



State of Utah

GARY R. HERBERT
Governor

GREGORY S. BELL
Lieutenant Governor

Department of Administrative Services

KIMBERLY K. HOOD
Executive Director

Division of Facilities Construction and Management

DAVID G. BUXTON
Director

ADDENDUM NO. 2

Date: August 11, 2010

To: Contractors

From: Mike Ambre

Reference: New Facilities/Planning Center
Utah Valley University – Orem, Utah
Project No.09247790

Subject: **Addendum No. 2**

Pages	Addendum	1 page
	Revised Bid Form	2 pages
	<u>Architects Addendum</u>	<u>45 pages</u>
	Total	48 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.*

2.1 SCHEDULE CHANGES – There are no changes to the project schedule.

2.2 GENERAL – Revised Bid Form adding three additive alternates.
Prior & Associates, please see attached sheets.

Utah!
Where ideas connect



Division of Facilities Construction and Management

REVISED BID FORM

NAME OF BIDDER _____ DATE _____

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the New Facilities/Planning Center – Utah Valley University - Orem, Utah – DFCM Project No.09247790 and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

BASE BID:

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATIVE #1 – General contractor to provide additional cost associated with providing casework in Reception Area 109 as shown on Add Alternate 1 & 3 drawing.

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATIVE #2 – General contractor to provide additional cost associated to include HP-9 and HP-10 with associated ductwork, grilles and piping etc. See drawings M201 and MP201 in addendum #2

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

ADDITIVE ALTERNATIVE #3 – General contractor to provide additional cost associated with providing anodized aluminum solar shading system on South Building Elevation as shown on drawing AA 1 & 3.

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by February 18, 2011, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of \$750.00 per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor’s Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable 100% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:

(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

Respectfully submitted,

Name of Bidder

ADDRESS:

Authorized Signature

ADDENDUM NO. 1

Date: August 11th, 2010

PROJECT:

Utah Valley University
New Facilities and Parking Building
Orem, Utah

ARCHITECT:

P+A ARCHITECTS
821 EAST KENSINGTON AVENUE
SALT LAKE CITY, UT 84105

The original Contract Documents issued for the above noted project are amended as noted in this Addendum. It shall be the sole responsibility of the bidder to appropriately disseminate this information to all concerned prior to the assigned bid time and date, and to coordinate the Addendum with the Contract Documents.

This Addendum consists of a total of Thirty Seven (37) 8 ½" x 11" documents, including this document.

If there are still unresolved questions after examining this addendum, please submit those questions via telephone or facsimile as soon as possible so that an addendum can be issued to clarify those issues in a timely manner.

Architectural:

1. See revised specification section 08800 Glazing to replace original specification section. Note different glass type, shading coefficients and U values.
2. See revised drawings AWS400, AWS401 and AWS 402 to replace original documents.
3. See specification section 03490-Glass Fiber Reinforced Precast Concrete add to section 1.6 quality assurance item B2, that the manufacturer has to participate in PCI's or NPCA (National Precast Concrete Association) certification and can be a designated certified plant of one or both of these organizations.
4. All attachment angles, kickers etc, required for GFRC panel installation to be provided by GFRC Panel manufacturer.
5. Curtain wall window framing system shall be changed from a 5" back to an 8" back if required for design wind loading and additional steel. Front face cover to be changed from a 3" to a 2" cover/cap.
6. See attached specification section 01030 Alternates. General contractors shall provide pricing for alternates as listed on bid form in appropriate order. See attached drawings ADD ALT, M201 and MP201 as part of the add alternates.
7. See architectural drawing A-FPI01. Note window tag 15 as noted along grid lines "A" and 4.8 and 7. Window tag 15 at this location to be changed to window tag 13. Note window tag 09 as noted along grid lines "B" and 1 & 2. Window tag 09 at this location to be changed to window tag 10.

8. See architectural drawing A-SH600 Door Schedule:
 - a. Door 113A frame type to be as per frame type 08 on sheet A-SH601
 - b. Door 113B frame type to be as per frame type 08 (sim.) on sheet A-SH601
 - c. Door 136B frame type to be as per frame-type 19 on sheet A-SH601
 - d. Door 137A and 137B frame type to be as per frame type 05 on sheet A-SH601
9. See architectural drawing A-BD900 detail 06 & 07. Detail indicates cavity between the framed wall and brick veneer to be filled with Pee-Gravel. General Contractor shall use 1-1/2" free draining mesh in cavity wall as per specification section 4810-3.
10. See architectural drawing A-SD101. General contractor shall remove existing antenna and dispose of, see reference note #15.
11. General contractors shall remove existing 3'-0" of fill soil under new building footprint down to native soil as noted in soils report and provide structural fill as replacement soil as noted in soils report.
12. See revised drawings A-BD900 to replace original documents. Note, only change to original drawing is detail 06 and 08.
13. This project will be a tax exempt job.
14. Special inspections and testing will be provided by DFCM.
15. All permit fees, impact fees and utility fees will be paid for by the DFCM.

Architectural Substitutions:

1. Johns Manville single ply EPDM reinforced and unreinforced roofing membrane may be used as a roofing membrane. Roofing membrane must meet specification requirements.
2. Alternate 3.5 ACOUSTICAL PANEL CEILING SCHEDULE
 - A. Ceiling type CT-1 Acoustical Panel Ceiling
 1. Products: Provide the following: USG ceiling system Olympia ClimaPlus, FLB edge, 24"x 24" panels.
 2. 9/16" DXT Centricitee exposed tee suspension grid system.
 - B. Ceiling type CT-2 Panel Ceiling
 1. Products: USG ceiling system Celebration Wood Tones 2'x2'
 2. 9/16" DXF Finline Grid with inner black reveal, tee suspension system.
 - C. Provide 6" Compasso edge trim.

