 (1) 3.1 and 3.2.
2. Tank shall be flat bottomed with a domed top.
3. Tank shall be constructed of PBA FREE polyethylene and be UV stabilized for long-term outdoor use.
4. Tank finish: Durable plastic in manufacturer's standard colors.
5. All tank connections shall include reinforcing hardware and EPDM gaskets.

6. Drain fitting shall include ball valve and cap.
7. 12 inch top man-way for domestic water fill.
8. Side man-way shall include 316 stainless steel reinforcing hardware and 304 stainless steel cover hardware.
9. Low level tank sensor which shall be interlocked to pump control panel.
10. Overfill tank sensor which shall activate warning strobe and horn and shall activate shut off valve for domestic cold water.
11. Provide tank outlet to pump with two-arch sidewall expansion joint EPDM expansion joint, 4 inch butterfly valve, two bolt kits, mating flange and stainless steel support
12. Mixer accumulator plate and plate support frame. All components shall be constructed of 304 stainless steel.
13. Pulsair systems mixer Model 8KPM or equal. Mixer system to include 5 accumulator plates, pre-plumbed filter, regulator, injection valve and Pulsair pneumatic controller with toggle on off switch and pulse rate/dwell dial.
14. Controller:
    a. Mixing system shall sequentially inject compressed air at the bottom of tank under accumulator plates.
    b. Mixing system controller shall have adjustable injection time (pulse duration) and dwell (time between pulses). Adjustments shall be user friendly on control unit. Operation shall be continuous when "ON".
    c. Mixers shall be variable speed (pulse frequency) and variable power (injection pressure). Pulse rate and injection time shall be adjustable at controller. Injection pressure shall be set at compressed air regulator.
15. Seismic: Provide tank lateral restraint system, including tie-down lugs and wet stamped design calculations.

2.2 Accessories

1. 22 inch x 36 inch x 12 inch Chute
2. Fiberglass ladder with safety deck and cage

PART 3 - EXECUTION

3.1 INSPECTION

A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.

B. Inspect equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all equipment items and specified accessories.

3.2 INSTALLATION

A. Perform work under direct supervision of Foreman of Construction Superintendent with authority to coordinate installation of scheduled equipment with Project Manager.

B. Install equipment in accordance with plans, shop drawings, and manufacturer's instructions:
1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
3. Equipment and tanks shall be seismically braced and anchored to meet all local, state, and federal codes and provisions.

C. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 TESTING

A. After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with specifications in the presence of the Project Manager or designated representative using acceptance procedures provided by the manufacturer. Testing report shall be submitted to the Project Manager or designated representative.

3.4 CLEANUP

A. Touch-up damage to painted finishes.

B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

C. Clean area around equipment installation and remove packing and installation debris from job site.

D. Notify Project Manager or designated representative when installation and cleanup is 100% complete and ready for final observation (punch list).

3.5 TRAINING

A. Direct the technical representative to provide specified hours of training to designated Owner's maintenance personnel in operation and maintenance of the following equipment. Coordinate, with Owner, training schedule and list of personnel to be trained.

1. 7250 System, brine mixing, 8000 gallons; 4 hours (minimum)

B. Obtain, from technical representative, a list of Owner's personnel trained in equipment operations and maintenance.

END OF SECTION 43 2200

NOTES

1. SEE STRUCTURAL SECTION DETAIL ON SHEET 2/C0702.
2. REGRADE & COMPACT EXISTING BASE COURSE PRIOR TO INSTALLING NEW ASPHALT PAVEMENT.

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4041 B Street
Anchorage, Alaska 99503
907-562-2000
#AECL848
3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543

PROJECT NO. 0308

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
AIRPORT EQUIPMENT FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA
49th
Naomi R. Hobbs
Naomi R. Hobbs
No. CE9959
08/06/18
REGISTERED PROFESSIONAL ENGINEER

GRADING PLAN

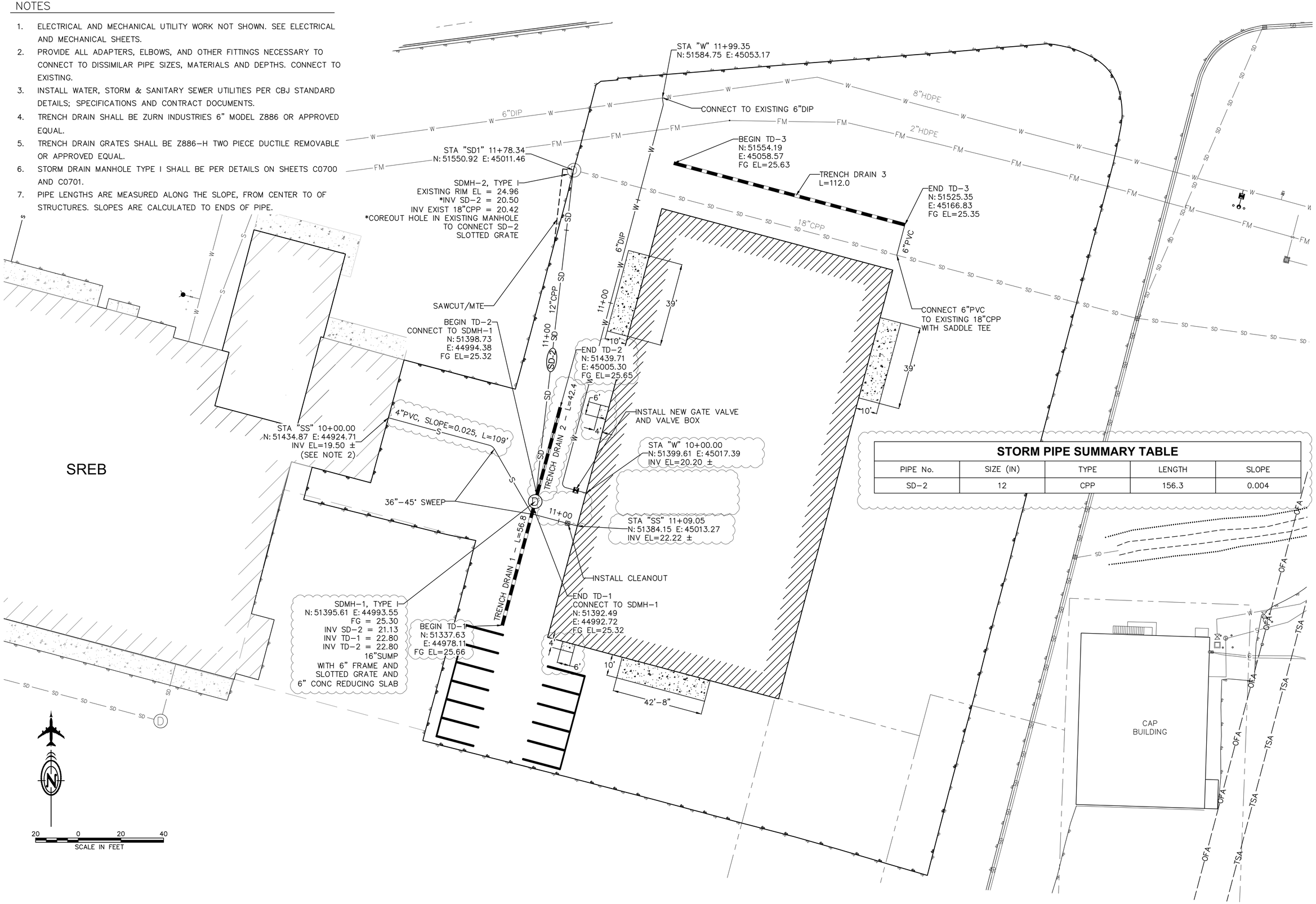
JUNEAU CONTRACT BE 19-037

C0400

FULL SIZE PRINTED ON 22X34

NOTES

1. ELECTRICAL AND MECHANICAL UTILITY WORK NOT SHOWN. SEE ELECTRICAL AND MECHANICAL SHEETS.
2. PROVIDE ALL ADAPTERS, ELBOWS, AND OTHER FITTINGS NECESSARY TO CONNECT TO DISSIMILAR PIPE SIZES, MATERIALS AND DEPTHS. CONNECT TO EXISTING.
3. INSTALL WATER, STORM & SANITARY SEWER UTILITIES PER CBJ STANDARD DETAILS; SPECIFICATIONS AND CONTRACT DOCUMENTS.
4. TRENCH DRAIN SHALL BE ZURN INDUSTRIES 6" MODEL Z886 OR APPROVED EQUAL.
5. TRENCH DRAIN GRATES SHALL BE Z886-H TWO PIECE DUCTILE REMOVABLE OR APPROVED EQUAL.
6. STORM DRAIN MANHOLE TYPE I SHALL BE PER DETAILS ON SHEETS C0700 AND C0701.
7. PIPE LENGTHS ARE MEASURED ALONG THE SLOPE, FROM CENTER TO OF STRUCTURES. SLOPES ARE CALCULATED TO ENDS OF PIPE.



STORM PIPE SUMMARY TABLE

PIPE No.	SIZE (IN)	TYPE	LENGTH	SLOPE
SD-2	12	CPP	156.3	0.004

20 0 20 40
SCALE IN FEET

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ANCHORAGE, ALASKA 99503 907.561.5543
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JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
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STATE OF ALASKA
49th
Naomi R. Hobbs
Naomi R. Hobbs
No. CE9959
08/06/18
REGISTERED PROFESSIONAL ENGINEER

UTILITY PLAN

C0600

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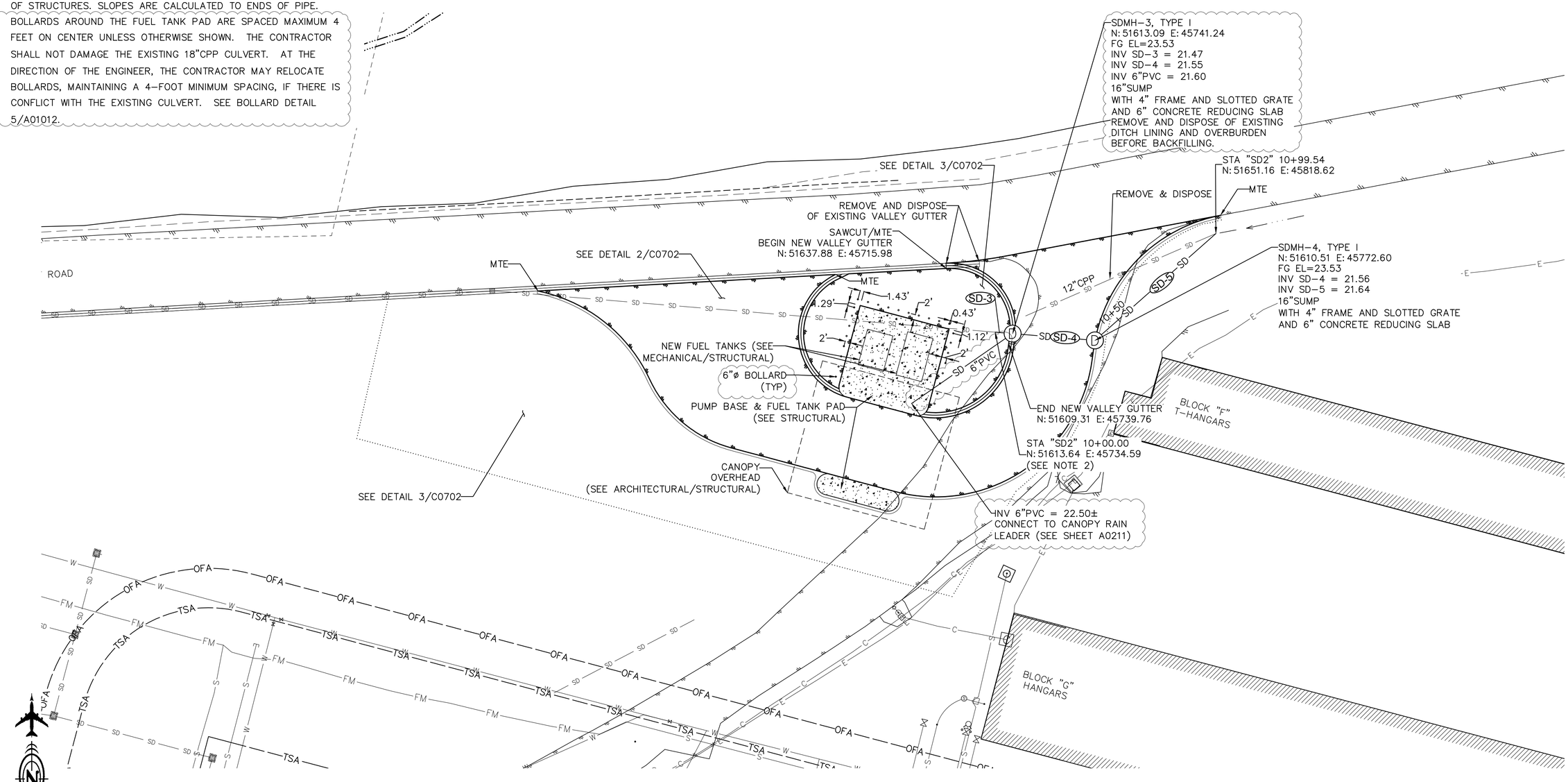
JUNEAU CONTRACT BE 19-037

NOTES

1. ELECTRICAL AND MECHANICAL UTILITY WORK NOT SHOWN. SEE ELECTRICAL AND MECHANICAL SHEETS.
2. PROVIDE ALL ADAPTERS, ELBOWS, AND OTHER FITTINGS NECESSARY TO CONNECT TO DISSIMILAR PIPE SIZES, MATERIALS AND DEPTHS. CONNECT TO EXISTING.
3. INSTALL WATER, STORM & SANITARY SEWER UTILITIES PER CBJ STANDARD DETAILS; SPECIFICATIONS AND CONTRACT DOCUMENTS.
4. STORM DRAIN MANHOLE TYPE I SHALL BE PER DETAILS ON SHEETS C0800 AND C0801.
5. PIPE LENGTHS ARE MEASURED ALONG THE SLOPE, FROM CENTER TO OF STRUCTURES. SLOPES ARE CALCULATED TO ENDS OF PIPE.
6. BOLLARDS AROUND THE FUEL TANK PAD ARE SPACED MAXIMUM 4 FEET ON CENTER UNLESS OTHERWISE SHOWN. THE CONTRACTOR SHALL NOT DAMAGE THE EXISTING 18"CPP CULVERT. AT THE DIRECTION OF THE ENGINEER, THE CONTRACTOR MAY RELOCATE BOLLARDS, MAINTAINING A 4-FOOT MINIMUM SPACING, IF THERE IS CONFLICT WITH THE EXISTING CULVERT. SEE BOLLARD DETAIL 5/A01012.

STORM PIPE SUMMARY TABLE

PIPE No.	SIZE (IN)	TYPE	LENGTH	SLOPE
SD-3	18	CPP	6.7	0.003
SD-4	18	CPP	31.5	0.003
SD-5	12	CPP	61.4	0.004



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UTILITY PLAN

JUNEAU CONTRACT BE 19-037

C0601

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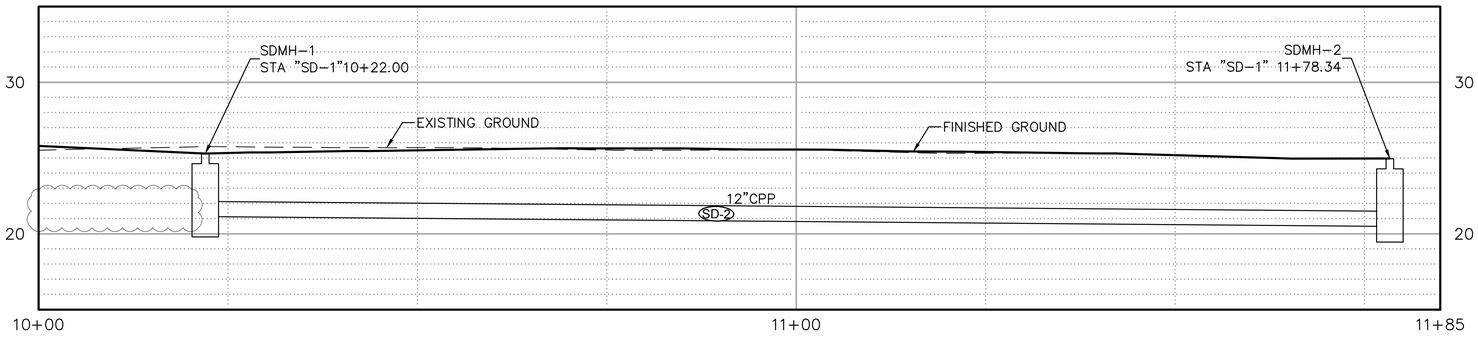
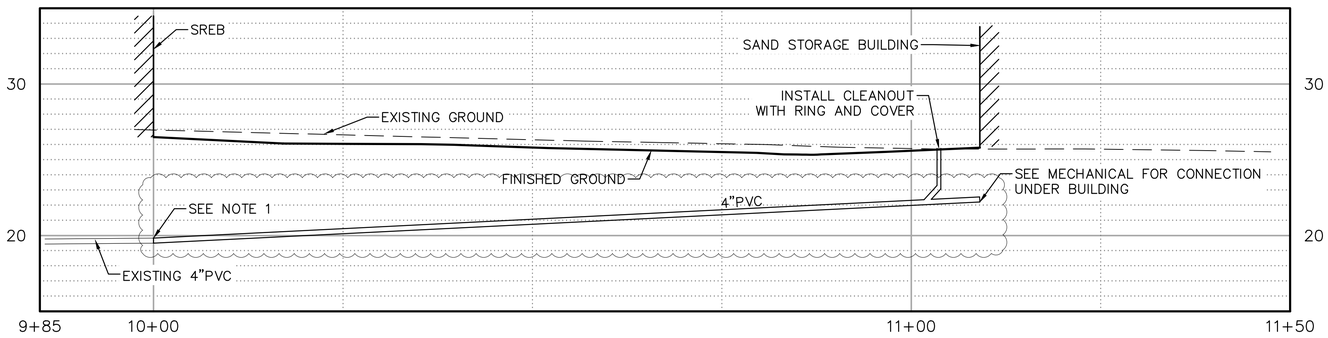
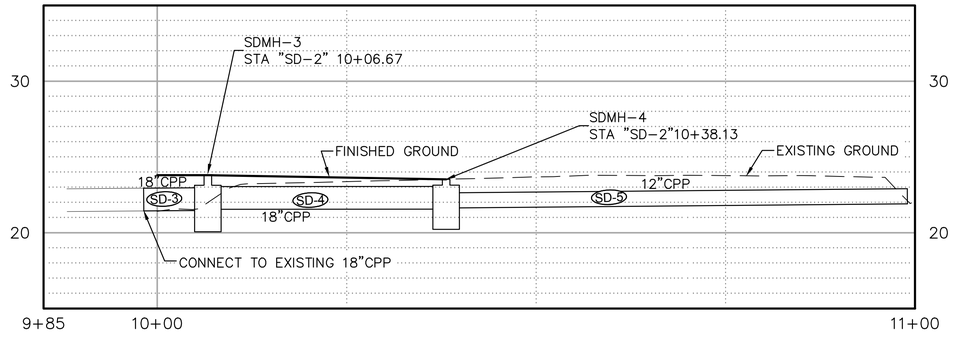


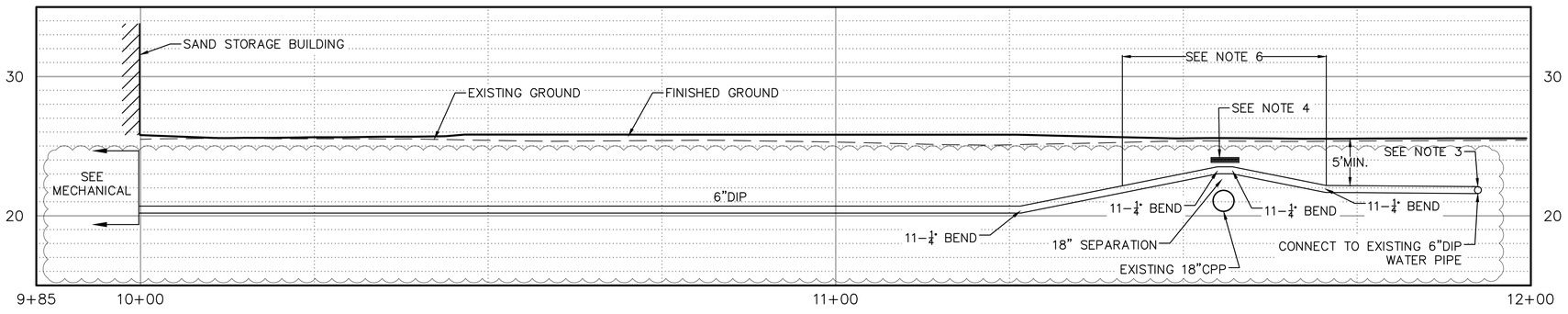
SD 1 PROFILE



SANITARY SEWER PROFILE



SD 2 PROFILE



WATER LINE PROFILE

NOTES

1. PROVIDE ALL ADAPTERS, ELBOWS, AND OTHER FITTINGS NECESSARY TO CONNECT TO DISSIMILAR PIPE SIZES, MATERIALS AND DEPTHS. CONNECT TO EXISTING.
2. ELECTRICAL AND MECHANICAL UTILITY WORK NOT SHOWN. SEE ELECTRICAL AND MECHANICAL SHEETS.
3. SEE SHEETS C0600 & C0601 FOR PIPE LENGTHS, INVERT ELEVATIONS AND STRUCTURE DETAILS & NOTES.
4. INSTALL THREE 2-INCH THICK BOARDS OF RIGID INSULATION ABOVE WATER SERVICE PER DETAIL 4/C0701.
5. REFERENCE CBJ STANDARD DETAILS FOR NEW SANITARY SEWER CLEANOUT.
6. INSTALL INSULATION BOARD ABOVE WATER SERVICE PER DETAIL 4/C0701 UNLESS OTHERWISE SHOWN OR DIRECTED BY THE ENGINEER.

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UTILITY PROFILES

JUNEAU CONTRACT BE 19-037

C0602

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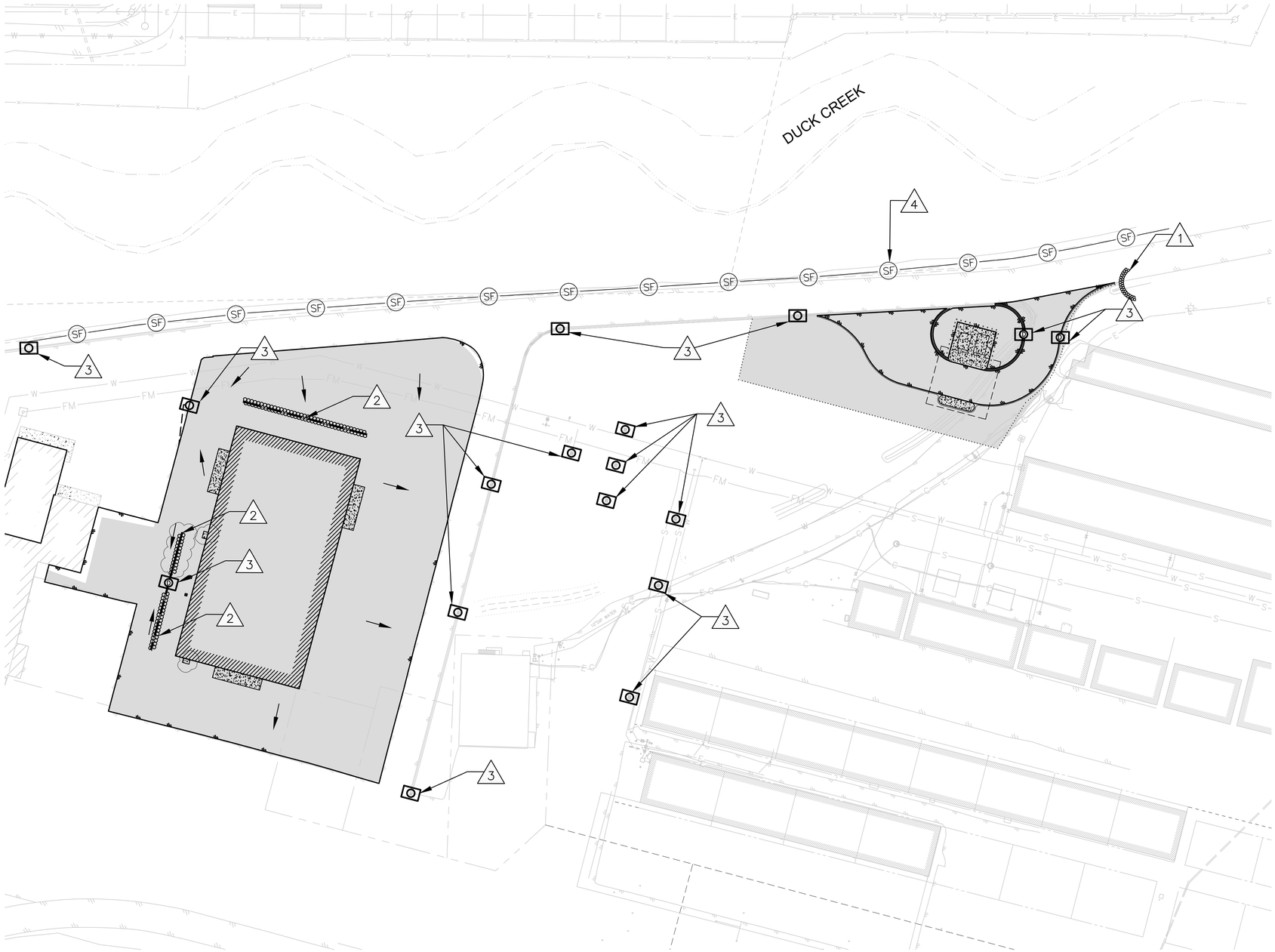
ESCP NOTES:

1. THE ESCP SHEETS ARE NOT A COMPREHENSIVE REPRESENTATION OF ALL BMPS REQUIRED TO MAINTAIN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT (CGP). BMPS SHOWN ON THE ESCP SHEETS ARE ONLY A STARTING POINT FOR THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING ANY ADDITIONAL BMPS TO ACCOUNT FOR THEIR PHASING AND METHODS OF CONDUCTING WORK.
2. CONTRACTOR SHALL UTILIZE BMPS MOST APPROPRIATE FOR CONDITIONS ON-SITE. IF INSPECTION REVEALS EROSION CONTROL MEASURES ARE INEFFECTIVE, THE CONTRACTOR SHALL IMMEDIATELY IMPLEMENT CORRECTIVE ACTION, AS NECESSARY, TO CORRECT THE DEFICIENCY.
3. CONTRACTOR SHALL ESTABLISH MATERIAL STORAGE AND STAGING AREAS.
4. PRESERVE EXISTING VEGETATION WHEN PRACTICAL.
5. THE CONTRACTOR SHALL USE CONTROL MEASURES TO ENSURE THAT CONSTRUCTION ACTIVITIES HAVE MINIMAL IMPACTS ON THE NATURAL BUFFER AREAS OF RECEIVING WATERS.
6. ALL DISTURBED AREAS NOT RECEIVING HMA PAVEMENT, NON-ERODIBLE GRAVELS, OR RIPRAP SHALL RECEIVE TOPSOIL AND SEED AS A FINAL STABILIZATION MEASURE, UNLESS OTHER TREATMENTS ARE REQUIRED BY PERMIT CONDITIONS.
7. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES AFTER PROJECT COMPLETION.
8. PROVIDE VELOCITY DISSIPATERS AT ALL DEWATERING DISCHARGE POINTS.

