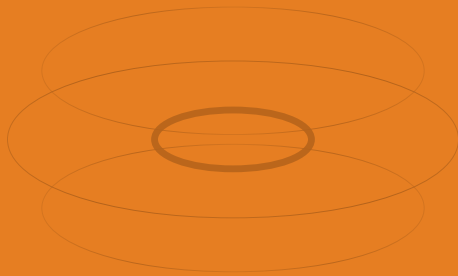


OWNER

Prefabricated Buildings B-101 and B-102

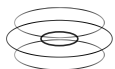


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[REDACTED] [REDACTED], [REDACTED] County, [REDACTED]

ISSUE SUMMARY AND APPROVAL

This page records each issue of SPC-SPC-016. The preparer, reviewer and approver sign for each revision.

Rev.	Date	Issue purpose	Description
A	2026-09-29	Issued for Review	First issue

Contributors

Rev.	Discipline	Prepared by	Reviewed by	Approved by
A	Specifications			

SECTION PC-SPC-016 PREFABRICATED BUILDINGS B-101 AND B-102

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes the requirements for the two prefabricated buildings in Table 1-1, and the Contractor's work to receive, set, anchor, seal and connect them.

Table 1-1: Buildings

Tag	Building	Nominal size	Construction	Plot location	Electrical area
B-101	Analyzer shelter for AT-141 (gas chromatograph), AT-142, AT-143, AT-144, the SMP-146 controls and sample conditioning; heated and ventilated	10 x 12 ft	Fiberglass-reinforced plastic (FRP) panels on a steel skid base	(118, 118)	Interior Class I, Division 2 by ventilation (ELE-RPT-001)
B-102	Control and electrical building for the remote terminal unit, safety programmable logic controller (PLC), flow computer FQI-110, the 24 VDC battery system, UPS-101 (120 VAC, 1.5 kVA, 8 h), panelboards and telecom	12 x 24 ft	Insulated prefabricated steel on a structural steel skid base	(215, 25)	Unclassified; outside all classified areas and at least 50 ft from any release source

Note 1: Plot coordinates in feet per MEC-DWG-001. The demarcation panel JB-W01 for (the receiving pipeline operator) is at the north fence, not in B-102.

- B. Both buildings are Owner-furnished packages, procured by the Owner to Parts 1 and 2 of this section, built and factory tested by the building vendor, with the analyzer and control system integrators installing their equipment in the vendor's shop. Part 2 and article 3.01 apply to the building vendor through the Owner's purchase order; the remainder of Part 3 applies to the Contractor.

C. Related sections:

- SPC-SPC-003, Cast-in-Place Concrete and Reinforcement (foundations).
- SPC-SPC-010, Above-Ground Painting.
- SPC-SPC-013, Electrical Installation in Hazardous Locations.
- SPC-SPC-014, Instrumentation Installation, Tubing and Calibration.
- SPC-SPC-017, Mechanical Equipment Setting.
- SPC-SPC-018, Pre-commissioning, Commissioning and Startup.

D. Work by others:

1. Foundations, under SPC-SPC-003 and STR-DWG-006.
2. Supply and configuration of the analyzers, remote terminal unit, PLC, flow computer and UPS, by the equipment vendors and the Owner's systems integrator.
3. Field wiring outside the buildings to their junction boxes and entry plates (SPC-SPC-013), and sample tubing outside B-101 (SPC-SPC-014).

1.02 REFERENCES

A. Codes and standards:

1. International Building Code, 2021 edition as adopted in (HOLD H-11). Occupancy and construction type as the EOR determines.
2. ASCE 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
3. AISC 360-22 (steel skid base and framing); AISI S100 (cold-formed steel panels).
4. NFPA 70-2023, National Electrical Code, including Articles 110, 480, 500 and 501.
5. API RP 500, 3rd Edition (classification of enclosed areas and adequate ventilation); API RP 555 (process analyzers).
6. NFPA 72 (detection and alarm), NFPA 101 (egress) and NFPA 496 (purged enclosures, only if used).
7. ISA-92.00.01, Performance Requirements for Toxic and Combustible Gas Detectors; ISA-TR12.13.02, Installation, Operation and Maintenance of Combustible Gas Detection Instruments.
8. ASTM E84 (surface burning characteristics); IEEE 1635 (battery ventilation); IEEE 1100 (grounding of electronic equipment); UL 484 and UL 1995 (air conditioners and heating equipment).
9. ASME BTH-1-2020 (lifting lugs).