Mechanical:

1. See attached mechanical addenda no. 1.

Electrical:

1. See attached electrical addenda no. 1

Structural:

1. See attached structural addenda no. 1

Geotechnical:

1. See attached letter from geotechnical engineer indicating soils report has been reviewed and the new 2 story buildings design loading on existing soil conditions should be adequate for building loads

End of Addendum I



MECHANICAL ADDENDUM #01

DATE: August 06, 2010
PROJECT NO: 9422
PROJECT: UVU Parking & Facility Building

DIVISION – 15

GENERAL

1. Add alternate shall include HP-9 and HP-10 with associated ductwork, grilles, piping, etc. See sheets M201 and MP201 in this addendum.

DRAWINGS

SHEET - M-201

1. Heat Pumps, HP-9 and HP-10, are to be included as an alternate. Associated ductwork, grilles, piping, etc are to be included in alternate. See supplementary drawing for heat pump alternate layout.
2. Supply and return ductwork for HP-11 to be relocated as part of alternate. See supplementary drawing for new alternate layout.

SHEET - MP201

1. Heat Pump, HP-9 and HP-10, are to be included as an alternate. See supplementary drawing for thermostat locations and piping.

SHEET - M-601

1. Heat Pumps, HP-9 and HP-10, are to be included as an alternate

PRIOR APPROVALS

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.

<u>Item</u>	<u>Manufacturer</u>	<u>Comments</u>
Registers, Grilles & Ceiling Diffusers	Carners	APPROVED
Ceiling Exhaust Fans	Broan-Nutone	APPROVED
Fire Protection	First Fire Protection	APPROVED
Louvers	Greenheck	APPROVED
Water Source Heat Pump	McQuay	APPROVED
Water Source Heat Pump	Addison	APPROVED
Water Source Heat Pump	Mammoth	APPROVED
Energy Recovery Units	Greenheck	APPROVED
Energy Recovery Units	Venmar	APPROVED



ELECTRICAL ADDENDUM #02

DATE: August 09, 2010
PROJECT NO: 9422
PROJECT: UVU Parking & Facility Building

DIVISION – 16

SPECIFICATION SECTION

Section 16717 Communications horizontal cabling was added and the specification index was revised to reflect this new section.

DRAWINGS

SHEET - E-001

1. Symbol schedule was revised for the data symbols and powerpack.

SHEET - E200

1. A power pack was added for the wall mounted occupancy sensors in the lobby.

SHEET - E400,401

1. The data/communications riser was added.

PRIOR APPROVALS

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.

<u>Item</u>	<u>Manufacturer</u>	<u>Comments</u>
L1,L1E	METALUX 2RDI LITHONIA 2AVG	APPROVED APPROVED
L2,L2E	GOTHAM AF	APPROVED
L3,L3E	GOTHAM AF	APPROVED
L4,L4E	CORELITE IQ FINELITE S12 PRUDENTIAL WV-SL	APPROVED APPROVED APPROVED
L5	PRUDENTIAL WV-SL	APPROVED
L6	MCPHILBEN SL LITHONIA LQM	APPROVED APPROVED
L7	VISA CB-3108	APPROVED

	DM LIGHTING 4694 SPI AIW1274	APPROVED APPROVED
L8	VISA OW-MOD DM LIGHTING 4915	APPROVED APPROVED
L9	ISOLITE-EYE LITHONIA AFN	APPROVED APPROVED
L10	CAMMAN P4270	APPROVED
L14	DAYBRITE VIN	APPROVED
L15	MCPHILBEN PDNBZ LITHONIA DS	APPROVED APPROVED
P4	US ARCHITECT (2)APG SPAULDING NK2 GARDCO HPV19 LITHONIA KSE2	APPROVED APPROVED APPROVED APPROVED
P4-POLE	US ARCHITECT SNTS SPAULDING SSS GARDCO SSS LITHONIA SSS	APPROVED APPROVED APPROVED APPROVED



UTAH OFFICES
Sandy
Layton
St. George

Project Number: U1044-015-091

August 11, 2010

Prior & Associate Architects
821 Kensington Ave
Salt Lake City, UT 84105

ATTENTION: Scott Prior

REFERENCE: UVU New Facilities Building
Structural Addendum # 1

Mr. Prior,

Per your request, we have reviewed the calculations and drawings for the above referenced project. Please be advised as follows:

- The following details have been revised and are attached herein. 4A/S300, 4B/S300, 1/S301, 7/S301, 6/S301, and 12/S301.
- Column sizes at the braced frames are shown on detail 6/S300.
- Base plate sizes at the braced frames are shown on detail 1/S300.
- The beam size from grid E to F5.1 near grid 4.9 shall be C12x20.7
- Detail 22/S301 is not used in this project.
- Detail 6/S101 is required at all roof drain locations.

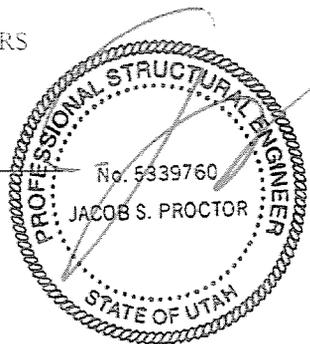
We hope this meets your needs. If you have any further questions regarding this matter, please call this office at your convenience.