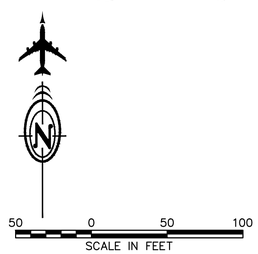
ESCP LEGEND

- AREA OF IMPROVEMENT
- CULVERT INLET/OUTLET PROTECTION/FIBER ROLLS
- DISCHARGE POINT
- DITCH LINE
- FIBER ROLLS FOR EROSION AND SEDIMENT CONTROL
- INLET PROTECTION
- SILT FENCE
- SURFACE FLOW



EROSION & SEDIMENT CONTROL NOTES:

1. INSTALL CULVERT INLET/OUTLET PROTECTION FIBER ROLLS.
2. INSTALL FIBER ROLLS.
3. INSTALL INLET PROTECTION.
4. INSTALL SILT FENCE.



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3909 ARCTIC BOULEVARD, SUITE 103
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PROJECT NO. 0308

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
AIRPORT EQUIPMENT FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA
49th
Naomi R. Hobbs
Naomi R. Hobbs
No.CE9959
08/06/18
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EROSION AND SEDIMENT CONTROL PLAN

JUNEAU CONTRACT BE 19-037

C0800

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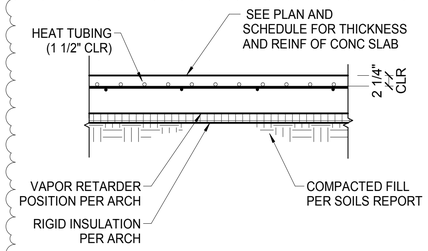
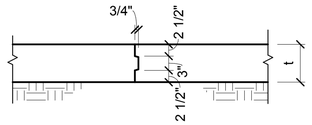
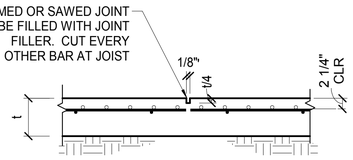


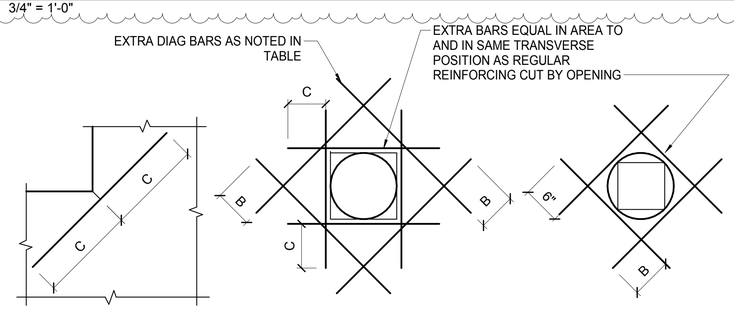




TYPICAL INTERIOR SLAB ON GRADE | TYPICAL SLAB CONSTRUCTION JOINTS | TYPICAL SLAB CONTROL JOINT

1 TYPICAL INTERIOR SLAB ON GRADE DETAILS

3/4" = 1'-0"



OPENINGS LARGER THAN 21" DIA | OPENINGS LESS THAN 21" DIA

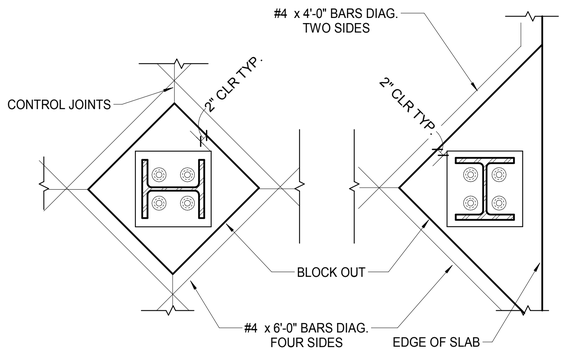
C=LAP SPLICE MIN
B=12" MIN
EXTRA BARS NOT REQUIRED AT SLEEVES OR WALL PIPES WHEN REINFORCING IS NOT CUT AND OPENING IS LESS THAN 10 INCH

EXTRA DIAG BARS	
CONCRETE THICKNESS	BAR SIZE
4"-7.99"	4
8"-9.99"	5
10"-11.99"	5 T&B
12"-18"	6 T&B

RE-ENTRANT CORNERS | OPENING REINFORCING

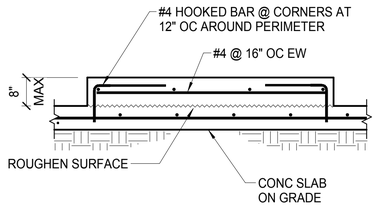
2 TYPICAL WALL OPENING REINFORCING

1" = 1'-0"



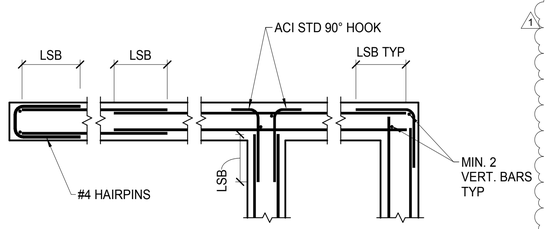
3 COL ISOLATION JOINST

3/4" = 1'-0"

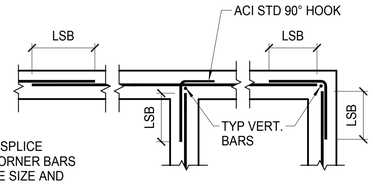


4 TYPCIAL HOUSEKEEPING PAD

3/4" = 1'-0"



DOUBLE CURTAIN PLAN - 10" AND THICKER WALLS



NOTES:
LSB = CLASS B LAP SPLICE
ALL HORIZONTAL CORNER BARS SHALL BE THE SAME SIZE AND SPACING AS HORIZONTAL BARS.

SINGLE CURTAIN PLAN - 8" WALLS

5 TYPICAL CORNER REINFORCING

3/4" = 1'-0"

SPREAD FOOTING REINFORCING SCHEDULE

MARK	FTG SIZE	FTG DEPTH	T.O.F. ELEV.	TOP MAT REINFORCING	BOTTOM MAT REINFORCING
F4	4'-0"x4'-0"	12"	SEE PLAN		(5) #5 EA. WAY
F5	5'-0"x5'-0"	12"	SEE PLAN	(6) #5 EA. WAY	(6) #5 EA. WAY
F6	6'-0"x6'-0"	18"	SEE PLAN	(8) #6 EA. WAY	(8) #6 EA. WAY
F8	8'-0"x8'-0"	24"	SEE PLAN	(10) #6 EA. WAY	(10) #6 EA. WAY
F9	9'-0"x9'-0"	24"	SEE PLAN	(11) #6 EA. WAY	(11) #6 EA. WAY 1

NOTES:

STRIP FOOTING REINFORCING SCHEDULE

MARK	FTG WIDTH	FTG DEPTH	T.O.F. ELEV.	LONGITUDINAL REINFORCING	TRANSVERSE REINFORCING
SF2	2'-0"	12"	SEE PLAN	(3) #5 AT MID HEIGHT	NONE
SF3	3'-0"	12"	SEE PLAN	(4) #5 AT MID HEIGHT	#5 AT 12" OC
SF8	8'-0"	16"	SEE PLAN	#6 AT 12" OC TOP AND BOT	#6 AT 8" OC TOP #6 AT 12" OC BOT
SF9	9'-9"	18"	SEE PLAN	#6 AT 12" OC TOP AND BOT	#6 AT 8" OC TOP #6 AT 12" OC BOT

CONCRETE WALL REINFORCING SCHEDULE

MARK	THICKNESS	VERTICAL REINFORCING	HORIZONTAL REINFORCING	POSITION	REMARKS
8C	8"	#5 @ 16" OC	#5 @ 12" OC	CENTERED	TYPICAL CONCRETE STEM WALL
12C	12"	#6 @ 8" OC INSIDE FACE #6 @ 12" OC OUTSIDE FACE	#5 @ 12" OC INSIDE FACE #5 @ 12" OC OUTSIDE FACE		CHEM STORAGE WALLS
12R	12"	#6 @ 8" OC INSIDE (SAND)FACE #6 @ 12" OC OUTSIDE FACE	#5 @ 12" OC INSIDE FACE #5 @ 12" OC OUTSIDE FACE		SAND STORAGE RETAINING WALLS
16C	16"	#5 @ 12" OC	#5 @ 12" OC	EA FACE	TYPICAL CONCRETE STEM WALL AT BRACE FRAMES
24C	24"	#6 @ 12" OC	#5 @ 12" OC	EA FACE	CHEM STORAGE WALLS

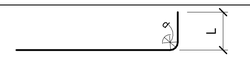
MINIMUM CLEARANCE IS 2" FOR WALL REINFORCING.
PLACE HORIZONTAL BARS TO THE OUTSIDE OF VERTICAL BARS ON WALLS WIHT REINFORCING ON EA FACE.

SLAB REINFORCING SCHEDULE

THICKNESS	TYPE	REINFORCING	CONCRETE COVER	HEAT TUBING
6"	ON GRADE	#4 @ 16" OC EACH WAY	2 1/4" CLR FROM TOP	YES
8"	ON GRADE	#4 @ 8" OC EACH WAY	2 1/4" CLR FROM TOP	YES
10" SAND STORAGE SLAB	ON GRADE	#4 @ 12" OC EACH WAY TOP AND BOTTOM	2 1/4" CLR FROM TOP, 3" FROM BOTTOM	YES
10" PIT MAT SLAB	ON GRADE	#4 @ 12" OC EACH WAY TOP AND BOTTOM	1 1/2" CLR FROM TOP, 3" FROM BOTTOM	NO

ACI STANDARD 90° HOOK DIMENSIONS

BAR SIZE	#3	#4	#5	#6	#7	#8	
MIN. BEND DIAM. (d)	2 1/4"	3"	3 3/4"	4 1/2"	5 1/4"	6"	
EXTENSION LENGTH (L)	6"	8"	10"	12"	14"	16"	



NOTE: REFERENCE ACI 318-05 SEC. 7.1 & 12.5.4

LAP SPLICES

BAR SIZE	#3	#4	#5	#6	#7	#8	
CLASS B SPLICE	28"	37"	47"	56"	81"	93"	

NOTE: INCREASE TABULATED LAP LENGTH BY 20% FOR BUNDLES OF 3 BARS.

REINFORCING CLEARANCE/COVER

EXPOSURE CONDITION		MIN. COVER	TOLERANCE*
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH		3"	-3/8", +1"
EXPOSED TO EARTH OR WEATHER	#5 AND SMALLER BARS:	1 1/2"	-1/4", +1/2"
	#6 AND LARGER BARS:	2"	-1/4", +1/2"
NOT EXPOSED TO EARTH, WEATHER OR IN CONTACT WITH GROUND:		3/4"	-1/4", +3/8"
TIES AND STIRRUPS		1 1/2"	-1/4", +1/2"

NOTES: "-" INDICATES TOLERANCE DECREASE TOWARDS MEMBER FACE. "+" INDICATES AWAY FROM MEMBER FACE.

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JUNEAU INTERNATIONAL AIRPORT
JNU SAND/CHEM BUILDING & FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS
PROJECT NO.0308

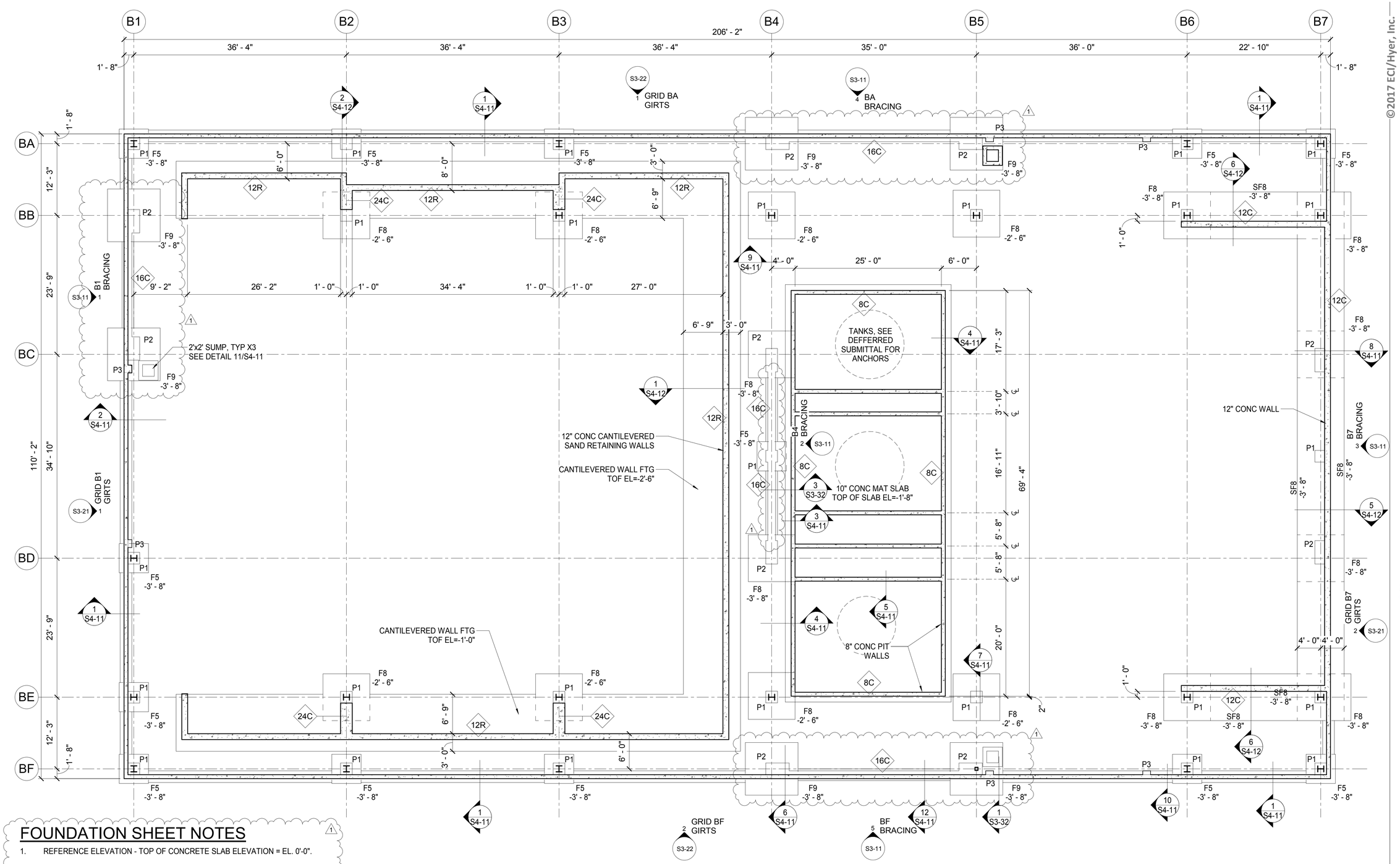
STATE OF ALASKA 49 TH
F. Charles Kerley
SE14476
8.6.18
REGISTERED STRUCTURAL ENGINEER

CONCRETE REINFORCING SCHEDULES AND TYPICAL DETAILS

AUTHOR: CK CHECKED: JG
REVISION: 1
ISSUE DATE: 08.06.2018
JUNEAU CONTRACT: BE 19-037

S1-21

FULL SIZE PRINTED ON 22 x 34



FOUNDATION SHEET NOTES

1. REFERENCE ELEVATION - TOP OF CONCRETE SLAB ELEVATION = EL. 0'-0".
2. UNLESS NOTED OTHERWISE, ALL STRIP FOOTINGS ON THIS SHEET ARE 2'-0" WIDE (SF2), AND TOP OF STRIP FOOTING ELEVATION = -3'-8" UNO. SEE S1-21 FOR FOOTING SCHEDULE.
3. UNLESS NOTED OTHERWISE, SEE PLAN FOR TOP OF FOOTING ELEVATION. SEE S1-21 FOR FOOTING SCHEDULE.
4. UNLESS NOTED OTHERWISE, TOP OF PIER ELEVATION = -1'-0". SEE S1-22 FOR PIER DIAGRAMS.
5. ALL UNMARKED CONCRETE STEM WALLS THIS SHEET ARE 8" CONC CIP (C8).

1 FOUNDATION PLAN

1/8" = 1'-0"

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49 TH
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SE14476
8.6.18
REGISTERED STRUCTURAL ENGINEER

FOUNDATION PLAN

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JUNEAU CONTRACT: BE 19-037

S2-00

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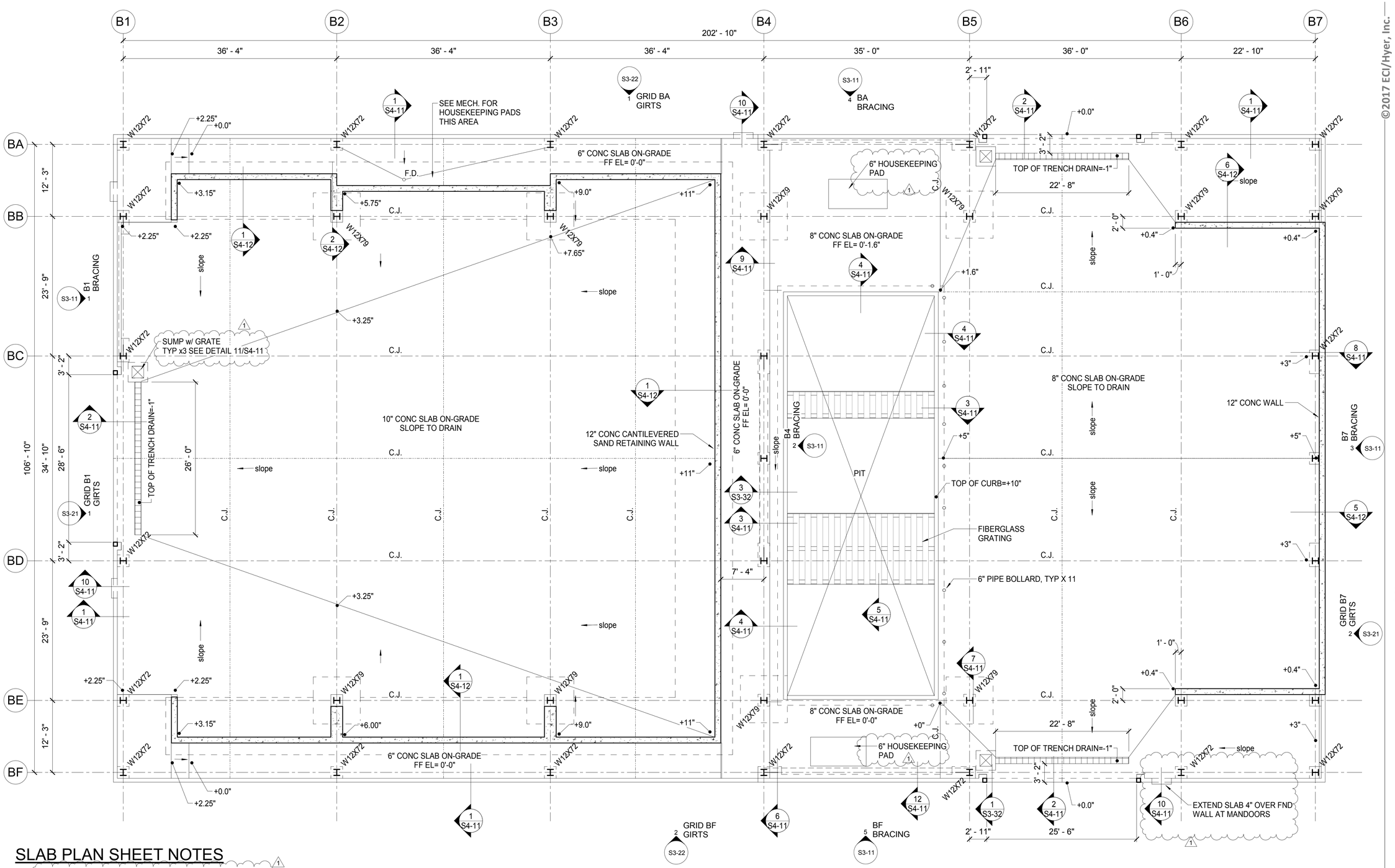

SLAB PLAN SHEET NOTES

1. REFERENCE ELEVATION - TOP OF CONCRETE SLAB ELEVATION = EL. 0'-0".
2. INSTALL CONTROL JOINTS AS SHOWN AND AT ALL REENTRANT CORNERS. SUBMIT CONSTRUCTION JOINTS FOR APPROVAL.
3. SLOPE FLOOR SLABS AS SHOWN.

1 SLAB PLAN

1/8" = 1'-0"

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SLAB PLAN

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S2-10

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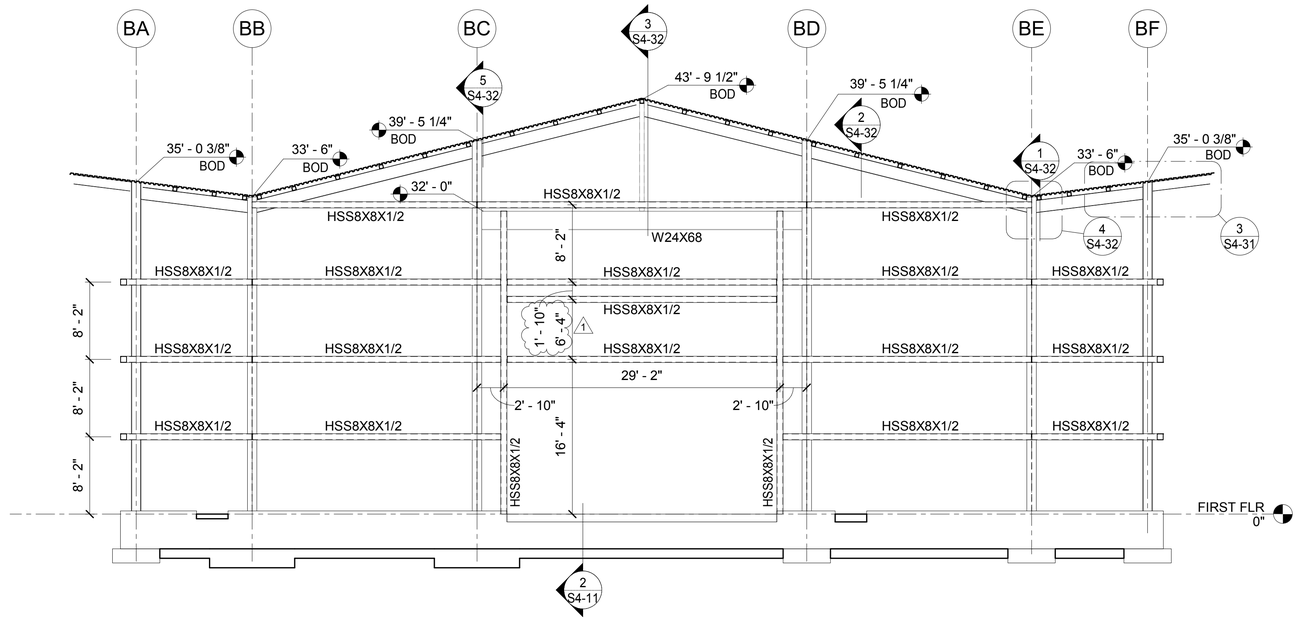
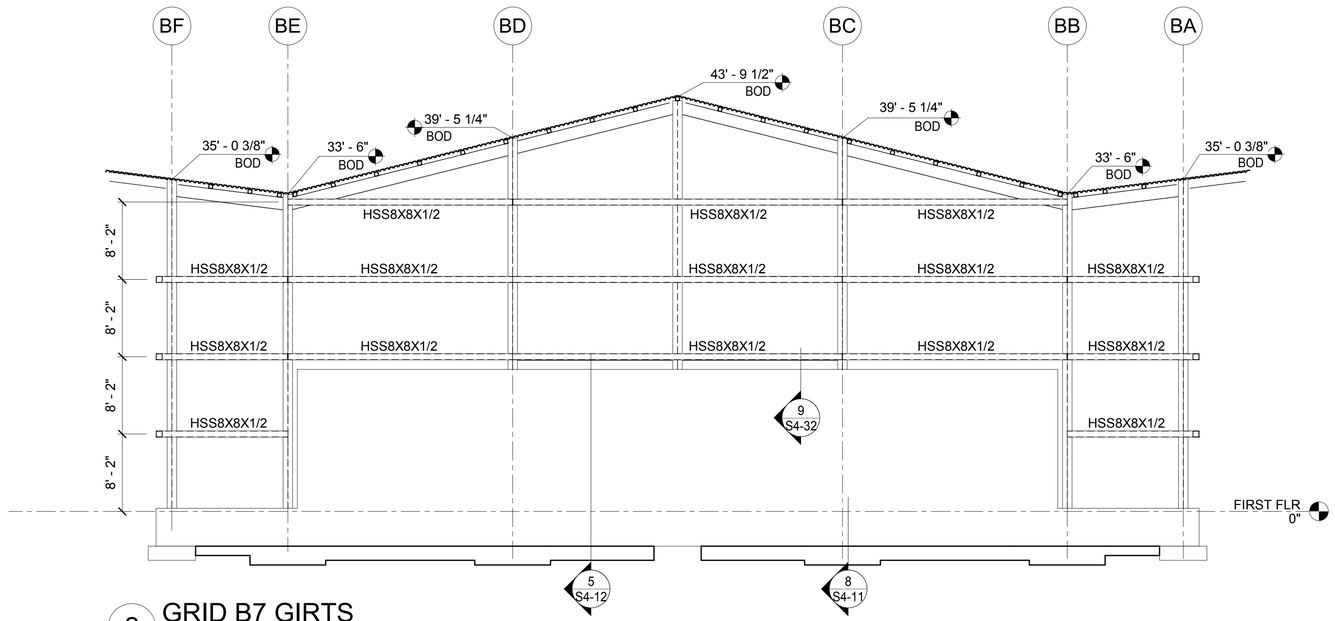


