Watson Tate Savory Liollio
ARCHITECTURE

ADDENDUM NO.: ONE DATE: 05 April 2012

PROJECT TITLE: **HORIZON CENTRAL GAS PIPING AUGMENTATION**
Horizon I Research Facility
University of South Carolina
State Project No. H27-I966

WRITTEN BY: Regina R. Floyd, AIA. LEED AP

TO: Prospective Bidders / Plan Holders

This addendum is issued pursuant to Article 1.1.1 of the AIA General Conditions of the Contract (A201) in connection with the revision of Bidding Documents which have been previously issued.

Addenda are issued prior to execution of Contract. All instructions contained herein shall be reflected in the Contract Sum and this Addendum will be made a part of the Contract Documents, if, as, and when a Construction Contract is awarded.

This Addendum forms a part of the Contract Documents and modifies the original documents dated 26 March 2012 as noted below. Acknowledge receipt of this Addendum in this space provided on the Bid Form. Failure to do so will subject the Bidder to disqualification.

This Addendum consists of 2 pages and the following attachments:

Pre-Bid Conference Memorandum..... 3 pages
Pre-Bid Sign In Sheets..... 3 pages
Drawing P1.0 – Ground Floor Methane Process Piping ..... 1 sheet (30 x 42)
Drawing P1.1 – First Floor Methane Process Piping ..... 1 sheet (30 x 42)
Drawing P1.2 – Second Floor Methane Process Piping ..... 1 sheet (30 x 42)
Drawing P1.3 – Third Floor Methane Process Piping ..... 1 sheet (30 x 42)

A. PRE-BID CONFERENCE:

1. See attached Pre-Bid Conference Memorandum and Pre-Bid Sign In sheet for items discussed at Pre-Bid Conference held April 05, 2012 and list of attendees.

B. ADDITIONAL SITE VISIT:

1. Additional site visits to be requested by end of day Tuesday, April 10th to allow scheduled dates/times to be issued by addenda for all interested parties.

C. REVISIONS TO THE PROJECT MANUAL:

1. **SE-310** – REQUEST FOR ADVERTISEMENT:
   A. Bid Delivery Addresses (located near bottom of page): Revise Hand-Delivery recipient name to read "Kay Keisler" (in lieu of Michelle Adams). The address remains the same.

D. REVISIONS TO DRAWINGS:

1. DRAWING P1.0 – GROUND FLOOR METHANE PROCESS PIPING:
   DRAWING P1.1 – FIRST FLOOR METHANE PROCESS PIPING:
   DRAWING P1.2 – SECOND FLOOR METHANE PROCESS PIPING:
   DRAWING P1.3 – THIRD FLOOR METHANE PROCESS PIPING:

   A. Replace these drawings with the attached revised Drawings P1.0, P1.1, P1.2 and P1.3, noted with Revision date of 04/09/12 for Addendum No. 01. Revisions have been shown clouded.

E. BIDDER QUESTIONS:

1. Is the pressure at the drops 100 psig as shown for the riser? Same 100 psig as the risers.

2. Is it required to only have 1 line down the service corridor with branches taking off left and right into the labs at Third Floor – or can lines run down either side of the corridor as was done with the hydrogen? Either 1 line down the center or line on either side of corridor is acceptable.

3. Can existing supports (brackets & pieces of unistrut) used for the existing hydrogen lines be used to support the methane piping? Existing unistrut supports can be used for new piping. Existing brackets support pneumatics lines that would be required to be relocated and properly supported to allow use of existing brackets.

4. Is this a Design/Build Project? No, adequate information is provided in documents to properly complete the work.

5. Are product data or pre-installation drawings required to be submitted? Product shall be submitted for review and approval. Pre-installation drawings are not required.

6. Drawings reference International Fuel Gas Code. Is this in place of or in addition to NFPA requirements? 2009 International Fuel Gas code is applicable code, per AHJ. NFPA guidelines are applicable, if referenced in 2009 IFGC.

END OF ADDENDUM

Watson Tate Savory Liollio
ARCHITECTURE

PRE-BID CONFERENCE MEMORANDUM

DATE:	05 April 2012
DATE OF MEETING:	05 April 2012, 9:00 a.m.
LOCATION OF MEETING:	USC FACILITIES & PLANNING 743 Greene Street Columbia, SC 29201
TO:	File
FROM:	Regina R. Floyd, AIA, LEED AP
RE:	**HORIZON CENTRAL GAS PIPING AUGMENTATION** **Horizon I Research Facility** University of South Carolina State Project No. H27-I966
SUBJECT:	**Pre-Bid Conference**
ATTENDING:	See attached sign-in sheets (3 pages)
COPY:	All Attendees

A. Kay Keisler, USC Project Procurement Officer, opened the meeting verifying that this was a non-mandatory pre-bid meeting and introduced the following attendees: Kay Keisler, procurement officer for USC and Regina Floyd, project architect with Watson Tate Savory Liollio Architecture.

B. Project Description:

1. Project is to provide design, labor, material and equipment to install a Methane Distribution system at the existing 5-story Horizon 1 Research Facility.
2. Contractor shall have a current South Carolina Process Piping Contractor License, in force when bids are offered.
3. Contractor must provide verification that company has designed and installed a low flow specialty gas system consisting of helically welded stainless steel piping and associated sensor system valued at $150,000 or more during the past 5 years.

C. Kay Keisler reviewed the bidding requirements and providing information for submitting a responsive bid:

1. Bid date is Thursday, April 19th at 2:00 p.m. at USC Facilities & Planning Office, 743 Greene Street, Columbia, SC in the same conference room where the pre-bid was held. No bids received after 2:00 will be opened and Bidders are urged to arrive a few minutes early and check the clock inside the room.