Very truly yours,
VECTOR STRUCTURAL ENGINEERS

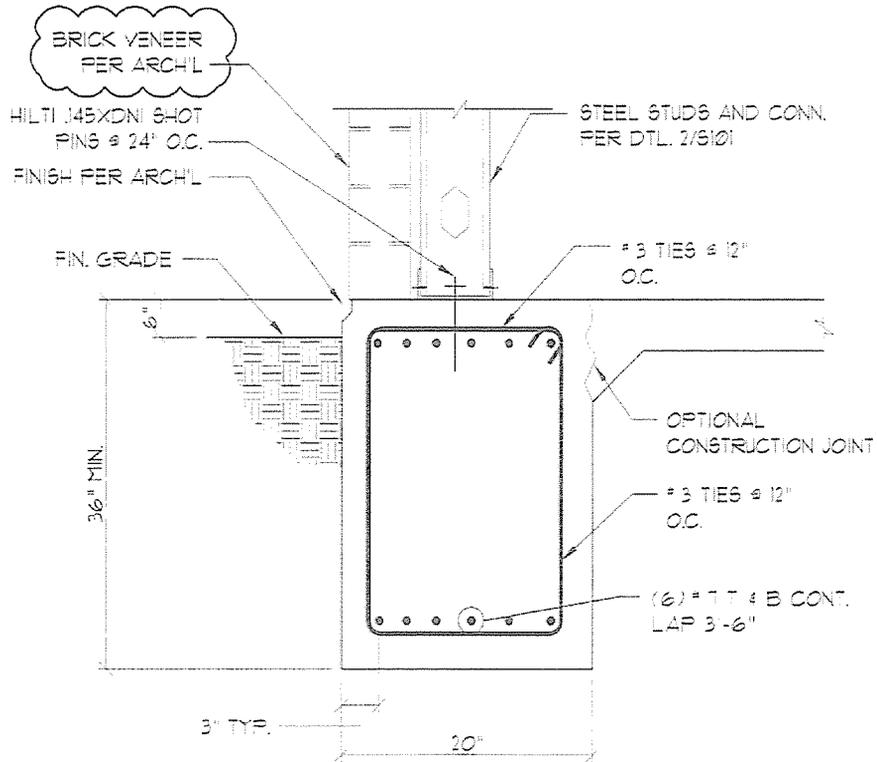
Jacob S. Proctor, S.E.
Project Engineer

JSP/jsp

Enclosures

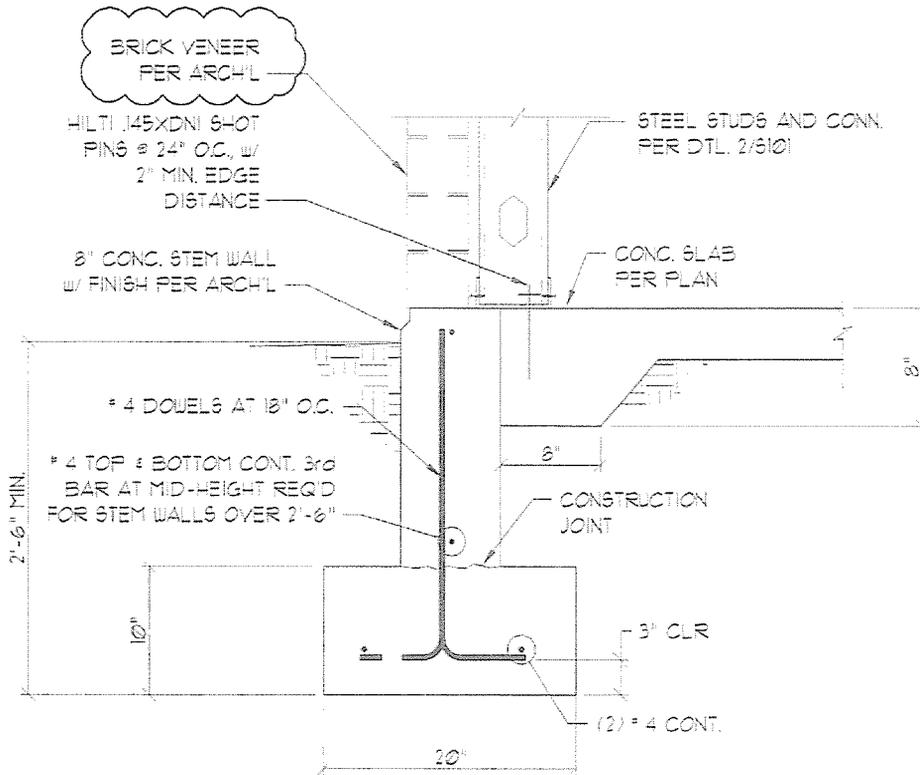


AUG 11 2010



REVISED DTL 4A/S300