1 GRID B1 GIRTS
1/8" = 1'-0"



2 GRID B7 GIRTS
1/8" = 1'-0"

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GIRT ELEVATIONS

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S3-21

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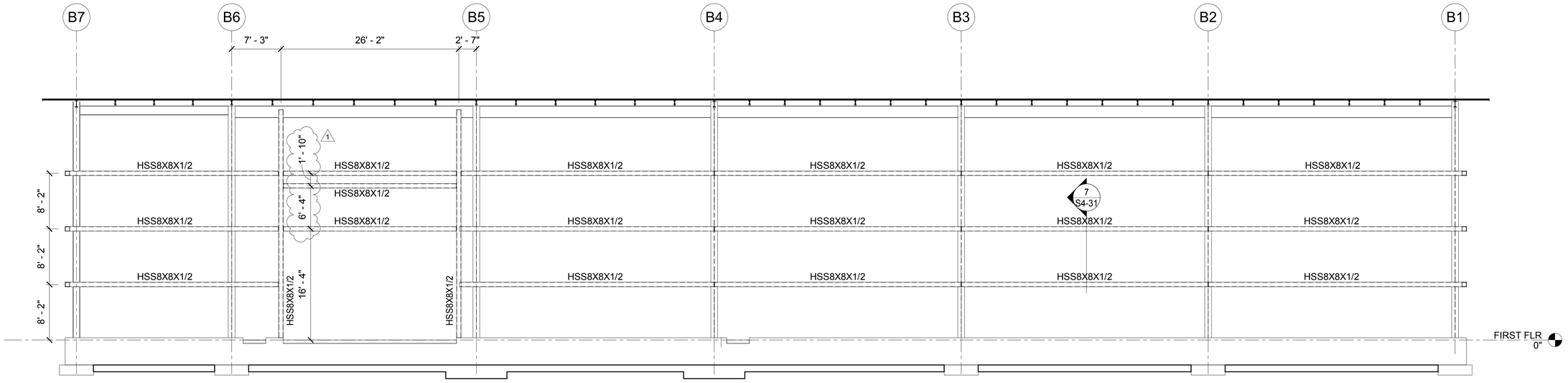
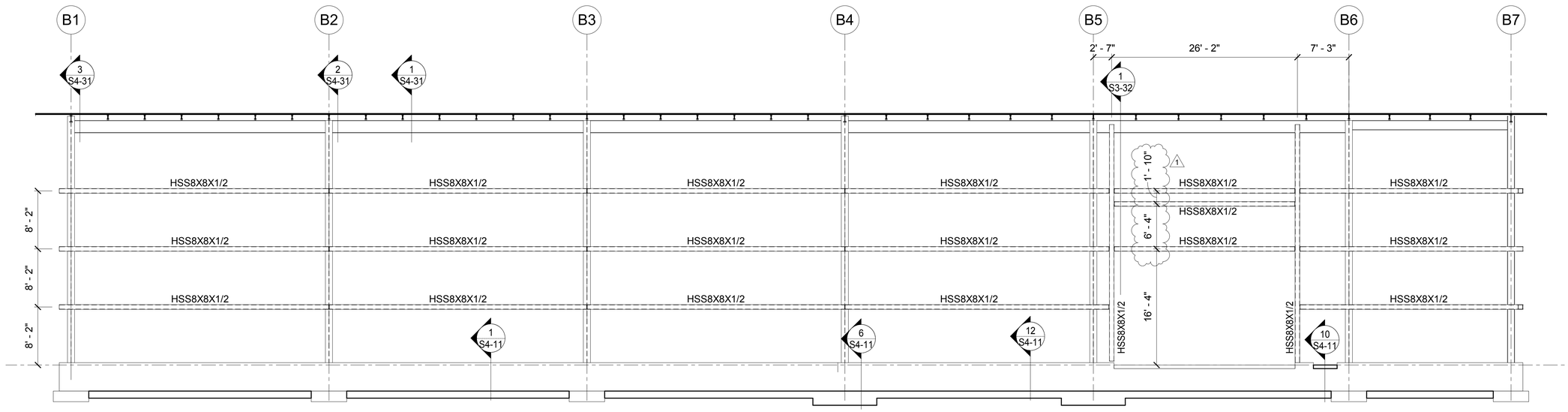


1 GRID BA GIRTS

1/8" = 1'-0"



2 GRID BF GIRTS

1/8" = 1'-0"

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GIRT ELEVATIONS

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S3-22

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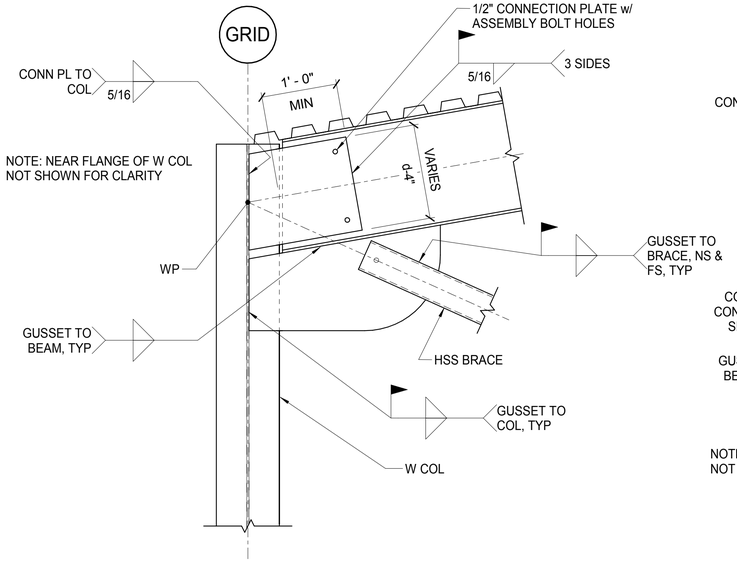
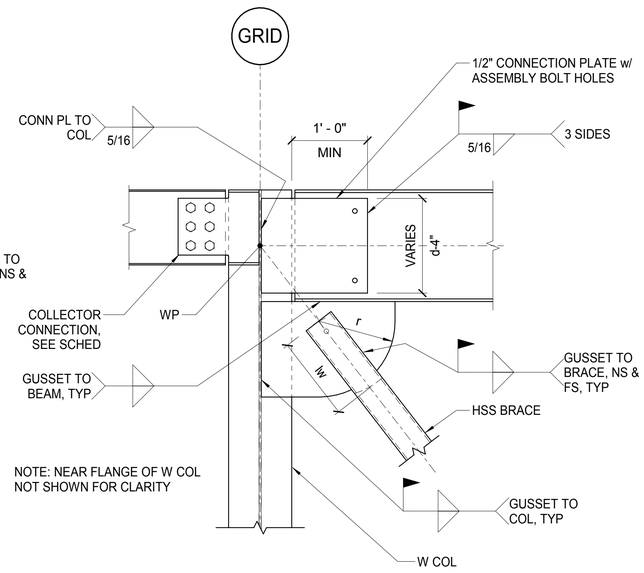


1 BRACE AT SLOPED ROOF BEAM
1" = 1'-0"



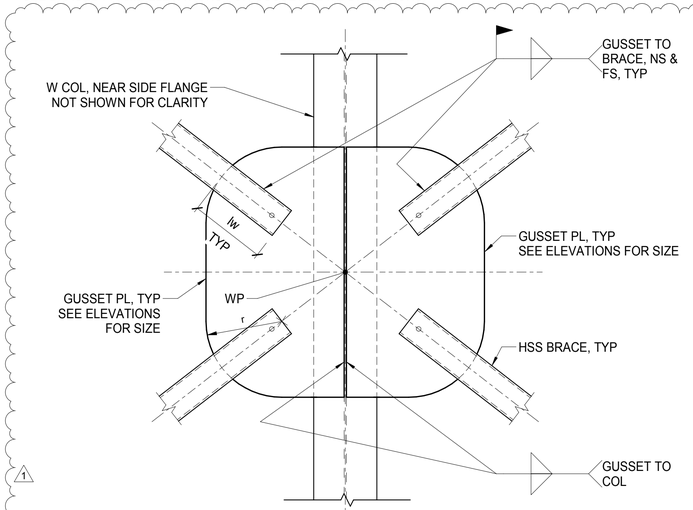
2 BRACE AT ROOF BEAM
1" = 1'-0"

OCBF BRACE CONNECTION SCHEDULE

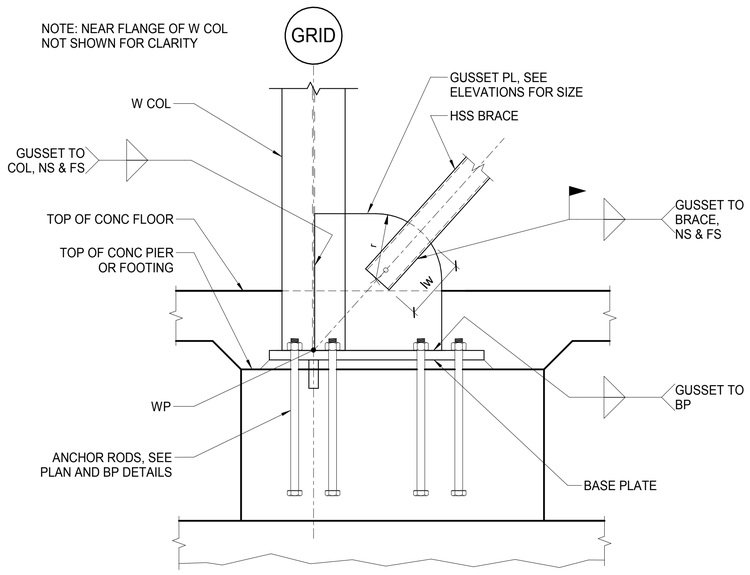
BRACE SIZE	GUSSET PLATE		BRACE AND GUSSET WELDING			
	RADIUS (r)	THICKNESS	BRACE TO GUSSET WELD LENGTH (lw)	BRACE TO GUSSET FILLET WELD SIZE	GUSSET TO COLUMN FILLET WELD SIZE	GUSSET TO BEAM OR BP FILLET WELD SIZE
HSS6x6x3/8	12"	3/4"	12"	5/16	5/16	5/16
HSS6x6x1/2	12"	3/4"	12"	5/16	5/16	5/16

BRACE NOTES

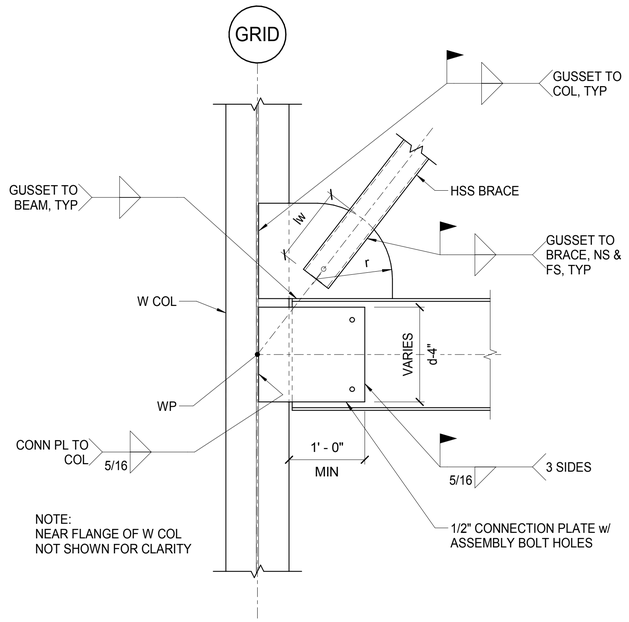
1. SLOT ALL BRACES AT CENTER LINE TO RECEIVE GUSSET PLATES. PROVIDE A SINGLE 3/4" ERECTION BOLT FOR EACH BRACE.
2. STEEL DETAILER SHALL PROVIDE TO-SCALE DRAWINGS OF ALL BRACE CONNECTIONS IN THE STRUCTURE FOR APPROVAL.
3. GUSSET PLATE MATERIAL IS ASTM A572 GR 50.
4. SEE BRACED FRAME ELEVATIONS FOR GUSSET PLATE DIMENSIONS.



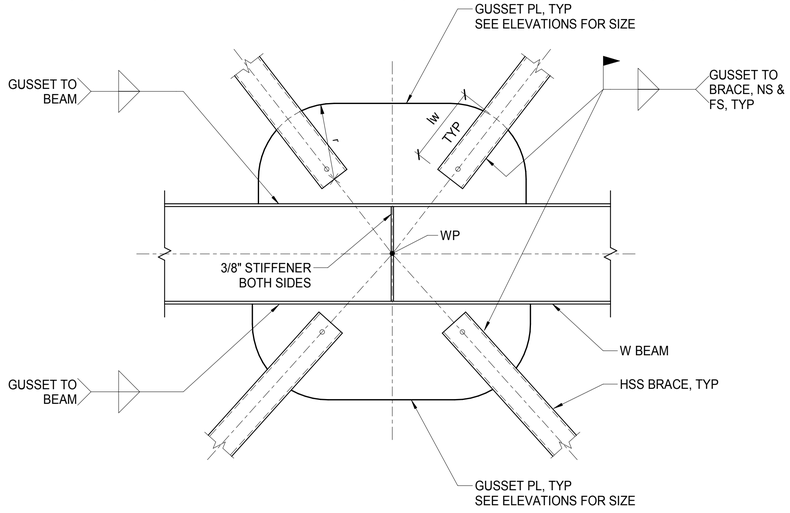
3 BRACE AT W COLUMN
1" = 1'-0"



4 BRACE AT BASE PLATE
1" = 1'-0"



5 BRACE AT BEAM
1" = 1'-0"



6 BRACE AT W BEAM
1" = 1'-0"

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BRACED FRAME DETAILS

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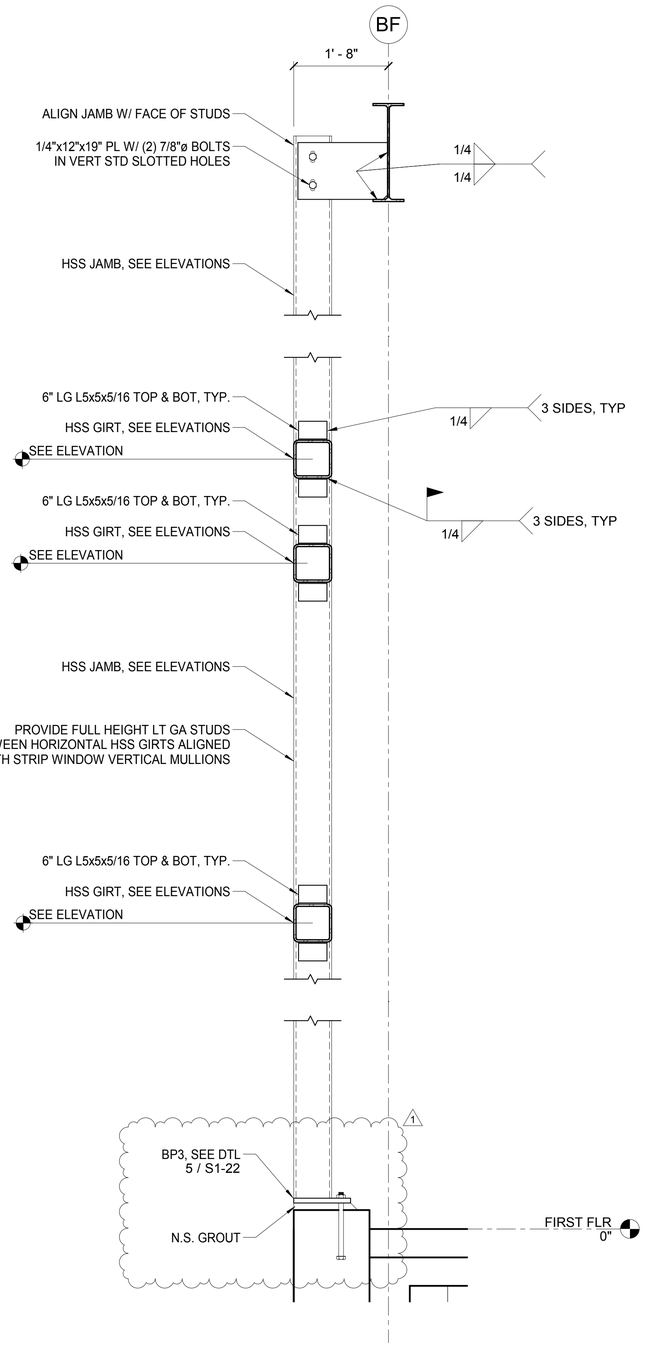
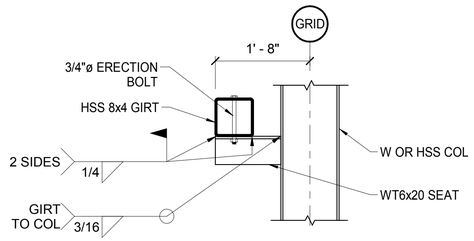
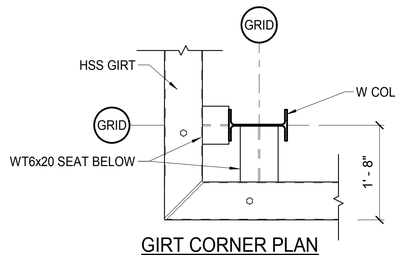


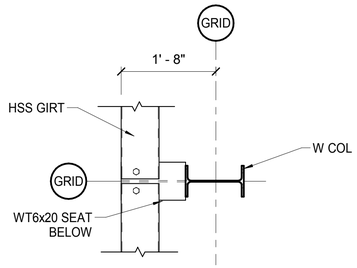
1 TYP OH DOOR JAMB/GIRT CONNECTIONS
3/4" = 1'-0"



TYPICAL GIRT SEAT DETAIL

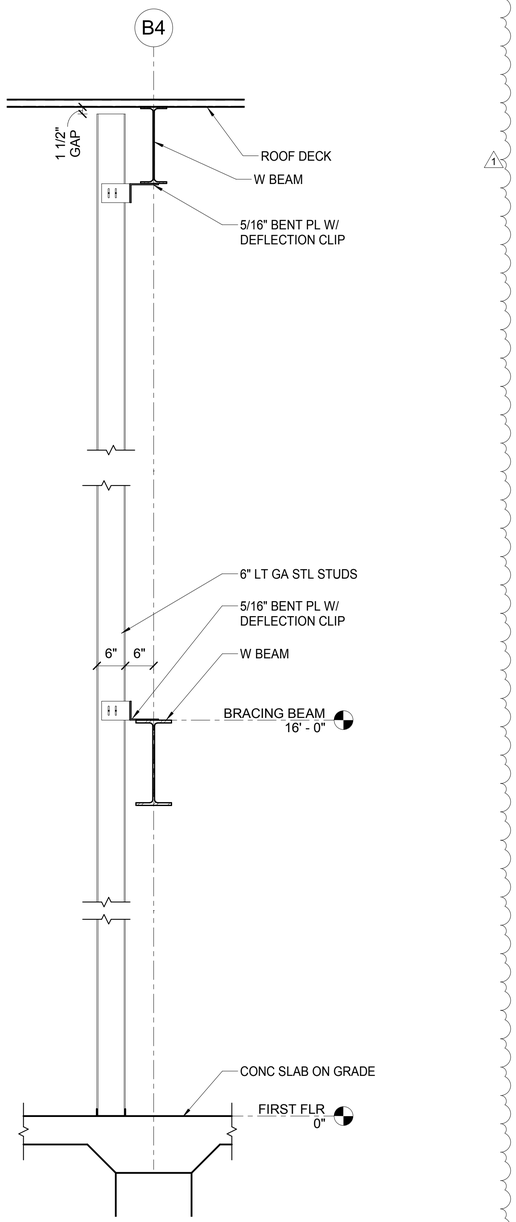


GIRT CORNER PLAN



GIRT SPLICE PLAN

2 TYPICAL GIRT CONNECTION
3/4" = 1'-0"



3 INTERIOR PARTITION WALL GIRT SECTION
3/4" = 1'-0"

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F. Charles Kerley
SE14476
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GIRT AND DOOR FRAME DETAILS

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S3-32

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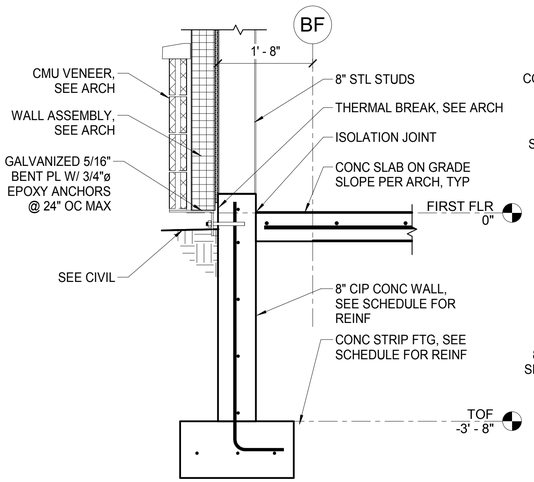
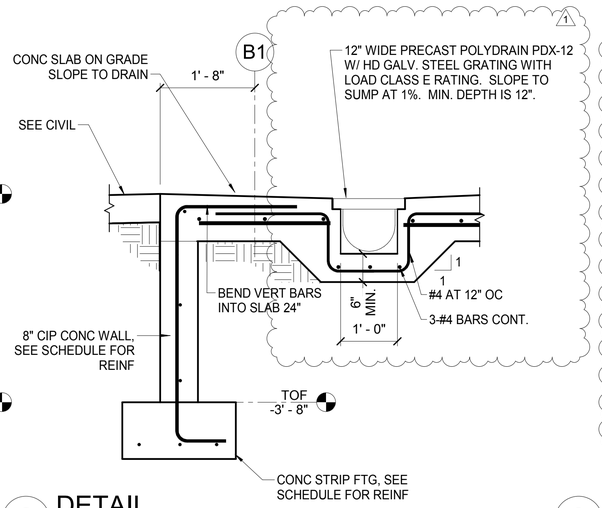


1 DETAIL
3/4" = 1'-0"



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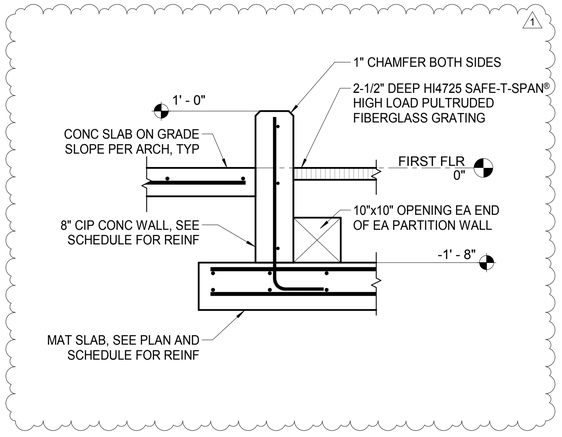
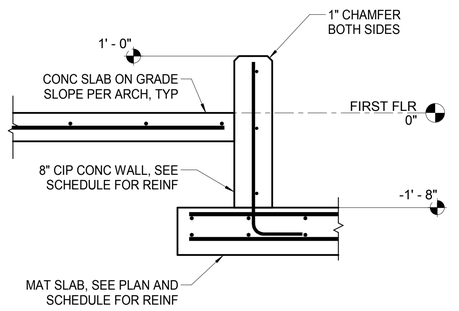
3/4" = 1'-0"



3 PIT DETAIL
3/4" = 1'-0"



4 PIT DETAIL
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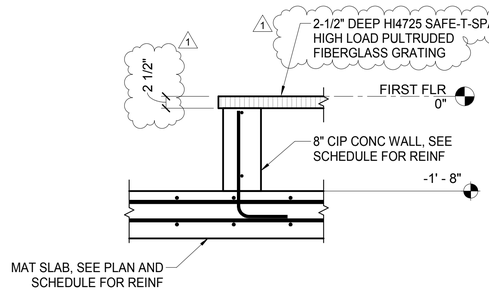
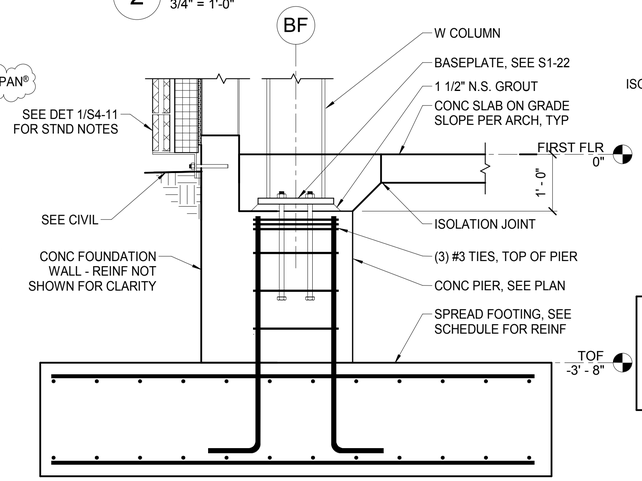
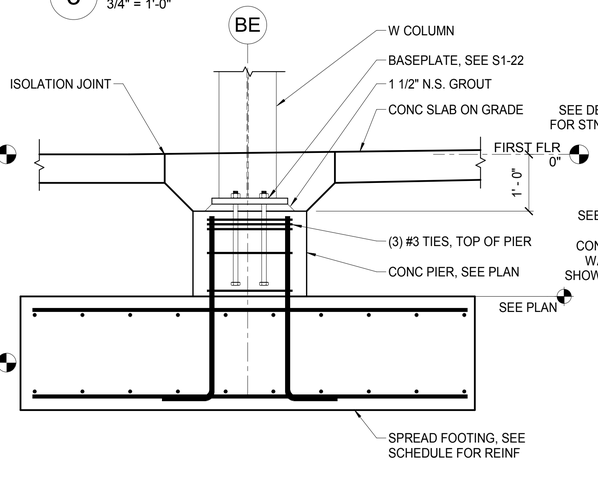


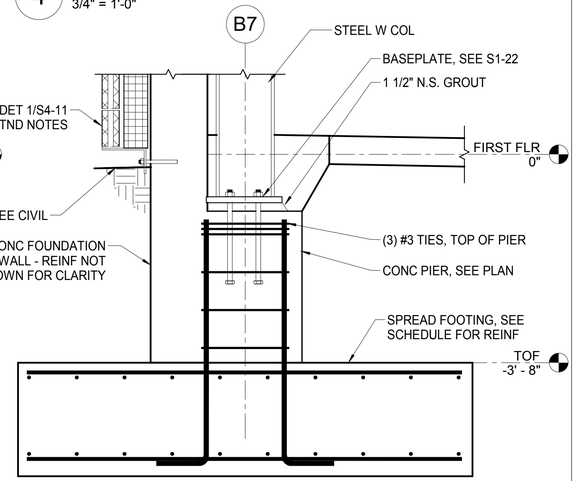
5 PIT DETAIL
3/4" = 1'-0"



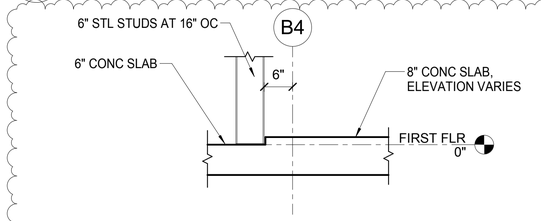
6 PIER DETAIL
3/4" = 1'-0"



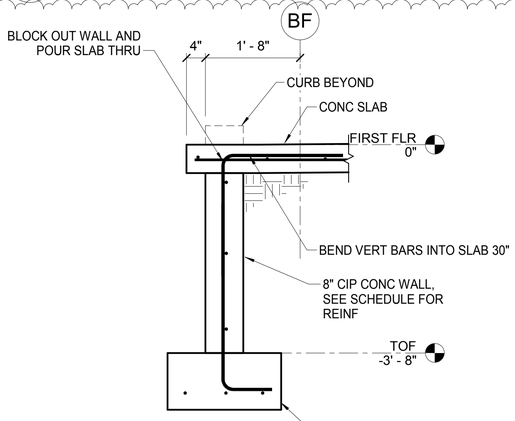
7 PIER DETAIL
3/4" = 1'-0"