2. Bids shall be hand delivered or mailed. Bids shall be addressed to Kay Keisler as noted on the SE-310 Invitation for Bids. Bidders are requested to call Kay on bid day to confirm receipt of mailed bids at (803) 777-5812. If bids are hand delivered to front desk, bidder should make sure it is stamped in received prior to bid time.
3. Base Bid Amount should be indicated with figures only.
4. The Bid Security is 5% of the Base Bid amount and must be included with the bid. Bid Security may be submitted with the bid on an AIA A310 document with a power of attorney attached, by electronic bid bond, or by certified cashier check. An example of the AIA A310 form is included in the project manual.
5. Successful bidder will be required to provide Payment and Performance bonds on the forms provided in the project manual.
6. Bidders should review AIA Instructions to Bidders and 00201-OSE Standard Supplementary Instructions to Bidders for a list of items which may cause bids to be considered non-responsive. These items include but or not limited to:
   a. Bid delivered late
   b. Bid Security not attached
   c. Qualification of Bid
   d. Subcontractors not listed
   e. Addenda not acknowledged
6. Notice of Intent to Award will be posted at 743 Greene Street. Date of posting will be announced at the bid.
7. Plans are available at AGC (Association of General Contractors), Dodge Plan Room, Reed Construction Data, and USC purchasing website (purchasing.sc.edu), and from Watson Tate Savory Liollio as noted in the advertisement.

C. Specific Bidding Requirements were addressed as follows:

1. Substitution requests and written questions must be received by Watson Tate Savory Liollio no later than 6:00 p.m. on Tuesday, April 10, 2012, to allow substitution approvals to be issued by addenda.
2. At least one addenda will be issued to document the Pre-Bid Meeting.
3. Saturday, April 14th at 2:00 p.m. (120 hours prior to bid) is the cut-off time for Addenda to be issued by the Architect, except to change the date of the bid.
4. No questions that provide information not in the documents will be answered after the final addenda is issued.
5. Contract Time (120 calendar days) and Liquidated Damages requirements ($500 per day) on the Bid Form were reviewed.
6. No subcontractors are required to be listed on the bid form.

D. Specific Project Requirements were addressed as follows:

1. Special Inspections and Building Inspections will be required. Inspectors are hired by the agency and the cost is not to be included in the bid.
2. A portion of the Ground Floor at building may be utilized for contractor laydown area.
3. Parking for Contractor forces will be provided at gravel lot adjacent to building.
4. Larger utility elevator and Stair No. 3 at the South end of the building will be allowed to be used by the Upfit contractor – but clear access must be maintained for building occupants.

5. Work will be performed in finished and occupied areas of the building:
   a. Work in operating labs will be coordinated with the USC Facilities Building Manager.
   b. Any damage caused by Contractor forces to existing work or surfaces to be repaired by Contractor.
   c. Access to building occupants and egress from building must not be blocked by construction activities.
   d. No unplanned or scheduled interruptions to services or utilities will be allowed.

E. Site Visits:

1. Attendees were invited to Site Visit at the Horizon I Building and viewed the area to be upfit and an adjacent lab as an example of the finished construction.
2. Building will be open for an additional site visit if requested by end of day Tuesday, April 10th so that date and time of additional site visits can be issued to any interested parties by addendum.

Attachments: Pre-Bid Conference sign-in sheets, April 5, 2012 (3 pages).

END OF MEMORANDUM

University of South Carolina
Horizon Central Gas Piping Augmentation
Project Number: H27-I966
Non-Mandatory Pre-Bid Conference
April 5, 2012 @ 9:00 AM, 743 Greene Street, Columbia, SC 29208, Conf. Room 53

ATTENDEE'S NAME	COMPANY NAME & MAILING ADDRESS
Richard Douglas III	DFIT, LLC 418 WJ McLeod Rd Prosperity SC 29127 PHONE# 803-364-1514 FAX# same EMAIL dfit@bellsouth.net
Larry Nichols	DFIT ADDRC PHONE# FAX# EMAIL
REGINA FLOYD	WATSON TATE SAVORY LOLLIO PHONE# FAX# EMAIL
Charles Dunning	ZUUK INT'L, INC POBOX 70276 CHAS. SC 29415 3567 Meeting ST. 29405 PHONE# 843-414-8500 FAX# 843-414-9850 EMAIL Cdunning@ZUUKMAIL.com

Make sure to list your company name (on this form) the same way as if you were submitting a bid to us. Please print clearly. Addendum may be emailed.

University of South Carolina
Horizon Central Gas Piping Augmentation
Project Number: H27-I966
Non-Mandatory Pre-Bid Conference
April 5, 2012 @ 9:00 AM, 743 Greene Street, Columbia, SC 29208, Conf. Room 53

ATTENDEE'S NAME	COMPANY NAME & MAILING ADDRESS
John Hayes	ZunK International PO Box 70276 Charleston S.C. 29415 PHONE# 888-421-0225 FAX# 843-414-9850 EMAIL Jhayes@ZunKMail.com
Dale Blessing	Applied Engineered Systems, LLC 3404 Legareville Rd Johns Island, SC 29455 PHONE# 843-906-6655 (c) FAX# 843-559-9648 EMAIL wdblessing@yahoo.com
Don Gibson	U.S.C. Facilities Maintenance 743 Greene Cola SC 29208 PHONE# 777-1083 FAX# EMAIL dgibson@fmc.sc.edu
Kay Keisler	USC 743 Greene Street Columbia, SC 29208 PHONE# 803-777-5812 FAX# 803-777-8739 EMAIL KKeisler@fmc.sc.edu

Make sure to list your company name (on this form) the same way as if you were submitting a bid to us. Please print clearly. Addendum may be emailed.

University of South Carolina
Horizon Central Gas Piping Augmentation
Project Number: H27-I966
Non-Mandatory Pre-Bid Conference
April 5, 2012 @ 9:00 AM, 743 Greene Street, Columbia, SC 29208, Conf. Room 53

ATTENDEE'S NAME	COMPANY NAME & MAILING ADDRESS
Craig Spires	USC 743 Greene Street Columbia, SC 29208 PHONE# 803-312-4318 FAX# EMAIL CSSpires@fmc.sc.edu
	PHONE# FAX# EMAIL
	PHONE# FAX# EMAIL
	PHONE# FAX# EMAIL

