State of Utah

JON M. HUNTSMAN, JR.
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Lieutenant Governor

Department of Administrative Services
KIMBERLY K. HOOD
Executive Director

Division of Facilities Construction and Management
DAVID G. BUXTON
Director

ADDENDUM #2

Date: August 5, 2009

To: Contractors

From: Mike Ambre, Project Manager, DFCM

Reference: Physical Education Building Infill
Utah Valley University, Orem, Utah
Project No. 09097790

Subject: **Addendum No. 2**

Pages	Addendum	1 page
	Revised Schedule	1 page
	Architects Addendum	26 pages
	Total	28 pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.

While we contend that SB220 should only be potentially applicable to a contract issued after the effective date of said bill, this is to clarify that for purposes of this contract, regardless of the execution or effective dates of this contract, the status of Utah Law and remedies available to the State of Utah and DFCM, as it relates to any matter referred to or affected by said SB220, shall be the Utah law in effect at the time of the issuance of this Addendum.

2.1 **SCHEDULE CHANGES – There are changes to the project schedule.**
Bid and Bid Bonds due – Wednesday, August 12, 2009 at 2:00 PM
Subcontractors List due – Thursday, August 13, 2009 by 2:00 PM

2.2 **GENERAL** – Axis Architects Addendum. Please see attached.

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	STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES **Division of Facilities Construction and Management**	**DFCM**

REVISED –PROJECT SCHEDULE
PER ADDENDUM #2 – dated August 5, 2009

PROJECT NAME: **PHYSICAL EDUCATION BUILDING INFILL**
UTAH VALLEY UNIVERSITY – OREM, UTAH
DFCM PROJECT NO. : 09097790

Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	July 16, 2009	12:00 PM	DFCM 4110 State Office Building SLC, UT and the DFCM web site*
Mandatory Pre-bid Site Meeting	Tuesday	July 21, 2009	11:00 AM	UVU Orem Campus (meet in the hall of the Physical Ed. Building)
Last Day to Submit Questions	Wednesday	July 29, 2009	12:00 PM	Michael Ambre– DFCM E-mail:mambre@utah.gov Fax (801)-538-3267
Addendum Deadline (exception for bid delays)	Wednesday	August 5, 2009	2:00 PM	DFCM web site*
Prime Contractors Turn in Bid and Bid Bond	**Wednesday**	**August 12, 2009**	**2:00 PM**	DFCM 4110 State Office Building SLC, UT
Subcontractors List Due	**Thursday**	**August 13, 2009**	**2:00 PM**	DFCM 4110 State Office Building SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	October 30, 2009	5:00 PM	

*** DFCM's web site address is http://dfcm.utah.gov**

Axis Architects

ADDENDUM - 1

Project: UVU PE Infill II
DFCM Project Number: 09097790
Axis Project Number: 0910
To: Mike Ambre
From: Axis Architects
Date: August 5, 2009

Please make the following revisions to the construction documents:

General:

1. Materials purchased for this project shall be tax exempt.
2. The Contractor shall provide dust-control during construction that will contain dust from construction operations within the area being worked on; including but not limited to, a dust control barrier along Grid E.8, between Grids 8.0 and 8.1.
3. A temporary office on site will not be required for this project.
4. Portable temporary toilets will not be required; provided the use of UVU's facilities by the Contractor does not create a cleanliness or maintenance problem. If UVU identifies that there is a problem, they can require portable toilets for Contractor use.
5. Refer to the attached Mechanical Addendum and associated Drawings and Specifications.

Answers to Submitted Questions:

1. Division 051200 Structural steel specs call for AISC certified fabricator on steel not DFCM approved. Is correct? **Answer:** Steel Fabricator shall meet the requirements of Division 051200, and the requirement on Drawing Sheet SE101, that Steel Fabricators must be on the DFCM list of approved fabricators.
2. On page AE201 note 3D in the center of the new structural concrete beam calls out a control joint. There is no detail for this I can find in the arch/structural drawings. Is it merely a chamfer joint? **Answer:** yes, it is a chamfer joint. See the existing beam along Grid E.8 for a similar condition.
3. There is a specification section 079513 Architectural Joint systems but I can't find anything on the plans. Is there a detail missing for this? **Answer:** an expansion joint will not be required for this project; see below.
4. Question regarding excavation for roof drain lines and related shoring? **Answer:** Excavation and Shoring will be required for work relating to roof drain lines. See below for Architectural and Plumbing revisions.

Specifications:

02 41 00 Selective Demilition; Part 3, 3.1, E - replace the text with the following: "Do not remove any element that might result in structural deficiency other than the elements clearly indicated to be removed on the drawings. Contractor is responsible for temporary shoring or other method of support".

07 95 13 Architectural Joint Systems – eliminate this section. Expansion joints will not be required on this project.

Drawings:

GI101 Replace the previously issued Drawing Sheet GI101 with the attached revised Drawing Sheet GI101.

AE001 1. Add the following note to apply to excavations for plumbing lines: Excavate as necessary to accomplish the work outlined in the plumbing drawings, and associated documents. Soils are sandy and loose and will require shoring. The existing roof drainage lines are at depths of approximately 14 feet below the existing grade. Provide shoring that will ensure that existing footings are not undermined, and that work can proceed safely at required depths. See Drawing Sheet SE001, VII General Conditions, G4 Shoring, for shoring requirements to accomplish this work. Shoring shall be designed and reviewed by the Structural Engineer before proceeding with excavation.

AE101 1. Add the following note to apply to excavations for plumbing lines: Excavate as necessary to accomplish the work outlined in the plumbing drawings, and associated documents. Soils are sandy and loose and will require shoring. The existing roof drainage lines are at depths of approximately 14 feet below the existing grade. Provide shoring that will ensure that existing footings are not undermined, and that work can proceed safely at required depths. See Drawing Sheet SE001, VII General Conditions, G4 Shoring, for shoring requirements to accomplish this work. Shoring shall be designed and reviewed by the Structural Engineer before proceeding with excavation.

2. A1/AE101 - At the wall between the Hallway and Office 151E, add Keynote 10A at the Hallway Side. Keynote 10A is already included in the Keynote Legend, and refers to Fire Extinguisher In Semi-Recessed Cabinet.

3. A1/AE101 - Revise the wall between the Hallway Office 151D to be framed with 6 inch studs (Wall Type tag indicating ‘6’). This wall will contain cleanouts for underslab roof drain lines. Coordinate with Plumbing Drawings.

4. A1/AE101 - At Office 151C, add a note at the floor that indicates: Set cleanouts for underslab roof drain lines flush with the T.O. Conc. Slab so carpet can be installed smooth over the top. Coordinate with Plumbing Drawings.

5. A1/AE101 – Revise the dimesion reading 1200’-0” parallel to Grid E.8 and starting at Grid 8.1, to read 12’-6”.

AE401 1. At Wall Section A4/AE401, eliminate ‘EXIST.’ From below Keynote 8B. This is the section of window that will be removed and relocated to this location as shown on the Plans and Elevation.

AE601 At Detail A4/AE601 – revise to show the sloped portion of the existing slab/wall edge being chipped away to 2 inches deep, and filled in level with concrete for a finished surface level with the new slab.

SE001 Replace the previously issued Drawing Sheet SE001 with the attached revised Drawing Sheet SE001.

EE101 Replace the previously issued Drawing Sheet EE101 with the attached revised Drawing Sheet EE101.

EX601 Replace the previously issued Drawing Sheet EX601 with the attached revised Drawing Sheet EX601.

Prior Approvals:

Products: The following manufacturers, trade names and products are allowed to bid on a name brand only basis with the provision that they completely satisfy all and every requirement of the drawings, specifications and all addenda shall conform to the design, quality and standards specified, established and required for the complete and satisfactory installation and performance of the building and all its respective parts.

Item	**Manufacturer**	**Comments**
EPDM Single-Ply Roofing System	Versico	Approved

Attachments:

Mechanical Addendum with associated Drawings and Specifications
Drawing Sheet GI101
Drawing Sheet SE001
Drawing Sheet EE101
Drawing Sheet EX601

Note: This addendum shall be part of the construction documents. Items in this addendum apply to all drawing and specification sections whether referenced or not involving the portion of the work added, deleted, modified or otherwise addressed in the addendum. Acknowledge receipt of this addendum in the space provided on the bid form. Failure to do so may subject the bidder to disqualification.

End of Addendum

ADDENDUM

Project Name: UVU PE Office Infill | Addendum No.: 1

DFCM Project # #09097790 | Date: 08-05-09

From: WHW Engineering Inc
8619 South Sandy Parkway
Sandy, Utah 84070
Phone (80) 466-4021 Fax (801) 466-8536

To: All bidders

This Addendum forms and becomes a part of the Contract Documents and modifies the original Bidding Documents dated July 2009 as noted below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of 18 pages.

I - CHANGES TO PRIOR ADDENDA: NA

II - CHANGES/CLARIFICATIONS TO SPECIFICATIONS:

Item II-1. Specification section 230900: Replace with the attached specification section 230900.

III - CHANGES/CLARIFICATIONS TO DRAWINGS:

Item III-1. Sheet PE101: According to as-built drawings, the existing roof drain line is approximately 15' below grade. Coordinate with the G.C. to provide excavation, shoring, backfill, landscaping repairs, etc. as necessary to make connections to this line. Take care to protect adjacent building, footings, landscaping, utilities, etc. as required. Existing concrete piping below new building envelope to be replace with cast iron. See attached drawing.

Item III-2. Sheet PE501: Details C2 and C4 have been added.

End of Mechanical Addendum

SECTION 230900 – AUTOMATIC TEMPERATURE CONTROLS

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the Building Management System (BMS) control equipment for HVAC systems and components, including open protocol control components for terminal heating and cooling units.

B. Related Sections include the following found in Division 23000 and 26000 Sections of the Specifications:

1. Fire Alarm Systems.
2. Basic Mechanical Requirements.
3. Refrigeration Equipment.
4. Air Handling Equipment.
5. Test and Balance.
6. Basic Electrical Requirements.
7. Cables, Low Voltage. (600 Volts and below)
8. Wiring Devices.
9. Motor Control Centers.
10. Basic Electrical Materials.

1.3 SYSTEM DESCRIPTION Ethernet (IEEE 802.3), peer-to-peer CSMA/CD

A. Furnish all labor, materials, equipment, and service necessary for a complete and operating temperature control system, utilizing a high speed peer to peer network of interoperable Direct Digital Controls (DDC), Graphical User Interface (GUI) with color graphic displays available for a minimum of at least p 64 possible client computers, and electronic interfaces and actuation devices, as shown on the drawings and as described herein.

B. The Local Area Network (LAN) shall be either a 10 or 100 Mpbs Ethernet network supporting BACnet, Java, XML, HTTP, and CORBA IIOP for maximum flexibility for integration of building data with enterprise information systems and providing support for multiple Universal Network Controllers (UNCs), user workstations and a local host computer system.

C. The Enterprise Ethernet (IEEE 802.3) LAN shall utilize Carrier Sense Multiple/Access/Collision Detect (CSMA/CD), Address Resolution Protocol (ARP) and User Datagram Protocol (UDP) operating at 10 or 100 Mbps.

D. The TAC-IA system will consist of an open architecture that utilizes EIA standard 709.1, the LonTalk™ protocol, as the common communication protocol between all controllers and integral ANSI / ASHRAE™ Standard 135-2004, BACnet functionality to assure interoperability between all system components. Both the LonTalk™ protocol and the ANSI / ASHRAE™ Standard 135-2004, BACnet protocol are required to assure that the project is fully supported by the leading HVAC open protocol to reduce future building maintenance, upgrade, and expansion costs.

E. Where utilized by a LonMark/LonWorks based Control System, LonTalk™ packets may be encapsulated into TCP/IP messages to take advantage of existing infrastructure or to increase network bandwidth.

1. Any such encapsulation of the LonTalk™ protocol into IP datagrams shall conform to existing LonMark™ guide-lines for such encapsulation and shall be based on industry standard protocols.
2. The products used in constructing the BMS shall be LonMark™ compliant.
3. In those instances in which Lon-Mark™ devices are not available, the BMS contractor shall provide LonWorks™ devices with application source code, device resource files, and external interface definitions.

F. The software tools required to network manage both LonTalk™ protocol and the ANSI / ASHRAE™ Standard 135-2004, BACnet protocol must be provided with the system. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein or on the plans that are required to meet the functional intent, shall be provided without additional cost to the Owner. Minimum BACnet compliance is Level 3; with the ability to support data read and write functionality. Physical connection of BACnet devices shall be via Ethernet/Ethernet IP or MS/TP.

a. Complete temperature control system to be DDC with electronic sensors and electronic/electric actuation of dampers and electronic actuation of terminal equipment valves and actuators as specified herein. The BMS is intended to seamlessly connect

G. All work described in this section shall be installed, wired, circuit tested and calibrated by factory certified technicians qualified for this work and in the regular employment of the authorized office representing the controls manufacturer. The authorized office shall have a minimum of 10 years of installation experience with the manufacturer and shall provide documentation in the bid and submittal package verifying longevity of the installing company's relationship with the manufacturer when requested. Supervision, calibration and checkout of the system shall be by the employees of the authorized office and shall not be subcontracted. The control contractor shall have an in place support facility within 50 miles of the site with factory certified technicians and engineers, spare parts inventory and all necessary test and diagnostic equipment for the installed system, and the control contractor shall have emergency service available.