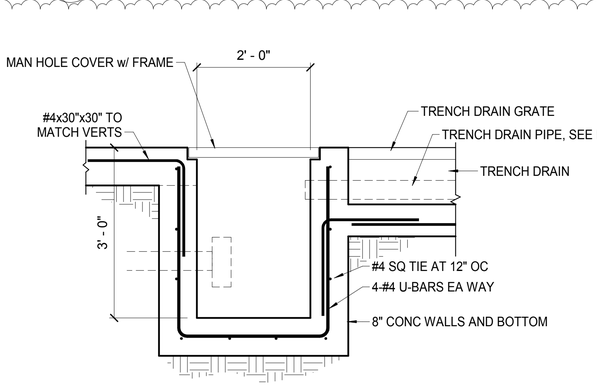
8 PIER DETAIL
3/4" = 1'-0"



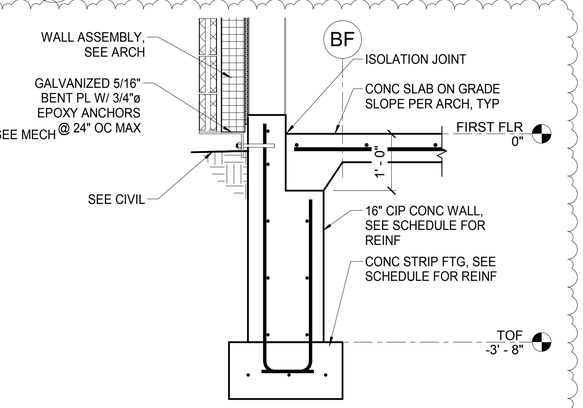
9 INTERIOR PARTITION WALL
3/4" = 1'-0"



10 FOUNDATION DETAIL AT MANDOORS
3/4" = 1'-0"



11 SUMP DETAIL
3/4" = 1'-0"



12 DETAIL
3/4" = 1'-0"

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PROJECT NO.0308

JUNEAU INTERNATIONAL AIRPORT
JNU SAND/CHEM BUILDING & FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA 49 TH
F. Charles Kerley
SE14476 8.6.18
REGISTERED STRUCTURAL ENGINEER

FOUNDATION DETAILS

AUTHOR: CK
CHECKED: JG
REVISION: 1
ISSUE DATE: 08.06.2018
JUNEAU CONTRACT: BE 19-037

S4-11

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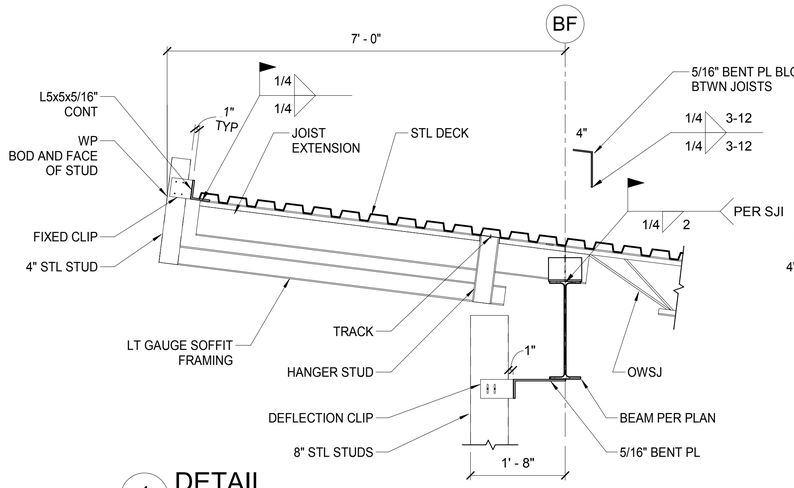
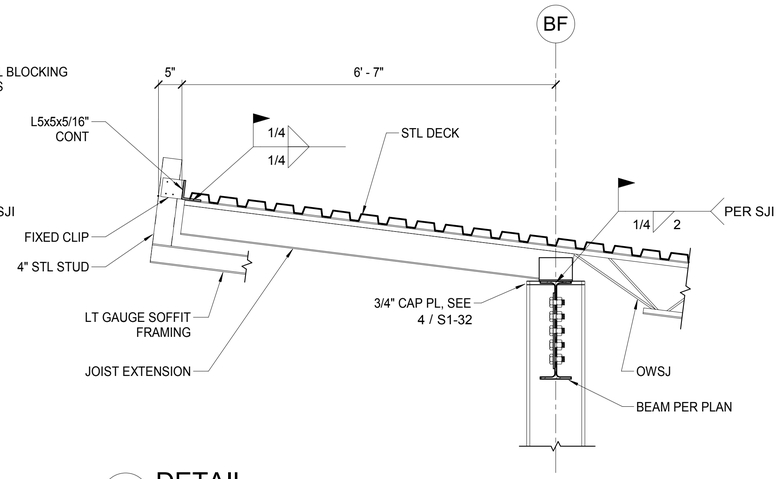
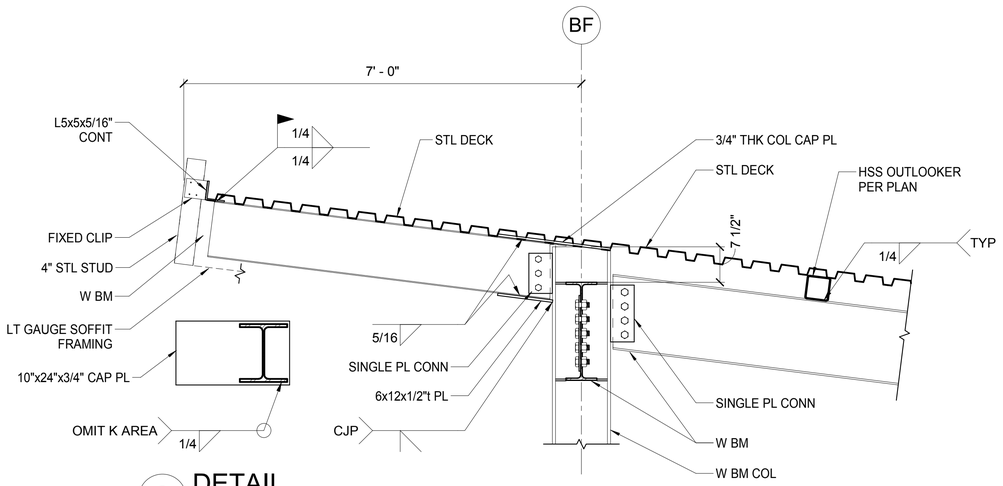


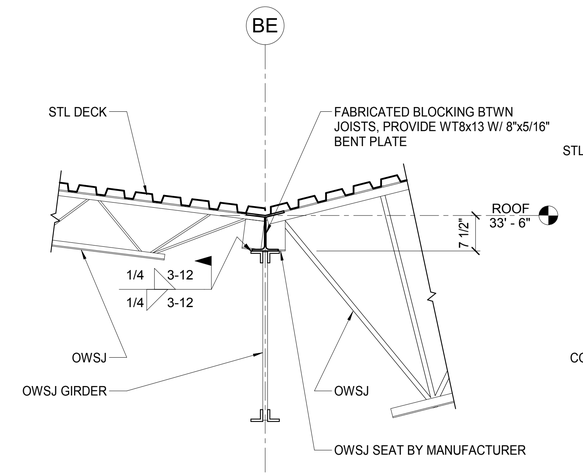
1 DETAIL
3/4" = 1'-0"



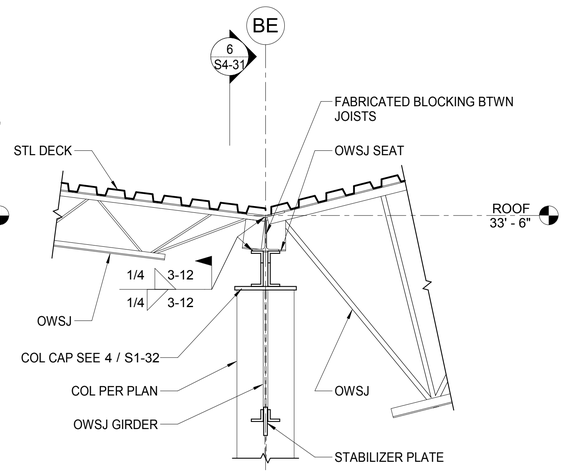
2 DETAIL
3/4" = 1'-0"



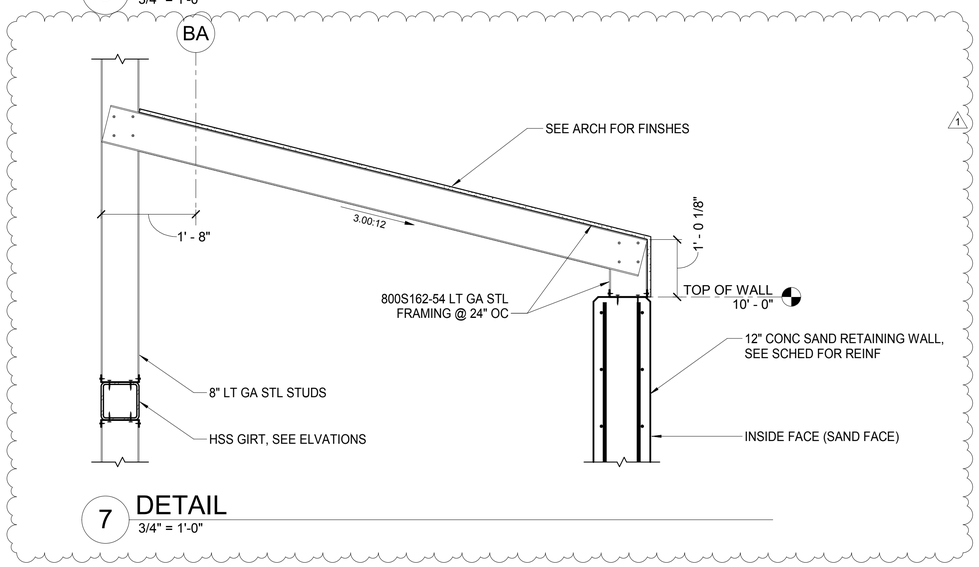
3 DETAIL
3/4" = 1'-0"



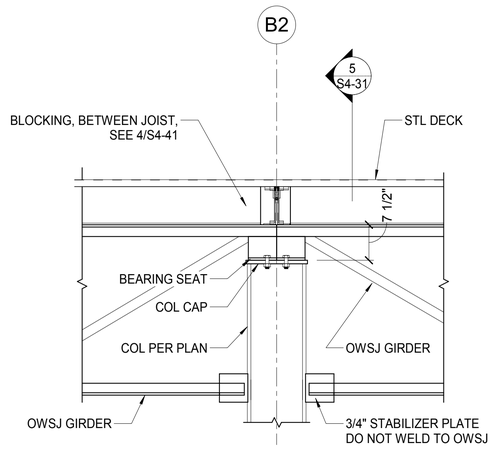
4 DETAIL
3/4" = 1'-0"



5 DETAIL
3/4" = 1'-0"



7 DETAIL
3/4" = 1'-0"



6 DETAIL
3/4" = 1'-0"

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PROJECT NO.0308

JUNEAU INTERNATIONAL AIRPORT
JNU SAND/CHEM BUILDING & FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

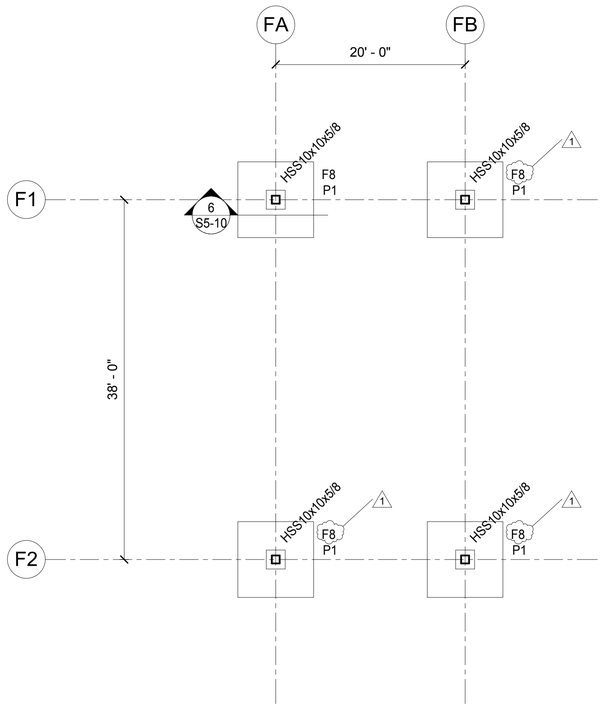
STATE OF ALASKA
49 TH
F. Charles Kerley
SE14476
8.6.18
REGISTERED STRUCTURAL ENGINEER

ROOF FRAMING DETAILS

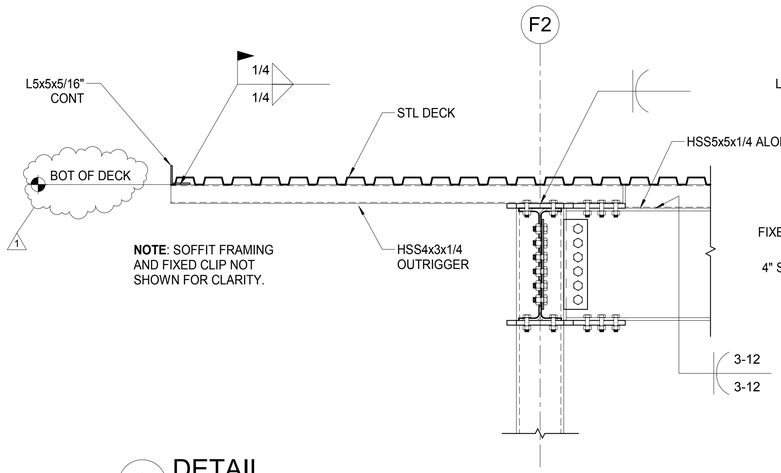
AUTHOR: CK
CHECKED: JG
REVISION: 1
ISSUE DATE: 08.06.2018
JUNEAU CONTRACT: BE 19-037

S4-31

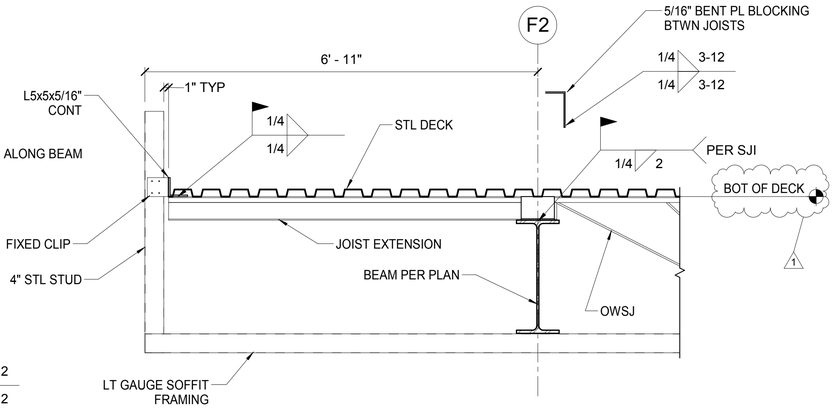
FULL SIZE PRINTED ON 22 x 34



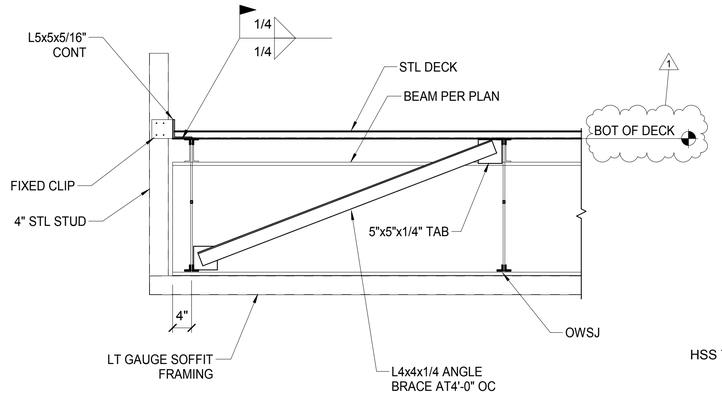
1 FOUNDATION PLAN
1/8" = 1'-0"



3 DETAIL
3/4" = 1'-0"



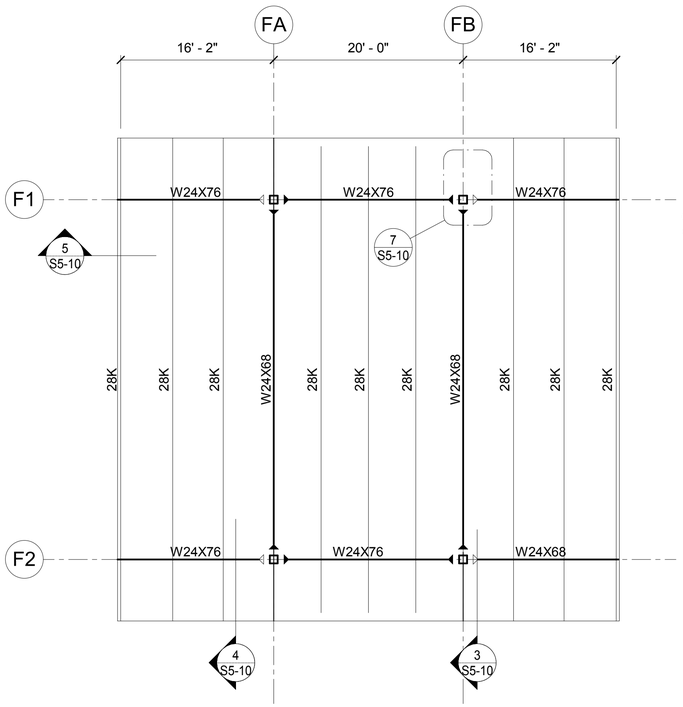
4 DETAIL
3/4" = 1'-0"



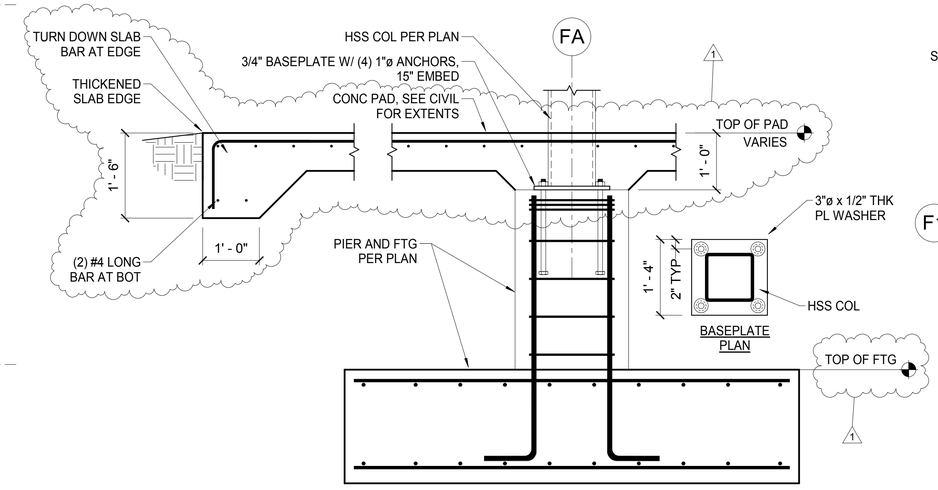
5 DETAIL
3/4" = 1'-0"

FUEL ISLAND SHEET NOTES

1. TOP OF FOOTING THIS SHEET ONLY = -5'-9".
2. TOP OF CONCRETE PAD THIS SHEET VARIES, SEE CIVIL FOR CONCRETE PAD DIMENSIONS AND ELEVATIONS.
3. BOTTOM OF DECK / TOP OF JOIST THIS SHEET ONLY = 19'-1 1/2".
4. IF UNDIMENSIONED, JOIST AND BEAMS ARE EQUALLY SPACED BETWEEN GRIDS.
5. ALL ROOF DECK IS 1 1/2" TYPE B GALVANIZED STEEL DECK. SEE SCHEDULES FOR MINIMUM THICKNESS AND FASTENING.



2 FRAMING PLAN
1/8" = 1'-0"



6 DETAIL
3/4" = 1'-0"

7 MF CONNECTION PLAN DETAIL
1" = 1'-0"

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JUNEAU INTERNATIONAL AIRPORT
JNU SAND/CHEM BUILDING & FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS
PROJECT NO.0308

STATE OF ALASKA 49 TH
F. Charles Kerley
SE14476
8.6.18
REGISTERED STRUCTURAL ENGINEER

FUEL ISLAND PLANS AND DETAILS

AUTHOR: CK CHECKED: JG
REVISION: 1
ISSUE DATE:08.06.2018
JUNEAU CONTRACT: BE 19-037

S5-10

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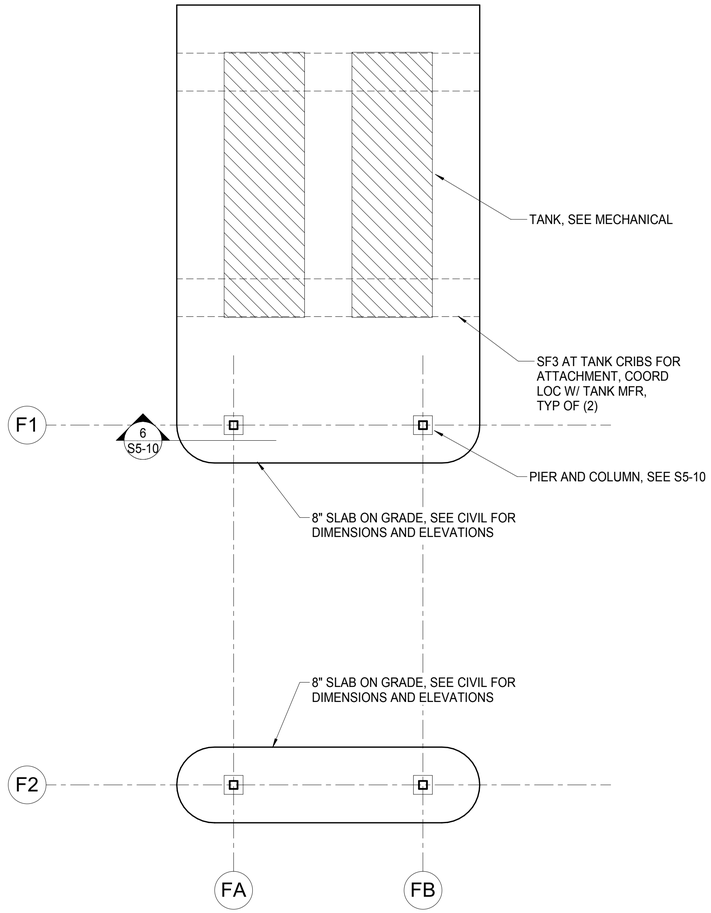

1 SLAB PLAN
1/8" = 1'-0"

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JUNEAU INTERNATIONAL AIRPORT
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STATE OF ALASKA
49 TH
F. Charles Kanley
SE14476
8.6.18
REGISTERED STRUCTURAL ENGINEER

FUEL ISLAND SLAB PLAN AND DETAILS

AUTHOR: CK CHECKED: JG
REVISION: 1
ISSUE DATE: 08.06.2018
JUNEAU CONTRACT: BE 19-037

1 S5-11
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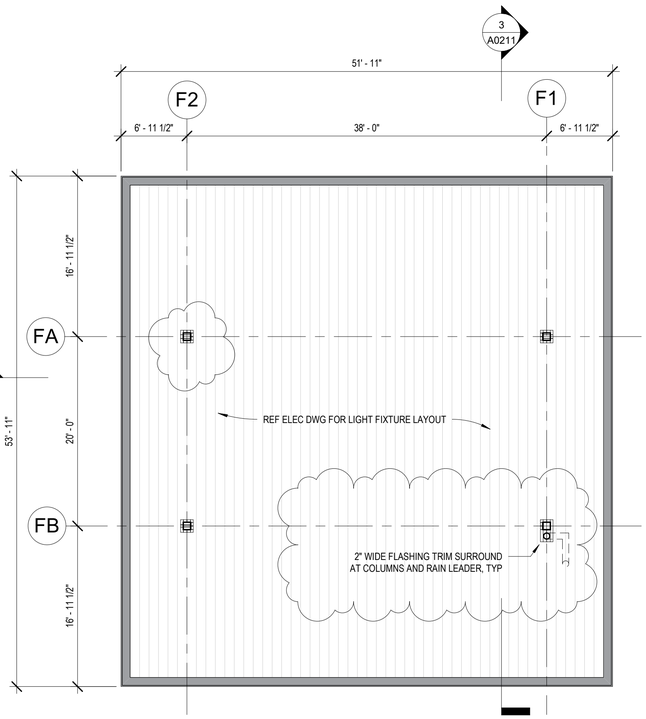
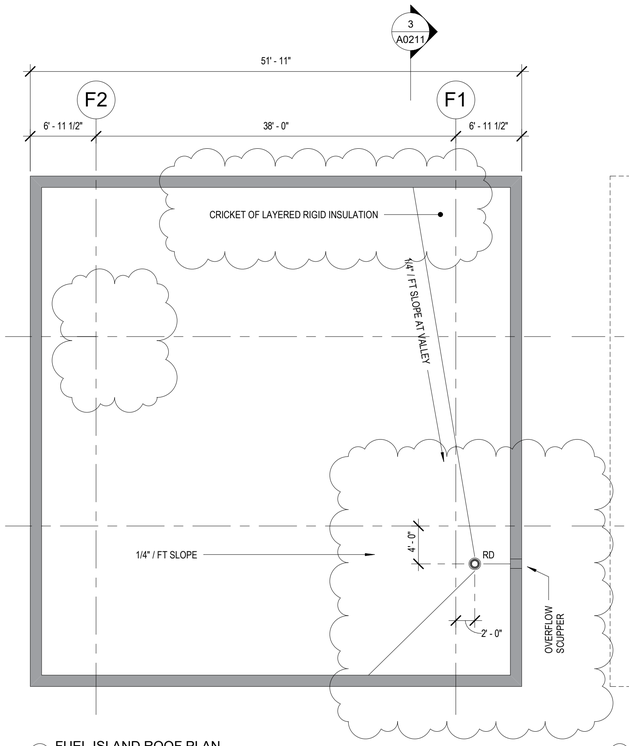
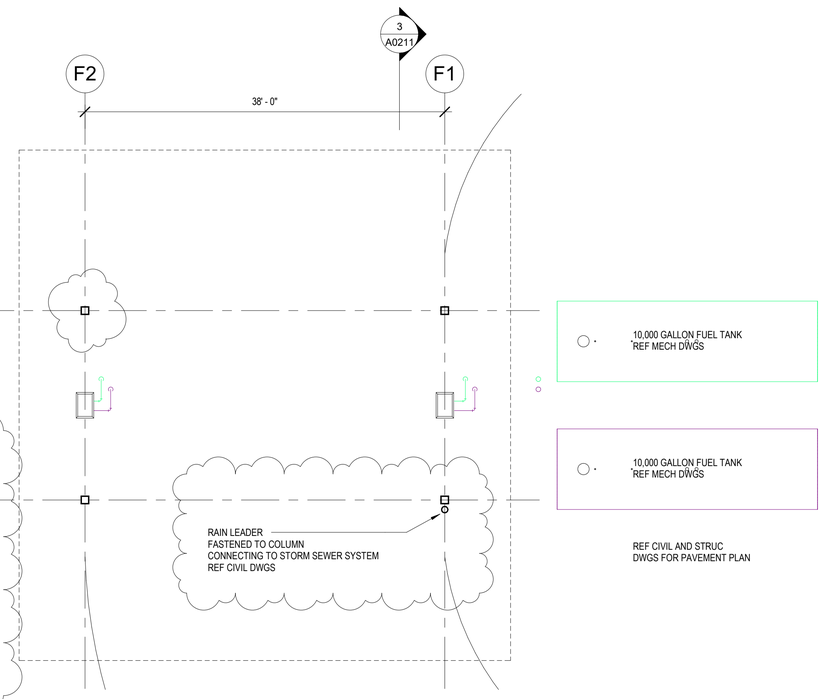