B. Project documents:

1. GEN-DB-001, Basis of Design (site loads, spacing criteria).
2. ELE-RPT-001, Hazardous Area Classification; ELE-DWG-002, Hazardous Area Classification Plan.
3. ELE-DWG-001, One-Line Diagram; ELE-CAL-001, Electrical Load List; ELE-CAL-003, UPS and Battery Sizing; ELE-DWG-006, B-102 Equipment Layout and Elevations.
4. SAF-RPT-003, Fire and Gas Detection Philosophy and Layout; SAF-DWG-001, Fire and Gas Detector Layout.
5. INS-DWG-001, Control System and Network Architecture; INS-LST-003, Alarm and Trip Setpoint Schedule; INS-LST-004, Cause and Effect Matrix.

6. MEA-DWG-003, Analyzer Shelter B-101 Layout and Sample Conditioning Schematic;
 MEA-CAL-004, Sampling System Design.
7. STR-DWG-006, Building Pads and Supports.
8. CON-CAL-001, Critical Lift Plans.

1.03 DEFINITIONS

A. Adequate ventilation: ventilation that keeps any flammable gas release below 25 % of the lower flammable limit (LFL), which API RP 500 accepts as met by at least 6 air changes per hour or 1 cfm per ft² of floor area, together with detection of loss of ventilation.

B. Entry plate: a gland plate or penetration panel for cable and tubing entry.

1.04 SUBMITTALS

A. The building vendor (through the Owner) and the Contractor shall submit the items in Table 1-2.

Table 1-2: Submittal Schedule

No.	Submittal	By	Timing	Action
16-01	General arrangement: plan, elevations, equipment layout, door swing, NEC 110.26 working space, penetrations, lifting points, center of gravity, shipping and installed weights	Vendor	4 weeks after order	EOR and Owner approval
16-02	Structural calculations sealed by a professional engineer licensed in : loads of 2.01, skid base design for lifting and for support on the foundation, shear and uplift at each anchor	Vendor	6 weeks after order	EOR approval
16-03	Anchorage reactions and anchor bolt layout, for foundation design	Vendor	4 weeks after order	EOR approval
16-04	Heating, cooling and ventilation calculations (2.02 and 2.03)	Vendor	6 weeks after order	EOR approval
16-05	Electrical drawings (power, lighting, receptacles, HVAC circuits, grounding, gas detection) and the hazardous location compliance matrix for B-101	Vendor	6 weeks after order	EOR approval
16-06	Material data: panels, insulation R-values, FRP flame spread, doors and hardware, HVAC units, fans, detectors	Vendor	6 weeks after order	EOR approval
16-07	Factory acceptance test (FAT) procedure	Vendor	4 weeks before FAT	Owner and EOR approval
16-08	FAT report with punch list	Vendor	1 week after FAT	Owner approval
16-09	Shipping, lifting and setting procedure (spreader bar, rigging points, weights)	Vendor	2 weeks before shipment	Owner and Contractor review

No.	Submittal	By	Timing	Action
16-10	Installation, operation and maintenance manuals and spare parts list	Vendor	At shipment	Owner review
16-11	Setting report: anchor bolt survey, levelness, anchor torque, sealing	Contractor	Within 3 days of setting	Owner review

1.05 QUALITY ASSURANCE

- A. The Owner and the EOR will witness the FAT. The receiving pipeline operator may witness the flow computer and analyzer integration at the FAT under the Interconnect and Operating Agreement (HOLD H-01).
- B. Hold and witness points shall be as listed in 3.07 and in SPC-SPC-019.

1.06 DELIVERY, STORAGE AND HANDLING

- A. The vendor shall prepare each building for shipment with doors locked, internal equipment secured, openings sealed, desiccant in panels, and shock and tilt indicators fitted. Vendor-installed equipment shall be anchored for road transport (typically 3 g longitudinal, 2 g lateral and 2 g vertical).
- B. The Contractor shall inspect each building on arrival (indicators, exterior damage, shifted interior equipment), photograph it, and report damage within 24 hours.
- C. A building not set within 7 days of arrival shall be stored level on cribbing above standing water, with its space heaters energized from temporary power, to prevent condensation on the electronics.