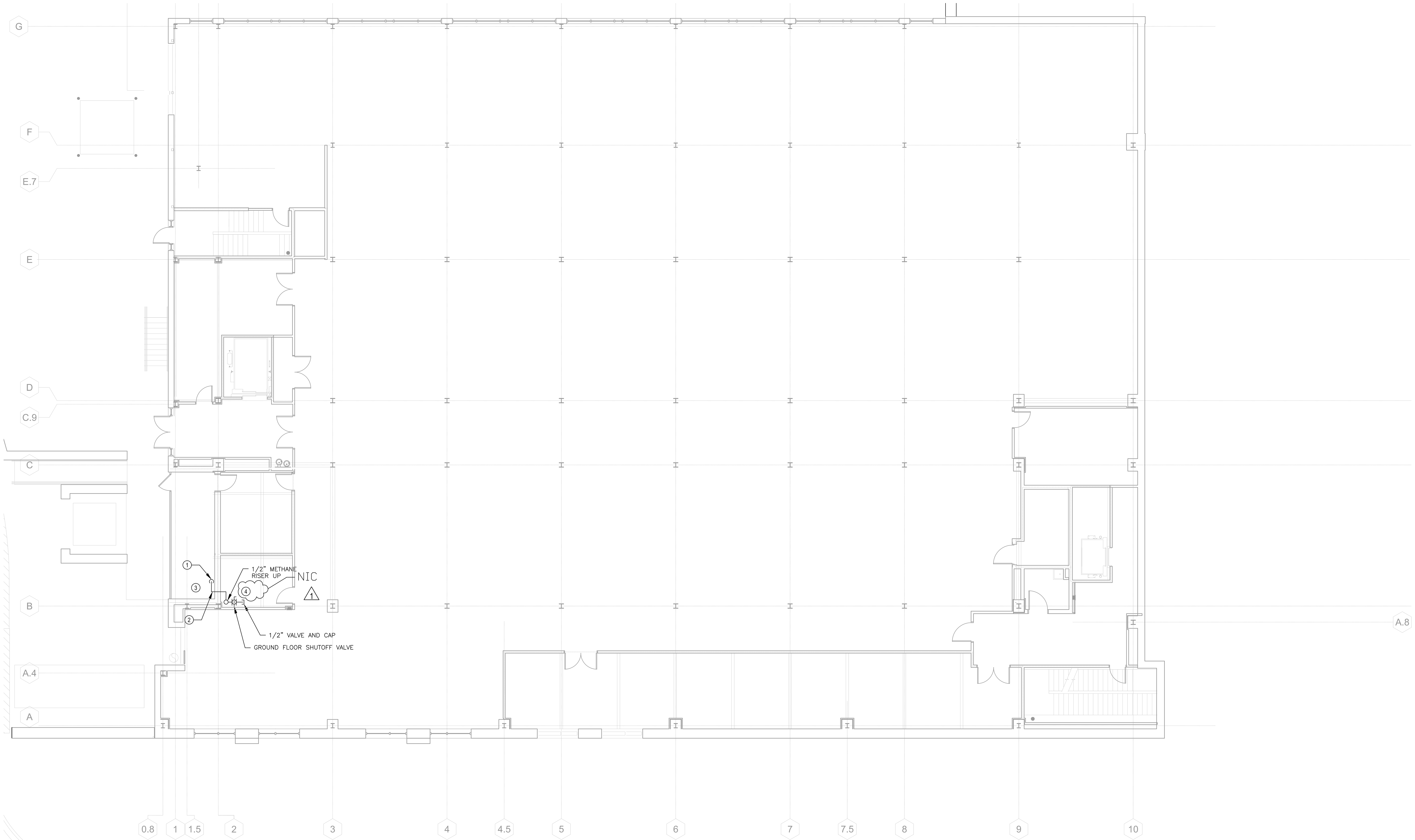
Make sure to list your company name (on this form) the same way as if you were submitting a bid to us. Please print clearly. Addendum may be emailed.

GENERAL NOTES:

1. ENTIRE METHANE PIPING SYSTEM SHALL BE INSTALLED IN COMPLIANCE WITH 2009 INTERNATIONAL FUEL GAS CODE.
2. EXCEPT FOR THROUGH PENETRATIONS, METHANE PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED IN EXPOSED LOCATIONS AND PROVIDED WITH READY ACCESS FOR VISUAL INSPECTION.
3. LAB GAS TUBING: THE LAB GAS PIPING SHALL BE FULLY ANNEALED, HIGH QUALITY SEEMLESS, DRAWN TYPE 316 AUSTENITIC STAINLESS STEEL HYDRAULIC TUBING COMPLYING WITH ASTM A269. 1/4"ø SHALL BE 0.035" WALL THICKNESS AND 1/2"ø SHALL BE 0.049" WALL THICKNESS. TUBING HARDNESS SHALL BE 80 HRB OR LESS.
   - 3.1. DURING WELDING, THE TUBING SYSTEM SHALL BE CONTINUOUSLY PURGED WITH UHP ARGON. CLEAN AND PURGE AT COMMISSIONING.
   - 3.2. SYSTEMS SHALL BE PRESSURE TESTED AT 300 PSIG (UHP HELIUM) FOR 24 HOURS. MAXIMUM PRESSURE DROP FOR THE 24 HOUR TEST (TEMPERATURE CORRECTED) SHALL BE 0 PSIG. THE TEST METHODS AND DEVICES USED SHALL BE APPROVED 5 DAYS PRIOR TO THE TEST. THE TEST DEVICES SHALL BE CALIBRATED AND TRACEABLE.
   - 3.3. THE MINIMUM SUPPORT SPACING SHALL BE 4 FT FOR 1/4" TUBING AND 5 FT FOR 1/2" TUBING.
   - 3.4. THE MANDREL BEND TUBING RADIUS SHALL BE A MINIMUM OF 3 TIMES THE TUBING OUTSIDE DIAMETER.
   - 3.5. TUBING SHALL BE SWAGELOK 316L-T4 AND T8 OR EQUAL.
   - 3.6. JOINING METHODS SHALL BE ORBITAL WELD FOR ALL JOINTS.
4. ALL NEW LAB GAS TUBING, COMPONENTS AND ASSOCIATED EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. THE LAB GAS SYSTEM, COMPONENTS AND EQUIPMENT SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR AFTER ACCEPTANCE BY THE OWNER INCLUDING LABOR AND MATERIALS.
5. REQUIRED CONTROL WIRING, PNEUMATIC CONTROL TUBING, SAFETY INTERLOCKS, ETC. SHALL BE COORDINATED WITH THE EXISTING GAS DETECTION AND FIRE ALARM SYSTEMS.
6. DROPS SHALL TERMINATE WITH 1/4 TURN BALL VALVE (SIMILAR TO SWAGELOK SS43G WITH COMPRESSION FITTING AND SC11 CLEANLINESS LEVEL).
7. SHUTOFF VALVES SHALL BE 1/4 TURN BALL VALVE (SIMILAR TO SWAGELOK SS43G WITH SC11 CLEANLINESS LEVEL.)
8. EXISTING GAS DETECTION SYSTEM SHALL REMAIN UNCHANGED.
9. PROVIDE SHOP DRAWING SUBMITTALS FOR ALL MATERIALS TO BE PROVIDED.
10. CONTRACTOR SHALL HAVE SOUTH CAROLINA PROCESS PIPING LICENSE AND MINIMUM 5 YEARS EXPERIENCE WITH ORBITALLY WELDED 316 STAINLESS STEEL PIPING SYSTEMS.