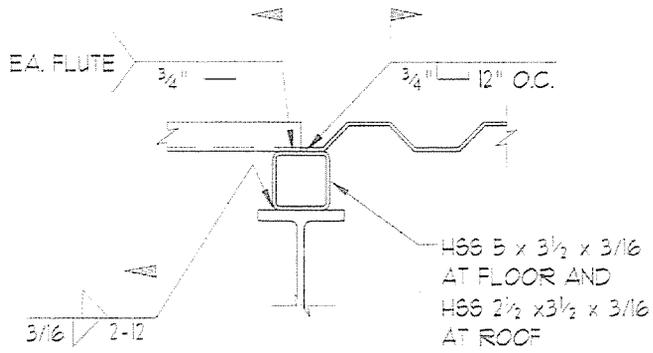
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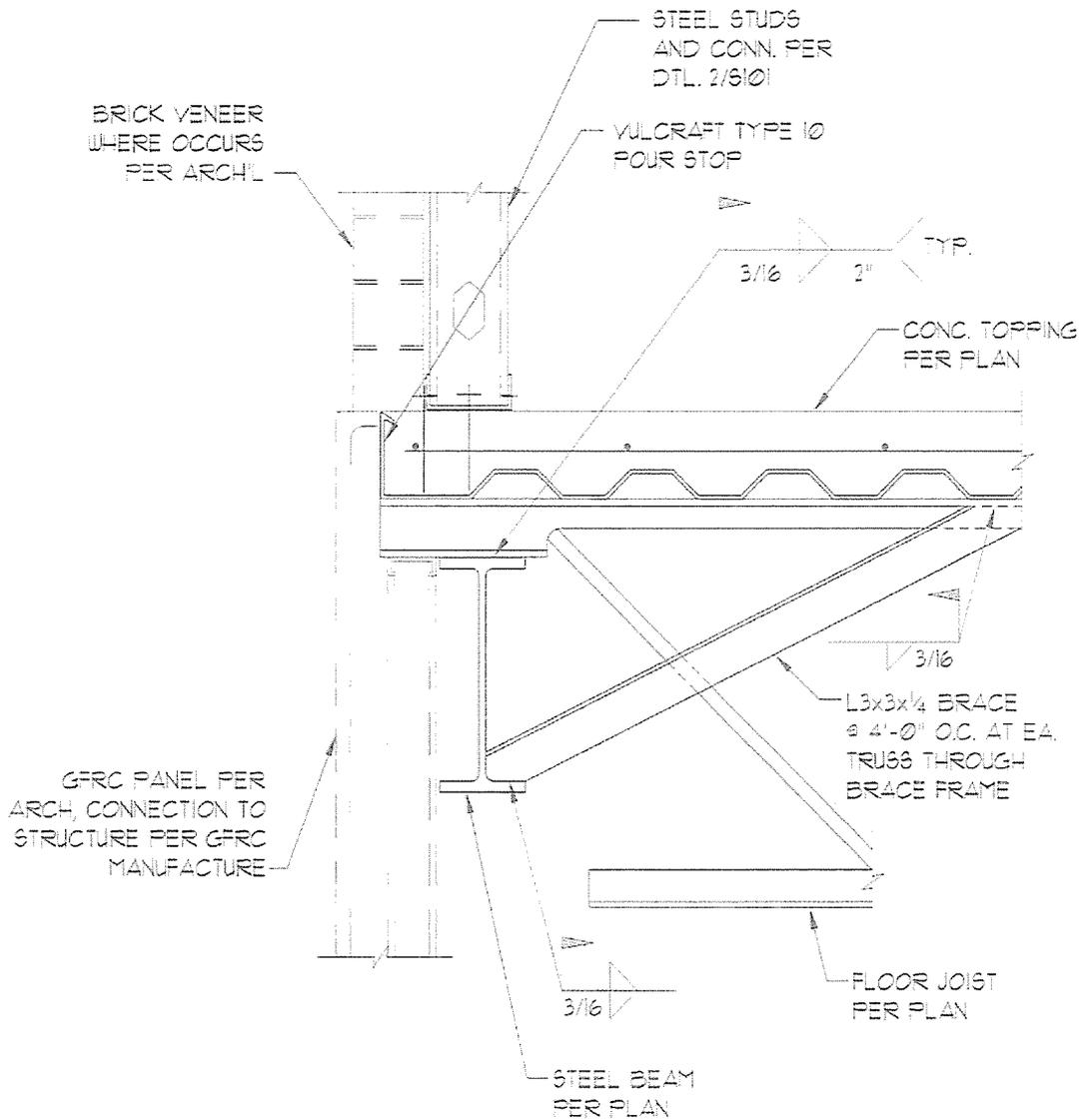
REVISED DTL 4B/S300

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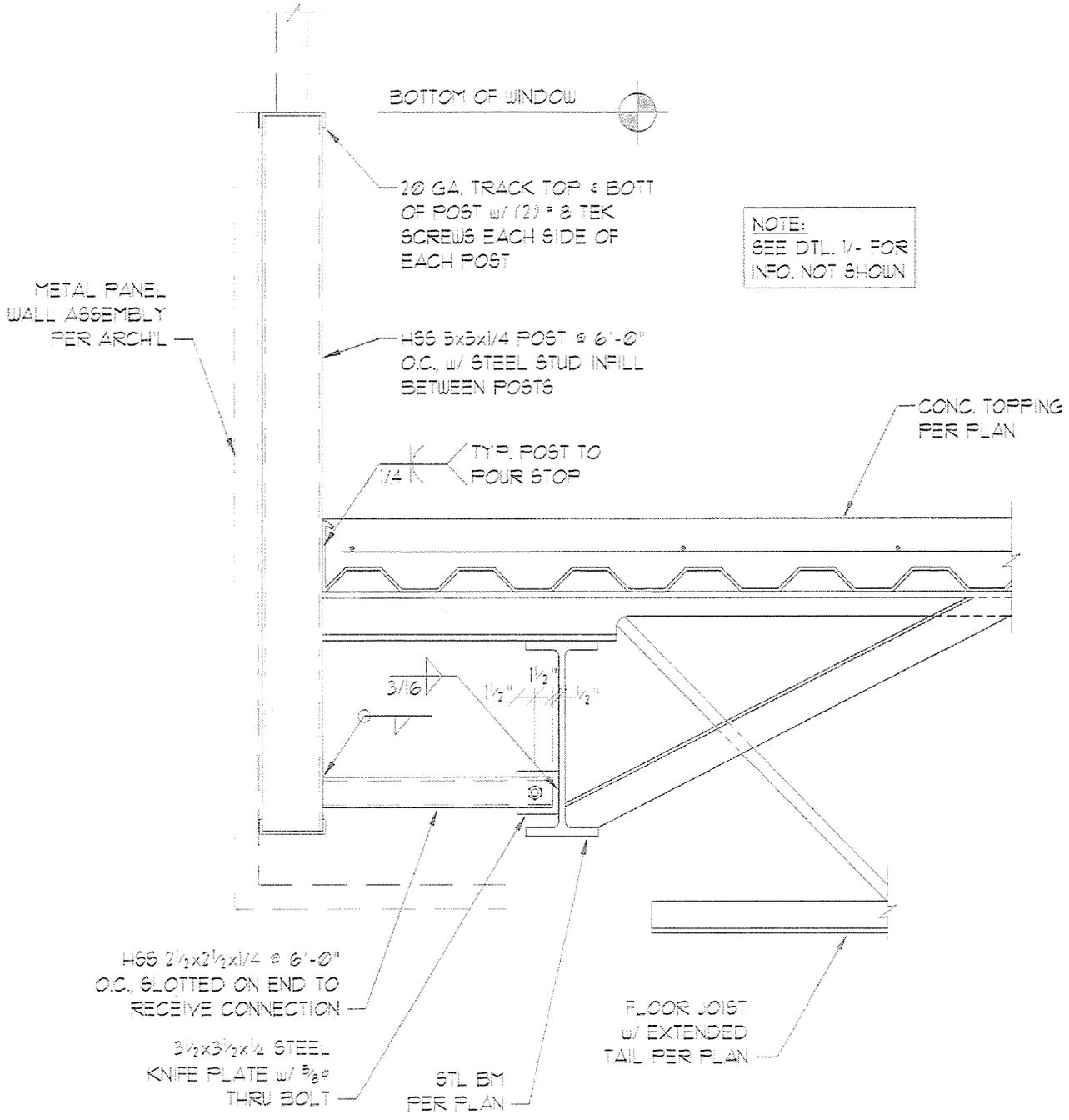
BETWEEN JOISTS