1.07 MEASUREMENT AND PAYMENT

- A. Pay item 16.01, B-101 analyzer shelter setting and connection: lump sum, including receiving, storage with temporary heat, lifting and setting, shimming, anchoring, grounding bonds, skirting, penetration sealing and support of the site acceptance test. It excludes the building supply (Owner-furnished), the foundation (pay item 03.03), field wiring (pay item 13.01) and sample tubing (pay item 14.01).
- B. Pay item 16.02, B-102 control and electrical building setting and connection: lump sum, with the same inclusions and exclusions as pay item 16.01.

PART 2 PRODUCTS

2.01 STRUCTURAL DESIGN

- A. Each building and its skid base shall be designed for the loads in Table 2-1.

Table 2-1: Structural Design Loads

Load	Value
Dead	Self-weight plus all installed equipment, listed by the vendor
Roof live and collateral	20 psf live; 5 psf collateral for roof-hung items
Floor live	B-101: 100 psf; B-102: 150 psf, or the actual equipment load if greater (battery racks, panels)
Snow	10 psf ground snow (HOLD H-06), with drift to ASCE 7
Wind	108 mph basic wind speed, Risk Category II, Exposure C, enclosed building; components and cladding to ASCE 7-22 Chapter 30 (HOLD H-06)
Ice	0.5 in radial with 30 mph concurrent wind on exposed appurtenances
Seismic	Site Class D, $S_S = 0.12$ g, $S_1 = 0.06$ g, Seismic Design Category B (HOLD H-06); installed equipment anchored for the same demand under ASCE 7 Chapter 13, because induced seismicity in central makes the exemptions for low-hazard sites inappropriate
Lifting	Skid base and lugs designed for 2.0 times the lifted weight; lugs to ASME BTH-1 Design Category B
Deflection	Roof L/240 under live load; walls L/180 under wind; floor L/360

- B. The skid base shall be blast cleaned to SSPC-SP 10 and coated with the above-ground system of SPC-SPC-010, or hot-dip galvanized to ASTM A123.
- C. Each building shall have four lifting lugs arranged for a spreader bar. The building shall not be lifted with slings bearing on the roof.
- D. Panels shall have 20 % spare breakers and spaces, and terminal strips 20 % spare terminals.
- E. Each building shall carry a nameplate with tag, vendor, serial number, year, design loads and weight.

2.02 B-101 ANALYZER SHELTER

- A. Construction: FRP wall and roof panels with polyurethane or polyisocyanurate core, R-13 minimum walls and R-19 roof, white UV-stable gelcoat exterior, interior panels with an ASTM E84 flame spread of 25 or less, and a floor of FRP or aluminum diamond plate on the steel skid base. Interior materials shall be non-sparking and static dissipative.
- B. Area classification: the interior is Class I, Division 2, because the analyzers and sample systems are release sources inside the building. All interior electrical equipment shall be listed for Class I, Division 2, Group D, T3 or better, with the chromatograph oven and heated components per the chromatograph vendor's listing.
- C. Ventilation: two exhaust fans EF-101A and EF-101B, 250 cfm each, duty and standby with automatic changeover, shall give at least 12 air changes per hour (192 cfm for the 960 ft³ interior). This is twice the 6 air changes per hour that API RP 500 accepts as adequate ventilation, and is the dilution basis of SAF-RPT-003. The intake shall be from an unclassified location and the exhaust at high level, because natural gas is lighter than air. The fans shall have motors listed

for Class I, Division 1, because they sit in the exhaust stream. Airflow switch FSL-208 shall be wired to the safety PLC and alarm on loss of ventilation. Louvered vents are not a substitute for the fans.

- D. Gas detection: two combustible gas detectors, GD-205 and GD-206 (catalytic or infrared), within 12 in of the ceiling at the locations of SAF-DWG-001, with setpoints from INS-LST-003 (high 20 % LFL, high-high 40 % LFL). A high-high on either detector shall close sample shutoff SDV-141 and isolate non-essential power to B-101. A confirmed high-high (one detector at 40 % LFL and the other at 20 % or more) shall also initiate the station emergency shutdown, per INS-LST-004.
- E. Heating: a thermostatically controlled electric heater listed for Class I, Division 2, holding the interior at the chromatograph vendor's minimum (typically 50 °F) at -5 °F ambient with the ventilation running. Open-flame and catalytic gas heaters are not permitted.
- F. Cooling: if the vendor's calculation (16-04) shows the interior exceeding the chromatograph maximum (typically 104 °F) at 110 °F ambient, a Class I, Division 2 air conditioner shall be provided.
- G. Door: 36 x 80 in minimum, outward swing, with panic hardware, window, closer, weather seal and door switch ZS-211 to the remote terminal unit.
- H. Sample entry: a 316 stainless steel bulkhead plate with a bulkhead union for each sample, vent, calibration and carrier line, with SDV-141 and its restriction orifice RO-141A at the west wall entry (MEA-CAL-004). The individual 1/2 in vent tubes (lines 1130 to 1135) shall be routed to 3 ft above the roof; together they discharge about 183 scf/d of gas continuously.
- I. Lighting: Class I, Division 2 LED fixtures giving 50 fc at the analyzer faces, and an emergency light with battery.
- J. Gas cylinders: an exterior rack with restraint chains, or a ventilated cabinet, for carrier and calibration gases.