KEY NOTES:

1. PROVIDE COMBINATION AUTO/CHANGEOVER/BANK SELECTOR PRESSURE REGULATOR (SIMILAR TO SWAGELOK KMC1G9C412AD0010), 316 SS BODY, DUAL STAGE HIGH ACCURACY GAS DELIVERY SYSTEM. UNIT SHALL AUTOMATICALLY SWITCH GAS FLOW FROM A DEPLETED CYLINDERS IN MANIFOLD TO SECONDARY MANIFOLD (1 MANIFOLD PER SIDE WITH 2 CYLINDERS PER MANIFOLD.) UNIT SHALL BE BRACKET MOUNTED WITH 1/4" PORTS AND INCLUDE INLET AND SUPPLY PRESSURE GAUGES. MANIFOLD SHALL CONSIST OF MANUAL SHUTOFF VALVE, FLEXIBLE STAINLESS STEEL HOSE, CHECK VALVE (SIMILAR TO SWAGELOK 6LV-CW4BW4), AND CYLINDER GAS CONNECTION.
2. PROVIDE AIR TO OPEN SHUTOFF VALVE (SIMILAR TO SWAGELOK 6LUV-DP) AND EXCESS FLOW CONTROL VALVE (SIMILAR TO SWAGELOK SS-XSS4) BETWEEN SWITCHING PANEL AND METHANE PIPE ENTRANCE TO BUILDING.
3. PROVIDE VENTED RUPTURE DISC (SET @ 100 PSIG) ON BUILDING SERVICE SIDE OF CHANGEOVER PRESSURE REGULATOR, LOCATED IN CYLINDER BAY.
4. NIC — PROVIDE INFRARED COMBUSTIBLE GAS SENSOR FOR DETECTION OF METHANE. SENSOR SHALL BE SIMILAR TO SCOTT HEALTH & SAFETY SERIES 4688-IR OR EQUAL BY MSA, DET-TRONICS, THERMO SCIENTIFIC. SENSORS SHALL CONNECT TO EXISTING HONEYWELL PLC GAS DETECTION PANEL LOCATED IN 1ST FLOOR SERVICE CORRIDOR. SENSORS SHALL ALARM WHEN METHANE LEVEL REACHES 1% CONCENTRATION. FLOW CONTROL VALVE(S) SHALL CLOSE AND 2ND ALARM SHALL ACTIVATE WHEN 1.5% METHANE CONCENTRATION LEVEL IS SENSED. PROVIDE ELECTRICAL TRANSFORMER, WIRING, CONDUIT, CIRCUIT BREAKER FROM NEAREST EMERGENCY POWER PANEL AS REQUIRED FOR SENSORS.



1 / P1.0 **GROUND FLOOR METHANE PROCESS PIPING**

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

JOB N

Watson Tate Savory Liollio
ARCHITECTURE
Charleston | Asheville | Charlotte | Columbia

HORIZON CENTRAL GAS PIPING AUGMENTATION
Beta Research Facility Construction
University of South Carolina
Work Order No.: CP00326647/FM00378366

Innovista
University of South Carolina

SSOE, Inc.
2520 Meridian Parkway
Suite 450
Durham, NC 27713
T 919-361-9606
Project # 012-00147-00

SOUTH CAROLINA SSOE, INC. No. C 00746 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 27906 MEREDITH L. MAY
2/16/2012

Project Number: H27-I966

Date: 26 MARCH 2012

Revisions:

1	04/09/12	ADDENDUM 1

Ground Floor Methane Process Piping

P1.0

CONSTRUCTION DOCUMENTS

GENERAL NOTES:

1. ENTIRE METHANE PIPING SYSTEM SHALL BE INSTALLED IN COMPLIANCE WITH 2009 INTERNATIONAL FUEL GAS CODE.
2. EXCEPT FOR THROUGH PENETRATIONS, METHANE PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED IN EXPOSED LOCATIONS AND PROVIDED WITH READY ACCESS FOR VISUAL INSPECTION.
3. LAB GAS TUBING: THE LAB GAS PIPING SHALL BE FULLY ANNEALED, HIGH QUALITY SEEMLESS, DRAWN TYPE 316 AUSTENITIC STAINLESS STEEL HYDRAULIC TUBING COMPLYING WITH ASTM A269. 1/4"ø SHALL BE 0.035" WALL THICKNESS AND 1/2"ø SHALL BE 0.049" WALL THICKNESS. TUBING HARDNESS SHALL BE 80 HRB OR LESS.
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   - 3.2. SYSTEMS SHALL BE PRESSURE TESTED AT 300 PSIG (UHP HELIUM) FOR 24 HOURS. MAXIMUM PRESSURE DROP FOR THE 24 HOUR TEST (TEMPERATURE CORRECTED) SHALL BE 0 PSIG. THE TEST METHODS AND DEVICES USED SHALL BE APPROVED 5 DAYS PRIOR TO THE TEST. THE TEST DEVICES SHALL BE CALIBRATED AND TRACEABLE.
   - 3.3. THE MINIMUM SUPPORT SPACING SHALL BE 4 FT FOR 1/4" TUBING AND 5 FT FOR 1/2" TUBING.
   - 3.4. THE MANDREL BEND TUBING RADIUS SHALL BE A MINIMUM OF 3 TIMES THE TUBING OUTSIDE DIAMETER.
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5. REQUIRED CONTROL WIRING, PNEUMATIC CONTROL TUBING, SAFETY INTERLOCKS, ETC. SHALL BE COORDINATED WITH THE EXISTING GAS DETECTION AND FIRE ALARM SYSTEMS.
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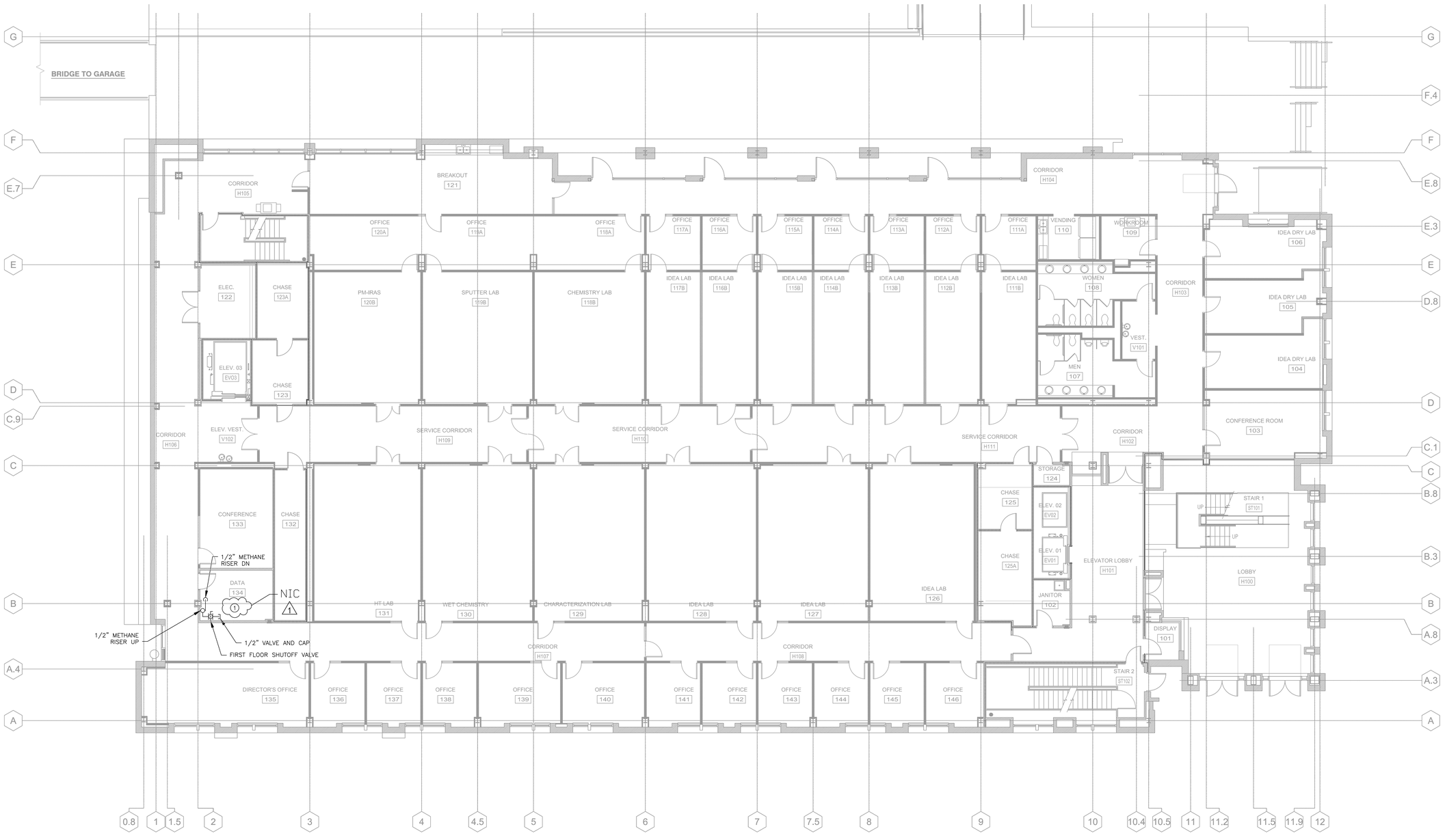
8. EXISTING GAS DETECTION SYSTEM SHALL REMAIN UNCHANGED.
9. PROVIDE SHOP DRAWING SUBMITTALS FOR ALL MATERIALS TO BE PROVIDED.
10. CONTRACTOR SHALL HAVE SOUTH CAROLINA PROCESS PIPING LICENSE AND MINIMUM 5 YEARS EXPERIENCE WITH ORBITALLY WELDED 316 STAINLESS STEEL PIPING SYSTEMS.

KEY NOTES:

NIC

1. PROVIDE INFRARED COMBUSTIBLE GAS SENSOR FOR DETECTION OF METHANE. SENSOR SHALL BE SIMILAR TO SCOTT HEALTH & SAFETY SERIES 4688-IR OR EQUAL BY MSA, DET-TRONICS, THERMO SCIENTIFIC. SENSORS SHALL CONNECT TO EXISTING HONEYWELL PLC GAS DETECTION PANEL LOCATED IN 1ST FLOOR SERVICE CORRIDOR. SENSORS SHALL ALARM WHEN METHANE LEVEL REACHES 1% CONCENTRATION. FLOW CONTROL VALVE(S) SHALL CLOSE AND 2ND ALARM SHALL ACTIVATE WHEN 1.5% METHANE CONCENTRATION LEVEL IS SENSED. PROVIDE ELECTRICAL TRANSFORMER, WIRING, CONDUIT, CIRCUIT BREAKER FROM NEAREST EMERGENCY POWER PANEL AS REQUIRED FOR SENSORS.



1 / P1.1 **FIRST FLOOR METHANE PROCESS PIPING**

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

JOB N

Watson Tate Savory Liollio ARCHITECTURE

Charleston | Asheville | Charlotte | Columbia

HORIZON CENTRAL GAS PIPING AUGMENTATION

Beta Research Facility Construction

innovista University of South Carolina

University of South Carolina

Work Order No.: CP00326647/PM00378366

ssoe

SSOE, Inc.
550 Mamaroneck Avenue
Suite 450
Harrison, New York 10528
T 914-381-7600
Project # 012-00147-00

SOUTH CAROLINA SSOE, INC. No. C 00746 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER NO. 27506 EDITH L. MAY 2/6/2012

Project Number: H27-I966

Date: 26 MARCH 2012

Revisions:

1	04/09/12	ADDENDUM 1

First Floor Methane Process Piping

P1.1

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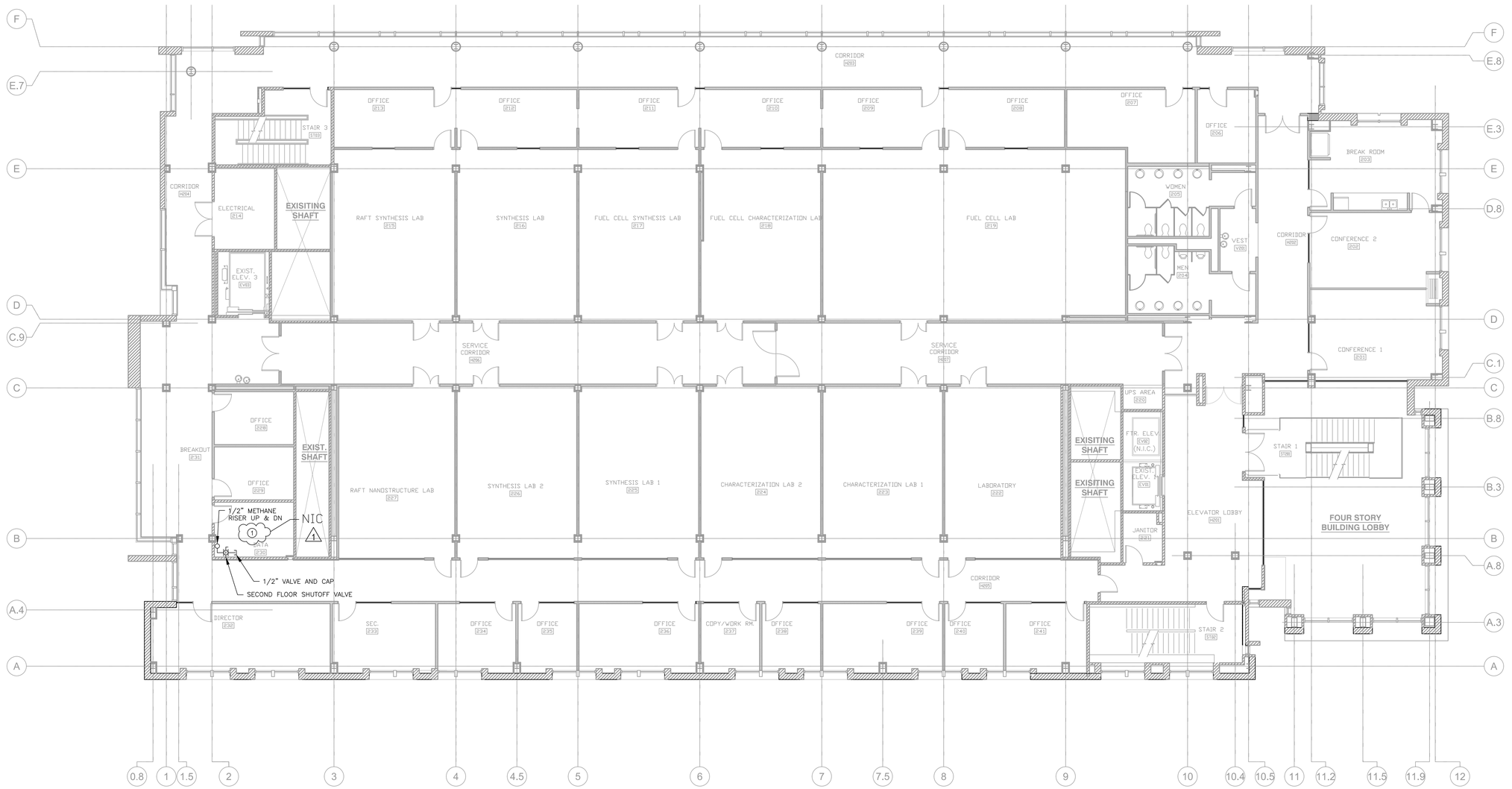


1 / P1.2 **SECOND FLOOR METHANE PROCESS PIPING**

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

JOB N

Watson Tate Savory Liollio ARCHITECTURE
Charleston | Asheville | Charlotte | Columbia

HORIZON CENTRAL GAS PIPING AUGMENTATION
Beta Research Facility Construction

innovista University of South Carolina

University of South Carolina
Work Order No.: CP00326647/PM00378366

ssoe
SSOE, Inc.
950 East Paces Ferry Road
Suite 450
Atlanta, Georgia 30326-1713
T 919-381-8000
Project # 012-00147-00

SOUTH CAROLINA
SSOE, INC.
No. C 00746
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
NO. 27506
REGISTERED PROFESSIONAL ENGINEER
EDITH L. MAYER
2/6/2012