1.4 INSTALLATION OF PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION.

A. Sections from Division 23000 – Ductwork Accessories:

1. Automatic Dampers.
2. Terminal Unit Controls.

1.5 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION.

1. Sections from Division 23000 –

1.6 PRODUCTS NOT FURNISHED OR INSTALLED BUT INTEGRATED WITH THE WORK OF THIS SECTION.

1. NA

B. Sections from Division 26000- Fire Alarm System.
   1. Smoke Detectors (duct).

1.7 SUBMITTALS.

A. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.

   1. Each control device labeled with setting or adjustable range of control.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

   1. Schematic flow diagrams showing fans, pumps, coils, dampers, valves, and control devices.
   2. Wiring Diagrams: Power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
   3. Details of control panel faces, including controls, instruments, and labeling.
   4. Written description of sequence of operation.
   5. Schedule of dampers including size, leakage, and flow characteristics.
   6. Schedule of valves including close-off and flow characteristics.
   7. Trunk cable schematic showing programmable control unit locations and trunk data conductors.
   8. Listing of connected data points, including connected control unit and input device.
   9. System graphics indicating monitored systems, data (connected and calculated) point addresses, and operator notations.
   10. System configuration showing peripheral devices, batteries, power supplies, diagrams, modems, and interconnections.

C. External Interface Files: XIF files or object diagrams for each DDC system component (Custom Application Controller and Application Specific Controller) proposed.

D. Software and Firmware Operational Documentation: Include the following:
   1. Engineering, Installation, Operation and Maintenance manuals.
   2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
   3. Device address list.
   4. Printout of software application and graphic screens.
   5. Licenses, guarantee, and warranty documents for all equipment and systems.

E. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

F. Maintenance Data: For systems to include in maintenance manuals specified in Division 1. Include the following:

   1. Maintenance instructions and lists of spare parts for each type of control device and compressed air station.
   2. Interconnection wiring diagrams with identified and numbered system components and devices.
   3. Keyboard illustrations and step-by-step procedures indexed for each operator function.
   4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
   5. Calibration records and list of set points.

G. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

H. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors. Revise Shop Drawings to reflect actual installation and operating sequences.

1.8 QUALITY ASSURANCE.

A. **Important:** Bids by wholesalers, distributors, mechanical contractors, ABCS, ACS, and non-franchised contractors shall not be acceptable. The intent of this is to ensure expertise, accountability, single point responsibility for the TAC-IA DDC System and the avoidance of conflict of interests with other divisions and contractors.

B. The system manufacturer shall, as a minimum, manufacture and supply the Custom Application Controller, Application Specific Controller, Unitary Equipment Controller, Advanced Application Controller, Graphical User Interface, damper actuators, and valve actuator assemblies., except where stated otherwise in this specification.

C. All work described in this section shall be installed, wired, circuit tested by TAC qualified and certified electricians that are licensed journeymen or enrolled in a qualified electrician apprentice program and properly supervised according to state and local ordinances. Also work described in this section shall be calibrated by factory certified technicians qualified for this work and in the regular employment of the temperature control system manufacturer's local field office.

D. The Building Management System contractor shall have a full service facility within 50 miles of the project that is staffed with engineers trained in Integrating Interoperable TAC-IA Systems and technicians fully capable of providing LonMark/LonWorks and/or BACnet instructions and routine emergency maintenance service on all system components.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilation Systems.".

G. Comply with National Electric Code, UL-916 Energy Management Systems, LonMark™, ULC, FCC Part 15, subpart J, Class B Computing Devices.

H. Comply with EIA Standard 709.1 LonTalk™ protocol for DDC system control components.

1.9 PRE-BID SUBMITTAL.

1.10 DELIVERY, STORAGE AND HANDLING.

A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to unit manufacturer.

1.11 COORDINATION.

A. Coordinate location of thermostats and other exposed control sensors with plans and room details before installation.

B. Coordinate equipment from other divisions including Motor-Control Centers," "Panelboards," and "Fire Alarm" to achieve compatibility with equipment that interfaces with those systems.

C. Coordinate supply of conditioned electrical circuits for control units and operator workstation.

D. Coordinate location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete".

E. Coordinate with the Owner's IT department on locations for UNC's, Ethernet communication cabling and TCP/IP addresses.

1.12 WARRANTY AND MAINTENANCE.

A. All components, system software, and parts furnished and installed by the BMS contractor shall be guaranteed against defects in materials and workmanship for 1 year of substantial completion. Labor to repair, reprogram, or replace these components shall be furnished by the BMS contractor at no charge during normal working hours during the warranty period. Materials furnished but not installed by the BMS contractor shall be covered to the extent of the product only. Installation labor shall be the responsibility of the trade contractor performing the installation. All corrective software modifications made during warranty periods shall be updated on all user documentation and on user and manufacturer archived software disks. The Contractor shall respond to the owner's request for warranty service within 24 standard working hours.

1.13 APPROVED MANUFACTURERS AND INSTALLING CONTRACTORS

1. TAC I/A-Series System as provided and installed by Utah-Yamas Controls Inc. Point of contact Bob Hooper 801-990-1950.
2. No other contractor or products considered.

1.14 DDC EQUIPMENT

A. The Operator Work Station, Graphical User interface as well as the associated Web services are all existing. This contractor shall generate graphics depicting this remodel and all affected mechanical equipment. All new controllers shall be added to the existing communication trunk so that all building ATC functions can be viewed and managed from multiple locations on campus.

B. Universal Network Controllers (UNC) shall employ a Niagara Framework™ software and hardware architecture solution (solution may be an OEM, licensed or re-branded product implementing the Niagara Framework™) as the foundation for managing and facilitating all services, global and communication functions.

1. The Universal Network Controllers (UNC) shall provide the interface between the LAN or WAN and the field control devices, and provide global supervisory control functions over the control devices connected to the UNC. It shall be capable of executing application control programs to provide:

   a. Calendar functions
   b. Scheduling
   c. Trending
   d. Alarm monitoring and routing
   e. Time synchronization by means of an Atomic Clock Internet site including automatic synchronization
   f. Integration of LonWorks controller data and BACnet controller data
   g. Network Management functions for all LonWorks based devices

C. Application Specific Control Units:

Single board construction comprising processor board with programmable, nonvolatile, RAM/EEPROM memory for custom control and unitary applications. ASCs shall be provided for Unit Ventilators, Fan Coils, Heat Pumps, Rooftop Units, and other applications as shown on the drawings. To assure complete interoperability, all ASCs firmware shall support all mandatory and all optional LonMark™ Standard Network Variables (SNVTs) for their LonMark™ profile as documented by the LonMark™ Interoperability Association. Bidder shall provide proof of ASC compliance for all the mandatory and all optional LonMark™ SNVTs. ASCs shall be based on the Echelon Neuron 3150 microprocessor working with the ASCs stand alone control program.

1. Units monitor or control each input/output point; process information; and download from the operator station.
2. Stand-alone mode control functions operate regardless of network status. Functions include the following:

    a. Peer to peer primary network level communications with automatic communications loss detection to maintain normal control functionality regardless of available network communications.
    b. Discrete/digital, analog, and pulse input/output.
    c. Monitoring, controlling, or addressing data points.
    d. Appropriate LonMark™ profiles for specific unitary applications.
    e. Support for all mandatory and optional LonMark™ Standard Network Variable Types (SNVTs) for their LonMark™ profile as documented by the LonMark™ Interoperability Association
    f. Internal customizable safeties and limits to prevent third party LonMark™ tools from providing improper and unrealistic inputs to ASC's.

3. Local operator interface port located on ASC and ASC sensor provides for download from or upload to portable workstation. All Lon bus devices shall be accessible from either port.
4. Communication: ASC's shall communicate with the Building Controller and CAC's at a baud rate of not less than 78.8K baud using LonTalk™ communications protocol (EIA 709.1).
5. ASC units monitor or control each input/output point; process information; and at least 50 expressions for customized HVAC control including mathematical equations, boolean logic, PID control loops with anti-windup, sequencers, timers, interlocks, thermostats, counters, interlocks, compare, limit, and alarms.
6. All ASC Controller setpoints shall be digital display setpoints with dual setpoint limits (integral hard limits which the user cannot exceed above and below and independent soft limits which are hidden from the user). All digital setpoints shall be network retentive after power outages and after replacement of sensor.

D. ASC Room Sensor

1. The ASC Sensor shall provide room temperature value to the ASC.
2. The ASC Sensor shall connect directly to the ASC and shall not utilize any of the I/O points of the controller.
3. The ASC Sensor shall provide a two-wire connection to the controller that is polarity and wire type insensitive.

4. The ASC Sensor shall be provided in a modular configuration that allows for the rough in of all wiring without the presence of the electronics or esthetic covering.
5. The ASC Sensor shall be provided in a modular configuration that allows for the rough in of all wiring without the presence of the electronics or esthetic covering.
6. The ASC Sensor shall allow for the customization of the color on the esthetic covering as a standard offering.
7. The ASC Sensor shall be supplied in the following manner:

    a. LCD display for showing (typically) the current temperature.
    b. Tenant override to allow timed override of unoccupied to occupied mode of operation.
    c. LED indication of override state.
    d. Up/Down keys to allow adjustment of the current setpoint
    e. User interface with the ASC Sensor shall be provided as a configurable function, and shall offer password protection for access to network variable editing.
    f. ASHRAE 95 compliance (LCD display and sub-base functionality)
    g. The room sensor shall provide access to additional diagnostic data from a sensor-user keypad request. This Diagnostic mode is displayed on the LCD screens and includes separate displays for the controllers:

        1) Subnet and Node Address
        2) Errors
        3) Alarms
        4) Temperature Offset

E. ASC – Fan Coil Unit, Unit Ventilator, Heat Pump, or Packaged Rooftop Controller Functionality.

Controls shall be microprocessor based as shown in the drawings or indicated in the sequence of operations. The ASC shall be a single integrated package consisting of a microprocessor, power supply, field terminations, and application software. The units shall be started and stopped from the BMS. A low limit protection thermostat in the mixed air section of the unit shall close down the outdoor air damper, open coil valves, and alarm the BMS when a temperature below 38°F (adjustable) is sensed. All input/output signals shall be directly hardwired to the ASC controller. In all cases, the controller shall automatically resume proper operation following the return of power to, or control by the ASC.

1. All ASCs must have an operating temperature range -40°F to 140°F and 5 to 95% RH, non condensing because they are located in the proximity of extreme temperatures (hot water/steam pipes or the outdoor air.)
2. All ASCs shall have capability for both ASHRAE Cycle II and ASHRAE Cycle III fully tested and validated. Bidder shall provide application documentation for ASC ASHRAE cycle II and III compliance including sequence of operation, controller program, and available SNVT's. The control program shall also be fully customizable in the field to accommodate any local or project specific requirements that may be required.
3. All duct averaging sensors for ASCs must be true continuous averaging units that sense the mean temperature over the complete length of the sensor end to end.

Sensors that provide four or nine sensing points, which may be accurate due to air temperature stratifications, are not acceptable.

4. All ASCs shall be easily replaceable for ease of future maintenance and to minimize downtime.
5. The outputs of the ASC shall be of the relay Form C and universal analog form. All digital outputs shall be relay type Form C. ASC devices utilizing non-relay outputs shall provide an interface relay for all points. All analog outputs shall be programmable for their start points and span to accommodate the control devices.

F. LANs:

Capacity for a minimum of 64 client workstations connected to multi-user, multitasking environment with concurrent capability to access DDC network or control units.

1. Enterprise Network LAN

   a. Media: Ethernet (IEEE 802.3), peer-to-peer CSMA/CD, operating at 10 or 100 Mbps, cable 10 Base-T, UTP-8 wire, category 5

2. Primary Controller Network LAN

   a. Media: LonTalk™ (EIA 709.1), peer to peer, FTT-10 operating at 78.8K.

3. Secondary Network LAN (If Required)

   a. Media: LonTalk™ (EIA 709.1), peer to peer, FTT-10 operating at 78.8K

4. Remote Connection

   a. ISDN, ADSL, T1 or dial-up connection, monthly charges paid by building owner

G. Software: Existing

1.15 CONTROL PANELS

A. Local Control Panels: Unitized NEMA 1 cabinet with suitable brackets for wall or floor mounting, located adjacent to each system under automatic control. Provide common keying for all panels.

1. Fabricate panels 0.06-inch thick, furniture-quality steel, or extruded-aluminum alloy, totally enclosed, with hinged doors and keyed lock and with manufacturer's standard shop-painted finish.
2. Interconnections between internal and face-mounted devices pre-wired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections shall be UL Listed for 600 volt service, individually identified per control/interlock drawings, with adequate clearance for

field wiring. Control terminations for field connection shall be individually identified per control drawings.