REVISED DTL 1/S301

N.T.S.

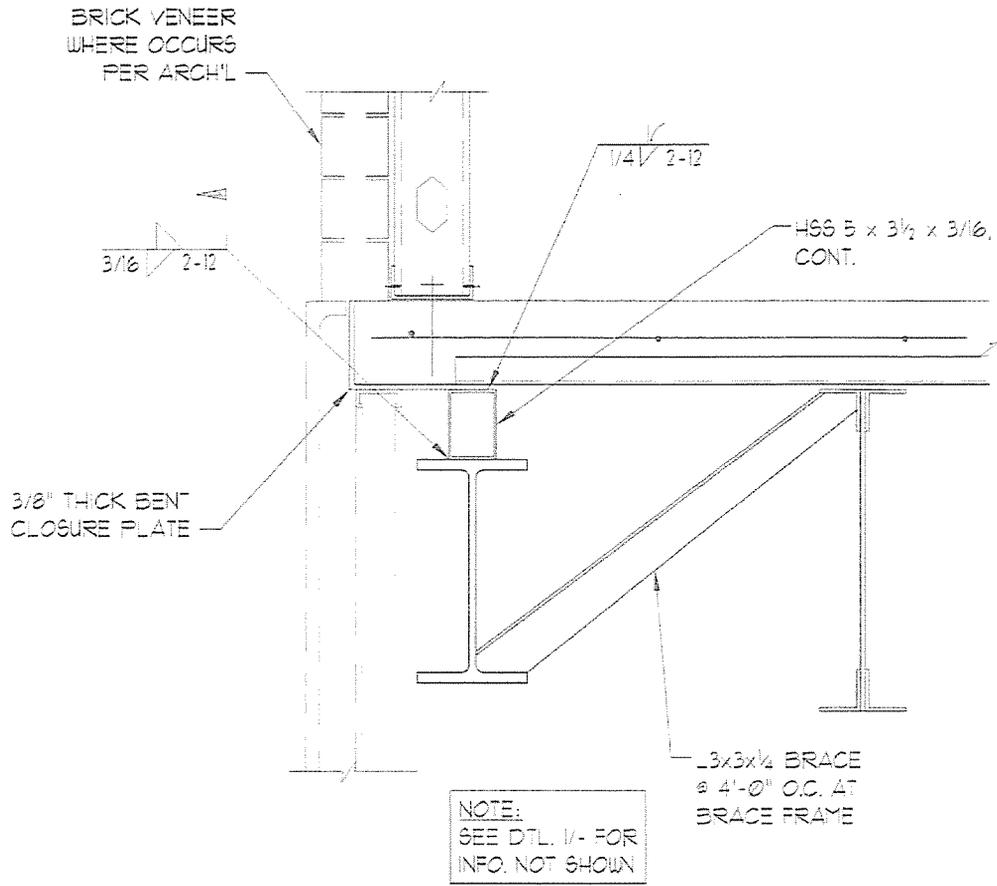




REVISED DTL 7/S301

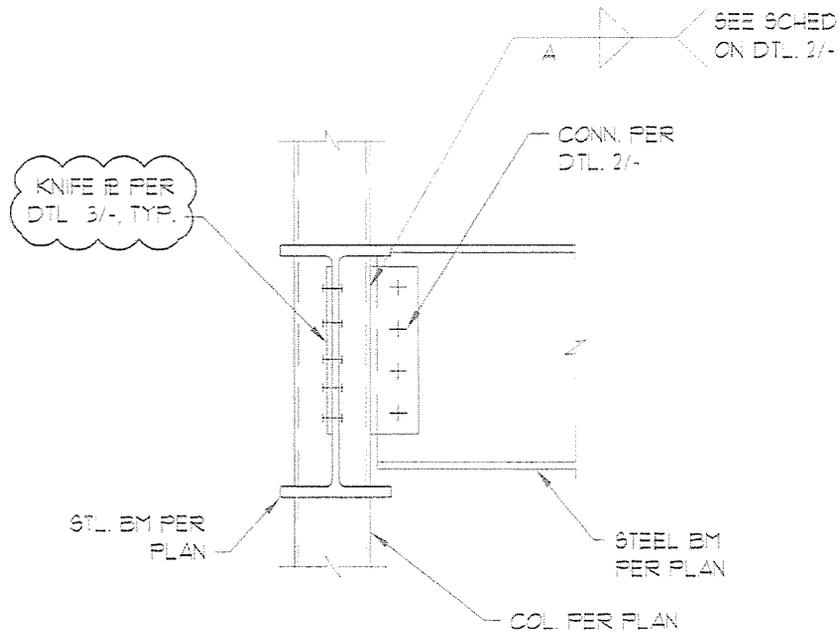
N.T.S.