Project Number: H27-I966

Date: 26 MARCH 2012

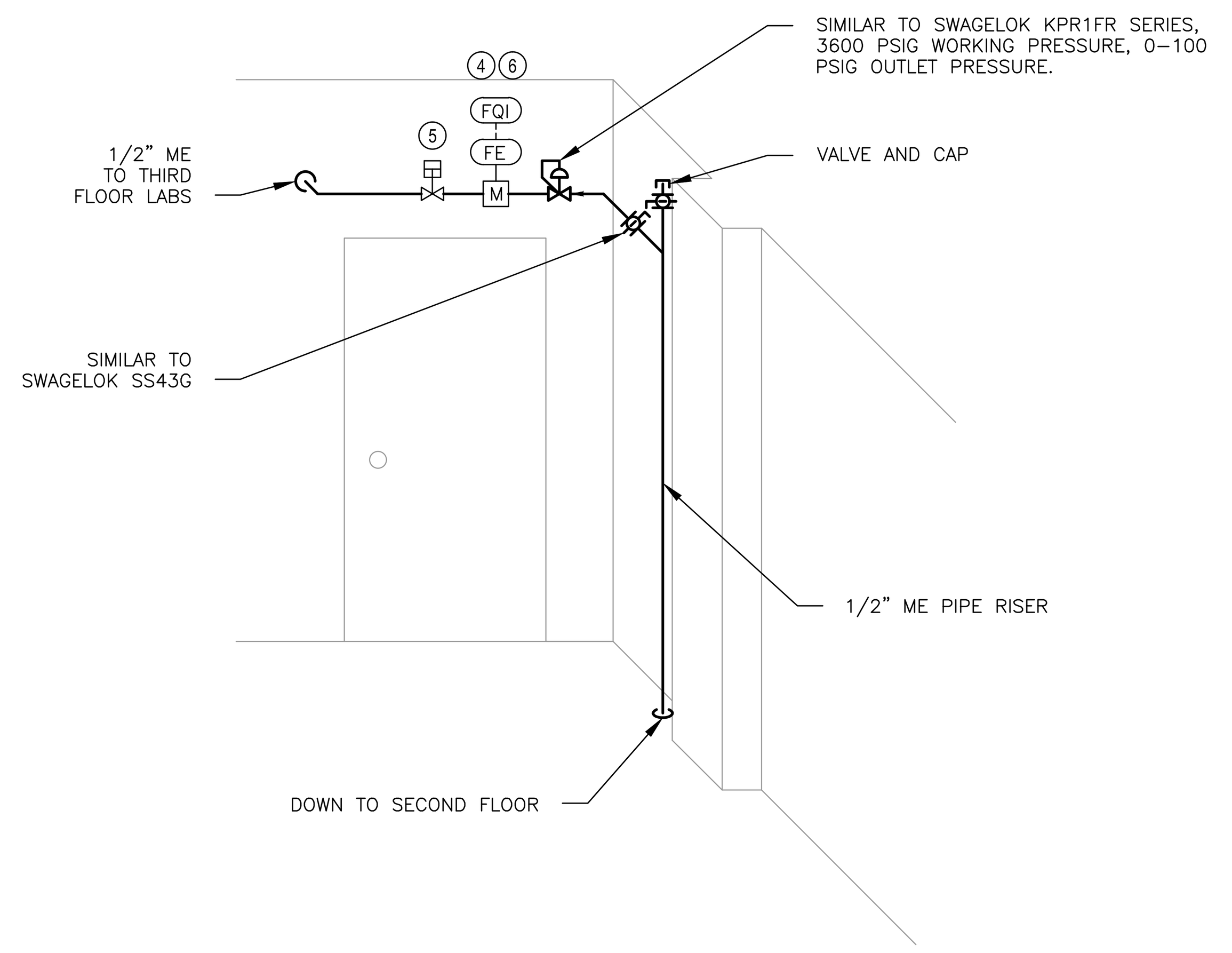
Revisions:

1	04/09/12	ADDENDUM 1

Second Floor Methane Process Piping

P1.2

CONSTRUCTION DOCUMENTS



2 / P1.3 — DATA ROOM 331 DETAIL

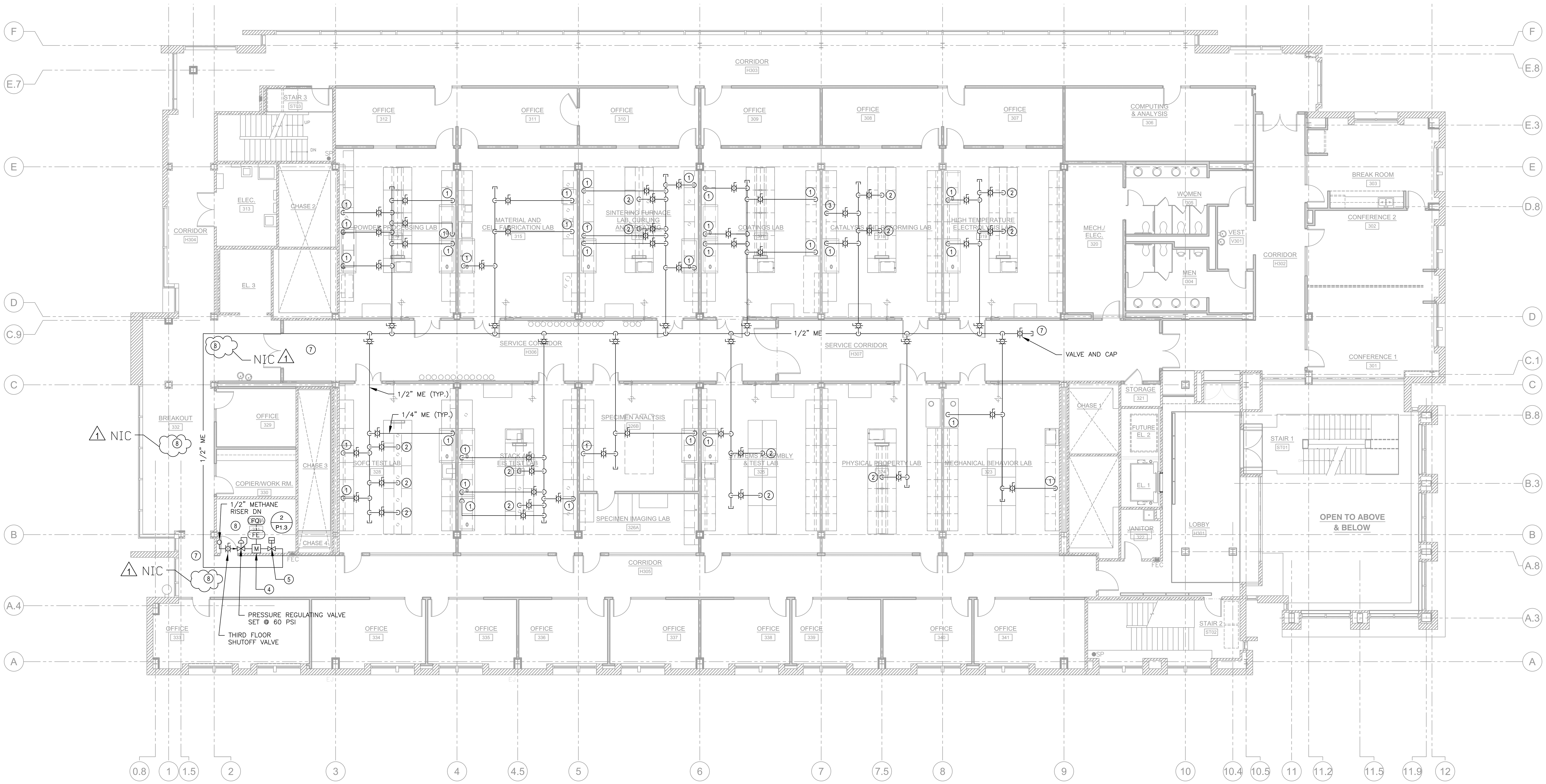
SCALE: NONE

GENERAL NOTES:

1. ENTIRE METHANE PIPING SYSTEM SHALL BE INSTALLED IN COMPLIANCE WITH 2009 INTERNATIONAL FUEL GAS CODE.
2. EXCEPT FOR THROUGH PENETRATIONS, METHANE PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED IN EXPOSED LOCATIONS AND PROVIDED WITH READY ACCESS FOR VISUAL INSPECTION.
3. LAB GAS TUBING: THE LAB GAS PIPING SHALL BE FULLY ANNEALED, HIGH QUALITY SEEMLESS, DRAWN TYPE 316 AUSTENITIC STAINLESS STEEL HYDRAULIC TUBING COMPLYING WITH ASTM A269. 1/4"Ø SHALL BE 0.035" WALL THICKNESS AND 1/2"Ø SHALL BE 0.049" WALL THICKNESS. TUBING HARDNESS SHALL BE 80 HRB OR LESS.
   - 3.1. DURING WELDING, THE TUBING SYSTEM SHALL BE CONTINUOUSLY PURGED WITH UHP ARGON. CLEAN AND PURGE AT COMMISSIONING.
   - 3.2. SYSTEMS SHALL BE PRESSURE TESTED AT 300 PSIG (UHP HELIUM) FOR 24 HOURS. MAXIMUM PRESSURE DROP FOR THE 24 HOUR TEST (TEMPERATURE CORRECTED) SHALL BE 0 PSIG. THE TEST METHODS AND DEVICES USED SHALL BE APPROVED 5 DAYS PRIOR TO THE TEST. THE TEST DEVICES SHALL BE CALIBRATED AND TRACEABLE.
   - 3.3. THE MINIMUM SUPPORT SPACING SHALL BE 4 FT FOR 1/4" TUBING AND 5 FT FOR 1/2" TUBING.
   - 3.4. THE MANDREL BEND TUBING RADIUS SHALL BE A MINIMUM OF 3 TIMES THE TUBING OUTSIDE DIAMETER.
   - 3.5. TUBING SHALL BE SWAGELOK 316L–T4 AND T8 OR EQUAL.
   - 3.6. JOINING METHODS SHALL BE ORBITAL WELD FOR ALL JOINTS.
4. ALL NEW LAB GAS TUBING, COMPONENTS AND ASSOCIATED EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. THE LAB GAS SYSTEM, COMPONENTS AND EQUIPMENT SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR AFTER ACCEPTANCE BY THE OWNER INCLUDING LABOR AND MATERIALS.
5. REQUIRED CONTROL WIRING, PNEUMATIC CONTROL TUBING, SAFETY INTERLOCKS, ETC. SHALL BE COORDINATED WITH THE EXISTING GAS DETECTION AND FIRE ALARM SYSTEMS.
6. DROPS SHALL TERMINATE WITH 1/4 TURN BALL VALVE (SIMILAR TO SWAGELOK SS43G WITH COMPRESSION FITTING AND SC11 CLEANLINESS LEVEL).
7. SHUTOFF VALVES SHALL BE 1/4 TURN BALL VALVE (SIMILAR TO SWAGELOK SS43G WITH SC11 CLEANLINESS LEVEL.)
8. EXISTING GAS DETECTION SYSTEM SHALL REMAIN UNCHANGED.
9. PROVIDE SHOP DRAWING SUBMITTALS FOR ALL MATERIALS TO BE PROVIDED.
10. CONTRACTOR SHALL HAVE SOUTH CAROLINA PROCESS PIPING LICENSE AND MINIMUM 5 YEARS EXPERIENCE WITH ORBITALLY WELDED 316 STAINLESS STEEL PIPING SYSTEMS.

(#) KEY NOTES:

1. METHANE PIPING DROPS TO WALL OUTLET ABOVE BENCH. DROP TO TERMINATE AT SAME HEIGHT AS EXISTING HYDROGEN VALVES.
2. METHANE PIPING DROPS TO OVERHEAD OUTLET AT EXISTING SERVICE CARRIER LOCATED AT 8'–0" AFF.
3. METHANE PIPING DROPS TO EXISTING OUTLET. DROP TO TERMINATE AT SAME HEIGHT AS EXISTING HYDROGEN VALVES.
4. FLOW ELEMENT (FATHOM MASS FLOW METER PN GR1121355 OR EQUAL).
5. FLOW CONTROL VALVE (ON–OFF) (SWAGELOK 6LVV–DP OR EQUAL).
6. INTERFACE FLOW METERING DEVICE AND FLOW CONTROL VALVE WITH EXISTING SENTINEL ALARM PANEL.
7. ROUTE METHANE PIPING ON WALL ADJACENT TO EXISTING HYDROGEN PIPING, COORDINATE ROUTE WITH EXISTING PIPING, DOORS, DUCTWORK, EQUIPMENT, ETC.
8. (NIC) PROVIDE INFRARED COMBUSTIBLE GAS SENSOR FOR DETECTION OF METHANE. SENSOR SHALL BE SIMILAR TO SCOTT HEALTH & SAFETY SERIES 4688–IR OR EQUAL BY MSA, DET–TRONICS, THERMO SCIENTIFIC. SENSORS SHALL CONNECT TO EXISTING HONEYWELL PLC GAS DETECTION PANEL LOCATED IN 1ST FLOOR SERVICE CORRIDOR. SENSORS SHALL ALARM WHEN METHANE LEVEL REACHES 1% CONCENTRATION. FLOW CONTROL VALVE(S) SHALL CLOSE AND 2ND ALARM SHALL ACTIVATE WHEN 1.5% METHANE CONCENTRATION LEVEL IS SENSED. PROVIDE ELECTRICAL TRANSFORMER, WIRING, CONDUIT, CIRCUIT BREAKER FROM NEAREST EMERGENCY POWER PANEL AS REQUIRED FOR SENSORS.



1 / P1.3 — THIRD FLOOR METHANE PROCESS PIPING

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

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ARCHITECTURE
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HORIZON CENTRAL GAS PIPING AUGMENTATION
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SOUTH CAROLINA / SSOE, INC. / No. C 00746 / CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA / LICENSED PROFESSIONAL ENGINEER / NO. 27906 / MEREDITH L. MAKE[illegible]
2/16/2012

Project Number: H27-I966

Date: 26 MARCH 2012

Revisions:

1	04/09/12	ADDENDUM 1

Third Floor Methane Process Piping

P1.3

CONSTRUCTION DOCUMENTS