3. Door-Mounted Equipment: Flush-mount (on hinged door) manual switches, including damper-positioning switches, changeover switches, thermometers, and gauges.
4. Provide ON/OFF power switch with over-current protection for control power sources to each local panel.

1.16 SENSORS

A. Electronic Temperature Sensors: Vibration and corrosion resistant for wall, immersion, or duct mounting as required.

1. Resistance Temperature Detectors: Platinum, thermistor, or balco

a. Accuracy: Plus or minus 0.2 percent at calibration point; thermistors shall have a maximum 5 year drift of no more than .225°F maximum error of no more than .36°F
b. Wire: Twisted, shielded-pair cable
c. Insertion Elements in Ducts: Single point, 6 inches long; use where not affected by temperature stratification or where ducts are smaller than 4 sq. ft.
d. Averaging Elements in Ducts: 60 inches, long, flexible for use where prone to temperature stratification or where ducts are larger than 4 sq. ft.; 264 inches long, flexible for use where prone to temperature stratification or where ducts are larger than 16 sq. ft; length as required.
e. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
f. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
g. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.

B. Equipment operation sensors as follows:

1. Status Inputs for Electric Motors: Current-sensing relay with current transformers, adjustable and set to 175 percent of rated motor current.

C. Electronic Damper Position Indication: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.

1.17 ACTUATORS

A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action under all environmental conditions (temperature, low power voltage fluctuations, tight seal damper design, maximum air and water flow forces).

1. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring

mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.

2. Nonspring-Return Motors for Valves Larger Than NPS 2-1/2": Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
3. Spring-Return Motors for Valves Larger Than NPS 2-1/2": Size for running and breakaway torque of 150 in. x lbf.
4. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
5. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

B. Electronic Damper and Valve Actuators: Direct-coupled type non-hydraulic designed for minimum 100,000 full-stroke cycles at rated torque. The actuator shall have rating of not less than twice the thrust needed for actual operation of the damper or valve

1. Coupling: V-bolt and V-shaped, toothed cradle.
2. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
3. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on non-spring-return actuators.
4. Actuators shall have the ability to be tandem mounted.
5. All spring-return actuators shall have a manual override. Complete manual override shall take no more than 10 turns.
6. Power Requirements (Two-Position Spring Return): 24V ac or dc, Maximum 10VA.
7. Power Requirements (Modulating): Maximum 15 VA at 24V ac.
8. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal.
9. Temperature Rating: -22°F to 140ºF.
10. Run Time: 200 seconds open, 40 seconds closed.
11. All actuators shall have a 5-year warranty.
12. Valves:

    a. Size for torque required for valve close-off at maximum pump differential pressure (regardless of water loop system pressures).
    b. Valve and Actuators shall come from the factory fully assembled.
    c. Spring Return Manual Override shall come with a 10 Degree Valve Preload to assure tight close off.

13. Dampers:

    a. Size for running torque calculated as follows:

        1) Parallel-Blade Damper with Edge Seals: 7 inch-pounds/sq. ft. of damper.

        2) Opposed-Blade Damper with Edge Seals: 5 inch-pounds/sq. ft. of damper.

        3) Parallel-Blade Damper without Edge Seals: 4 inch-pounds/sq. ft. damper.

        4) Opposed-Blade Damper without Edge Seals: 3 inch-pounds/sq. ft. of damper.

5) Dampers with 2 to 3 Inches wg. of Pressure Drop or Face Velocities of 1000 to 2500 FPM Multiply the minimum full-stroke cycles above by 1.5.

6) Dampers with 3 to 4 Inches wg. of Pressure Drop or Face Velocities of 2500 to 3000 FPM Multiply the minimum full-stroke cycles above by 2.0.

b. Spring Return Manual Override actuators shall have a factory set 5 Degree Damper Preload.

1.18 DAMPERS

A. Dampers: AMCA-rated, parallel, opposed blade designs; 0.1084 inch minimum, galvanized-steel frames with holes for duct mounting; damper blades shall not be less than 0.0635 inch galvanized steel with maximum blade width of .8 inches.

1. Blades shall be secured to 1/2-inch diameter, zinc-plated axles using zinc-plated hardware, with nylon blade bearings, blade-linkage hardware of zinc-plated steel and brass, ends sealed against spring-stainless-steel blade bearings, and thrust bearings at each end of every blade.
2. Operating Temperature Range: -40°F to 200°F
3. For standard applications, include optional closed-cell neoprene edging.
4. For low-leakage applications, use parallel- or opposed-blade design with inflatable seal blade edging, or replaceable rubber seals, rated for leakage at less than 10 cfm per sq. ft. of damper area, at differential pressure of 4 inches wg. when the damper is being held by torque of 50 in. x lbf; when tested according to AMCA 500D.

1.19 CONTROL CABLE

A. Electronic and Fiber-Optic Cable for Control Wiring: As specified in Division 16 Section "Control/Signal Transmission Media."

B. LON communication cable shall be category 4.

1. EXECUTION

1.20 EXAMINATION

A. Verify that conditioned power supply is available to control units and operator workstation.

B. Verify that duct, pipe, and equipment mounted devices and wiring are installed before proceeding with installation.

1.21 INSTALLATION

A. Install equipment level and plumb.

B. Install software in control units and operator workstation. Implement all features of programs to specified requirements and as appropriate to sequence of operation.

C. Connect and configure equipment and software to achieve sequence of operation specified.

D. Verify location of thermostats and other exposed control sensors with plans and room details before installation. Locate all 60 inches above the floor.

   1. Install averaging elements in ducts and plenums in crossing or zigzag pattern.

E. Install guards or tamper proof enclosures on thermostats in the following locations:

   1. Entrances.
   2. Public areas.
   3. Where indicated.

F. Install automatic dampers according to Division 23000 Section "Duct Accessories.

G. Install damper actuators on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

H. Install labels and nameplates to identify control components according to Division 23000 Section "Basic Mechanical Materials and Methods."

I. Install labels and nameplates to identify control components according to Division 23000 Section "Mechanical Identification."

J. Install duct volume-control dampers according to Division 23000 Sections specifying air ducts.

K. Install electronic and fiber-optic cables according to Division 26000 Section "Control/Signal Transmission Media."

1.22 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Install raceways, boxes, and cabinets according to Division 26000 Section "Raceways and Boxes."

B. Install building wire and cable according to Division 26000 Section "Conductors and Cables."

C. Install signal and communication cable according to Division 26000 Section "Control/Signal Transmission Media."

   1. Cable may be installed in plenums where reasonable access is available as allowed by the National Electrical Code and local area codes.
   2. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.

3. Install exposed cable in raceway.
4. Install concealed and inaccessible cable in raceway.
5. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
6. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
7. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.

1.23 CONNECTIONS

A. Piping installation requirements are specified in other Division 23000 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

1. Install piping adjacent to machine to allow service and maintenance.

B. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

1.24 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections.

B. Replace damaged or malfunctioning controls and equipment.

1. Start, test, and adjust control systems.
2. Demonstrate compliance with requirements, including calibration and testing, and control sequences.
3. Adjust, calibrate, and fine tune circuits and equipment to achieve sequence of operation specified.

C. Verify DDC as follows:

1. Verify software including automatic restart, control sequences, scheduling, reset controls, and occupied/unoccupied cycles.
2. Verify operation of operator workstation.
3. Verify local control units including self-diagnostics.

1.25 ON-SITE ASSISTANCE

A. Occupancy Adjustments: Within one year of date of Substantial Completion, provide one Project site visit, as scheduled by Owner, to adjust and calibrate components and to assist Owner's personnel in making program changes and in adjusting sensors and controls to suit actual conditions for one visit addressing summer specific sequences

and operations and one visit addressing winter specific sequences and operations. The site visit will consist of no more than 8 hours.

1.26 SEQUENCE OF OPERATION

A. General: The over all intent of this remodel is to provide DDC Control of two new packaged Rooftop air handling units. The overall functionality and quality of workmanship will meet the existing campus standard as well as DFCM standard for "High Performance Buildings.

B. Rooftop Air Handling Units (Typical of 1)

The Constant Volume Rooftop air handling units consist of a mixed air section with outdoor air and return air dampers, Dx Cooling and Gas Heat (2-stages each). The unit is DDC controlled using electric actuation.

The air handling unit is scheduled for automatic operation on a time of day basis for Occupied and Unoccupied modes. Within the Occupied mode, the system can enter the Warm-Up mode when the space temperature is below set point or the Cool-Down mode when the space temperature is above set point. The system stays in the Warm-Up or Cool-Down mode until the mode set point is satisfied. Within the Unoccupied mode, Night Heating is available when the space temperature drops below 65 degrees F (18 degrees C). The latest start time is the scheduled occupancy for the space.

The air handling unit operates in Warm-Up, Cool-Down, Occupied, Unoccupied, Night Heating and Safety modes as follows (All suggested set points and settings are adjustable.):

Warm-Up

The supply fan starts. The mixing dampers are positioned for 100% return air, the DX cooling remains disabled. The gas heat stages on to maintain the space temperature set point (72°F Adjustable). If time reaches the latest start time during the Warm-Up mode, the outdoor air damper opens to its minimum position. The system is prevented from entering the Warm-Up mode more than once per day. When the space temperature falls below setpoint as noted by a space temperature sensor, the gas heat is enabled. The converse occurs when the space temperature rises above setpoint.

Cool-Down

The supply fan starts. The gas heat is disabled. The DX cooling is enabled and the mixing dampers modulate to maintain the space temperature set point. When the outdoor air dry bulb temperature is above the economizer changeover value, the mixing dampers are positioned for 100% return air. If time reaches the latest start time during the Cool-Down mode, the outdoor air damper opens to its minimum position or is controlled in economizer operation.

Occupied

The fan starts or continues to run and the unit is controlled as follows:

When the outside air dry bulb temperature is below the economizer changeover value, the Gas Heat and DX Cooling are enabled and mixed air dampers modulate in sequence without overlap to maintain the desired Space temperature set point. The mixing dampers ramp open slowly to minimize overshooting.

When the outside air dry bulb temperature is above the economizer changeover value, the mixing dampers are placed in the minimum outdoor air position. The Gas Heat and DX Cooling are enabled in sequence without overlap to maintain the supply air temperature set point.

Unoccupied (Normal Off)

The supply fan stops, the DX Cooling is disabled and the mixing dampers close to the outdoor air. If the OAT is less than 45 degrees F (7 degrees C), the Gas heat is enabled to maintain the unoccupied supply air set point. If the OAT is 45 degrees F (7 degrees C) or above, the gas heat is disabled.

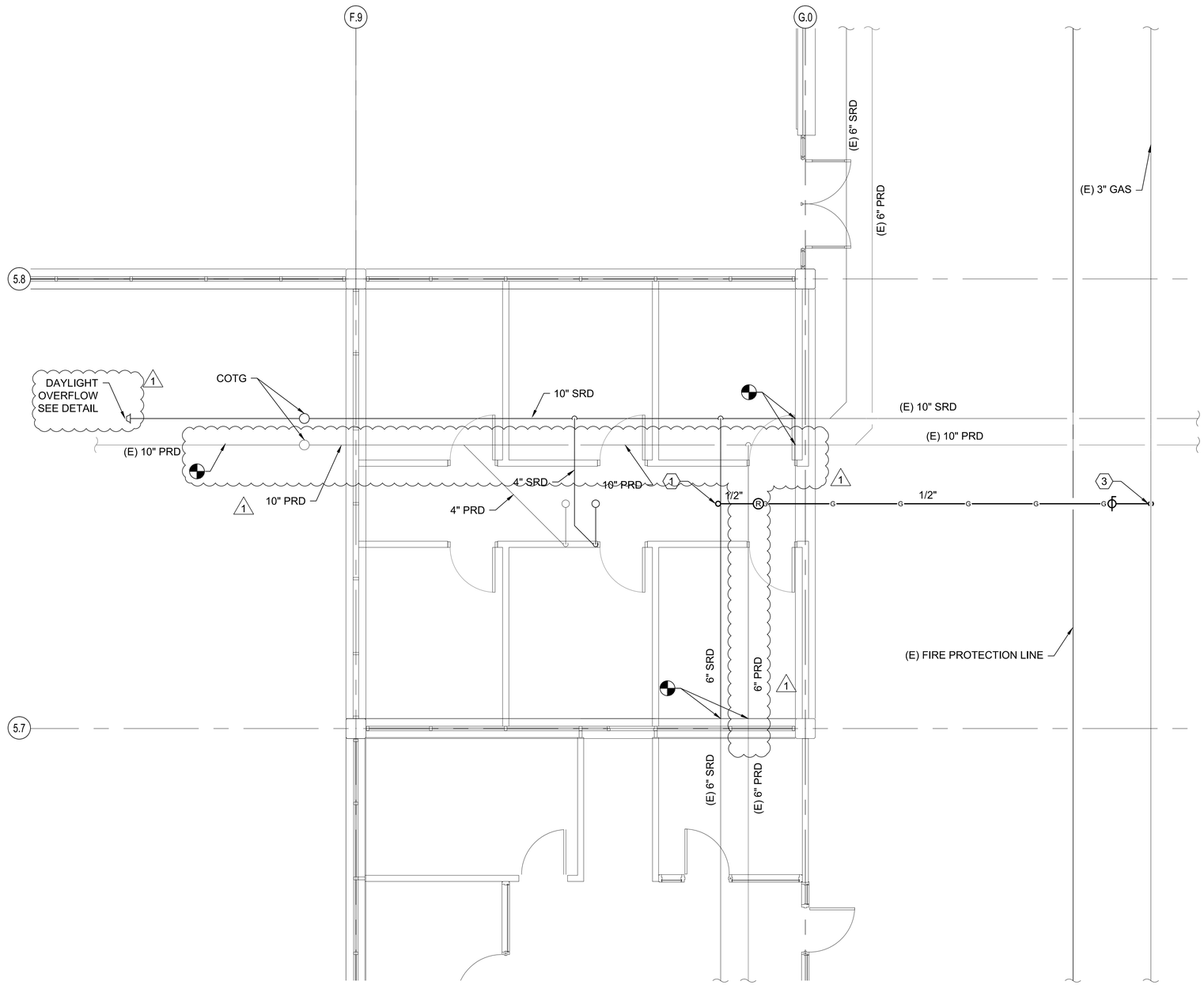
Safety

If the rooftop unit is called to be on and does not, as sensed by the current transmitter and verified through the discharge air temperature, an alarm shall be sent to the central work station.