2.03 B-102 CONTROL AND ELECTRICAL BUILDING

- A. Construction: 12 x 24 ft with at least 9 ft interior clear height, on a structural steel skid base (ASTM A992, A500 or A36), with 16 gauge galvanized steel wall panels on steel studs, R-13 walls, R-19 roof, galvanized or painted interior liner, sloped roof, and steel floor plate with nonconductive floor covering in front of panels.
- B. Area: unclassified. No process piping, gas-containing instrument or tubing shall enter B-102; instrument signals enter only as electrical signals. The vendor shall make no penetration other than those on the approved general arrangement.
- C. Heating, ventilation and air conditioning: two 100 % wall-mounted air conditioners with heat, operating lead and lag, holding the interior between 50 and 85 °F at ambient temperatures from -5 to 110 °F. Combustible gas detector GD-207 shall be installed at the fresh-air intake. On a GD-207 high alarm (20 % LFL) the outside-air damper shall close, the units shall go to recirculation, and the alarm shall annunciate at the remote terminal unit; on high-high (40 % LFL)



- the station emergency shutdown action of INS-LST-004 applies. Pressurization under NFPA 496 is not required because B-102 is unclassified; a slight positive pressure (0.05 in water column nominal) is desirable but is not a safety function.
- D. UPS-101: space, floor loading and ventilation for the 1.5 kVA on-line UPS with its 48 VDC external battery (ELE-CAL-003) and maintenance bypass switch, in addition to the 24 VDC battery system. The building shall provide the cable entry for the 50 ft telecom antenna mast near B-102, which is supplied by others.
- E. Batteries: valve-regulated lead-acid batteries on braced racks with spill containment where the battery type requires, and ventilation for hydrogen to NEC Article 480 and IEEE 1635.
- F. Fire protection: no fire-rated walls are required, because the spacing criteria of GEN-DB-001 provide the separation. A 10 lb ABC and a 10 lb CO2 extinguisher shall be mounted by each door, and a smoke detector shall be wired to the remote terminal unit.
- G. Doors: two 36 x 80 in outward-swing steel doors with panic hardware at opposite ends, each with a door switch. NEC 110.26(C)(2) does not require two exits for this equipment, but the Owner requires them so that no one can be trapped behind a faulted panel.
- H. Working space: NEC 110.26 clearances in front of all panels, laid out for Condition 2 at 480Y/277 V (42 in depth).
- I. Cable entry: bottom entry plates with sealed conduit stubs, or a wall-mounted entry panel. Conduits from classified areas shall be sealed under NEC 501.15 and SPC-SPC-013, and every penetration fire-stopped and weather sealed.
- J. Lighting and power: 50 fc at panel faces, emergency lighting, receptacles, and an exterior light at each door.
- K. Grounding: an internal copper ground bus (1/4 x 2 in, at least 24 in long) connected to the skid base, and a separate isolated instrument ground bus to IEEE 1100, bonded at one point.

PART 3 EXECUTION

3.01 FACTORY ACCEPTANCE TEST

- A. The vendor's FAT, witnessed by the Owner, shall include at least: dimensional check against the general arrangement; inspection of structure, coating and sealing; continuity, insulation resistance and energized functional test of every circuit; heater and air conditioner operation; B-101 ventilation airflow measurement and calculated air change rate; response of GD-205, GD-206 and GD-207 to calibration gas, with alarm outputs; door switch and fan failure alarms; lighting levels; the integrated test of the analyzer or control system in the building by its integrator under that integrator's procedure; a water spray test of doors, roof seams and penetrations (15 min per face); and final weighing on load cells with the center of gravity marked.