REVISED DTL 6/S301

N.T.S.



REVISED DTL 12/S301

N.T.S.



Applied Geotechnical Engineering Consultants, Inc.

July 29, 2010

P + A Architects
821 East Kensington Avenue
Salt Lake City, UT 84105

Attention: Scott Prior
EMAIL: parchitects@comcast.net

Subject: Geotechnical Consultation
Proposed Facilities Department Building
Utah Valley University
Approximately 910 South 400 West
Orem, Utah
Project No. 1090751

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to provide additional geotechnical consultation for the proposed facilities department building to be located on the campus of Utah Valley University at approximately 910 South 400 West in Orem, Utah.

PREVIOUS STUDIES

AGEC previously conducted a geotechnical investigation for the proposed building and presented our findings and recommendations in a report dated December 3, 2009 under Project No. 1090751.

The proposed construction described in the above-referenced geotechnical report indicates that the proposed building is planned to be a single-story, masonry, slab-on-grade structure with a building footprint of approximately 5,000 square feet. Building loads were assumed to consist of wall loads of up to 5 kips per lineal foot and column loads of up to 50 kips.

On July 26, 2010, AGEC was notified that the proposed construction had changed to the following:

- A two-story, slab-on-grade structure.
- Steel-frame construction.
- Approximate building footprint, 6,000 square feet.

- Building loads estimated by the project structural engineers are wall loads up to 1.2 kips per lineal foot and column loads up to 100 kips.

CONCLUSIONS AND RECOMMENDATIONS

Based on our understanding of the revised proposed construction, the subsurface conditions encountered at the site and information presented in the above-referenced geotechnical report, the following conclusions and recommendations are given:

1. The recommendations presented in the above-referenced geotechnical report may be relied upon for the proposed construction as described above.
2. The estimated total settlement for foundations based on the proposed construction and the recommendations presented in the above-referenced geotechnical report, will be less than 1 inch. Differential settlement is estimated to be less than $\frac{3}{4}$ inch.

LIMITATIONS

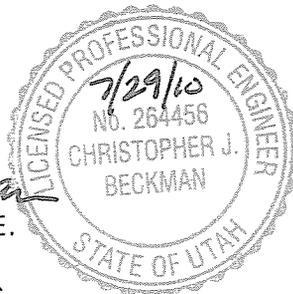
This letter has been prepared in accordance with generally accepted geotechnical engineering practices in the area for the use of the client. The conclusions and recommendations included in the letter are based on our understanding of the revised proposed construction, information presented in the above-referenced geotechnical report and our experience in the area. If the subsurface conditions or proposed construction is significantly different from what is described in this letter, we should be notified to reevaluate the recommendations given.

If you have any questions or if we can be of further service, please call.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.


Christopher J. Beckman, P.E.



Reviewed by DRH, P.E., P.G.
CJB/dc

SECTION 01030 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

- A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- B. Notification: Immediately following the award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of this Contract.
- D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

Utah Valley University
New Parking and Facilities Building
Division of Facilities Construction Management

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Additive alternate number shall be for the general contractor to provide additional cost associated with providing casework in Reception Area 109 as shown on Add Alternate 1 & 3 drawing.
- B. Alternate No. 2: Additive alternate number two shall be for the general contractor to provide additional cost associated to include HP-9 and HP-10 with associated ductwork, grilles and piping etc. See attached drawings M201 and MP201 with this addenda.
- C. Alternate No. 3: Additive alternate number three shall be for the general contractor to provide additional cost associated with providing anodized aluminum solar shading system on South Building Elevation as shown on drawing AA 1 & 3.

END OF SECTION 01030

SECTION 08800 - GLAZING

PART 1 - GENERAL

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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

- 1. Windows.
- 2. Doors.
- 3. Glazed curtain walls.
- 4. Storefront framing.

- B. Related Sections include the following:

- 1. Division 10 Section "Toilet Accessories" for mirrored glass at toilet room locations.

1.3 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

Utah Valley University
New Parking and Facilities Building
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- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: As indicated within Structural Drawings.
 - b. Specified Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour (meters per second) at 33 feet (10 m) above grade, according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.4.2, "Analytic Procedure," based on mean roof heights above grade indicated on Drawings.
 - c. Specified Design Snow Loads: As indicated, but not less than snow loads applicable to Project, required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7, "Snow Loads."
 - d. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - 1) Load Duration: 60 seconds or less.
 - e. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.
 - 1) For monolithic-glass lites heat treated to resist wind loads.
 - 2) For insulating glass.
 - 3) For laminated-glass lites.
 - f. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
 - g. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.
 - C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 - D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
 2. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- (13-mm-) wide interspace.
 3. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F (W/sq. m x K).
 4. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
 5. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass and of 12-inch- (300-mm-) long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- C. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.
 - 1. Each color of tinted float glass.
 - 2. Coated vision glass.
 - 3. Insulating glass for each designation indicated.
 - 4. For each color (except black) of exposed glazing sealant indicated.
- D. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- E. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- G. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- H. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
 - 1. Tinted float glass.
 - 2. Coated float glass.
 - 3. Insulating glass.
 - 4. Glazing sealants.
 - 5. Glazing gaskets.
- I. SWRI Validation Certificate: For each elastomeric glazing sealant specified to be validated by SWRI's Sealant Validation Program.
- J. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.

Utah Valley University
New Parking and Facilities Building
Division of Facilities Construction Management

- C. Source Limitations for Tinted Glass: Obtain tinted, heat-absorbing, and light-reducing float glass from one primary-glass manufacturer for each tint color indicated.
- D. Source Limitations for Coated Glass: Obtain coated glass from one manufacturer for each type of coating and each type and class of float glass indicated.
- E. Source Limitations for Insulating Glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.
- F. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- G. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
 - 1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Glass Testing Agency Qualifications: An independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- H. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
 - 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
 - 3. Test elastomeric glazing sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- I. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.
 - 1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - a. Perform tests under normal environmental conditions replicating those that will exist during installation.
 - 2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 - 5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

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- J. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
 - 1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

 - K. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines."