POINTS TO INCLUDE:

Supply Fan	DI/DO
Economizer Dampers	AO
Discharge Air Temperature	AI
Return Air Temperature	AI
Space Temperature	AI
Gas Heat (2-stages)	DO
DX Cooling (2-stages)	DO
RTU Safety	DI

END OF SECTION 230900



A2 PLUMBING FLOOR PLAN

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

PROJECT NORTH

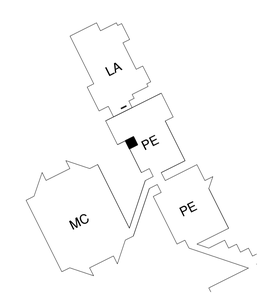
SHEET NOTES:

1. NEW 1/2" GAS LINE UP TO NEW ROOF TOP UNIT. SEE PE102 FOR CONTINUATION.
2. ROUTE GAS PIPING HIGH TIGHT TO STRUCTURE.
3. TIE INTO EXISTING GAS LINE. GAS LINE WILL NEED TO BE ISOLATED AND COMPLETED PURGED FOR TIE IN. SHUT DOWN OF GAS LINE WILL NEED TO BE DONE DURING LOW USAGE TIME, AND COMPLETED AS QUICKLY AS POSSIBLY. COORDINATE WITH UVU PROJECT MANAGER.

GENERAL NOTES:

1. FIRE SPRINKLERS SHALL BE PROVIDED BY DESIGN BUILD FIRE SPRINKLER CONTRACTOR, PER UTAH VALLEY UNIVERSITY FIRE MARSHALL REQUIREMENTS. DESIGN BUILD CONTRACTOR SHALL BE NICET CERTIFIED PER SPECIFICATION AND SHALL PROVIDE DEFERRED SUBMITTAL WITH ALL APPLICABLE CALCULATIONS DRAWINGS ETC.
2. ALL PIPING, DUCT WORK, CONDUIT, ETC. TO BE PAINTED &/OR LABELED IN ACCORDANCE WITH UVU STANDARDS. SEE SPECIFICATIONS.
3. ALL PIPING UNDER NEW BUILDING ENVELOPE SHALL BE REPLACED WITH CAST IRON.

KEYPLAN



WHW ENGINEERING INC.
MECHANICAL ELECTRICAL PLUMBING
8618 South Pioneer Suite 101
WEST JORDAN, UTAH 84088
(801)568-0211 FAX 496-0506
EMAIL: bobbitt@whwengineering.com

UVU

Axis Architects

352 SOUTH DENVER STREET (440 E.) SALT LAKE CITY UTAH 84111 P 355-3003 F 355-0113

Utah Valley University Physical Education Infill II

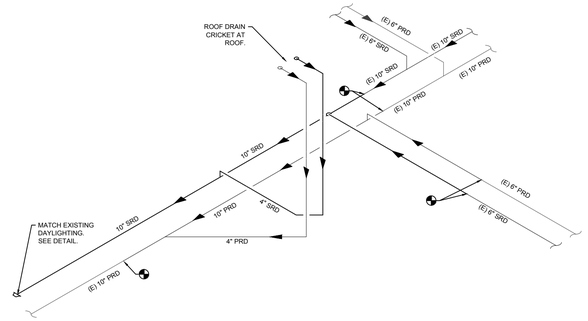
OREM, UTAH

1 ADDENDUM 1

Axis Job #	0910
Owner #	09097790
Date	07-10-2009
Drawn	STAFF
Checked	WP

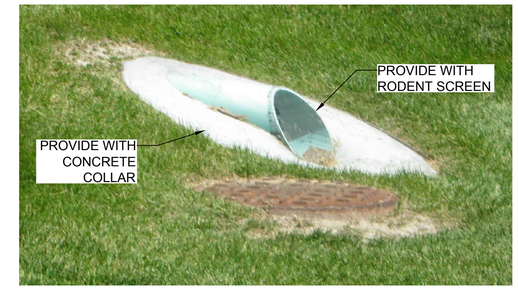
PLUMBING PLANS

PE101

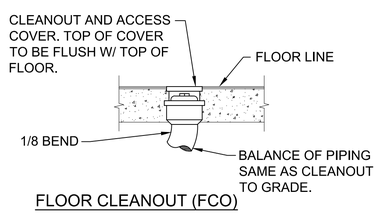


1

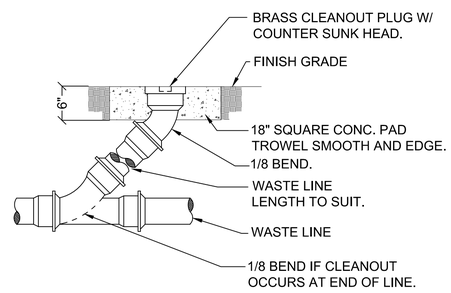
C2 ROOF DRAIN ISOMETRIC DETAIL
SCALE: NONE



C4 DAYLIGHT OVERFLOW DETAIL
SCALE: NONE

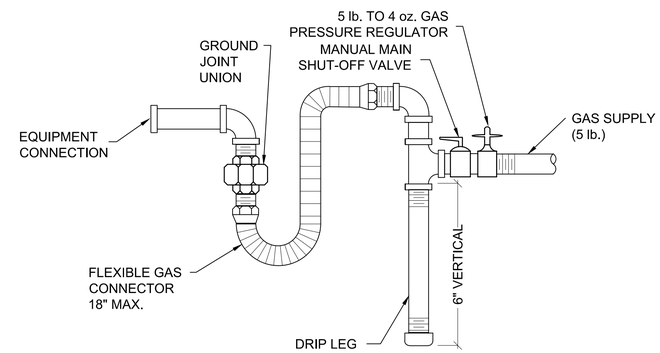


FLOOR CLEANOUT (FCO)

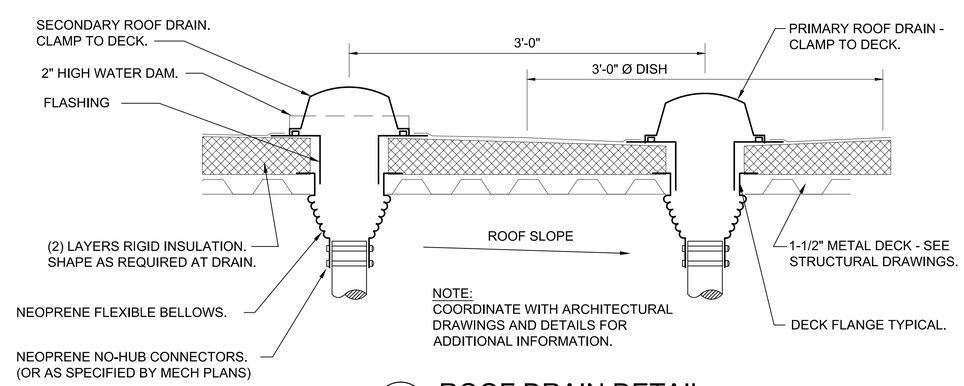


CLEANOUT TO GRADE (COTG)

B2 CLEAN-OUT DETAILS
SCALE: NONE



B4 GAS LINE CONNECTION DETAIL
SCALE: NONE



A4 ROOF DRAIN DETAIL
SCALE: NONE

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	INDIVIDUAL LINE SIZES					REMARKS
		TRAP	WASTE	VENT	COLD WATER	HOT WATER	
PRD-1	PRIMARY ROOF DRAIN	-	4"	-	-	-	
SRD-1	SECONDARY ROOF DRAIN	-	4"	-	-	-	

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DFCM

UVU

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Utah Valley University Physical Education Infill II
OREM, UTAH

1 ADDENDUM 1

Axis Job #	0910
Owner #	09097790
Date	07-10-2009
Drawn	STAFF
Checked	WP

PLUMBING DETAILS AND SCHEDULES

PE501

CODE ANALYSIS

APPLICABLE CODES

	Year		Year
International Building Code	2006	National Electrical Code	2008
International Mechanical Code	2006	Uniform Code for Building Conservation	
International Fuel Gas Code	2006	ADA Accessibility Guide lines	ICC/ANSI 117.1 2003
International Plumbing Code	2006		
International Fire Code	2006		
International Energy Conservation Code	2006		

A. Occupancy and Group: B

Change in Use: Yes ____ No ✓ Mixed Occupancy: Yes ✓ No ____
Special Use and Occupancy (e.g. High Rise, Covered Mall): COVERED MALL BUILDING

B. Seismic Design Category: D Design Wind Speed: 90 mph

C. Type of Construction (circle one):

I/A I/B II/A (II/B) III/A III/B IV/HT V/A V/B

D. Fire Resistance Rating Requirements for the Exterior Walls based on the fire separation distance (in hours):

North: 0 South: 0 East: 0 West: 0

E. Mixed Occupancies: ✓ Non separated Uses: 0

F: Sprinklers:

Required: ✓ Provided: ✓

Type of Sprinkler System (IBC 903.3.1) NFPA 13

G: Number of Stories: 2 Building Height: 30'

H: Actual Area per Floor (square feet): ADDITION 900 SF

I: Tabular Area: (table 503): N/A - UNLIMITED - COVERED MALL BUILDING

J: Area Modifications:

a) $A_a = \left\{ A_t + \left[A_t \times I_f \right] + \left[A_t \times I_s \right] \right\}$ $I_f = \left[F/P - 0.25 \right] W / 30$

b) Sum of the Ratio Calculations for Mixed Occupancies:

$\frac{\text{Actual Area}}{\text{Allowable Area}} \leq 1$

c) Total Allowable Area for:
1) One Story: ____
2) Two Story: $A_a(2)$____
3) Three Story: $A_a(3)$____

d) Unlimited Area Building: Yes ✓ No ____ Code Section: 402

K. Fire Resistance Rating Requirements for Building Elements (hours).

Element	Hours	Assembly Listing	Element	Hours	Assembly Listing
Exterior Bearing Walls	0		Floors - Ceiling Floors	0	
Interior Bearing Walls	0		Roofs - Ceiling Roofs	0	
Exterior Non-Bearing Walls	0		Exterior Doors and Windows	0	
Structural Frame	0		Shaft Enclosures	1 Hr.	
Partitions - Permanent	N/A		Fire Walls	N/A	
Fire Barriers	N/A		Fire Partitions	N/A	
			Smoke Partitions	N/A	

L. Design Occupant Load: 900 S.F. @ 100 S.F. PER OCCUPANT = 9

Exit Width Required: .15" x 9 = 1.35 Exit Width Provided: 60"

M. Minimum Number of Required Plumbing Facilities: EXISTING - NO NEW PROVIDED

a) Water Closets - Required (m) 4 (f) 4 Provided (m) 5 (f) 10
b) Urinals - Required (m) - (f) ____ Provided (m) 5 (f) ____
c) Lavatories - Required (m) 4 (f) 4 Provided (m) 5 (f) 5
d) Bath Tubs or Showers: -
e) Drinking Fountains: 5 Service Sinks: 1

FOOTNOTES:

1) In case of conflict with the U.S. Department of Justice Federal Registers Parts I through V - ADA Guidelines and specific reference to the International Building Code Accessibility Chapters, the more restrictive requirement shall govern.

2) Additional Code Information shall be provided at the discretion of the Building Official for Complex Buildings. Including, but not limited to:
a) High Rise Requirements.
b) Atriums.
c) Performance Based Criteria.
d) Means or Egress Analysis.
e) Fire Assembly Locator Sheet.
f) Exterior and Interior Accessibility Route.
g) Fire Stopping, Including Tested Design Number.