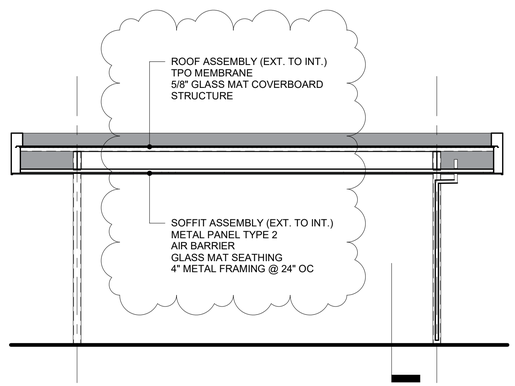
5 FUEL ISLAND RCP
1/8" = 1'-0"



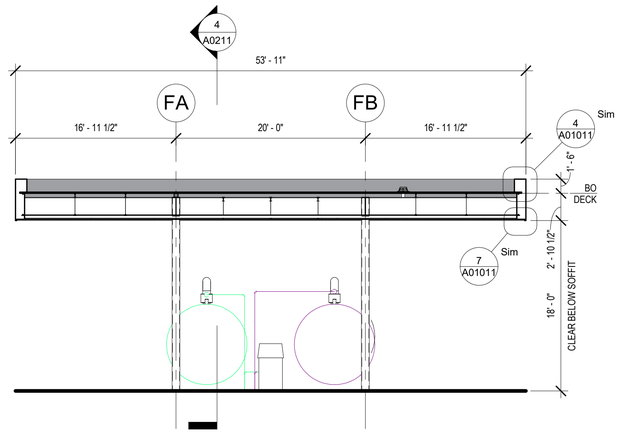
1 FUEL ISLAND ROOF PLAN
1/8" = 1'-0"



2 FUEL ISLAND FLOOR PLAN
1/8" = 1'-0"



4 N/S SECTION THRU CANOPY
1/8" = 1'-0"



3 E/W SECTION THRU CANOPY
1/8" = 1'-0"

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JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

FUEL ISLAND

JNU CONTRACT BE 19-037

A0211

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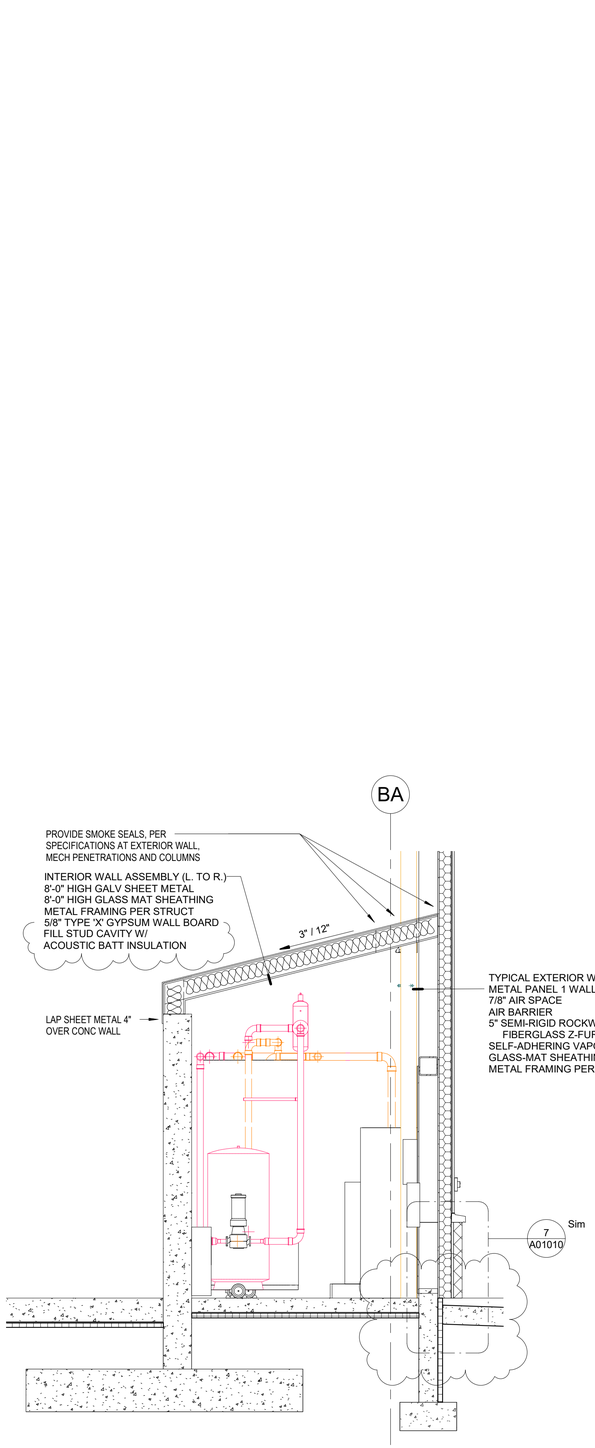
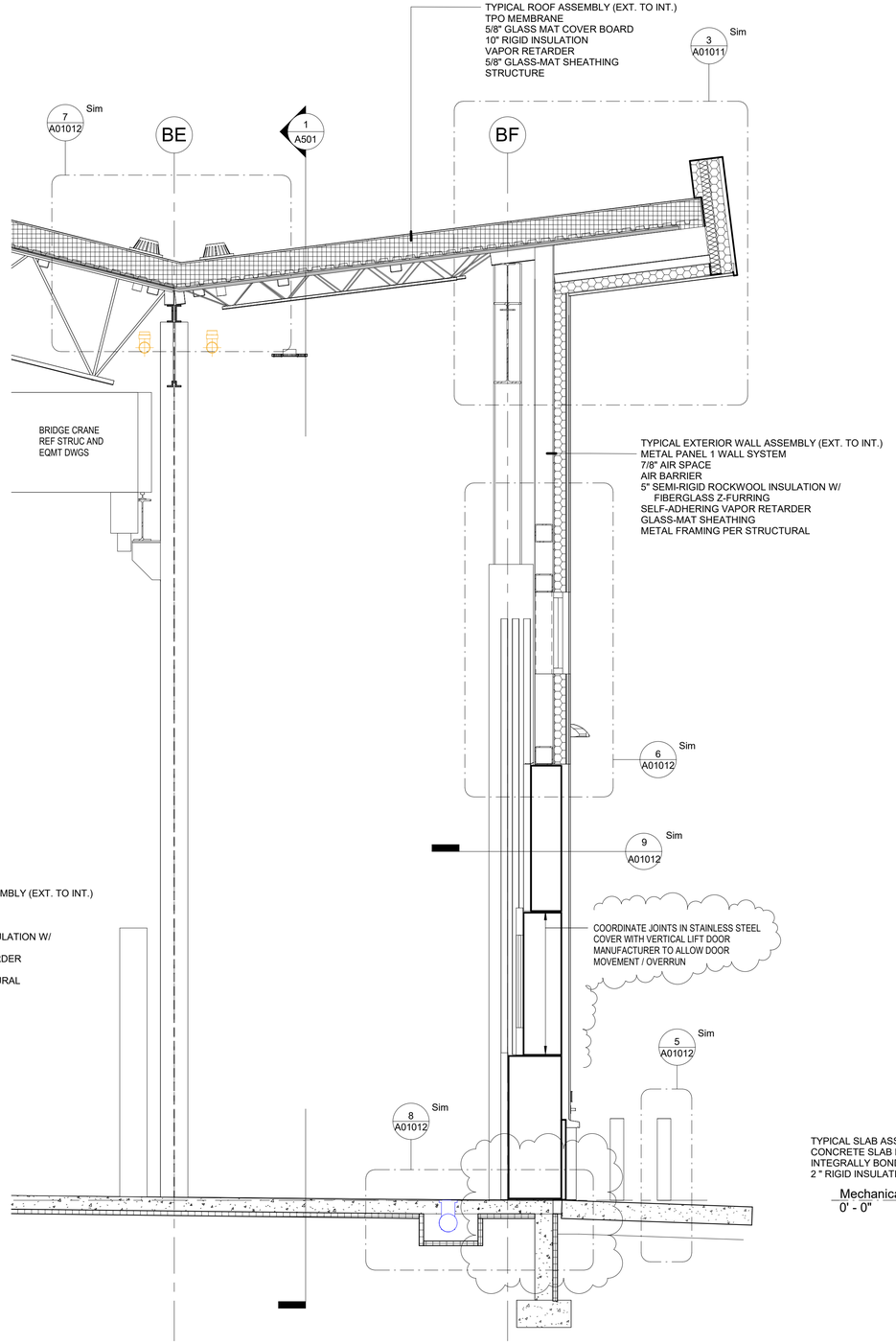
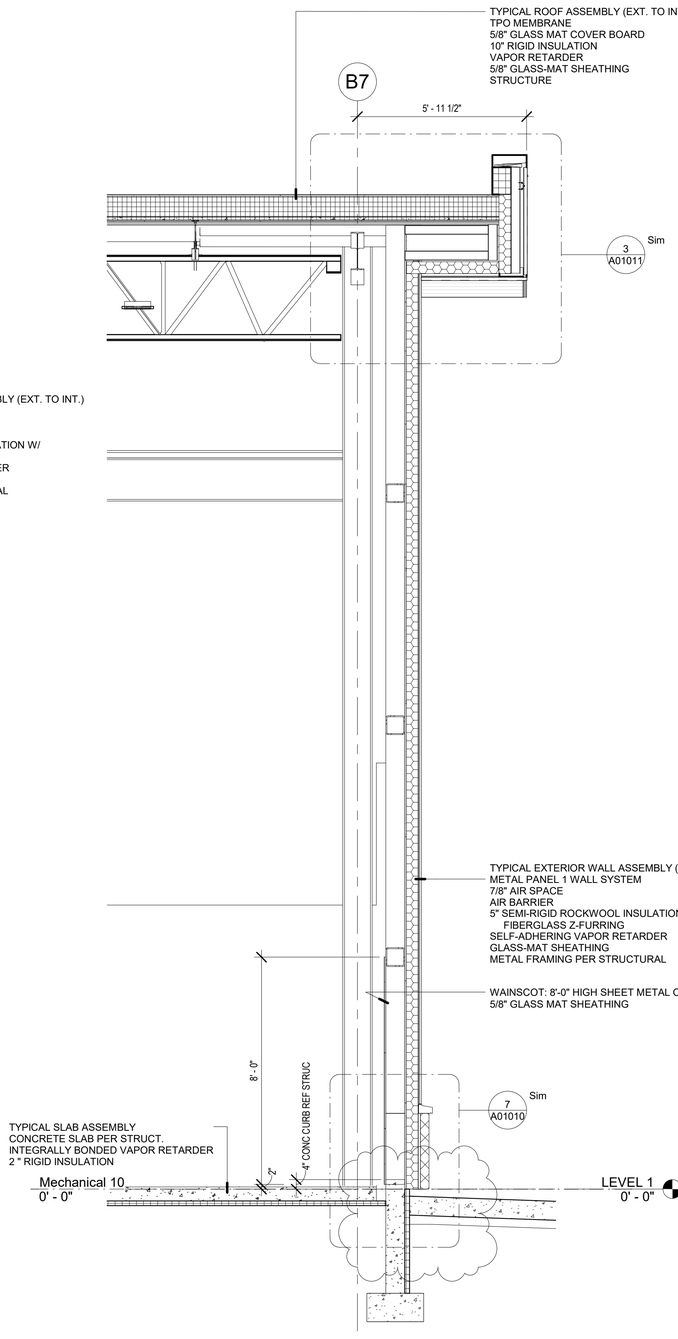


1 SECTION DTL @ MECH CEILING
3/8" = 1'-0"



3 EXT WALL SECTION @ OVERHEAD DOOR
3/8" = 1'-0"



2 EXT WALL SECTION @ CONC WALL AND WAINSCOTT
3/8" = 1'-0"

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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS
PROJECT NO.0308

STATE OF ALASKA
19 TH
JASON W. SWIFT
09.08.2018

WALL SECTIONS

JNU CONTRACT BE 19-037

A0601

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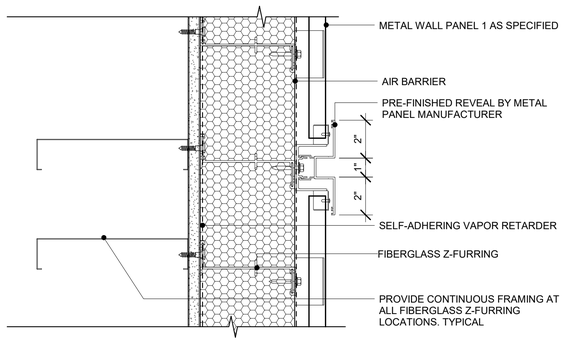
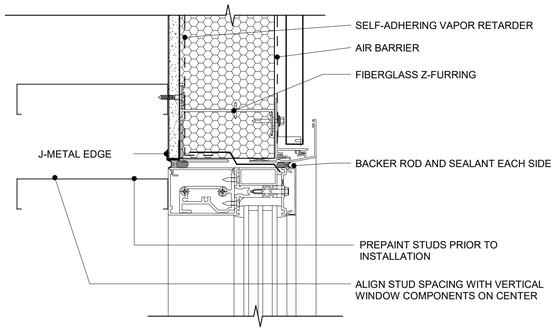
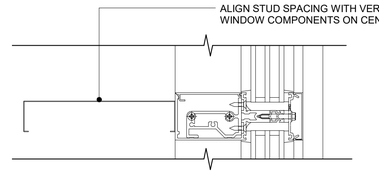


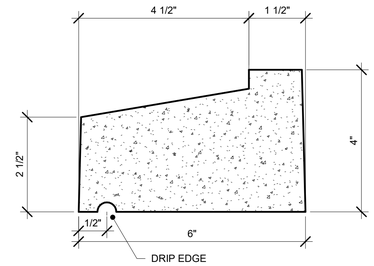
1 - TYPICAL METAL PANEL JOINT
3" = 1'-0"



2 - TYPICAL WINDOW JAMB DETAIL
3" = 1'-0"

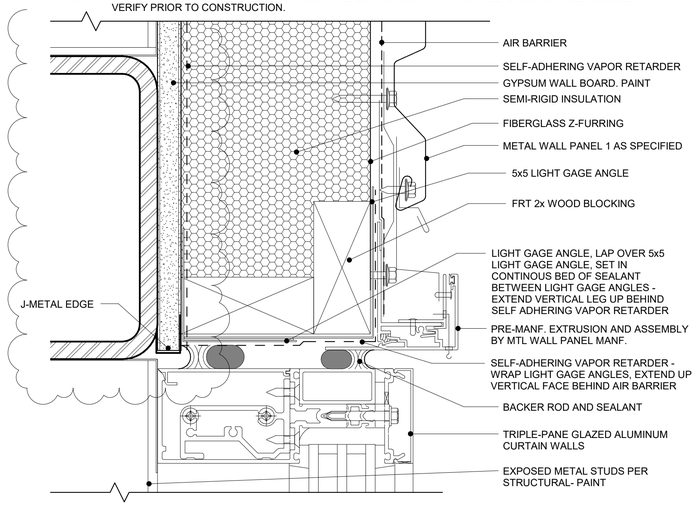


3 - TYPICAL WINDOW MULLION DETAIL
3" = 1'-0"

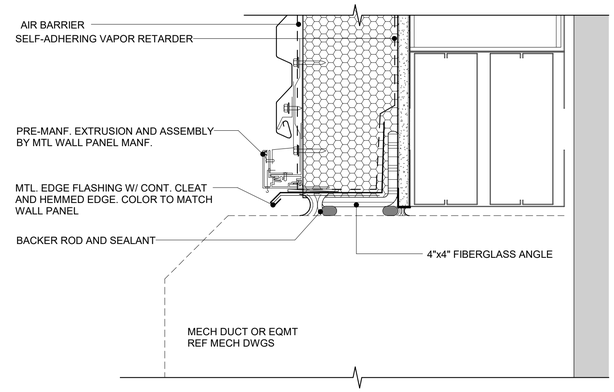


4 - PRECAST CAP DETAIL
6" = 1'-0"

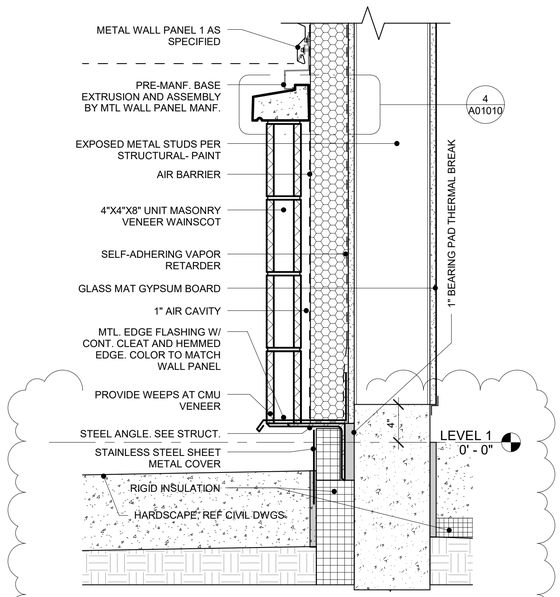
NOTES:
1. COORDINATE FIBERGLASS FURRING WITH METAL PANEL FASTENER LOCATIONS. TYPICAL
2. COORDINATE ROUGH OPENING OF WINDOW HEADER TO ALIGN WITH COMPLETE METAL PANEL MODULE. VERIFY PRIOR TO CONSTRUCTION.



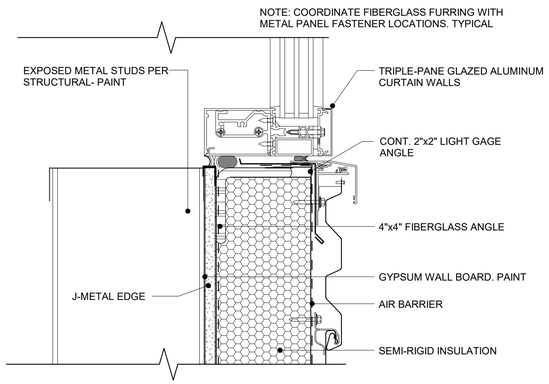
5 - TYPICAL WINDOW HEAD
6" = 1'-0"



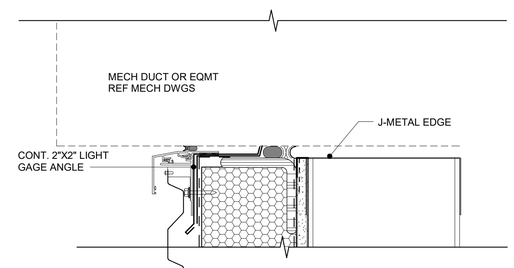
6 - MECH DUCT OR EQMT HEAD/JAMB DETAIL
3" = 1'-0"



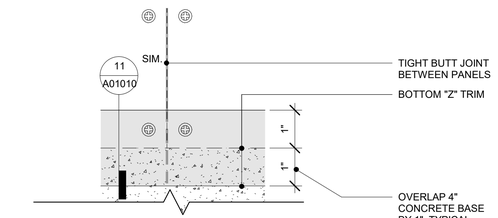
7 - SIDING TRANSITION
1 1/2" = 1'-0"



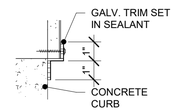
8 - TYPICAL WINDOW SILL
3" = 1'-0"



9 - MECH DUCT OR EQMT SILL FLASHING DETAIL
3" = 1'-0"



10 METAL WAINSCOT
6" = 1'-0"



11 WALL PROTECTION PANEL TRIM
3" = 1'-0"

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ANCHORAGE, ALASKA 99503 907.561.5543
PROJECT NO.16-0002

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
AIRPORT EQUIPMENT FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

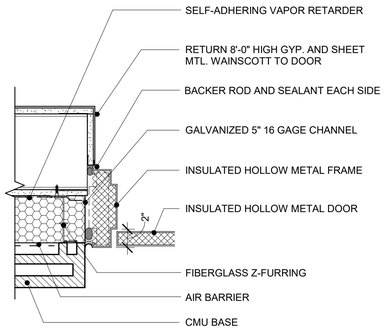
STATE OF ALASKA
19TH
JASON W. SWIFT
09.08.2018

EXTERIOR DETAILS

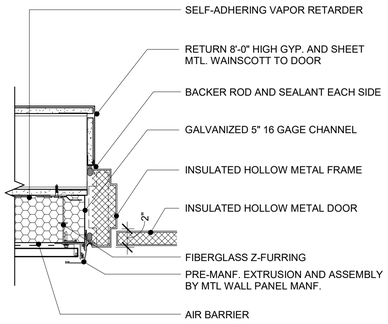
JNU CONTRACT BE 19-037

A01010

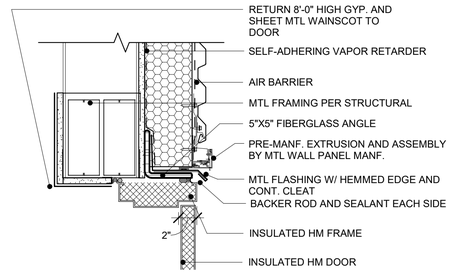
FULL SIZE PRINTED ON 22 x 34



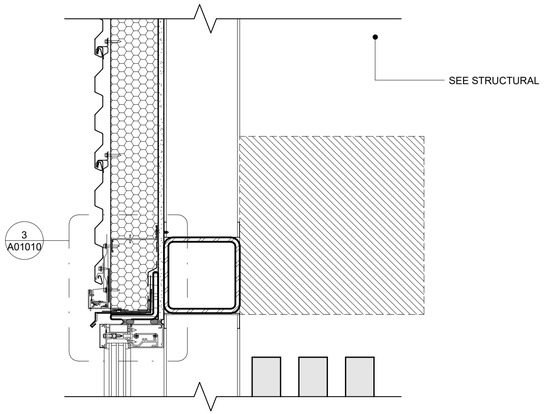
1 - EXTERIOR DOOR JAMB AT WAINSCOT
1 1/2" = 1'-0"



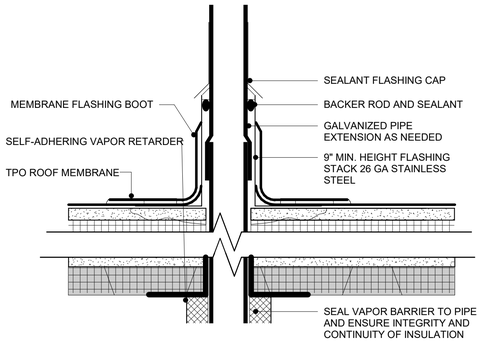
2 - EXTERIOR DOOR JAMB
1 1/2" = 1'-0"



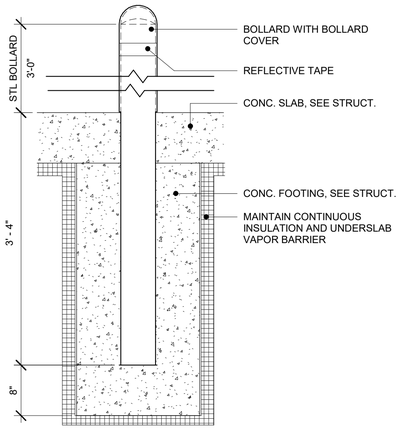
3 - INSULATED HM DOOR HEAD
1 1/2" = 1'-0"



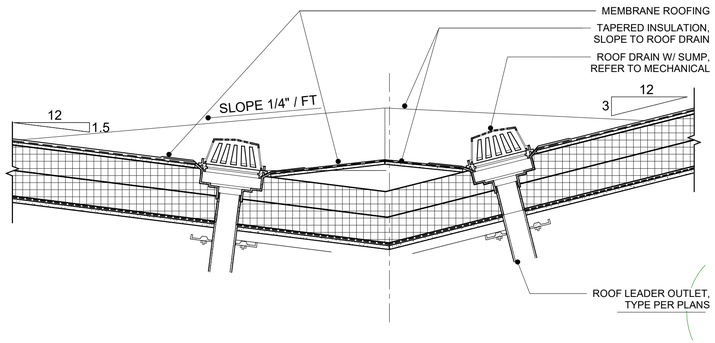
6 - HEAD DETAIL @ VERTICAL LIFT DOOR
1 1/2" = 1'-0"



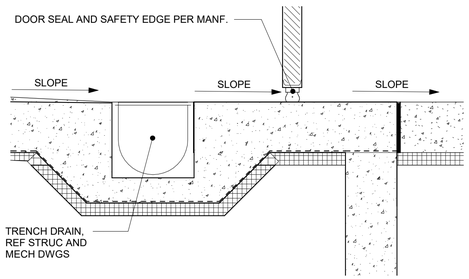
4 - VTR
3" = 1'-0"



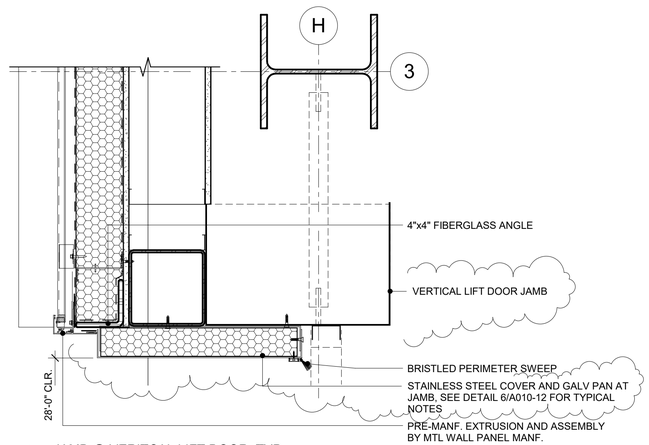
5 - STATIONARY BOLLARD INTERIOR/EXTERIOR
1" = 1'-0"



7 - ROOF VALLEY @ ROOF DRAINS
1" = 1'-0"



8 - DOOR SILL VERTICAL LIFT DOORS
1" = 1'-0"



9 - JAMB @ VERITCAL LIFT DOOR, TYP.
1 1/2" = 1'-0"

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JNU CONTRACT BE 19-037

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FULL SIZE PRINTED ON 22 x 34

EQUIPMENT KEYNOTES LEGEND

1	6 INCH HIGH CONCRETE HOUSEKEEPING PAD, COORDINATE SIZE WITH EQUIPMENT, REFERENCE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DETAILS.
2	COORDINATE LOCATION OF EQUIPMENT MOUNTED FROM STRUCTURE SO THAT IT DOES NOT CONFLICT WITH BRIDGE CRANE TRAVEL.
3	PROVIDE CRANE STOPS 6 INCHES FROM END WALLS/COLUMNS. A MINIMUM OF 6 INCHES OF OSHA REQUIRED CLEARANCE SHALL BE PROVIDED BETWEEN ALL BRIDGE CRANE COMPONENTS AND BUILDING STRUCTURE.
4	REFERENCE STRUCTURAL AND PLUMBING DRAWINGS FOR GRATING AND TRENCH DRAIN DETAILS
5	NEW 2 INCH COPPER COMPRESSED AIR LINE. TAP TOP OF EXISTING 2 INCH COPPER COMPRESSED AIR LINE FROM PHASE 1
6	25'-0"x68'-0"x20" DEEP PIT. REFER TO STRUCTURAL DRAWINGS FOR DETAILS
7	CG-90 BAG STORAGE, 60 PALLETS STACKED 3 HIGH
8	SALT BAG STORAGE, 252 PALLETS STACKED 3 HIGH
9	SALT BAG STORAGE, 8 PALLETS STACKED 3 HIGH
10	12 INCH MANWAY FOR FILLING 7250 BRINE MIXING TANK. REFER TO PLUMBING DRAWINGS FOR DETAILS

EQUIPMENT LINE TYPE LEGEND

CF/CI

OF/CI

OF/OI

SYMBOLS LEGEND

- CENTERLINE
- KEYNOTES
- FRONT/APPROACH ACCESS TO EQUIPMENT
- ELEVATION
- BREAK LINE
- ELBOW UP
- ELBOW DOWN

EQUIPMENT GENERAL NOTES

1. ALL CONTRACTOR FURNISHED (CF) EQUIPMENT SHOWN ON THESE DRAWINGS WITH A FOUR DIGIT IDENTIFICATION NUMBER IS BASED ON A SPECIFIED MANUFACTURER. ANY MODIFICATION AND/OR SUBSTITUTION OF SAID EQUIPMENT IS SUBJECT TO COMPLETE COORDINATION BY THE CONTRACTOR OF ALL CONNECTIONS SERVICES, OPENING SIZE AND ANY OTHER CONSTRUCTION RELATED REQUIREMENTS.
2. CONTRACTOR TO VERIFY AND COORDINATE ALL STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING REQUIREMENTS OF EQUIPMENT WITH MANUFACTURER'S APPROVED SHOP DRAWINGS PRIOR TO INSTALLATION.
3. THIS LAYOUT IS PROVIDED FOR GENERAL LOCATION OF EQUIPMENT. UNLESS SPECIFICALLY LOCATED BY DIMENSIONS ON THE DRAWINGS, THE EQUIPMENT SHALL BE PLACED NEAR THE THE LOCATION ON THE DRAWINGS BUT IN THE MOST OPERATIONALLY EFFICIENT POSITION AND ORIENTATION.
4. SEISMICALLY BRACE ALL FIXED EQUIPMENT AND STORAGE EQUIPMENT PER LOCAL AND STATE SEISMIC RESTRAINT GUIDELINES.
5. CONTRACTOR SHALL REFER TO EQUIPMENT LAYOUT DRAWINGS FOR EXACT LOCATIONS AND COORDINATION OF ALL EQUIPMENT. REFERENCE Q001 FOR EQUIPMENT IDENTIFIERS AND DESCRIPTION.
6. COORDINATE WORK WITH ARCHITECTURAL FEATURES SO THE INTERFERENCE BETWEEN PIPING, EQUIPMENT, MECHANICAL WORK AND BUILDING STRUCTURE IS AVOIDED.