 - L. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. National Accreditation and Management Institute.

 - M. Mockups: Before glazing, build mockups for each glass product indicated below to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Build mockups with the following kinds of glass to match glazing systems required for Project, including typical lite size, framing systems, and glazing methods:
 - a. Heat-strengthened coated glass.
 - b. Fully tempered glass.
 - c. Spandrel glass.
 - d. Coated insulating glass.
 - 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 4. Obtain Architect's approval of mockups before starting fabrication.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

 - N. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F (4.4 deg C).

1.9 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2.2 PRIMARY FLOAT GLASS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

- A. Fabrication Process: By vertical (tong-held) or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongless or free of tong marks.

- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

2.4 COATED FLOAT GLASS

- A. General: Provide coated glass complying with requirements indicated in this Article and in schedules at the end of Part 3.
 - 1. Provide Kind HS (heat-strengthened) coated float glass in place of coated annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.
 - 2. Provide Kind HS (heat-strengthened) coated float glass, except provide Kind FT (fully tempered) products where coated safety glass is indicated.
- B. Pyrolytic-Coated Float Glass: Float glass with solar-reflective metallic-oxide coating applied by pyrolytic deposition process during initial manufacture, complying with requirements specified in schedules at the end of Part 3.
- C. Sputter-Coated Float Glass: Float glass with metallic-oxide or metallic-nitride coating deposited by vacuum deposition process after manufacture and heat treatment (if any), complying with requirements specified in schedules at the end of Part 3.
- D. Coated Spandrel Float Glass: Float glass complying with requirements specified in monolithic glass schedules at the end of Part 3 and the following:
 - 1. Fallout Resistance: Provide spandrel units identical to those passing the fallout-resistance test for spandrel glass specified in ASTM C 1048.
 - 2. Factory apply manufacturer's standard opacifier of the following material to coated second surface of lites, with resulting products complying with GTA 89-1-6.
 - a. Manufacturer's standard opacifier material.
 - b. Polyester film laminated to glass with solvent-based adhesive.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
 - 1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.
- B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
- C. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - 1. Manufacturer's standard sealants.

- D. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
1. Aluminum with clear-anodized finish.
 2. Desiccant: Molecular sieve or silica gel, or blend of both.
 3. Corner Construction: Manufacturer's standard corner construction.

2.6 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.
- B. Elastomeric Glazing Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied, chemically curing sealant in the Glazing Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
1. Additional Movement Capability: Where additional movement capability is specified in the Glazing Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements in ASTM C 920 for uses indicated.

2.7 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
1. Neoprene, ASTM C 864.
 2. EPDM, ASTM C 864.
 3. Silicone, ASTM C 1115.
 4. Thermoplastic polyolefin rubber, ASTM C 1115.
 5. Any material indicated above.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
 - D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
 - E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
 - F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
 - H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
 - I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
 - J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
 - K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- 3.4 GASKET GLAZING (DRY)
- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
 - B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
 - C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
 - D. Install gaskets so they protrude past face of glazing stops.

3.5 PROTECTION AND CLEANING

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- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.6 MONOLITHIC FLOAT-GLASS SCHEDULE

- A. Uncoated Clear Float Glass: Where glass as designated below is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:
 - 1. Uncoated Clear Annealed Float Glass: Annealed or Kind HS (heat strengthened), Condition A (uncoated surfaces) where heat strengthening is required to resist thermal stresses induced by differential shading of individual glass lites and to comply with performance requirements.
 - 2. Uncoated Clear Fully Tempered Float Glass: Kind FT (fully tempered) as required by drawings.

3.7 INSULATING-GLASS SCHEDULE

- A. **Low-E Insulating Glass:** Where glass of this designation is indicated, provide uncoated insulating-glass units complying with the following:
 - 1. **Products:** Provide the following (or pre-approved equal):
 - a. **PPG – Solarban 60 Solar Control Low E Glass**
 - 2. **Overall Unit Thickness and Thickness of Each Lite:** 1" Overall thickness with (2) ¼" lites each and ½" air space.
 - 3. **Interspace Content:** Air with low "E" coating on the 3rd surface
 - 4. **Visible Light Transmittance:** 61%
 - 5. **Winter Night time U-Value:** 0.29
 - 6. **Shading Coefficient:** 0.36
 - 7. **Light to Solar Gain Ratio:** 1.92
 - 8. **Color:** Solexia

3.8 GLAZING SEALANT SCHEDULE

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- A. Low-Modulus Nonacid-Curing Silicone Glazing Sealant: Where glazing sealants of this designation are indicated, provide products complying with the following:
1. Products: Available products include the following:
 - a. 790; Dow Corning.
 - b. Silpruf; GE Silicones.
 - c. UltraPruf SCS2300; GE Silicones.
 - d. HiFlex 331; NUCO Industries, Inc.
 - e. NuFlex 309; NUCO Industries, Inc.
 - f. VP 275; Ohio Sealants, Inc.
 - g. 864; Pecora Corporation.
 - h. PSI-641; Polymeric Systems, Inc.
 - i. Omniseal; Sonneborn, Div of ChemRex, Inc.
 - j. Spectrem 1; Tremco.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 25.
 4. Additional Movement Capability: 100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement.
 5. Use Related to Exposure: NT (nontraffic).
 6. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
- B. Medium-Modulus Neutral-Curing Silicone Glazing Sealant: Where glazing sealants of this designation are indicated, provide products complying with the following:
1. Products: Available products include the following:
 - a. 791; Dow Corning.
 - b. 795; Dow Corning.
 - c. HiFlex 393; NUCO Industries, Inc.
 - d. PSI-631; Polymeric Systems, Inc.
 - e. SM5731 Poly-Glaze; Schnee-Morehead, Inc.
 - f. SM5733 Poly-Glaze; Schnee-Morehead, Inc.
 - g. Spectrem 2; Tremco.
 - h. Tremsil 600; Tremco.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 25.
 4. Use Related to Exposure: NT (nontraffic).
 5. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.