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635 S. State Street
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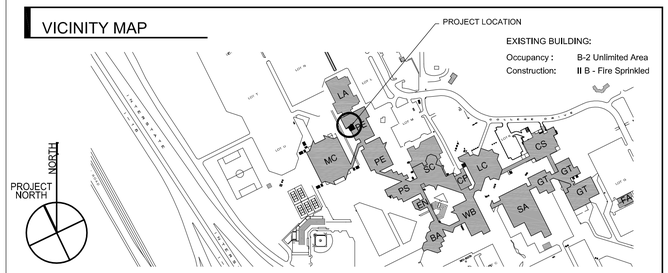
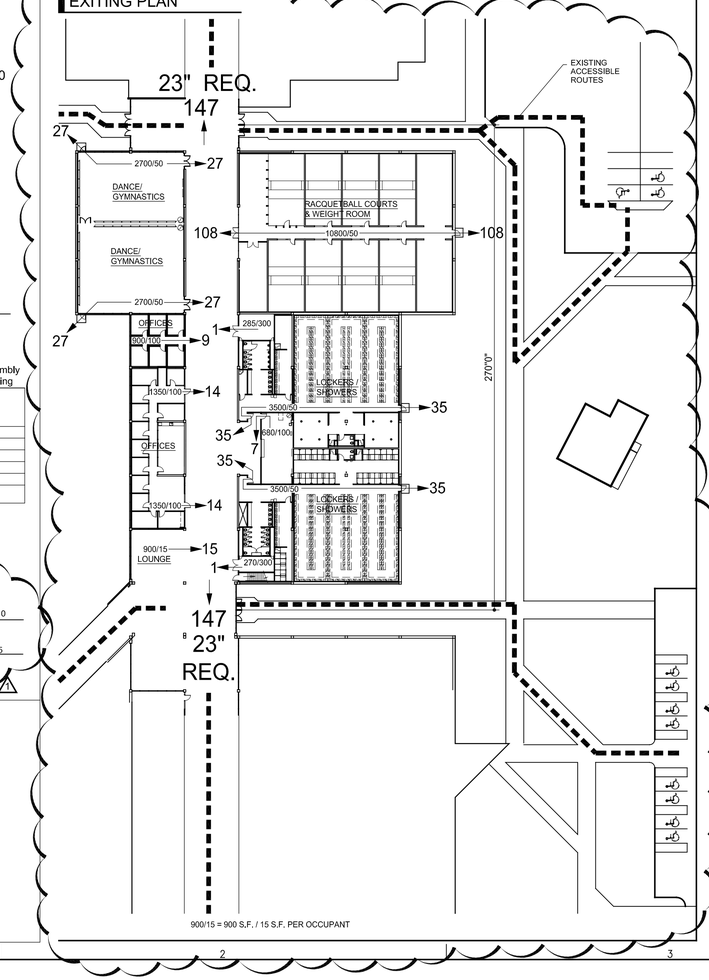
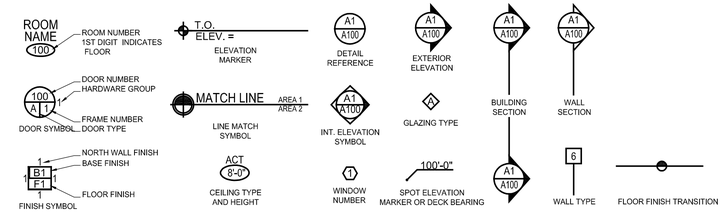
VICINITY MAP



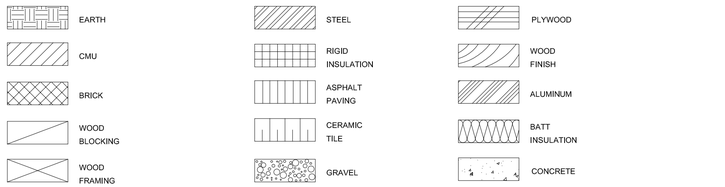
EXITING PLAN



SYMBOL LEGEND



GRAPHIC SYMBOLS



DRAWING INDEX

GENERAL
G1101 GENERAL INFORMATION

ARCHITECTURAL
AE001 ARCHITECTURAL SITE PLAN
AE101 PLANS
AE201 BUILDING ELEVATIONS
AE301 BUILDING SECTIONS
AE401 WALL SECTIONS
AE601 DETAILS
AE602 DETAILS

STRUCTURAL
SE001 STRUCTURAL GENERAL NOTES
SE101 STRUCTURAL PLANS
SE301 STRUCTURAL DETAILS
SE501 STRUCTURAL TYPICAL DETAILS

MECHANICAL
MG001 GENERAL NOTES AND LEGEND
ME101 MECHANICAL PLANS
ME501 MECHANICAL DETAILS
ME601 MECHANICAL SCHEDULES

PLUMBING
PG001 PLUMBING NOTES AND LEGEND
PD101 PLUMBING DEMOLITION PLANS
PE101 PLUMBING PLANS
PE102 PLUMBING ROOF PLANS
PE501 PLUMBING DETAILS

ELECTRICAL
EG001 SYMBOLS, SCHEDULES, NOTES
EE101 LIGHTING & POWER PLANS
EX501 DIAGRAMS
EX601 ONE-LINE DIAGRAM & SCHEDULES

NOTE: THE SHEETS LISTED ABOVE REPRESENT A FULL SET OF CONSTRUCTION DOCUMENTS AND INCLUDE A DETAIL BOOK AND A PROJECT MANUAL AND SHALL NOT BE SEPARATED. ANY CONTRACTOR, SUBCONTRACTOR, VENDOR OR ANY OTHER PERSON PARTICIPATING IN OR BIDDING ON THIS PROJECT SHALL BE RESPONSIBLE FOR REVIEWING ALL THE CONSTRUCTION DOCUMENTS INCLUDING BUT NOT LIMITED TO DRAWINGS, DETAILS, PROJECT MANUAL, SPECIFICATIONS AND ANY AND ALL ADDENDA ISSUED.

UTAH VALLEY UNIVERSITY PHYSICAL EDUCATION INFILL II
Orem, Utah

DFCM PROJECT #09097790
CONSTRUCTION DOCUMENTS
July 10, 2009

ROOFING CODE COMPLIANCE

ALL ROOFING MATERIAL MANUFACTURERS ARE TO REQUIRED TO MEET OR EXCEED THE UL ASSEMBLY # AS OUTLINED IN THE UNDERWRITERS LABORATORIES, INC. ROOFING MATERIALS AND SYSTEMS DIRECTORY BOOK

Carlisle Syntec Incorporated
1285 Ritner Hwy PO Box 7000
Carlisle, PA 17013

UL R8103
EPDM, 60 Mil

Firestone Building Products Co.
1st FL 310 E 96th St.
Indianapolis, IN 46240

UL R9516
EPDM, 60 Mil

NOTE: ALL OTHER MANUFACTURERS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO BID. UL ASSEMBLY CRITERIA MUST BE PROVIDED TO THE ARCHITECT PRIOR TO APPROVAL.

DEFERRED SUBMITTALS

FIRE SPRINKLER:
THE DEFERRED SUBMITTAL FOR FIRE SPRINKLERS IS ANTICIPATED TO BE SUBMITTED FOR REVIEW TO THE BUILDING OFFICIAL AND FIRE MARSHALL ON OR AROUND SEPT. 15, 2009.

FIRE ALARM:
THE DEFERRED SUBMITTAL FOR THE FIRE ALARM SYSTEM IS ANTICIPATED TO BE SUBMITTED FOR REVIEW TO THE BUILDING OFFICIAL AND FIRE MARSHALL ON OR AROUND SEPT. 15, 2009.

State of Utah
Department of Administrative Services
Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

UTAH VALLEY UVU UNIVERSITY
ENGINEERING, FACILITIES PLANNING & CONSTRUCTION DEPARTMENT

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Utah Valley University
Physical Education Infill II
OREM, UTAH

3 ADDENDUM 1 - AUGUST 4, 2009

Axis Job #	0910
Owner #	09097790
Date	07-10-2009
Drawn	-
Checked	-

GENERAL INFORMATION

GI101

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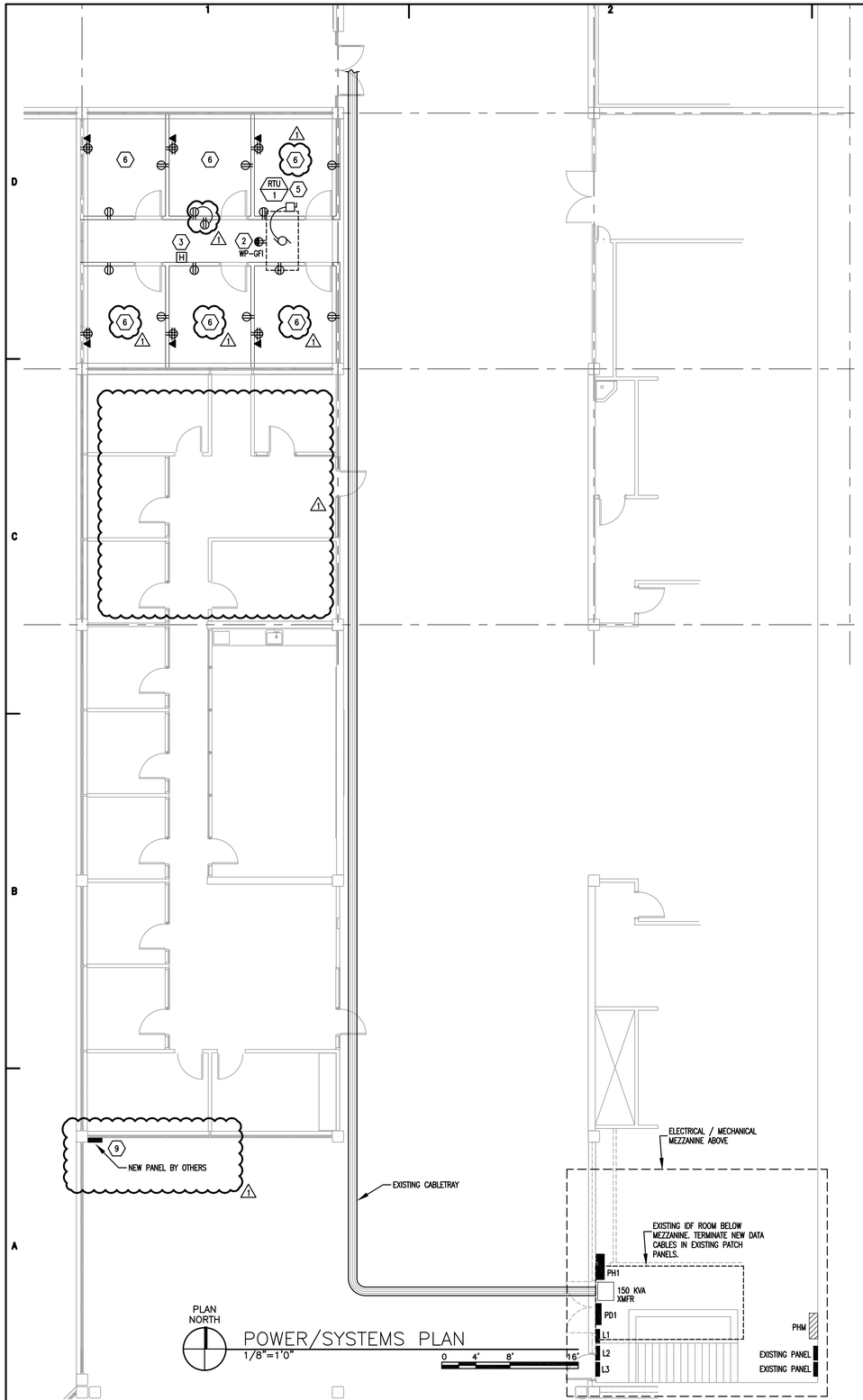
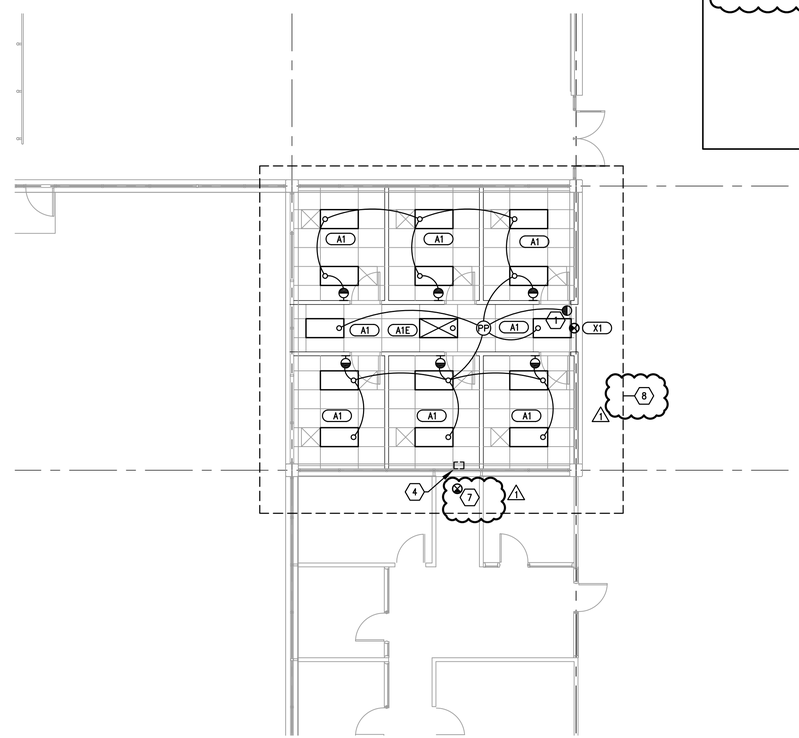