3.02 SETTING AND ANCHORING

- A. Each building shall be lifted per the vendor's procedure and the rigging requirements of CON-CAL-001, with a spreader bar and tag lines. B-101 and B-102 are critical lifts under SPC-SPC-001.
- B. The building shall be set after the anchor bolt survey of SPC-SPC-003, shimmed at each anchor with stainless or galvanized steel shims (maximum stack 1 in), and leveled within 1/8 in over its length.
- C. Anchor nuts shall be tightened to snug tight plus the turn or torque of STR-DWG-006, with double nuts or lock washers where specified, and the skid bearing points grouted where the foundation design requires it, under the grouting rules of SPC-SPC-017.
- D. The skid base shall be bonded to the station ground grid at two diagonally opposite points under SPC-SPC-013.
- E. Shipping restraints and indicators shall be removed, and interior equipment alignment and doors checked.

3.03 PENETRATION SEALING

- A. Every cable, conduit and tubing penetration shall be sealed against weather, rodents and gas migration. Conduits from classified areas shall be sealed under SPC-SPC-013. Tubing shall enter B-101 only through the bulkhead plate.
- B. Under-floor openings in B-102 shall be closed with steel plate and a listed sealant, leaving no open floor penetration.
- C. Skirting of galvanized sheet or FRP with screened vents shall be installed around each skid base, to keep animals out while ventilating the space under the building.

3.04 SITE ACCEPTANCE

- A. The FAT tests that transport could affect shall be repeated on site as part of the site acceptance test of SPC-SPC-018: heating and cooling, B-101 ventilation airflow, gas detector bump test and calibration, alarms to the remote terminal unit, emergency lighting and door switches.

3.05 ACCEPTANCE

- A. Each building is accepted when it meets every criterion in Table 3-1.

Table 3-1: Acceptance Criteria

Parameter	Criterion	Method
Dimensions	Overall within $\pm 1/4$ in of the general arrangement; anchor points within $\pm 1/8$ in	Tape
Structure	Sealed calculations accepted for the loads of Table 2-1	Review

Parameter	Criterion	Method
B-101 ventilation	Each fan 250 cfm nominal and not less than 192 cfm (12 air changes per hour) measured by anemometer traverse or flow hood; standby fan starts on FSL-208	Measurement
B-101 loss of ventilation	FSL-208 alarms within 30 s of fan stop	Functional test
Gas detectors	Response to 50 % LFL methane: T_{90} within 30 s (catalytic) or per the ISA-92.00.01 certificate; alarms at 20 % and 40 % LFL within ± 3 % LFL	Calibration gas
Temperatures	B-101 held within the chromatograph vendor's limits (typically 50 to 104 °F); B-102 held at 50 to 85 °F; capacity test at FAT and 24 hour trend at site	Test, trend
Water tightness	No leak after a 15 min hose test on each face	Hose test at FAT
Electrical	Insulation resistance and functional tests per SPC-SPC-013; B-101 compliance matrix accepted	Test, review
Setting	Level within 1/8 in over the full length; anchor nuts torqued; skid bonded to the grid at two points at 0.1 ohm or less	Level, torque, ohmmeter
Penetrations	All sealed; no daylight visible from inside at any penetration; conduit seals poured	Visual

3.06 FIELD QUALITY CONTROL

A. Records shall use forms QF-16-01 (building receiving inspection), QF-16-02 (building setting record) and QF-16-03 (building site acceptance checklist).

3.07 HOLD AND WITNESS POINTS

A. The hold and witness points in Table 3-2 apply. Party codes: C Contractor, O Owner, E EOR, W receiving pipeline operator; H hold, W witness, R review, S surveillance, P perform.

Table 3-2: Hold and Witness Points

ID	Activity	C	O	E	W	Record
HP-16-01	Building general arrangement, structural calculations and anchorage reactions approved before fabrication and before foundation construction	-	R	H	-	Submittals 16-01 to 16-03
HP-16-02	FAT of B-101 and B-102, with integrated analyzer and control systems, before release for shipment	S	H	R	W	FAT report 16-08
WP-16-01	Receiving inspection on arrival	P	W	-	-	QF-16-01
WP-16-02	Setting, leveling and anchoring	P	W	-	-	QF-16-02
HP-16-03	Site acceptance (ventilation rate, gas detectors, heating and cooling, alarms) before process gas is introduced into B-101	P	H	R	-	QF-16-03

END OF SECTION