ABBREVIATIONS

AFF	ABOVE FINISH FLOOR
CA	COMPRESSED AIR
CC	CONTROL CONSOLE
CF/CI	CONTRACTOR FURNISHED / CONTRACTOR INSTALLED
CFM	CUBIC FEET PER MINUTE
CL	CENTERLINE
EQ	EQUAL
EQ ID	EQUIPMENT IDENTIFIER
FF	FINISH FLOOR
FR	FILTER REGULATOR
FRL	FILTER, REGULATOR, LUBRICATOR
GPM	GALLONS PER MINUTE
ID	IDENTIFICATION
NTS	NOT TO SCALE
OH	OVERHEAD
QC	QUICK COUPLER
SPEC	SPECIFICATION
TLM	TANK LEVEL MONITOR
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
W	WATER

COMPRESSED AIR PIPING SCHEDULE

PIPE TYPE	FITTING TYPE	JOINT TYPE	VALVE TYPE
ASTM B88 TYPE "L" COPPER TUBING	ANSI B16.22 WROUGHT COPPER SOLDER JOINT	ASTM B32-SOLDER GRADE 95TA (LEAD FREE)	ASTM B283-C37700 BRASS BALL VALVE 300 PSI (MIN)

COMPRESSED AIR PIPING ACCESSORIES

QUICK COUPLERS	PROVIDE 3/8 INCH QUICK DISCONNECT COUPLERS AT COMPRESSED AIR DROP GRACO MODEL #110198 OR SCHRADER MODEL #13138. PROVIDE 1/2 INCH QUICK DISCONNECT COUPLERS AT COMPRESSED AIR DROP GRACO MODEL #110199 OR SCHRADER MODEL #C10. PROVIDE 3/4 INCH QUICK DISCONNECT AT COMPRESSED AIR DROP GRACO MODEL #110200. VERIFY WITH OWNER THE TYPE OF COUPLER TO MATCH EXISTING TOOL CONNECTIONS.
FILTER / REGULATOR / LUBRICATOR ASSEMBLY	PROVIDE 3/4 INCH PORT SIZE FILTER / REGULATOR / LUBRICATOR ASSEMBLY GRACO MODEL #246948 (F-R) AND #214849 (L) OR APPROVED EQUAL. FOR FILTER/REGULATOR ASSEMBLY GRACO MODEL #246948.

COMPRESSED AIR PIPING NOTES

GENERAL

1. ALL PIPING/TUBING SHALL BE INSTALLED BY AN EXPERIENCED INSTALLATION CONTRACTOR WITH A MINIMUM OF 5 YEARS EXPERIENCE INSTALLING COMPRESSED AIR PIPING SYSTEMS FOR VEHICLE MAINTENANCE FACILITIES. INSTALLING CONTRACTOR SHALL PROVIDE AND MAINTAIN A WARRANTY FOR THE SYSTEMS AND ITS COMPONENTS FOR ONE FULL YEAR FROM ACCEPTANCE.
2. INSTALLING CONTRACTOR SHALL SUBMIT DETAILED SYSTEM AND COMPONENT SHOP DRAWING(S) TO THE DESIGN TEAM FOR APPROVAL PRIOR TO INSTALLATION.

INSTALLATION

3. CONTRACTOR SHALL ENSURE THAT ALL FITTINGS, JOINTS AND VALVES FOR COMPRESSED AIR PIPING/TUBING SHALL MATCH THE PROPER RATING AND BURST PRESSURE FOR THE AIR COMPRESSOR RATING.
4. CONTRACTOR SHALL INSTALL PIPING/TUBING IN ACCORDANCE WITH THE PLANS PROVIDED IN THESE CONSTRUCTION DOCUMENTS AND WITH THE APPLICABLE NATIONAL / LOCAL CODES AND REGULATIONS.
5. CONTRACTOR SHALL REMOVE ALL SCALING, DIRT, CORROSION, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPING, FITTINGS, JOINTS, AND VALVES BEFORE ASSEMBLY.
6. CONTRACTOR SHALL INSTALL UNIONS ON ALL COMPRESSED AIR PIPING 2 INCHES OR LESS ADJACENT TO VALVES, AT ALL FINAL CONNECTIONS TO EQUIPMENT AND ELSEWHERE AS INDICATED ON THE DRAWINGS. UNIONS SHALL NOT BE CONCEALED.
7. CONTRACTOR SHALL ROUTE ALL PIPING/TUBING IN AN ORDERLY MANNER, AND IN THE LOCATION OR ZONE DESIGNATED ON THESE DRAWINGS. PIPING/TUBING SHALL BE GROUPED WHENEVER PRACTICAL AT COMMON ELEVATIONS AND SHALL BE BENT WHEREVER A CHANGE IN DIRECTION IS NECESSARY. 90 DEGREE FITTINGS SHALL ONLY BE USED WHEN TUBING CANNOT BE BENT TO CHANGE DIRECTION DUE TO FIELD CONDITIONS OR OTHER PHYSICAL CONSTRAINTS.
8. CONTRACTOR SHALL INSTALL ALL PIPING/TUBING IN A MANNER THAT CONSERVES BUILDING AREA AND NOT INTERFERE WITH THE PRIMARY USE OF THE SPACE. PIPING/TUBING SHALL BE SPACE NO CLOSER THAN 4 INCHES TOGETHER AND NO MORE THAN 6 INCHES APART. PIPE SIZES 1-1/2 INCH OR SMALLER SHALL BE SUPPORTED EVERY 6 FEET. PIPE SIZES 2 INCHES THROUGH 4 INCHES SHALL BE SUPPORTED EVERY 10 FEET. HANGER ROD SHALL BE GALVANIZED 3/8 INCH DIAMETER.
9. CONTRACTOR SHALL INSTALL A CAPPED DRIP LEG AT THE BASE OF THE VERTICAL RISER AND AT THE ENDS OF THE MAIN COMPRESSED AIR PIPING RUNS WITH A VALVE DRAIN PIPE AT THE NEAREST FLOOR OR HUB DRAIN.
10. CONTRACTOR SHALL INSTALL ALL PIPING/TUBING IN A MANNER THAT WILL ALLOW FOR PROPER CLEARANCE AND ACCESS TO JOINTS, UNIONS, AND VALVES.
11. ALL PIPING/TUBING, JOINTS, UNIONS AND CONNECTIONS SHALL BE PAINTED. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL COORDINATE ALL ASPECTS OF THE PAINTING. ALL PIPING/TUBING SHALL BE PROPERLY PREPARED AND CLEANED PRIOR TO APPLYING ONE COAT OF PRIMER AND ONE COAT OF FINISH PAINT. PAINT COLOR AND TYPE SHALL BE COORDINATED WITH ARCHITECT.
12. CONTRACTOR SHALL LABEL ALL COMPRESSED AIR PIPING/TUBING WITH PRODUCT TYPES EVERY 20 FEET, AT EACH CHANGE OF DIRECTION, OR MORE OFTEN IF NEEDED FOR CLARITY.
13. CONTRACTOR SHALL ADD OIL TO LUBRICATORS UPON INSTALLATION COMPLETION OF COMPRESSED AIR DROPS.

TESTING

14. ALL SYSTEM COMPONENTS (i.e. COMPRESSOR, VALVES, REGULATORS, DRYERS, OUTLETS, REELS, AND PIPING/TUBING) INSTALLED AS A PART OF THE CENTRAL COMPRESSED AIR DISTRIBUTION SYSTEM SHALL BE TESTED BY THE CONTRACTOR PRIOR TO ACCEPTANCE BY THE OWNER. COMPRESSED AIR PIPING/TUBING SHALL BE TESTED WITH AIR PRESSURE OF 150 PSI FOR 1 HOUR WHILE CHECKING THE ENTIRE SYSTEM FOR LEAKS. THE RESULTING PRESSURE DIFFERENTIAL SHALL NOT BE GREATER THAN THE DIFFERENTIAL CAUSE BY TEMPERATURE. LEAKING JOINTS SHALL BE REMADE WITH NEW MATERIALS. ALL EQUIPMENT MUST BE DISCONNECTED PRIOR TO START OF TEST.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING COMPRESSED AIR OUTLET ASSEMBLIES AND COMPRESSED AIR HOSE REELS.

CF/CI EQUIPMENT SCHEDULE

EQ ID #	DESCRIPTION	SPEC SECTION
5010	CRANE, BRIDGE, TOP RUNNING	41 22 00
7250	TANK, BRINE MIXING, 8,000 GALLON	43 22 00
7327	TANK, BRINE STORAGE, 12,000 GALLON	11 11 00
8088	COMPRESSOR, AIR, RECIPROCATING, DUPLEX 10 HP, HORIZONTAL RECEIVER, LARGE	11 11 13
8515	DRYER,AIR, REFRIGERATED, NON-CYCLING, 100 CFM	11 11 13
9485	BASE MOUNTED END SUCTION HIGH EFFICIENCY PUMP SKID	43 21 00
9487	BASE MOUNTED END SUCTION HIGH EFFICIENCY PUMP SKID	43 21 00

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HDR | ECI ARCHITECTURE DESIGN STRATEGY
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3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND AIRPORT EQUIPMENT FUELING STATION

AUGUST 14 2018
BID DOCUMENTS
PROJECT NO.0308

EQUIPMENT SCHEDULE AND NOTES

AUTHOR: KH
CHECKED: NM
REVISION: 1
ISSUE DATE: 08.08.2018
JUNEAU CONTRACT: BE 19-037

Q0001

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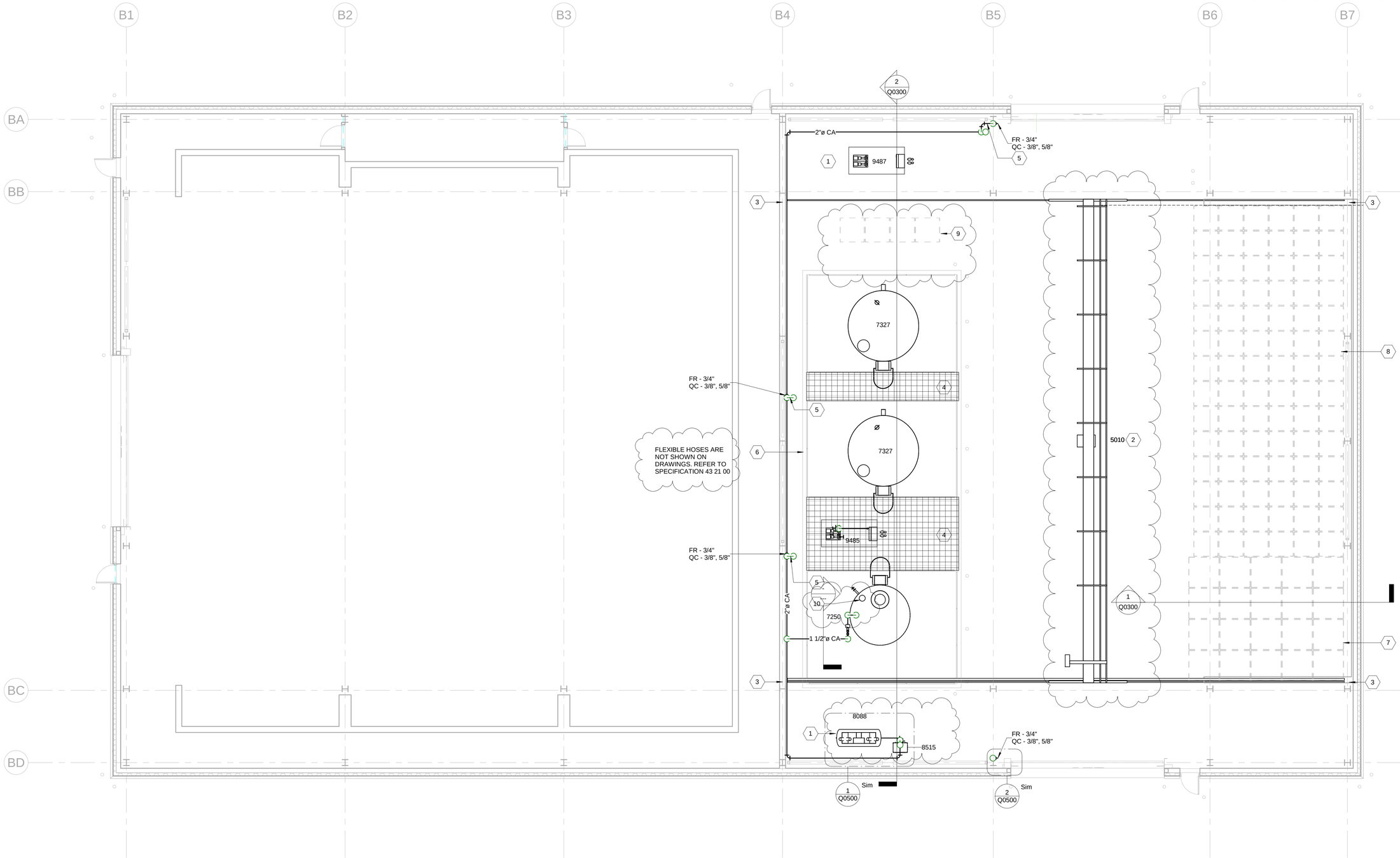
BATCH SEQUENCE

1. ADD 4,000 GALLONS WATER TO VESSEL- WATER TO BE CONTROLLED BY SHUT-OFF VALVE TO BE ACCESSIBLE FROM BASE OF BRINE MIXING TANK LADDER.
2. ADD 4 BAGS OF NEW DEAL PRODUCT TO VESSEL
3. ACTIVATE MIXER AT BUBBLER CONTROL PANEL AND OPERATE FOR 30 MINUTES
4. ADD 4 BAGS OF NEW DEAL PRODUCT TO VESSEL
5. ACTIVATE MIXER AND CONTINUE MIXING FOR 30 MINUTES
6. ADD WATER TO BRING BATCH TO 8,000 GALLONS



1 1-MAIN LEVEL
1/8" = 1'-0"

0' 4' 8' 16' 32'

PROJECT NORTH

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OVERALL EQUIPMENT LAYOUT PLAN

AUTHOR: KH
CHECKED: NM
REVISION: 1
ISSUE DATE: 08.08.2018
JUNEAU CONTRACT: BE 19-037

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2 Section 2
1/8" = 1'-0"

1 Section 1
1/8" = 1'-0"

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Q0300

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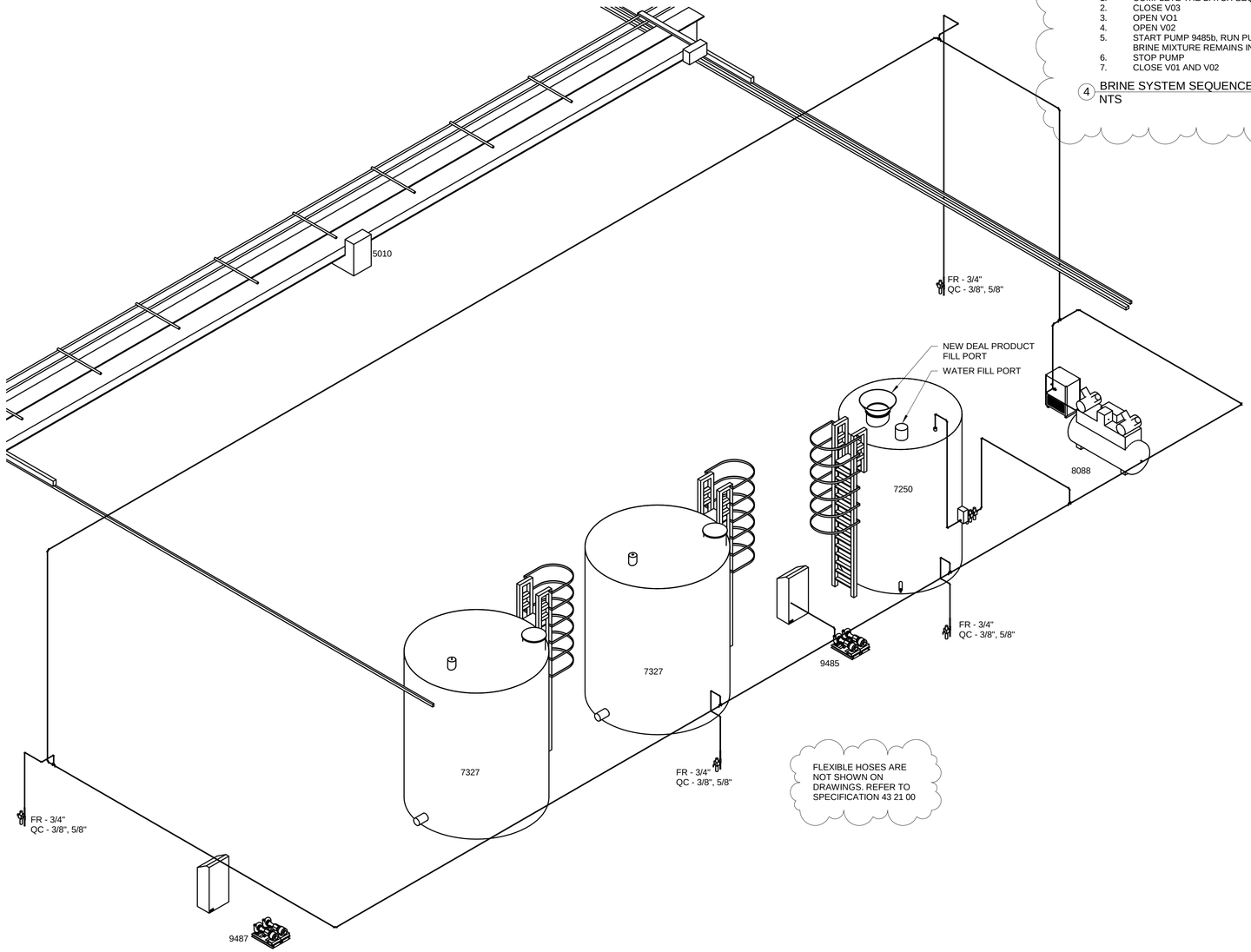
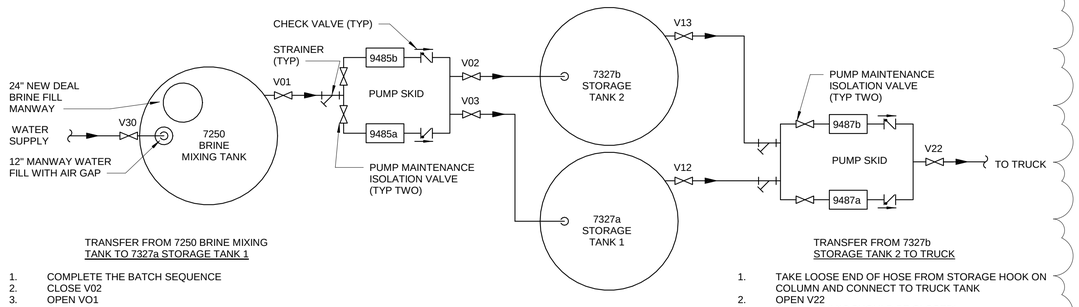


3 PIPING ISOMETRIC



TRANSFER FROM 7250 BRINE MIXING
TANK TO 7327a STORAGE TANK 1

1. COMPLETE THE BATCH SEQUENCE
2. CLOSE V02
3. OPEN VO1
4. OPEN V03
5. START PUMP 9485a, RUN PUMP UNTIL 12 INCHES OF BRINE MIXTURE REMAINS IN BRINE MIXING TANK 7250.
6. STOP PUMP
7. CLOSE V01 AND V03

TRANSFER FROM 7250 BRINE MIXING
TANK TO 7327b STORAGE TANK 2

1. COMPLETE THE BATCH SEQUENCE
2. CLOSE V03
3. OPEN VO1
4. OPEN V02
5. START PUMP 9485b, RUN PUMP UNTIL 12 INCHES OF BRINE MIXTURE REMAINS IN BRINE MIXING TANK 7250.
6. STOP PUMP
7. CLOSE V01 AND V02

TRANSFER FROM 7327a
STORAGE TANK 1 TO TRUCK

1. TAKE LOOSE END OF HOSE FROM STORAGE HOOK ON COLUMN AND CONNECT TO TRUCK TANK
2. OPEN V22
3. OPEN V12 (V13 SHOULD BE CLOSED)
4. START PUMP 9487a, RUN PUMP UNTIL TRUCK TANK IS TO DESIRED FILL CAPACITY
5. STOP PUMP
6. CLOSE V12 AND V22
7. DISCONNECT HOSE FROM TRUCK TANK

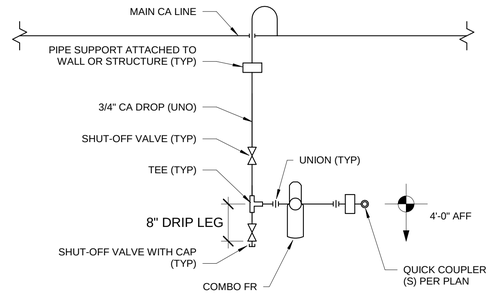
TRANSFER FROM 7327b
STORAGE TANK 2 TO TRUCK

1. TAKE LOOSE END OF HOSE FROM STORAGE HOOK ON COLUMN AND CONNECT TO TRUCK TANK
2. OPEN V22
3. OPEN V13 (V12 SHOULD BE CLOSED)
4. START PUMP 9487b, RUN PUMP UNTIL TRUCK TANK IS TO DESIRED FILL CAPACITY
5. STOP PUMP
6. CLOSE V13 AND V22
7. DISCONNECT HOSE FROM TRUCK TANK

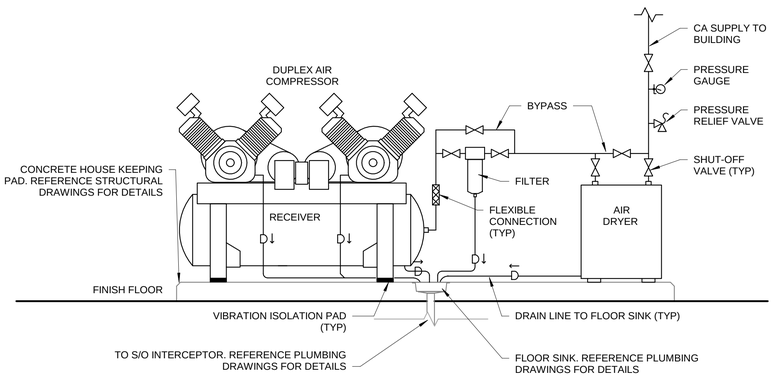
NOTE:

1. 9485 PUMPS SHALL BE INTERLOCKED WITH LOW LEVEL TANK SENSOR IN 7250 BRINE MIXING TANK.
2. 9485 PUMPS SHALL BE INTERLOCKED WITHOVER FILL LEVEL SENSORS IN 7327 TANKS 1 AND 2. PUMPS WILL SHUT OFF AND STROBE AND HORN SHALL ACTIVATE.
3. 9487 PUMPS SHALL BE INTERLOCKED WITH LOW LEVEL TANK SENSOR IN 7327 STORAGE TANKS.