POWER/SYSTEMS PLAN
1/8"=1'0"



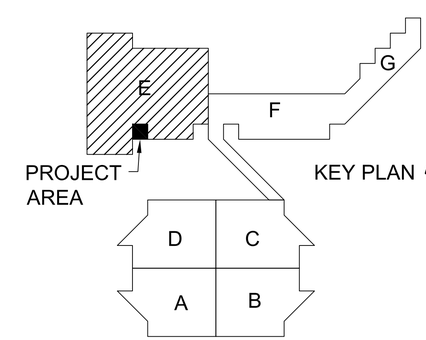
LIGHTING PLAN
1/8"=1'0"

GENERAL NOTES

1. PROVIDE 1" CONDUIT FOR ALL DATA OUTLETS SHOWN ON THIS PLAN ROUTED TO EXISTING CABLE TRAY AND TERMINATE WITH AN INSULATED THROAT CONNECTOR AND PLASTIC BUSHING. PROVIDE (3) NEW CAT 6 PLENUM RATED CABLES FOR EACH LOCATION. TERMINATE CABLES AT EXISTING PATCH PANEL AND TEST CABLE. CABLE TYPE, CONNECTORS, FACEPLATES, JACKS AND LABELING SHALL BE PER UVU IT STANDARDS. PROVIDE NEW MATCHING PATCH PANEL IN EXISTING IDF ROOM IF NO CAPACITY REMAINS.
2. PRIOR TO WORK IN EXISTING PANELS, COORDINATE POWER INTERRUPTION WITH OWNER. WORK MAY BE REQUIRED AFTER HOURS OR ON WEEKENDS.
3. CONTRACTOR SHALL VERIFY ALL EXISTING CIRCUIT NUMBERS SHOWN AND LOCATIONS OF HOMERUNS WITH THE ACTUAL EXISTING FIELD CONDITIONS PRIOR TO INSTALLATION.
4. PROVIDE CIRCUIT CONDUCTORS SIZED TO ACCOMODATE VOLTAGE DROP AS RECOMMENDED BY THE NATIONAL ELECTRIC CODE BASED ON CIRCUIT LOAD AND DISTANCE.

SHEET KEYNOTES

1. CEILING MOUNTED PIR MOTION SENSOR WITH 180° FIELD OF VIEW.
2. LOCATE WP GFI ON ROOF WITHIN 25' OF NEW RTU. CONNECT TO NEW CIRCUIT FEEDING ONE OF THE OFFICES BELOW.
3. CONNECT NEW FIRE ALARM HORN STROBE TO NEAREST EXISTING FIRE ALARM NOTIFICATION APPLIANCE. DEVICE TO MATCH EXISTING SYSTEM MANUFACTURER. VERIFY CIRCUIT CAPACITY PRIOR TO ADDING DEVICE, PROVIDE ANY POWER BOOSTER REQUIRED. CONTRACTOR TO VERIFY EXISTING SYSTEM MANUFACTURER PRIOR TO BID.
4. REMOVE EXISTING WALL PACK. PROVIDE BLANK COVER ON EXISTING OUTLET BOX. REMOVE EXISTING CIRCUITS BACK TO NEAREST JUNCTION BOX UPSTREAM OF THE OUTLET BOX.
5. RTU–1 ON ROOF. CONNECT TO NEW 30A, 3P CIRCUIT BREAKER IN EXISTING PANEL PD1. SEE SHEET EX601 FOR MORE INFO.
6. CONNECT RECEPTACLES IN THIS ROOM TO NEW DEDICATED 20A, 1P CIRCUIT BREAKER IN NEW FOOD SERVICE PANEL AS NOTED IN NOTE# 9. NEW LOAD ADDED = APPROX. 720W
7. REMOVE EXISTING EXIT SIGN, OUTLET BOX AND CONDUCTORS BACK TO NEAREST UPSREAM JUNCTION BOX. REPLACE CEILING TILE WITH MATCHING TILE IF EXIT SIGN IS CEILING MOUNTED OR ABANDON WALL MOUNTED BOX AND PATCH WALL IF WALL MOUNTED.
8. CONNECT ALL NEW LIGHTING TO EXISTING 277V CIRCUIT PH1–10 IN ADJACENT SPACE TO THE SOUTH. ESTIMATED CAPACITY ON EXISTING CIRCUIT = 1632W, NEW LOAD ADDED = APPROX. 1000W.
9. NEW 120/208V, 42 CIRCUIT FOOD SERVICE PANEL FURNISHED AND INSTALLED BY OTHERS. PROVIDE A DEDICATED 120V, 20A CIRCUIT WITH #10 THHN CONDUCTORS FOR EACH OFFICE AS INDICATED IN NOTES 6 ABOVE TO THIS PANEL. ROUTE CIRCUITS FROM NEW OFFICES DOWN CORRIDOR TO NEW PANEL. DO NOT ROUTE THROUGH EXISTING ADJACENT OFFICE SPACE. PANEL LOCATION SHALL BE VERIFIED PRIOR TO INSTALLATION.



KEY PLAN

Axis Architects
352 SOUTH DENVER STREET (440 E.) SALT LAKE CITY UTAH 84111 P 355-3003 F 355-0113

Utah Valley University Physical Education Infill II

OREM, UTAH

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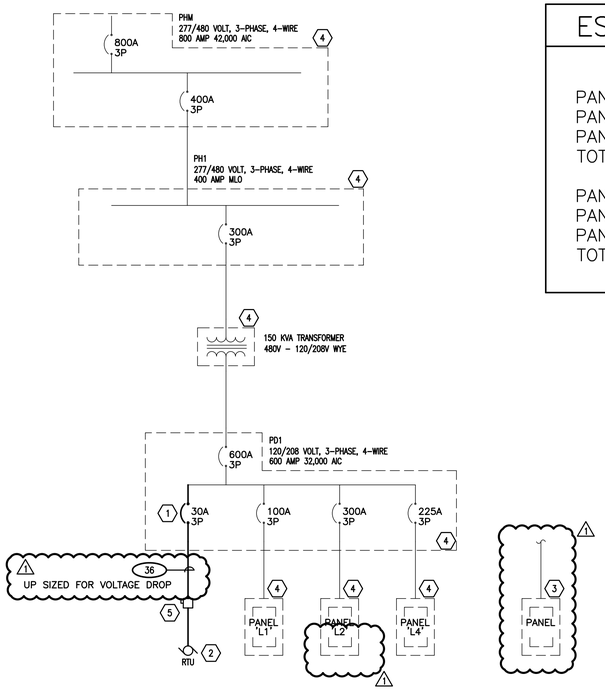
Axis Job #	0910
BNA Job #	09094A
Date	07-10-2009
Drawn	SCB
Checked	GM
Revision No. 1	8/4/2009 ADDENDUM #1

LIGHTING & POWER PLANS

EE101



1 ONE-LINE DIAGRAM
NO SCALE

ESTIMATED CONNECTED LOADS

PANEL L2 ESTIMATED CONNECTED LOAD = 180A
PANEL L2 BREAKER CAPACITY = 240A
PANEL L2 NEW LOADS = 0A
TOTAL L2 CONNECTED LOAD = 180A

PANEL PD1 ESTIMATED CONNECTED LOAD = 414A
PANEL PD1 BREAKER CAPACITY = 480A
PANEL PD1 NEW LOADS = 12A
TOTAL PD1 CONNECTED LOAD = 426A

SHEET KEYNOTES

1. PROVIDE NEW COMPATIBLE BREAKER IN EXISTING SQUARE D PANEL. PANEL MODEL #HC4268T5.
2. NEW RTU LOCATED ON ROOF OF IN-FILL AREA. SEE SHEET E1 FOR LOCATION.
3. NEW 120/208V, 42 CIRCUIT FOOD SERVICE PANEL BY OTHERS. CONNECT ALL NEW OFFICE RECEPTACLES TO THIS PANEL WITH DEDICATED CIRCUITS. REFER TO SHEET EE101 FOR MORE INFORMATION. VERIFY LOCATION WITH OWNER PRIOR TO INSTALLATION.
4. EXISTING ELECTRICAL EQUIPMENT
5. 240V, 30A, 3P, N3R DISCONNECT WITH 30A HACR FUSES

COPPER CONDUCTOR & CONDUIT SCHEDULE

TYPE	AMP.	COND. SIZE	CONDUCTOR QUAN.	CONDUCTOR SIZE	INSUL-ATION	EQ. GND. COND.
20	30	3/4"	2	10	THHN THWN	10
30	30	3/4"	3	10	THHN THWN	10
40	30	3/4"	4	10	THHN THWN	10
28	40	3/4"	2	8	THHN THWN	10
38	40	3/4"	3	8	THHN THWN	10
48	40	3/4"	4	8	THHN THWN	10
26	55	3/4"	2	6	THHN THWN	8
36	55	3/4"	3	6	THHN THWN	8
46	55	1"	4	6	THHN THWN	8
24	70	3/4"	2	4	THHN THWN	8
34	70	1"	3	4	THHN THWN	8
44	70	1-1/4"	4	4	THHN THWN	8
23	85	1"	2	3	THHN THWN	8
33	85	1"	3	3	THHN THWN	8
43	85	1-1/4"	4	3	THHN THWN	8
32	95	1-1/4"	3	2	THHN THWN	6
42	95	1-1/4"	4	2	THHN THWN	6
31	110	1-1/4"	3	1	THHN THWN	6
41	110	1-1/2"	4	1	THHN THWN	6
51	110	2"	5	1	THHN THWN	6
31X	150	1-1/2"	3	1/0	THHN THWN	6
41X	150	1-1/2"	4	1/0	THHN THWN	6
51X	150	2"	5	1/0	THHN THWN	6
32X	175	1-1/2"	3	2/0	THHN THWN	6
42X	175	2"	4	2/0	THHN THWN	6
52X	175	2"	5 *	2/0	THHN THWN	6
33X	200	2"	3	3/0	THHN THWN	6
43X	200	2"	4	3/0	THHN THWN	6
53X	200	2-1/2"	5	3/0	THHN THWN	6
34X	230	2"	3	4/0	THHN THWN	4
44X	230	2-1/2"	4	4/0	THHN THWN	4
54X	230	2-1/2"	5	4/0	THHN THWN	4
325	255	2"	3	250	THHN THWN	4
425	255	2-1/2"	4	250	THHN THWN	4
525	255	2-1/2"	5	250	THHN THWN	4
335	310	2-1/2"	3	350	THHN THWN	3
435	310	3"	4	350	THHN THWN	3
535	310	3"	5	350	THHN THWN	3
340	335	3"	3	400	THHN THWN	3
440	335	3"	4	400	THHN THWN	3
540	335	3"	5	400	THHN THWN	3
350	380	3-1/2"	3	500	XHHW	3
450	380	3-1/2"	4	500	XHHW	3
550	380	3-1/2"	5	500	XHHW	3

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ONE-LINE DIAGRAM AND SCHEDULES

EX601

STRUCTURAL GENERAL NOTES

I. Basis of Design

B1. Governing Building Code: 2006 International Building Code (IBC)

B2. Gravity Loading
A. Roof.....20 psf dead load
Snow Loads Plus Snowdrift
Pg= 43 psf
Pf= 33 psf
Ce= 1.0
Is= 1.1
Ct= 1.0

B3. Earthquake
A. Seismic Design Category D IE = 1.25
B. SDS = 0.80; SD1 = 0.48; Ss = 1.16, S1 = 0.487
C. Site Class = D
D. Lateral Force Resisting System = Concrete Shear Walls
E. Base shear = 0.17W R= 6
F. Analysis procedure = Equivalent Lateral-Force Procedure

B4. Wind velocity.....90 miles per hour (3 second gust speed) exposure B.
Net uplift force at roof equals 17 psf.
Importance Factor Iw.....1.1
Cladding and Components.....21 psf

B5. Foundation
A. Soil Bearing Pressure.....1500 psf ASSUMED.

B. Frost Depth.....30 inches.

II. Site Work

SW1. A minimum of 6" of topsoil shall be removed from the entire building site including all vegetation and debris.

SW2. Contractor shall over excavate 18" under all footings and 18" beyond edge of footing. An independent soils testing agency shall verify a 1500 psf soil bearing capacity of the soil subgrade prior to installing the replacement fill as specified in sheet SE001 notes SW3 through SW10.

SW3. All bearing earth to be undisturbed earth or compacted fill. The area on which the fill is placed must be frost free. The fill shall then be placed in layers not to exceed 8 inches in depth and compacted.

SW4. All fill and back fill shall be compacted to a minimum of 95% of maximum relative density for footings and 90% for all other structural fill based on AASHTO T180.

SW5. Any fill to be placed under the building and footings shall be a well graded granular material within the limits of the following gradation, unless otherwise specified by Soils Engineer:

Sieve Size	Percent Passing
4"	100
1"	60-90
#4	30-60
#40	10-30
#200	5-12

SW6. All water shall be removed from foundation excavation prior to placing of concrete. Do not pour concrete under water.

SW7. Any unusual soil conditions (water, clay, soft layers, etc.) encountered during excavation for footings shall be immediately brought to the attention of the architect and soils engineer.

SW8. All foundation excavations shall be protected from all detrimental changes in environmental conditions such as rain and freezing.

SW9. Contractor shall coordinate the architectural, structural, and civil drawings for top of footing elevations and footing steps and excavations.

SW10. Contractor shall verify all existing and future grades. Footings shall be poured to maintain the minimum frost protection or confinement indicated on details. Footing steps shall be provided as per typical details where required by site conditions.

III. Concrete and Reinforcing

C1. All work and materials shall comply with all areas of ACI318 and ACI 347 Publications and applicable ASTM Publications.

C2. Compressive strength of concrete at 28 days shall be as follows: (only 1-grade of concrete shall be poured on the job at one time). Use type II cement in contact with ground.

	Minimum Compressive Strength(psi) (At 28 Days)	Slump (+/- 1/2")	% Air Entrainment	Maximum Aggregate Size	Special Inspection Required
Footings	3000	4	3%	1 1/2"	NO
Foundation walls	4000	4	3%	3/4"	NO
Int.Slab on Grade	4000	3	3%	1 1/2"	NO
Ext.Slab on Grade	4500	3 5 1/2% to 7 1/2%		1 1/2"	NO

water/cement ratio = .45 max.

C3. Hardrock aggregates shall conform to ASTM C-33. Their Maximum size shall be 3/4" except 1" shall be used for footings and slabs on grade.

C4. Admixtures
A. Concrete mix shall include flyash as per ASTM C618 class "F" except that maximum loss on ignition shall be limited to 1% to yield specified quantities. Flyash replacement of cement shall be limited to 20% by weight.

C5. The contractor shall submit mix design and 3, 7, and 28 days strength tests for review by the structural engineer before any concrete is poured at the job site.

C6. All concrete that is placed by pumping shall be medium range-plasticized with water reducing admixture which shall comply with specifications for chemical admixtures for concrete, ASTM designation C-494 non-chloride and shall be used in strict accordance with manufacturer's recommendations. Product specification publication shall be submitted to structural engineer for review.

C7. Unless otherwise noted all reinforcement bars shall be securely anchored to the forms and spaced from them as follows: Minimum Coverage
A. Cast against & exposed to earth.....3 inches
B. Concrete exposed to earth or weather:
#6 through #18 bars.....2 inches
#5 bar and smaller.....1 1/2 inches
C. Not exposed to weather or in contact with ground: slabs, walls, joists:.....3/4 inches

C8. Reinforcing Steel
A. All reinforcing steel shall be bent, detailed and chaired as per the "ACI Manual of Standard Practice for Detailing Reinforcing Concrete Structures."
B. All reinforcing steel to be welded shall comply with ASTM A706.
C. All reinforcing steel shall be of new stock deformed bars conforming to ASTM A-615 grade 60 unless otherwise noted. Placement of bars in accordance with ACI 315 and ACI 318. Use bar supports per ACI 315 chapter 7 for all rebar and welded wire fabric. As per ACI 318, Section 7.5.1: "All reinforcement shall be accurately placed and adequately supported before concrete is placed and shall be secured against displacement within tolerances permitted in 7.5.2." Wet stabbing reinforcing is not allowed.
D. Unless otherwise indicated, all anchors welded to steel plates or angles that are embedded in masonry or concrete shall be deformed bar anchors conforming to A36 Steel or ASTM A706.
E. Minimum standard rebar lap lengths: #3=19" #4=25" #5=31" #6=37" #7=54" #8=62" #9=70" #10=78" #11=85".
Epoxy coated bar laps, multiply above values by 1.2. For epoxy coated rebars or wires with cover less than 3db or clear spacing less than 6db, the laps shall multiply the above values by 1.5.
Lightweight concrete bar laps, multiply above values by 1.3. (ie. #6=37"x1.3=49").
If more than 12" concrete is below rebar (beam top reinforcing), multiply above values by 1.3. (ie. #5=31"x1.3=41").
See shear wall schedule for seismic lap lengths.
All vertical reinforcing bars (unless noted otherwise) shall be doweled to footing with 90 degree standard hook.
F. Reinforcing for concrete walls as follows:(unless otherwise noted on drawings)

Thickness	Horizontal Reinf	Vertical Reinf
6"	#4 at 16" o.c.	#4 at 18" o.c.
8"	#4 at 12" o.c.	#4 at 18" o.c.
10"	#4 at 15" o.c. each face	#4 at 18" o.c. each face
12"	#4 at 12" o.c. each face each face	#4 at 18" o.c. each face each face

G. All dowels shall have at least 38 bar diameter embedment.
H. Break out dowels may be used for convenience of contractor, however dowels shall be Grade 40 and spacing of dowels shall be decreased by 1/3.
I. Provide corner bars at all intersecting corners. Use same size bar and spacing as horizontal wall reinforcing.
J. Add 2-#5 bars around all openings (unless otherwise noted) and extend 24" beyond corner of openings. Add also 2-#5 x 4'-0 diagonally at corners. For reinforcing over opening see opening details on drawings.
K. When called for on the drawings or when directed by engineer bars that are to be epoxy doweled are to be put in holes larger than the bar diameter (1/4" larger for rebar and 1/8" larger for threaded bars). The holes shall be ten bar diameters deep for 4000 psi concrete or above and 15 bar diameters for concrete below 4000 psi and masonry. Fill holes with "Simpson SET-XP" epoxy (or equal as approved by engineer).
All epoxy dowels and epoxy anchors are to be either threaded or deformed bars as per drawings. Apply epoxy as per manufacturer's recommendations. Mixing shall be done using a power mixer. For cold weather application gel shall be mixed at 70 degrees and kept at 40 degrees for 72 hours after application. Impact type drilling tools shall not be used for drilling holes or tightening anchors and shear bolt nuts into or through brick. SPECIAL INSPECTION IS REQUIRED.
L. The contractor shall include an "in-place" price in his bid for 1000 pounds of reinforcing bars to be used as directed by the structural engineer. This reinforcing steel need not be stockpiled at the job site. The contractor shall submit with his bid a unit price credit for the unused portion of bars.
M. Top rebar in slabs and beams including top 6" of ties and column bars exposed to weather are to be epoxy coated after fabrication as per ASTM A 775-81 "Standard Specifications for Epoxy-coated Rebar." Splice length of epoxy-coated top bars shall be 1.7 times the length in Note E. Splice length for all other epoxy coated bars shall 1.5 times Note E.
N. Beam Rebars shall be spliced as follows, unless noted otherwise:
a. Top bars at midspan.
b. Bottom bars at support.

C9. Concrete tests shall be made by testing laboratory approved by the owner. Use SSPC - Paint 20 (Galvanic). All reports being mailed to the architect and the contractor. In general, one test shall be made for each 50 cubic yards of concrete, or each days' pour if less than 50 yards, or as directed by Architect. Each test shall consist of 5 cylinders of which one shall be tested at 7 days, 2 tested at 28 days, and two retained in reserve for later tests, if required. Specimens shall be made and tested in accordance with ASTM C-172, C-31 and C-39 standards. Slump and Air entrainment test shall also be made with each set of cylinders taken. Contractor shall provide the cylinders. The testing laboratory shall transport all cylinders. The owner shall pay for all tests.

C10. Before concrete is poured, check with all trades to insure proper placement of all openings, sleeves, curbs, conduits, bolts, inserts, etc. relating to work.

C11. Drypack concrete shall be one part Portland cement and one part sand with sufficient water to allow a small amount of paste to come to the surface. Use for grouting joists and beam pockets unless otherwise noted.

C12. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days or until concrete has attained 75% of its design minimum compressive strength at 28 days. Support formwork from facing materials with structural members spaced sufficiently close to prevent deflection. Fit forms placed in successive units for continuous surfaces to be accurately aligned free from irregularities and within allowable tolerances.
Provide 1/16" camber per every 2.5 feet in concrete formwork of exposed to view concrete unless otherwise indicated by Architect/Engineer.

C13. All exposed to view concrete shall be stoned smooth while green, or as directed by Architect. No grout plaster shall be permitted.
Exposed to view concrete shall have 3/4" deep "V" groove placed vertically at 8'-0" o.c. or as directed by Architect.

C14. Protect freshly placed concrete from premature drying and excessive cold or hot temperature as per ACI 318 and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.

C15. Cold weather curing and protection requirements for concrete shall conform to the requirements of ACI 306 when depositing concrete at freezing temperature or below, the concrete mix shall have a temperature of at least 50 degrees but not more than 80 degrees. The concrete shall be maintained at a temperature of not less than 50 degrees and in a moist condition for not less than 7 days after placing or as directed by the structural engineer. The use of chemicals or additives to prevent freezing will not be permitted. Contractor shall prevent frost from penetrating under footings or interior slabs on grade or postpone concrete pour. Refer also to specifications and to any directive by structural engineer for additional cold weather requirements.

C16. Architect/Engineer shall be notified 48 hours prior to pouring any concrete in order to observe reinforcing placement.

C17. All concrete shall be properly vibrated in place using internal vibrating rods.

C18. Unless otherwise noted all concrete slabs apply a liquid type membrane forming curing compound complying with ASTM C 309, type 1, class A Moisture loss shall be not more than 0.055 gr./sq. cm. applied at 200 sq.ft./gal. When temperature is 75 degrees or more during placement do not use membrane but moist cure slab for 7 days continuous minimum or see ACI Committee 305 Report "Hot Weather Concreting". Submit method of curing for approval.

V. Structural Steel

S1. All structural steel work shall comply with the latest edition of the AISC "Standard Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", and "Code of Standard Practice". ASTM A-992 Fy=50 ksi minimum specified for structural shapes; A36 steel for miscellaneous steel, ASTM A-500 grade B for structural tubes; ASTM A-53 for structural pipes; typical U.N.O. Cambering shall meet the standard mill practice shown on AISC "Manual of Steel Construction". Steel fabricator shall be on list of DFCM approved fabricators.

S2. Shop paint and remove all rust, oils, mill scale. Apply one coat zinc chromate 2 dry mills thick. Provide touch up field coat at all abraded and welded areas, two dry mills thick. All steel exposed to moisture conditions shall be galvanized. (Follow SSPC - Paint 20; ASTM A 780)

S3. Unless noted otherwise, all structural steel to steel bolted connections shall use 3/4" diameter high strength bolts conforming to ASTM A-325 (N) and shall have carbonized washers under the turning unit. All other bolts shall conform to ASTM A-307.
A. Unless otherwise noted, all A325 bolts shall be tightened to "snug tight" requirements of AISC Table 4.1. The "Special Inspector" shall verify snug tight condition on 10% of installed bolts.
B. As noted on the drawings, bolts tightened to "PT" level shall follow requirements of AISC Table 4.1 for combined load transfer condition. Contractor shall use twist off bolts as per 8.2.3.

S4. Unless noted otherwise on plans, all steel floor beams with spans greater than 25' and all steel roof beams with spann greater than 40' shall have L/480 positive camber.

S5. Welding
A. All welding to be made by certified welders using E-70 series electrodes. (For all welding of ASTM A-572 steel, E70X8 electrodes shall be used and welding shall be as per AWS D1.1 "Structural Welding Code".)
B. All welders to be currently certified for all type of welds on this project under latest AWS D1.1, Structural Welding Code. Welders to have passed the Qualification Requirements within preceding 6 month period.
C. Welds made against concrete are to be done under the supervision of an approved testing agency and that fillet welds should be made in 1/8" passes 2" long at 4" o.c.
D. All steel to steel connections not shown bolted which is continuous, shall be welded to develop full strength capacity of connecting members.
E. Minimum size of fillet weld (unless noted otherwise on drawings).

Material thickness of thicker part joined	Minimum size of of fillet weld
to 1/4" inclusive	1/8" all around
over 1/4" to 1/2"	3/16" all around
over 1/2" to 3/4"	1/4" all around
over 3/4" to 1 1/2"	5/16" all around

F. Unless otherwise noted, all structural steel to steel connections shall be made in such a manner to develop full shear capacity of connecting members as per AISC specifications.
G. Field paint all abraded and welded surfaces for joists and metal deck. Use SSPC - Paint 20 (Galvanic).
H. Unless otherwise indicated, all anchors welded to steel plates or angles that are embedded in masonry or concrete shall be deformed bar anchors conforming to A36 Steel or ASTM A706.
I. All deck bearing angles or plates shall have full penetration welds at splices and corners typical unless noted otherwise.
J. All full penetration welds shall be tested by x-ray or ultrasonic procedures by an independent testing agency approved by the architect. Where testing procedures are not physically possible, visual inspection before and during welding shall be done by an independent testing agency.
K. 10% of all shop and field welds shall be done under the direct supervision of an independent testing agency approved by the architect and tested by magnetic particle procedures.
L. Copies of all tests results are to be sent to structural engineer. Welds found to be defective shall be corrected at no extra cost to the owner.
M. All weld testing shall be paid for by the owner.