4 BRINE SYSTEM SEQUENCE OF OPERATION
NTS



2 COMPRESSED AIR OUTLET
NTS



1 COMPRESSOR (DUPLEX) AND AIR DRYER DETAIL
NTS

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EQUIPMENT DETAILS AND SEQUENCE OF OPERATION
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REVISION: 1
ISSUE DATE: 08.08.2018
JUNEAU CONTRACT: BE 19-037

Q0500
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PLUMBING FIXTURE SCHEDULE

NOTES:

MARK	FIXTURE DESCRIPTION	HW/TW	CW	TRAP	WASTE	VENT	BASIS OF DESIGN	COMMENTS
FCO	FLOOR CLEANOUT	-	-	-	4"	-	ZURN Z1400 EXTRA HEAVY DUTY	
FD-1	FLOOR DRAIN	-	-	-	4"	-	ZURN Z453	
HB-1	DUAL TEMPERATURE HOSE BIB	3/4"	3/4"	-	-	-		
ORD-1	OVERFLOW ROOF DRAIN	-	-	-		-		
RD-1	ROOF DRAIN	-	-	-		-		
ST-1	SEDIMENT TRAP	-	-	-				
TD-1	TRENCH DRAIN	-	-	-	4"	-	GRATING PACIFIC EZ-150 WITH HDG GRATED COVER TH-10-EZ	PROVIDE SUMP AND SEDIMENT TRAP SECTION AT END OF DRAIN

STORAGE TANK SCHEDULE

NOTES:

MARK	SERVICE	DIMENSIONS (DIA" x H")	VOLUME	BASIS OF DESIGN		COMMENTS
				MANUFACTURER	MODEL	
ST-1	HEATING SYSTEM BUFFER TANK	42 x 100	350	A.O. SMITH	TJV-350 ASME	FULLY JACKETED AND INSULATED VERTICAL TANK. PROVIDE SIESMIC STRAPS.

UNIT HEATER SCHEDULE - ELECTRIC

MARK	TYPE	CFM	RPM	HEATING CAPACITY		ELECTRICAL			BASIS OF DESIGN		COMMENTS
				KW	BTU/HR	V	PH	HZ	MANUFACTURER	MODEL	
UH-1	ELECTRIC	380	1550	3	10,200	208	1	60	MODINE	HER 30	HORIZONTAL THROW. PROVIDE WALL MOUNTING BRACKET. MOUNTING HEIGHT 8 FT AFF.

AIR SEPARATOR SCHEDULE

MARK	SERVICE DESCRIPTION	FLUID	FLOW (GPM)	WPD (FT)	BASIS OF DESIGN		COMMENTS
					MANUFACTURER	MODEL	
AS-1	HEATING SYSTEM	WATER	57	2	SPIROTHERM	VDN250	COMBINATION AIR & DIRT SEPARATOR, REMOVABLE HEAD PIECE, SPIROTOP AIR VENT.
AS-2							

EXPANSION TANK SCHEDULE

NOTES:

MARK	SYSTEM	VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	PRECHARGE PRESSURE (PSIG)	BASIS OF DESIGN		COMMENTS
					MANUFACTURER	MODEL	
ET-1	HEATING SYSTEM	80	80	12	AMTROL	EXTROL 300-L	VERTICAL STYLE, BLADDER EXPANSION TANK.

HEAT PUMP SCHEDULE

NOTES:

MARK	HEAT PUMP TYPE	HEATING CAPACITY (MBH)	COP	GROUND SOURCE SIDE					BUILDING SIDE					ELECTRICAL DATA				BASIS OF DESIGN		COMMENTS
				FLUID TYPE	EFT (°F)	LFT (°F)	FLOW (GPM)	HEAD (FT)	FLUID TYPE	EFT (°F)	LFT (°F)	FLOW (GPM)	HEAD (FT)	V	PH	MCA	FLA	MANUFACTURER	MODEL	
GSHP-1	WATER SOURCE	284.9	2.52	25% PG	34	30.1	90	7.2	30% PG	110	120.3	57	3.1	460	3	60.5	53.8	DAIKIN	WWHA1420	CAPACITY BASED ON 25% PROPYLENE GLYCOL AND 30 DEG F GROUND SOURCE FLUID TEMP.

PUMP SCHEDULE

NOTES:

MARK	LOCATION	SERVICE	FLOW (GPM)	HEAD (FT)	FLUID	TYPE	RPM	ELECTRICAL				BASIS OF DESIGN		COMMENTS
								HP	V	PH	VFD	MANUFACTURER	MODEL	
P-1	MECHANICAL ROOM	GSHP-1 CIRC PUMP	57	20	30% PG	INLINE	3600	440 WATTS	208	1	Yes	GRUNDFOS	MAGNA3 40-120 F N	INTEGRAL VARIABLE SPEED DRIVE AND CONTROLLER.
P-2A	MECHANICAL ROOM	BUILDING HEATING	57	35	30% PG	INLINE	3600	0.75	460	3	Yes	GRUNDFOS	TP 40-160/2	PROVIDE EXTERNAL VFD
P-2B	MECHANICAL ROOM	BUILDING HEATING	57	35	30% PG	INLINE	3600	0.75	460	3	Yes	GRUNDFOS	TP 40-160/2	PROVIDE EXTERNAL VFD
RP-1A	MECHANICAL ROOM	RADIANT FLOOR MANIFOLDS	42	65	30% PG	INLINE	3600	3	460	3	Yes	GRUNDFOS	TP 80-240/2	PROVIDE EXTERNAL VFD
RP-1B	MECHANICAL ROOM	RADIANT FLOOR MANIFOLDS	42	65	30% PG	INLINE	3600	3	460	3	Yes	GRUNDFOS	TP 80-240/2	PROVIDE EXTERNAL VFD
RP-2A	MECHANICAL ROOM	SNOWMELT MANIFOLDS	15	53	30% PG	INLINE	3600	600 WATTS	208	1	Yes	GRUNDFOS	MAGNA3 40-180 F	INTEGRAL VARIABLE SPEED DRIVE AND CONTROLLER.
RP-2B	MECHANICAL ROOM	SNOWMELT MANIFOLDS	15	53	30% PG	INLINE	3600	600 WATTS	208	1	Yes	GRUNDFOS	MAGNA3 40-180 F	INTEGRAL VARIABLE SPEED DRIVE AND CONTROLLER.

GLYCOL TANK SCHEDULE

NOTES:

MARK	SERVICE	FUILD	TANK		ELECTRICAL			BASIS OF DESIGN		COMMENTS
			VOLUME (GALLONS)	DIMENSIONS (H" X DIA")	HP	V	PH	MANUFACTURER	MODEL	
GMT-1	HEATING SYSTEM	30% PG	50	42 x 28	1/3	120	1	WESSELS	GMP-13050	PROVIDE AUDIBLE LOW LEVEL ALARM.

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ECI ARCHITECTURE DESIGN STRATEGY
3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543

PROJECT NO.0308

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
AIRPORT EQUIPMENT FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA 49TH
COLIN P. FAY
ME 14049
19-05-31
REGISTERED PROFESSIONAL ENGINEER

MECHANICAL SCHEDULES (1 OF 2)

AUTHOR: CPF/MEB CHECKED: DHM

JUNEAU CONTRACT: BE 19-037

M0002

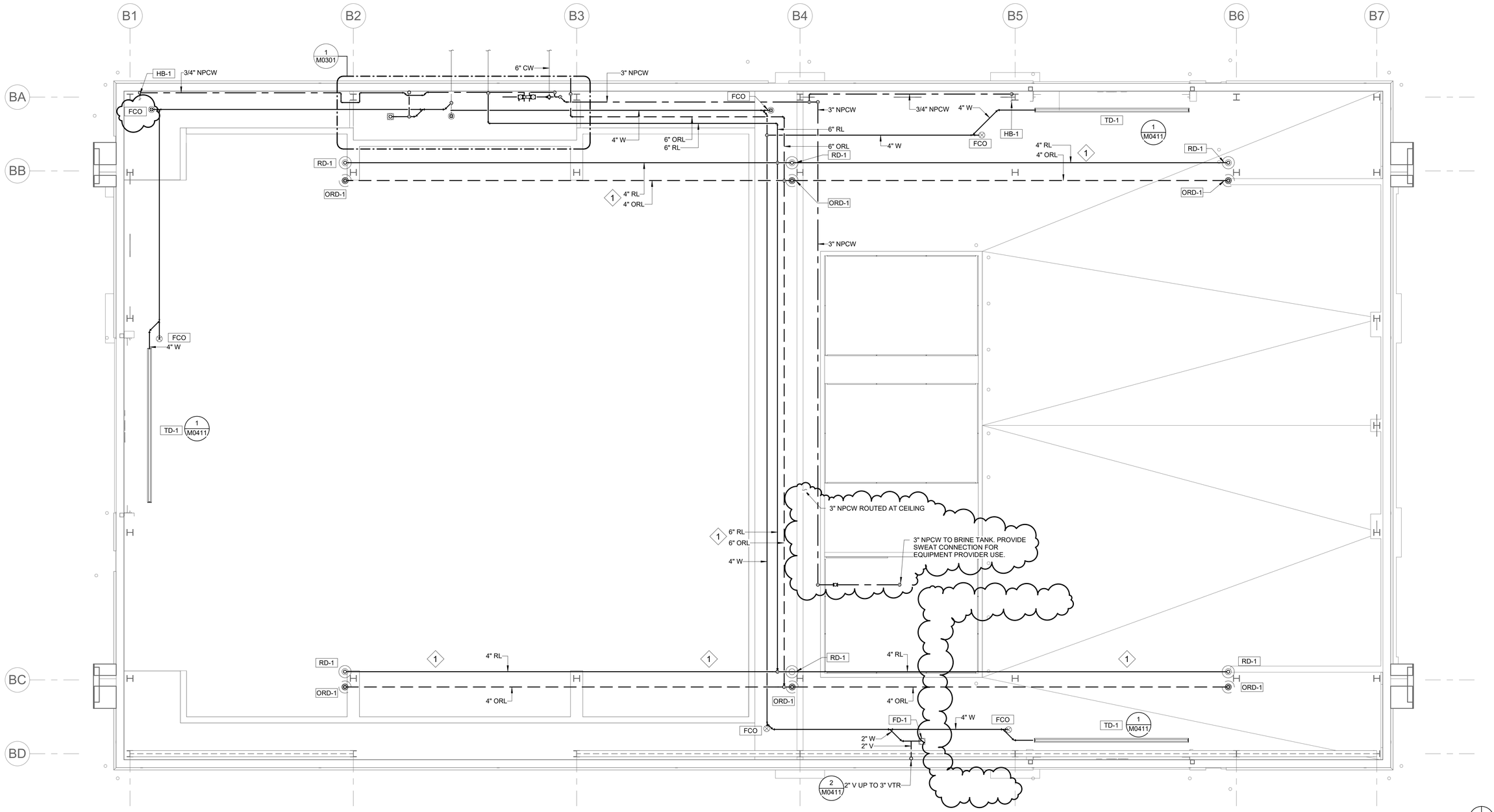
FULL SIZE PRINTED ON 22 x 34

SHEET NOTES

1. ROUTE ALL UNDERSLAB 4" WASTE PIPING AT 1% SLOPE.

SHEET KEYNOTES

1 ROUTE RL AND ORL PIPING AS HIGH AS PRACTICABLE .



1 FIRST FLOOR PLAN - PLUMBING
1/8" = 1'-0"

N

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PROJECT NO.0308

JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA 49TH
COLIN P. FAY
ME 14049
REGISTERED PROFESSIONAL ENGINEER

UNDERFLOOR & FIRST FLOOR PLAN - PLUMBING

AUTHOR: CPF/MEB CHECKED: DHM

JUNEAU CONTRACT: BE 19-037

M0111

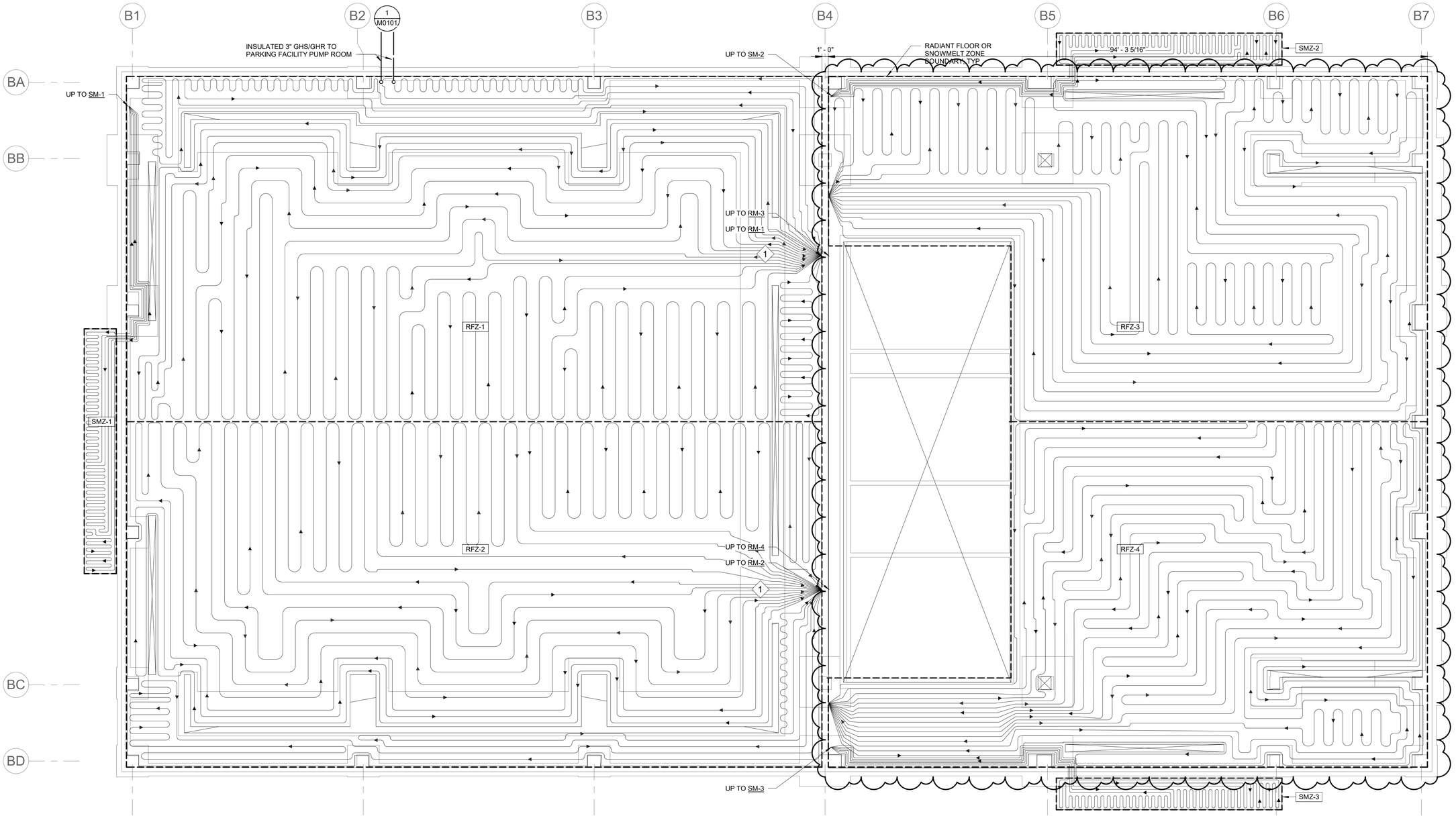
FULL SIZE PRINTED ON 22 x 34

SHEET NOTES

1. SUGGESTED TUBE ROUTING SHOWN FOR RADIANT FLOOR AND SNOWMELT ZONES. COORDINATE WITH RADIANT TUBING MANUFACTURER SHOP DRAWINGS.
2. 3-1/2" MAX DEPTH FROM TOP OF SLAB TO CENTER OF RADIANT TUBING. 1-1/2" MINIMUM OF SLAB COVERAGE REQUIRED ABOVE RADIANT TUBING.
3. SEE 1/M121 FOR SUPPLY/RETURN PIPING TO/FROM MANIFOLDS.
4. SEE M411 FOR TUBING DETAILS.

SHEET KEYNOTES

1. PROVIDE PIPE SLEEVES FOR RADIANT TUBING PENETRATION THROUGH CONCRETE FOOTING.



1 UNDERFLOOR PLAN - HYDRONIC
1/8" = 1'-0"

N

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JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA
49 TH
COLIN P. FAY
ME 14049
REGISTERED PROFESSIONAL ENGINEER

UNDERFLOOR PLAN - HYDRONIC

AUTHOR: CPF/MEB CHECKED: DHM

JUNEAU CONTRACT: BE 19-037

M0120

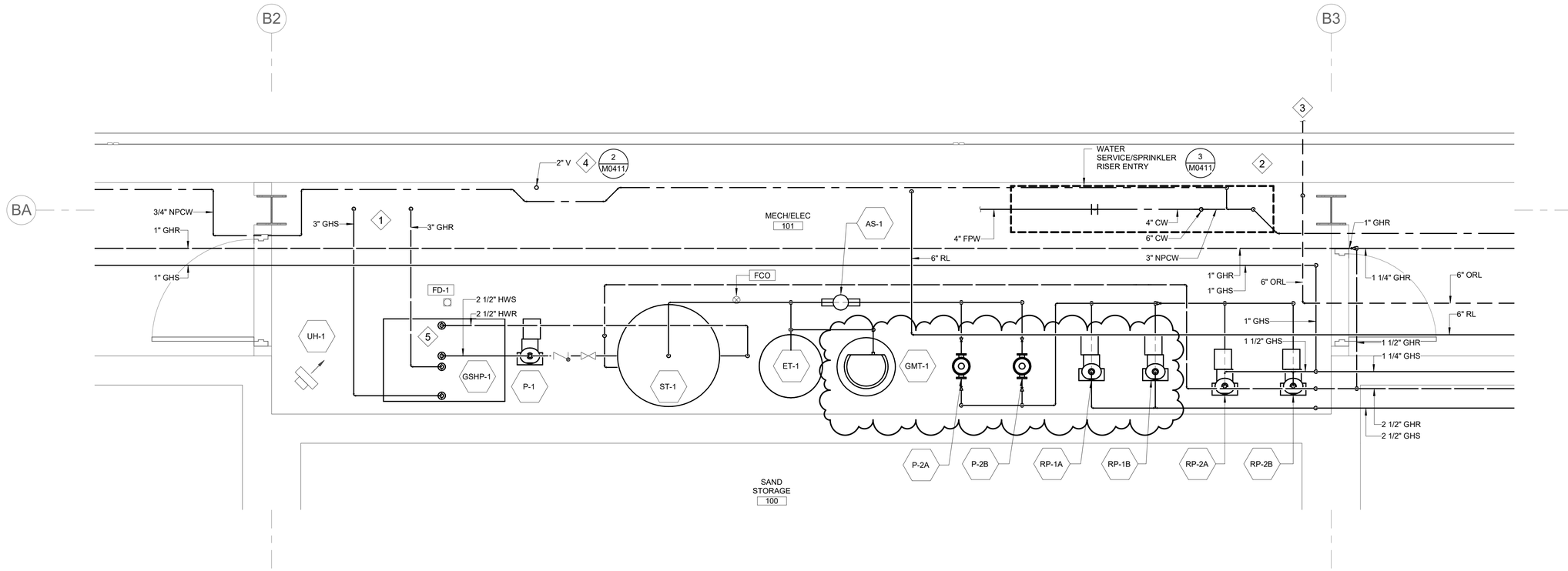
FULL SIZE PRINTED ON 22 x 34

SHEET NOTES

1. UNDERGROUND CONTINUATIONS SHOWN ON MECHANICAL SITE PLAN.

SHEET KEYNOTES

1. INSULATED 3" GHS/GHR TO SREB
2. 6" CW BY CIVIL UP TO FLANGE 12" A.F.F. IN MECHANICAL ROOM.
3. 6" STORM DRAIN OVERFLOW DISCHARGE SPOUT TO SPLASHBLOCK ON GRADE.
4. ROUTE 2" V UP TO 3" VTR.
5. ROUTE HEAT PUMP RELIEF PPIPING TO ROOF GOOSENECK OUTLET



1 FIRST FLOOR LARGE SCALE PLAN - MECHANICAL ROOM
1/2" = 1'-0"

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JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA 49TH
COLIN P. FAY
ME 14049
REGISTERED PROFESSIONAL ENGINEER

LARGE SCALE PLAN - MECHANICAL SPACE

AUTHOR: CPF/MEB CHECKED: DHM

JUNEAU CONTRACT: BE 19-037

N

M0301

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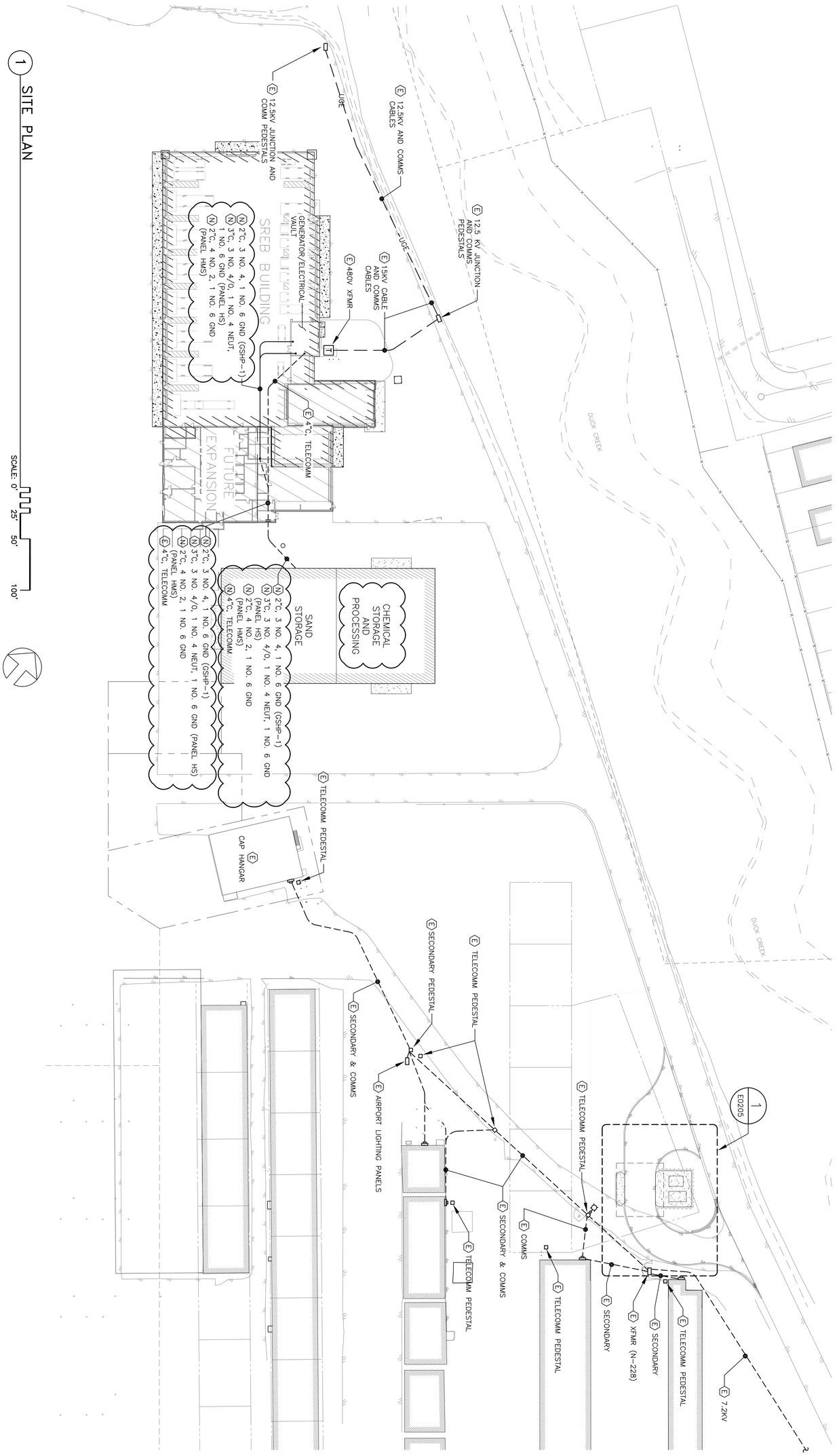

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E0101

FULL SIZE PRINTED ON 22 x 34

SITE PLAN

JNU CONTRACT BE 19-037

JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
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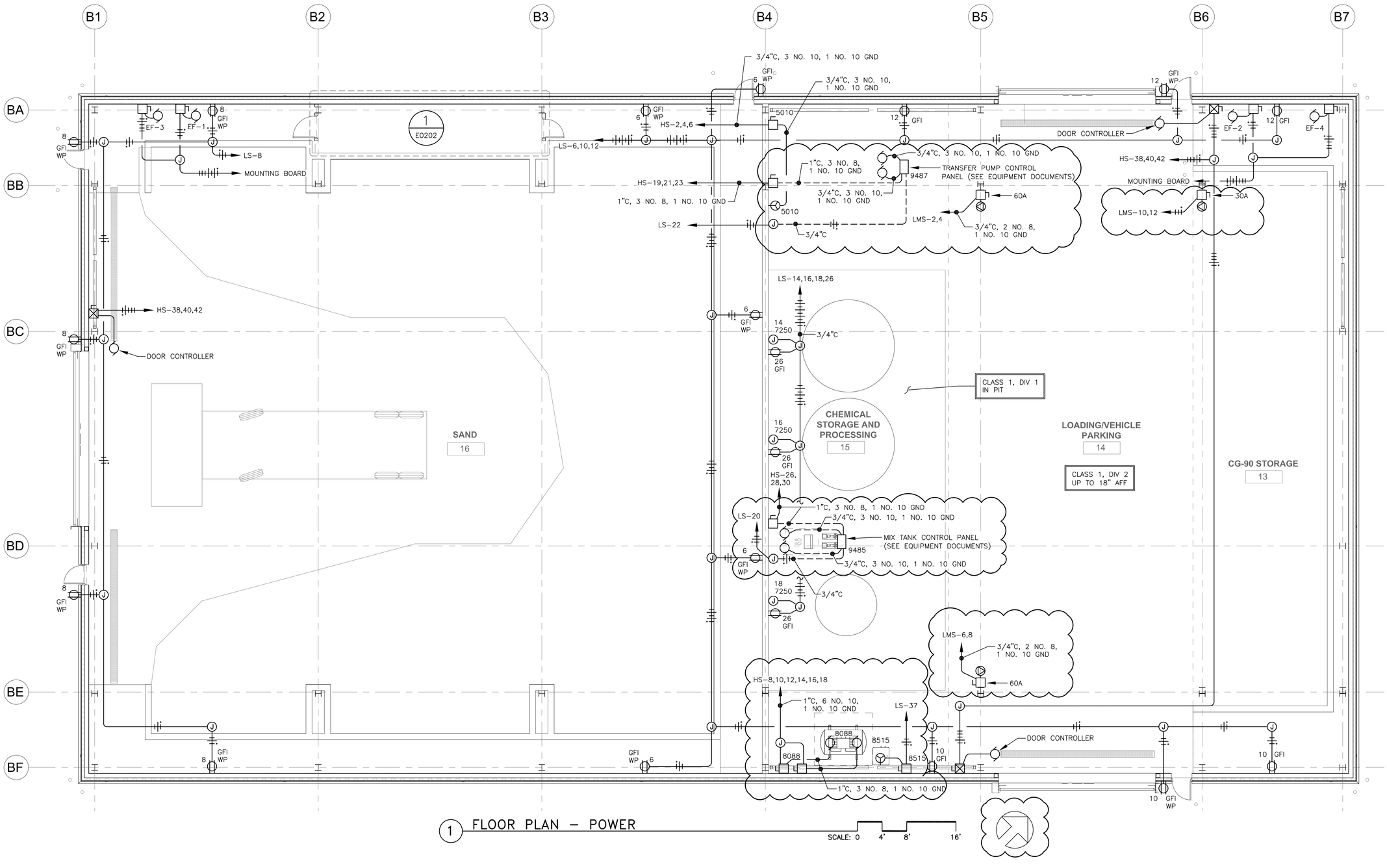
HAIGHT & ASSOCIATES, INC.
CONSULTING ELECTRICAL ENGINEERS
526 Main Street, Juneau, AK 99801
(907) 586-9788