S6. Steel Deck
A. All metal deck shall meet requirements of Steel Deck Institute (SDI) for wide rib deck. See drawings for type of deck. Manufacture shall be a member of SDI.
B. Deck manufacturer shall have ICBO certification showing lateral shear capacities of deck equaling 1100 plf TYPICAL, with an F (Flexibility Factor) less than 10.
C. Provide 18 gage sheet metal reinforcing at all valleys, hips, ridges, deck changing directions, and openings through metal deck. For openings 15" and larger frame opening with angle 3 x 3 x 1/4" unless otherwise noted. End laps to occur at supports and shall have minimum lap of 2". The deck shall be attached to all supports and the side lap of adjacent units.
D. All deck splices shall occur over supporting members and shall have a minimum of 4" of flat bearing surface contact.
E. Deck Welding (unless otherwise noted):
a. Supports parallel to deck 3/4" diameter puddle welds at 12" o.c.
b. Supports perpendicular to deck 3/4" diameter at each valley.
c. Top seam welds 1 1/2" at 12" o.c. Deck shall be crimped prior to all side or top seam welding. For composite floor deck, side lap use 1/4" diameter button punch at 24" o.c.
d. Welder shall be certified as a light gage welder in accordance with AWS.
e. Use E60 electrodes.
a, b, and c are minimum deck welding, deck supplier is to indicate deck welds on shop drawings to develop stated shear capacities.
F. Unless noted otherwise on drawings all deck shall bear on and be welded to continuous angle 3 x 3 x 1/4 x cont. at all deck boundaries fastened to concrete or masonry wall with weld plates as per typical details or 3/4" diameter x 8" x 3" J-bolts at 16" o.c. Provide angle 3 1/2 x joist depth x 3/16 under all changes in deck direction.
G. All continuous deck bearing angles shall have full penetration welds at splices and corners.
H. Architect/Engineer shall be notified 48 hours prior to application of roofing material in order to observe deck attachment.
I. Roof deck and joists and girders shall be designed for 17 psf uplift force minimum, U.N.O.
J. Temporary shoring for composite floor deck, see manufacturer for recommendations.

S7. Steel Joists
A. All open web steel joists, V5 joist substitutes, loose outrigger and bridging shall be fabricated according to the specifications of the "Steel Joist Institute" (SJI) and the manufacturers shall be members of SJI joists, outriggers and V5 members shall be anchored at their supports by welding unless otherwise noted. V5 joist substitutes are Vulcraft "V5" series or equal. All K series joists shall bear 4 inches minimum and LH series joists and open web and girders shall bear 6 inches minimum on steel bearing angles or plates. Joist and girder supplier shall submit shop drawings showing truss joist geometry and member sizes. Joist supplier shall submit design calculations for all joists with snow drift loading, point loads, or any non-standard loading conditions.
B. Joist bearing sloping 1/4" per foot or more provide beveled steel shims welded to joist and support.
C. All joist cross bridging shall be welded at each joist and at cross over points.
D. Where steel joist are exposed, use X bridging only. Coordinate bridging location with Architect. Do not run bridging through skylights, etc., unless otherwise indicated.
E. Live Load deflection shall be limited to L over 360 unless otherwise noted. Total load deflection for joist supports, folding doors, overhead moving tracks, and hallways should be limited to L/600.
F. Structural calculations shall be provided with a Utah P.E. stamp.
G. Top chord of joist shall be designed for an additional 5k axial force TYP. U.N.O.
H. A certification of compliance must be submitted to building official upon completion of fabrication per IBC 2206.5.
I. The bridging which supports the masonry and concrete wall shall be designed for 250 plf.
J. Side clamp of bottom chord of joist for mechanical and electrical support is not allowed.
K. Bottom chord shall be designed for 10 psf (vertical and miscellaneous loads).
L. Joists supporting running or walking track, or folding door, the total loads deflection should be limited to L/480 TYP. U.N.O.
M. Steel joists shall be designed for an additional 1K vertical load and 1K horizontal load for each basketball standard as indicated TYP. U.N.O..

S8. Steel Studs
A. Structural steel studs shall be as specified in this note and shown on drawings with minimum effective properties.

Stud Size	Gage	Gross Area (in.2)	EFFECTIVE IXX (in.4)
6"x 1 5/8	18	.43	2.22
6"x 1 5/8	16	.54	2.76
4"x 1 5/8	16	.42	1.06
3 5/8 x 1 5/8	16	.41	.84

B. All studs shall be spaced at 16" o.c. unless noted otherwise and to be standard painted unless otherwise noted.
Fy for 16 ga. and heavier material.50 Ksi
Fy for 18 ga. and lighter material.33 Ksi
C. Unless otherwise noted all bridging to be 1 1/2" minimum x 1/8" minimum x continuous cold rolled channels positioned through stud punch-outs and weld attached on both sides to stud punch-out. Bridging shall be spaced at 4'-6" o.c. to match punch-outs. Where punch-outs do not line up use weld attached bridge clip angles.
D. All track to be stud size by 1 1/2" flange by 16 gage standard painted unless noted otherwise. Attach track to concrete slab at 16" o.c. using ITT" diameter x 1 1/2" powder driven fasteners. Tracks and bridging to have Fy = 33,000 psi.
E. All splices of structural studs to be full strength. Use 2'-0" minimum section lapped 1'-0" above and below splice fully welded. Alternate all splices 24" minimum. Spot paint all welds after cleaning.
F. Load bearing stud walls must be fabricated with the stud ends seated against the track web. Full web and flange bearing must be provided.
G. All structural studs shall be welded to top and bottom tracks with 1/8" x 1 1/2" fillet at each stud flange and 1/8" x 3" at stud web.
H. Where plywood sheathing is screwed to metal studs, provide a 2 1/2" x 16 gage x cont. strap blocking at all horizontal panel edges between panel and studs.

S9. Headed stud type shear connectors shall conform to ASTM A-108 grade 1015 or 1020 cold finished carbon steel with dimensions complying with AISC specifications and as shown on drawings.

VII. General Conditions

G1. If discrepancies exist between specifications, general notes and drawings, call the Engineer (801-575-8223)to resolve the conflict or use the more expensive option.

G2. All dimensions on structural drawings shall be checked and verified against architectural drawings. All dimensions relating to existing site, buildings, installations or construction shall be field verified, all discrepancies shall be submitted to the architect. Do not proceed with fabrication and erection of materials affected until discrepancies are resolved.

G3. All omissions or discrepancies in the working drawings and or specifications shall be brought to the attention of the Architect and/or Structural Engineer before proceeding with any work involved.

G4. Shoring
A. Until all permanent members, including walls, slabs, floors and roof are in place and all connections are completed, stability of structure and all parts thereof shall be contractor's responsibility. During construction contractor shall keep construction loads within the design load limits shown on drawings. After construction is completed building owner shall keep loads on roof and floor within design limits shown on drawings.
B. Do not backfill walls until floor at top of wall is in place or adequate temporary bracing is provided.
C. Contractor shall provide shoring design calculations and drawings stamped by a Utah Registered Professional Engineer.

G5. All Construction shall be in accordance with the IBC 2006 and supplements unless a higher standard is called for.

G6. Unless a more stringent requirement is specified, design all members with minimum Live Load deflection of L/360.

G7. Contractor shall be responsible for safety and protection in and around job site and or adjacent properties.

G8. Observation visits to the site by Bsumek Mu and Associates Field Representative shall neither be construed as inspection nor approval of construction.

G9. Contractor shall provide 5 sets of shop drawings for review by structural engineer for: all reinforcing bars, structural steel, and all prefab. structural items (including structural calculations) and shall also be approved by the governing authority prior to installation. See Section 106.3.4.2.

G10. All openings through floors and walls shall be verified with architectural, mechanical and electrical drawings. Do not cut openings in concrete or masonry without approval of structural engineer and architect.

G11. Contractor/Window/Door - Supplier shall provide 1/2" minimum vertical movement capability in frame system.
Window/Door- Supplier shall design for wind load specified under "Basis for Design" and shall submit professional engineer stamped design calculations showing compliance with Wind Load Capacity and vertical movement capacity.

G12. Seismic bracing of electrical, mechanical equipment,ducts, piping, and ceiling system shall be designed by their respective supplier and stamped by a Utah Professional Engineer and submitted for design review and should be submitted to the governing authority for approval prior to installation.

G13. The appearance of all exposed structural elements shall be approved by architect or owner.
All blemishes, dents, or shipping damage in structural elements that are exposed to view shall be repaired before erection and shall be approved by the architect. All sweeps in beams joists, and girders greater than 1/2" shall be corrected. Repairs shall be made at no cost to the owner. For tolerances in wide flange shapes, follow AISC specifications.

G14. Mechanical ducts, piping, and electrical conduits which supports from the bottom chord of steel joist, should be limited to 50 lbs. for single clamp on one side within 6" of each panel point.

G15. Where the ducts and pipes are running parallel to the roof joist and the weight is more than 50 plf an additional joist shall be added.

VIII. Special Inspections and Structural Testing for Seismic Resistance

Special inspections shall be done by Special Inspectors that are qualified and approved for each area of work stated below or as required by the Building Official. All special inspections shall be paid for by the OWNER. The special inspector shall observe the work assigned for conformance with the approved design drawings and specifications. The special inspector shall submit reports to the owner, the Building Official, the Contractor, Architect, and Bsumek Mu and Associates. The special inspectors shall conform to and fulfill all other responsibilities as outlined in SECTION 1704, 1707, 1709 of the IBC 2006. The special inspector shall submit written reports of observations stating time, date, location of work and observation of work being done.

A. See note C2 for concrete above 2500 psi not requiring special inspections. Some higher strength concrete is specified for durability only.
B. Special inspections are required for the following work:
1. Concrete and reinforcing placement. Except for the following conditions:
a. For foundations satisfying requirement of IBC 2006,Table 1805.4.2.
b. Non-Structural slab on grade.
c. Site work concrete where no special hazards exist.
2. Bolts installed in concrete where indicated on drawings.
3. Welding except for the following:
a. Welded connections made by an approved fabricator's shop need no special inspection. When Building Official allows, periodic inspections for floor and roof deck welds and composite welded stud.
b. Periodic inspection may be done as outlined on drawings. See IBC 2006, Table 1704.3.
4. High strength bolting inspection for bearing type connections need be done only after installation.
5. Section 1707. Special inspections for seismic resistance.
6. All rebars and threaded rods epoxy doweled into concrete and/or grouted CMU.
C. Structural testing for seismic resistance, see Section 1708 of the IBC 2006.
D. Structural observations shall be done according to Section 106.3.4.1. All the seismic resisting elements shall be inspected, including footings.

SPECIAL INSPECTION AND TESTING (IBC 1704)

Indicate required Special inspections for project by checking the appropriate boxes:

FABRICATORS (IBC1704.2)

☒ Approved Fabricator	Fabricators Name:
☐ Unapproved Fabricator	Fabrication Name:

In-plant inspections
☐ Steel Construction ☐ Welding ☐ Details

STEEL (IBC1704.3)

Item			Reference/Comments
High Strength Bolting(1704.3.3)	☐ Continuous	☒ Periodic	
WELDING (1704.3.1)			
Details (1704.3.2)			
Complete & partial penetration groove welds	☒ Continuous	☐ Periodic	
Multipass fillet welds	☒ Continuous	☐ Periodic	
Single-pass fillet welds > 5/16"	☐ Continuous	☐ Periodic	
Single-pass fillet welds ≤ 5/16"	☐ Continuous	☒ Periodic	
Floor & roof deck welds	☐ Continuous	☒ Periodic	

CONCRETE CONSTRUCTION (IBC1704.4)

Item			Reference/Comments
Materials (1704.4.1)	☐ Continuous	☒ Periodic	
Steel placement	☐ Continuous	☒ Periodic	
Bolts prior & during placement	☒ Continuous	☐ Periodic	
Use of required design mix	☐ Continuous	☒ Periodic	
Concrete sampling for strength test, slump, air content, and temperature of comcrete	☒ Continuous	☐ Periodic	
Concrete & shotcrete placement	☒ Continuous	☐ Periodic	
Curing temperature and techniques	☐ Continuous	☒ Periodic	
Form work	☐ Continuous	☒ Periodic	

SOILS CONSTRUCTION (IBC1704.7)

Item			Reference/Comments
Site preparation	☐ Continuous	☒ Periodic	
Structural fill material	☒ Continuous	☐ Periodic	
Structural fill lift thickness	☒ Continuous	☐ Periodic	
Structural fill soil densities	☒ Continuous	☐ Periodic	
Backfill soils materials	☐ Continuous	☒ Periodic	
Backfill soil densities	☐ Continuous	☒ Periodic	

EPOXY (IBC1704.13)

Item			Reference/Comments
Material and instillation	☒ Continuous	☐ Periodic	

UVU
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Utah Valley University
Physical Education Infill II
OREM, UTAH

8-4-2009 - ADDENDUM #1

Axis Job #	0910
Owner #	09097790
Date	07-10-2009
Drawn	Tri
Checked	Peter

STRUCTURAL GENERAL NOTES

SE001