ECI ARCHITECTURE DESIGN STRATEGY
3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543
PROJECT NO.16-0002

NOTES:

1. ALL RECEPTACLES AT +48" AFF, UON.



1 FLOOR PLAN – POWER

SCALE: 0 4' 8' 16'

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(907) 586-9788

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3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543

PROJECT NO.16-0002

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
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AUGUST 14, 2018
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FLOOR PLAN POWER

JNU CONTRACT

BE 19-037

E0201

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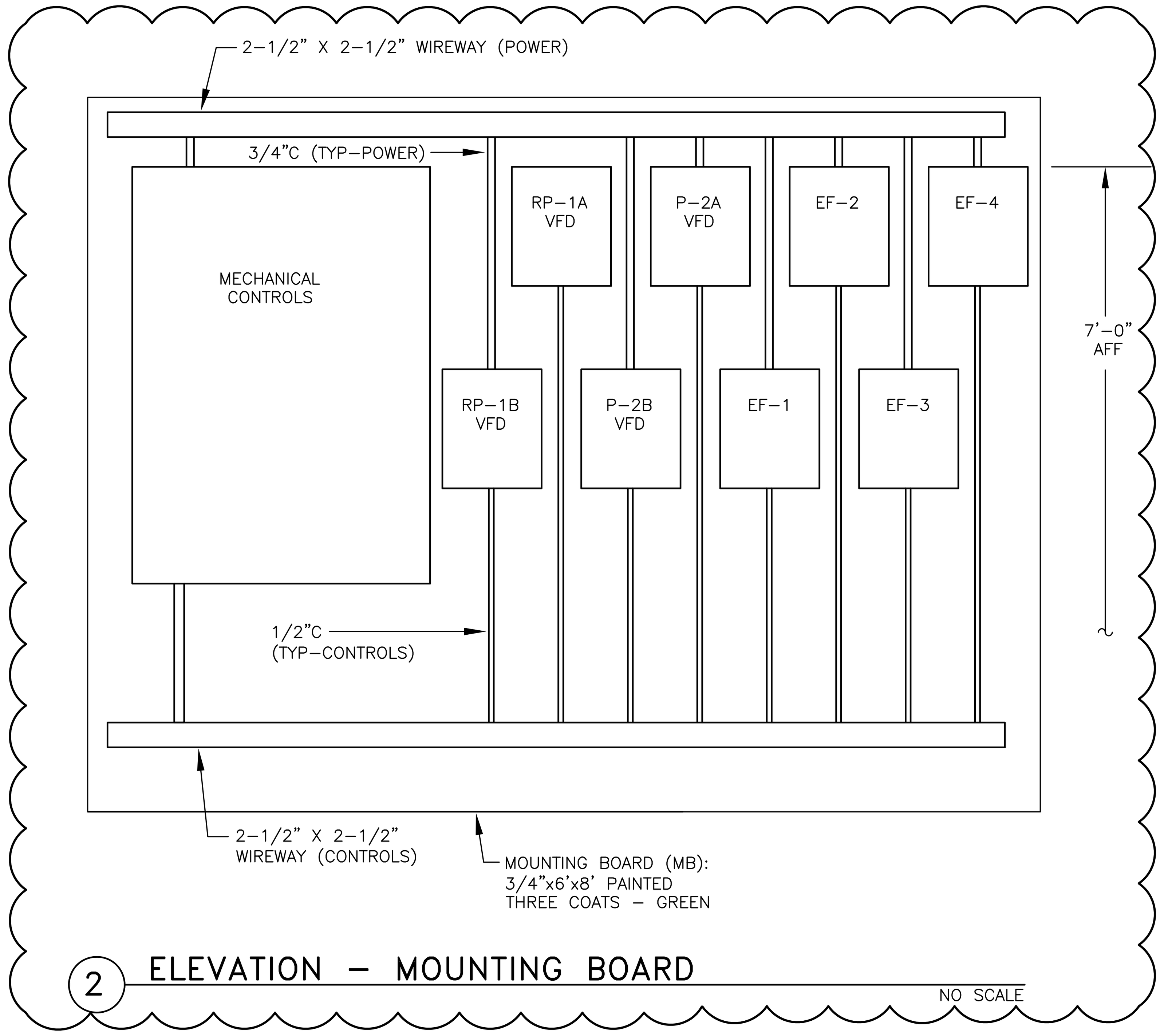


2 ELEVATION – MOUNTING BOARD

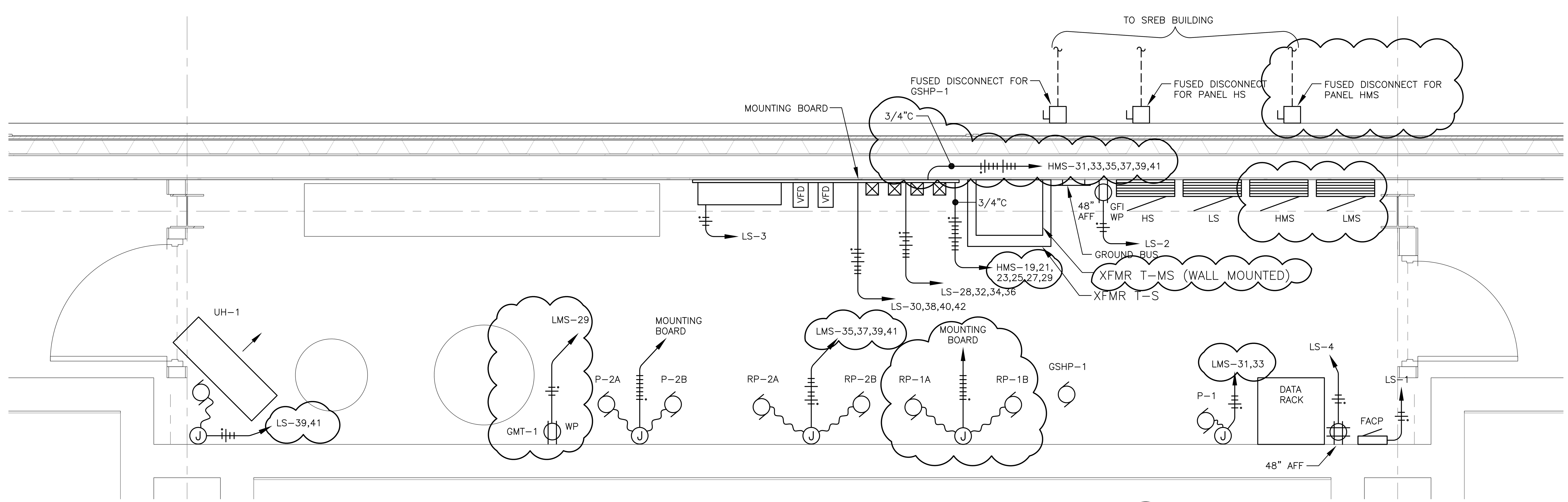
NO SCALE

MECHANICAL EQUIPMENT SCHEDULE

DESIGNATION			LOAD					CIRCUITING				CONTROL		
ITEM	DESCRIPTION	LOCATION	HP	KW	AMPS	VOLTS	PHASE	RATING	CONDUCTORS	DISCONNECT SWITCH	DISCONNECT FUSE	STARTER SIZE	CONTROL	REMARKS
UH-1	UNIT HEATER	MECHANICAL ROOM		3		208	1	20/2	2 NO. 12, 1 NO. 12 NEUT, 1 NO. 12 GND					
GSHP-1	HEAT PUMP	MECHANICAL ROOM			53.8	480	3	70/3	3 NO. 4, 1 NO. 6 GND	100A	70A			INTEGRAL DISCONNECT
P-1	CIRCULATION PUMP	MECHANICAL ROOM		0.44		208	1	15/2	2 NO. 12, 1 NO. 12 NEUT, 1 NO. 12 GND					INTEGRAL VFD
P-2A	HEATING PUMP	MECHANICAL ROOM	3/4			480	3	15/3	3 NO. 12, 1 NO. 12 GND					EXTERNAL VFD
P-2B	HEATING PUMP	MECHANICAL ROOM	3/4			480	3	15/3	3 NO. 12, 1 NO. 12 GND					EXTERNAL VFD
RP-1A	RADIANT PUMP	MECHANICAL ROOM	3			480	3	15/3	3 NO. 12, 1 NO. 12 GND					EXTERNAL VFD
RP-1B	RADIANT PUMP	MECHANICAL ROOM	3			480	3	15/3	3 NO. 12, 1 NO. 12 GND					EXTERNAL VFD
EF-1	EXHAUST FAN	CHEMICAL STORAGE	1/2			120	1	20/1	2 NO. 12, 1 NO. 12 GND	30A			NEMA 0	
EF-2	EXHAUST FAN	CHEMICAL STORAGE	1/2			120	1	20/1	2 NO. 12, 1 NO. 12 GND	30A			NEMA 0	
EF-3	EXHAUST FAN	CHEMICAL STORAGE	3			208	3	20/3	4 NO. 12, 1 NO. 12 GND	30A			NEMA 0	
EF-4	EXHAUST FAN	CHEMICAL STORAGE	2			208	3	15/3	4 NO. 12, 1 NO. 12 GND	30A			NEMA 0	
	DISPENSER PUMP	FUELING STATION	1			120	1	30/1	2 NO. 10, 1 NO. 10 GND				NEMA 0	
	DISPENSER PUMP	FUELING STATION	1			120	1	30/1	2 NO. 10, 1 NO. 10 GND				NEMA 0	
	DISPENSER PUMP	FUELING STATION	1			120	1	30/1	2 NO. 10, 1 NO. 10 GND				NEMA 0	
	DISPENSER PUMP	FUELING STATION	1			120	1	30/1	2 NO. 10, 1 NO. 10 GND				NEMA 0	
RP-2A	RADIANT PUMP	MECHANICAL ROOM		0.6		208	1	15/2	2 NO. 12, 1 NO. 12 NEUT, 1 NO. 12 GND					INTEGRAL VFD
RP-2A	RADIANT PUMP	MECHANICAL ROOM		0.6		208	1	15/2	2 NO. 12, 1 NO. 12 NEUT, 1 NO. 12 GND	100A	70A			INTEGRAL VFD
GMT-1	GLYCOL MIXING TANK	MECHANICAL ROOM	1/2			120	1	20/1	2 NO. 12, 1 NO. 12 GND					

SHOP EQUIPMENT SCHEDULE

ITEM	DESCRIPTION	LOCATION	HP	KW	AMPS	VOLTS	PHASE	PNL	CKT	RATING	CONDUCTORS	DISCONNECT	RECEPTACLE
5010	BRIDGE CRANE	CHEMICAL STOR & PROCESS 15			23.4	480	3	HS		30/3	3 NO. 10, 1 NO. 10 GND	30A	
7250	BRINE MAKER	CHEMICAL STOR & PROCESS 15			6	120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND		(J)
7250	BRINE MAKER	CHEMICAL STOR & PROCESS 15			6	120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND		(J)
7250	BRINE MAKER	CHEMICAL STOR & PROCESS 15			12	120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND		(J)
8088	AIR COMPRESSOR	CHEMICAL STOR & PROCESS 15	10			480	3	HS		30/3	3 NO. 10, 1 NO. 10 GND	30A	
8088	AIR COMPRESSOR	CHEMICAL STOR & PROCESS 15	10			480	3	HS		30/3	3 NO. 10, 1 NO. 10 GND	30A	
8515	AIR DRYER	CHEMICAL STOR & PROCESS 15	1/2			120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND	30A	
9485	MIX TANK PUMPS	CHEMICAL STOR & PROCESS 15	(2)10			480	3	HS		50/3	3 NO. 8, 1 NO. 10 GND	60A	
9485	MIX TANK CONTROL	CHEMICAL STOR & PROCESS 15			8	120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND		
9487	TRANSFER PUMPS	CHEMICAL STOR & PROCESS 15	(2)10			480	3	HS		50/3	3 NO. 8, 1 NO. 10 GND	60A	
9487	TRANSFER CONTROL	CHEMICAL STOR & PROCESS 15			8	120	1	LS		20/1	2 NO. 12, 1 NO. 12 GND		



1 ENLARGED FLOOR PLAN – MECHANICAL ROOM

SCALE: 0 1' 2' 4'

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PROJECT NO.16-0002

JUNEAU INTERNATIONAL AIRPORT
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AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

265-105 STATE OF ALASKA 49th B.G. HAIGHT EE 4800 6 AUG 2018

MECHANICAL EQUIPMENT SCHEDULE
ENLARGED FLOOR PLAN

JNU CONTRACT BE 19-037

E0202

FULL SIZE PRINTED ON 22 x 34

PANEL LS

SIZE	VOLTS/PHASE	MAIN	LOCATION	MOUNT
100 AMPS	208Y/120V, 3 PH	100A	MECHANICAL ROOM	SURFACE

CKT NO	DESCRIPTION	BREAKER AMP/POLE	KVA CKT	KVA AØ	KVA BØ	KVA CØ	CKT	BREAKER AMP/POLE	DESCRIPTION	CKT NO
1	FACP	15/1	0.1	0.3			0.2	20/1	MECHANICAL ROOM	2
3	MECHANICAL CONTROLS	15/1	0.1		0.5		0.4	20/1	DATA RACK	4
5	SPACE		0.0			0.9	0.9	20/1	SAND 16 EAST	6
7			0.0	0.9			0.9	20/1	SAND 16 WEST	8
9			0.0		0.5		0.5	20/1	LOADING/VEHICLE PARKING 14 SOUTH	10
11			0.0			0.5	0.5	20/1	LOADING/VEHICLE PARKING 14 NORTH	12
13			0.0	0.7			0.7	20/1	7250 BRINE MAKER	14
15			0.0		0.7		0.7	20/1	7250 BRINE MAKER	16
17			0.0			1.4	1.4	20/1	7250 BRINE MAKER	18
19			0.0	1.0			1.0	20/1	MIX TANK CONTROL	20
21			0.0		1.0		1.0	20/1	TRANSFER CONTROL	22
23			0.0			0.0	0.0		SPACE	24
25			0.0	0.4			0.4	20/1	LOADING/VEHICLE PARKING 14 WEST	26
27			0.0		1.2		1.2	20/1	EXHAUST FAN EF-1	28
29			0.0			1.2	1.2	20/1	EXHAUST FAN EF-2	30
31			0.0	1.3			1.3	20/3	EXHAUST FAN EF-3	32
33			0.0		1.3		1.3	--	----	34
35			0.0			1.3	1.3	--	----	36
37	8515 AIR DRYER	20/1	1.2	2.1			0.9	15/3	EXHAUST FAN EF-4	38
39	UNIT HEATER UH-1	20/2	1.5		2.4		0.9	--	----	40
41	----	--	1.5			2.4	0.9	--	----	42
BALANCED CONNECTED LOAD: 22.0 KVA / 61.1 AMPS				6.7	7.6	7.7				
MAXIMUM PHASE LOAD: 7.7 KVA / 64.2 AMPS										

PANEL HS

SIZE	VOLTS/PHASE	MAIN	LOCATION	MOUNT
225 AMPS	480Y/277V, 3 PH	MLO	MECHANICAL ROOM	SURFACE

CKT NO	DESCRIPTION	BREAKER AMP/POLE	KVA CKT	KVA AØ	KVA BØ	KVA CØ	CKT	BREAKER AMP/POLE	DESCRIPTION	CKT NO
1	EXTERIOR BUILDING MOUNTED LTG	20/1	0.5	7.0			6.5	30/3	5010 BRIDGE CRANE	2
3	SAND	20/1	2.3		8.8		6.5	--	----	4
5	CG-90 STOR, LOAD/VEHICLE, CHEM STOR	20/1	3.0			9.5	6.5	--	----	6
7	LOADING/VEHICLE EMERGENCY	20/1	0.4	4.3			3.9	30/3	8088 AIR COMPRESSOR	8
9	SPACE		0.0		3.9		3.9	--	----	10
11			0.0			3.9	3.9	--	----	12
13			0.0	3.9			3.9	30/3	8088 AIR COMPRESSOR	14
15			0.0		3.9		3.9	--	----	16
17			0.0			3.9	3.9	--	----	18
19	TRANSFER PUMPS	50/3	7.5	7.5			0.0		SPACE	20
21	----	--	7.5		7.5		0.0		SPACE	22
23	----	--	7.5			7.5	0.0		SPACE	24
25	SPACE		0.0	7.5			7.5	50/3	MIX TANK PUMPS	26
27			0.0		7.5		7.5	--	----	28
29			0.0			7.5	7.5	--	----	30
31			0.0	0.0			0.0		SPACE	32
33			0.0		0.0		0.0		SPACE	34
35			0.0			0.0	0.0		SPACE	36
37	PANEL LS XFMR T-S	50/3	6.4	9.0			2.6	20/3	DOOR OPERATORS	38
39	----	--	8.5		11.1		2.6	--	----	40
41	----	--	9.1			11.7	2.6	--	----	42
BALANCED CONNECTED LOAD: 125.9 KVA / 151.7 AMPS				39.2	42.7	44.0	BALANCED DEMAND LOAD: 112.8 KVA / 135.7 AMPS			
MAXIMUM CONNECTED LOAD: 44.0 KVA / 122.2 AMPS										

PANEL HMS

SIZE	VOLTS/PHASE	MAIN	LOCATION	MOUNT
100 AMPS	480Y/277V, 3 PH	MLO	MECHANICAL ROOM	SURFACE

CKT NO	DESCRIPTION	BREAKER AMP/POLE	KVA CKT	KVA AØ	KVA BØ	KVA CØ	CKT	BREAKER AMP/POLE	DESCRIPTION	CKT NO
1	PANEL LMS XFMR T-MS	50/3	8.1	8.1			0.0		SPACE	2
3	----	--	6.0		6.0		0.0			4
5	----	--	6.1			6.1	0.0			6
7	SPACE		0.0	0.0			0.0			8
9			0.0		0.0		0.0			10
11			0.0			0.0	0.0			12
13			0.0	0.0			0.0			14
15			0.0		0.0		0.0			16
17			0.0			0.0	0.0			18
19	HEATING PUMP P-2A	15/3	0.4	0.4			0.0			20
21	----	--	0.4		0.4		0.0			22
23	----	--	0.4			0.4	0.0			24
25	HEATING PUMP P-2B	15/3	0.4	0.4			0.0			26
27	----	--	0.4		0.4		0.0			28
29	----	--	0.4			0.4	0.0			30
31	RADIANT PUMP RP-1A	15/3	1.3	1.3			0.0			32
33	----	--	1.3		1.3		0.0			34
35	----	--	1.3			1.3	0.0			36
37	RADIANT PUMP RP-1B	15/3	1.3	1.3			0.0			38
39	----	--	1.3		1.3		0.0			40
41	----	--	1.3			1.3	0.0			42
BALANCED CONNECTED LOAD: 30.4 KVA / 36.6 AMPS				11.5	9.4	9.5				
MAXIMUM PHASE LOAD: 11.5 KVA / 31.9 AMPS										

PANEL LMS

SIZE	VOLTS/PHASE	MAIN	LOCATION	MOUNT
100 AMPS	208Y/120V, 3 PH	100A	MECHANICAL ROOM	SURFACE

CKT NO	DESCRIPTION	BREAKER AMP/POLE	KVA CKT	KVA AØ	KVA BØ	KVA CØ	CKT	BREAKER AMP/POLE	DESCRIPTION	CKT NO
1	SPACE		0.0	3.8			3.8	50/2	BLOCK HEATER OUTLET	2
3			0.0		3.8		3.8	--	----	4
5			0.0			3.8	3.8	50/2	BLOCK HEATER OUTLET	6
7			0.0	3.8			3.8	--	----	8
9			0.0		1.7		1.7	20/2	BLOCK HEATER OUTLET	10
11			0.0			1.7	1.7	--	----	12
13			0.0	0.0			0.0		SPACE	14
15			0.0		0.0		0.0			16
17			0.0			0.0	0.0			18
19			0.0	0.0			0.0			20
21			0.0		0.0		0.0			22
23			0.0			0.0	0.0			24
25			0.0	0.0			0.0			26
27			0.0		0.0		0.0			28
29	GLYCOL MIXING TANK GMT-1	20/1	1.2			1.2	0.0			30
31	CIRCULATION PUMP P-1	15/2	0.2	0.2			0.0			32
33	----	--	0.2		0.2		0.0			34
35	RADIANT PUMP RP-2A	15/2	0.3			0.3	0.0			36
37	----	--	0.3	0.3			0.0			38
39	RADIANT PUMP RP-2B	15/2	0.3		0.3		0.0			40
41	----	--	0.3			0.3	0.0			42
BALANCED CONNECTED LOAD: 21.4 KVA / 59.4 AMPS				8.1	6.0	7.3				
MAXIMUM CONNECTED LOAD: 8.1 KVA / 67.5 AMPS										

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HAIGHT & ASSOCIATES, INC.
CONSULTING ELECTRICAL ENGINEERS
526 Main Street, Juneau, AK 99801
(907) 586-9788

ECI ARCHITECTURE DESIGN STRATEGY
3909 ARCTIC BOULEVARD, SUITE 103
ANCHORAGE, ALASKA 99503 907.561.5543
PROJECT NO.16-0002

JUNEAU INTERNATIONAL AIRPORT
SAND & CHEMICAL BUILDING AND
AIRPORT EQUIPMENT FUELING STATION

AUGUST 14, 2018
ADDENDUM 1 - BID DOCUMENTS

STATE OF ALASKA
B.C. HAIGHT
EE 4800
6 AUG 2018

PANEL SCHEDULES

JNU CONTRACT BE 19-037

E0203
FULL SIZE PRINTED ON 22 x 34

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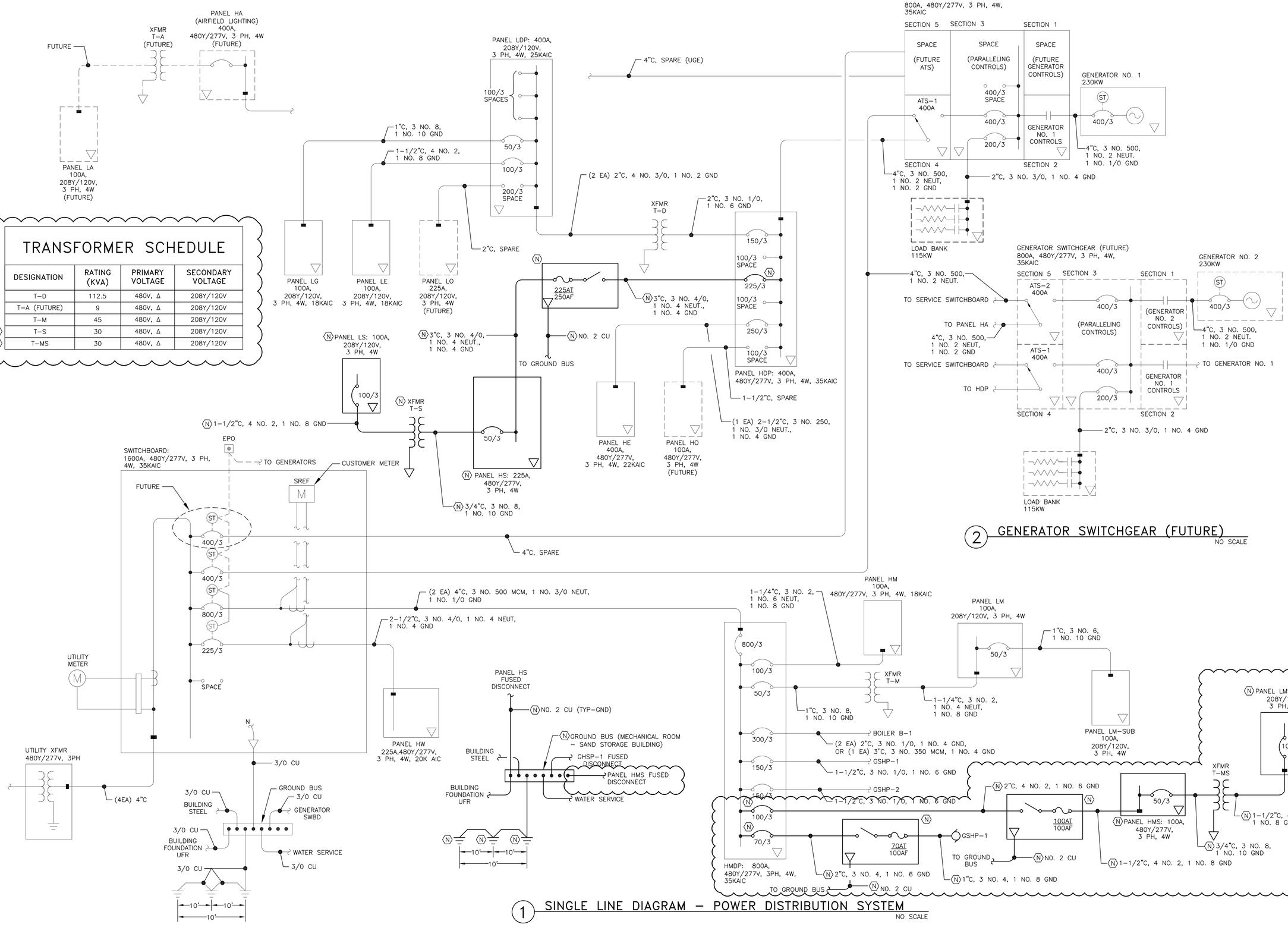
TRANSFORMER SCHEDULE

	DESIGNATION	RATING (KVA)	PRIMARY VOLTAGE	SECONDARY VOLTAGE
	T–D	112.5	480V, Δ	208Y/120V
	T–A (FUTURE)	9	480V, Δ	208Y/120V
	T–M	45	480V, Δ	208Y/120V
N	T–S	30	480V, Δ	208Y/120V
N	T–MS	30	480V, Δ	208Y/120V



2 GENERATOR SWITCHGEAR (FUTURE)
NO SCALE

1 SINGLE LINE DIAGRAM – POWER DISTRIBUTION SYSTEM
NO SCALE

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526 Main Street, Juneau, AK 99801
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ARCHITECTURE DESIGN STRATEGY
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PROFESSIONAL ENGINEER
6 AUG 2018

SINGLE LINE DIAGRAM

JNU CONTRACT BE 19-037

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