END OF SECTION 08800

SECTION 16717 - COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pathways.
 - 2. UTP cabling.
 - 3. Multiuser telecommunications outlet assemblies.
 - 4. Telecommunications outlet/connectors.

1.3 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- C. EMI: Electromagnetic interference.
- D. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- E. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- F. RCDD: Registered Communications Distribution Designer.
- G. UTP: Unshielded twisted pair.

1.4 HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.
 - 1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.

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2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
 3. Bridged taps and splices shall not be installed in the horizontal cabling.
- B. A work area is approximately 100 sq. ft., and includes the components that extend from the telecommunications outlet/connectors to the station equipment.
- C. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet in the horizontal cross-connect.

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
 2. Cabling administration drawings and printouts.
 3. Wiring diagrams to show typical wiring schematics, including the following:
 - a. Cross-connects.
 - b. Patch panels.
 - c. Patch cords.
 4. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:
 - a. Vertical and horizontal offsets and transitions.
 - b. Clearances for access above and to side of cable trays.
 - c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
 - d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.
- C. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.
- D. Source quality-control reports.
- E. Field quality-control reports.
- F. Maintenance Data: For splices and connectors to include in maintenance manuals.

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1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
 - 1. Installation Supervision: Installation shall be under the direct supervision of **Level 2 Installer**, who shall be present at all times when Work of this Section is performed at Project site.
 - 2. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- B. Testing Agency Qualifications: An NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.
- E. Grounding: Comply with ANSI-J-STD-607-A.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

1.11 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Device Plates: One of each type.
 - 2. Multiuser Telecommunications Outlet Assemblies: One of each type.

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PART 2 - PRODUCTS

2.1 PATHWAYS

- A. General Requirements: Comply with TIA/EIA-569-A.
- B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
 - 1. Support brackets with cable tie slots for fastening cable ties to brackets.
 - 2. Lacing bars, spools, J-hooks, and D-rings.
 - 3. Straps and other devices.
- C. Cable Trays:
 - 1. Refer to specification section 16139 "Cable trays" for more information.
- D. Conduit and Boxes: Comply with requirements in Division 16 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.
 - 1. Conduit shall be minimum size of 1" EMT stubbed into accessible ceiling space and extended to the cable tray as indicated on drawings.
 - 2. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 UTP CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Mohawk; a division of Belden CDT.
 - 2. Siemon Co. (The).
- B. Description: 100-ohm, 4-pair UTP, covered with a blue thermoplastic jacket for voice and white thermoplastic jacket for data.
 - 1. Comply with ICEA S-90-661 for mechanical properties.
 - 2. Comply with TIA/EIA-568-B.1 for performance specifications.
 - 3. Comply with TIA/EIA-568-B.2, Category 5e for voice and Category 6A for data.
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications, Plenum Rated: Type CMP or MPP, complying with NFPA 262.
 - b. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.

2.3 UTP CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Siemon Co. (The).
 - 2. Mohawk; a division of Belden CDT.

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- B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- C. Connecting Blocks: 110-style IDC for Category 5e. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.
- D. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
- E. Patch Cords: Factory-made, four-pair cables in **36-inch** lengths; terminated with eight-position modular plug at each end.
 - 1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
 - 2. Patch cords shall have color-coded boots for circuit identification.

2.4 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.
- B. Workstation Outlets: 8-port-connector assemblies mounted in single or multigang faceplate.
 - 1. Plastic Faceplate: High-impact plastic. Coordinate color with Division 16 Section "Wiring Devices."
 - 2. Metal Faceplate: Stainless steel, complying with requirements in Division 16 Section "Wiring Devices."
 - 3. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.
 - a. Angled mounting jacks for data, positioning the cord at a 45-degree angle.
 - 4. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.5 GROUNDING

- A. Comply with requirements in Division 16 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Comply with ANSI-J-STD-607-A.

2.6 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

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2.7 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test UTP cables according to TIA/EIA-568-B:2.
- C. Cable will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.
 - 1. Comply with requirements for raceways and boxes specified in Division 16 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF PATHWAYS

- A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.
- B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Communications Equipment Room Fittings." Drawings indicate general arrangement of pathways and fittings.
- C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.
- D. Comply with requirements in Division 16 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA/EIA-568-B.1.
 - 2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
 - 3. Install 110-style IDC termination hardware unless otherwise indicated.

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4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
 7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
 8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 10. In the communications equipment room, install a 10-foot-long service loop on each end of cable.
 11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
1. Comply with TIA/EIA-568-B.2.
 2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.
- D. Group connecting hardware for cables into separate logical fields.
- E. Separation from EMI Sources:
1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
 2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
 3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
 4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
 5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
 6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

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3.4 FIRESTOPPING

- A. Comply with requirements in Division 07 Section "Penetration Firestopping."
- B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.5 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with ANSI-J-STD-607-A.

3.6 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 16 Section "Identification for Electrical Systems."
- B. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
- C. A. Furnish electronic record of all drawings, in software and format selected by Owner.
- D. Cable and Wire Identification:
 - 1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - 2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
 - 3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
 - 4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 - a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - b. Label each unit and field within distribution racks and frames.
- E. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
 - 1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.

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C. Tests and Inspections:

1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
2. Visually confirm Category 5e, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. UTP Performance Tests:
 - a. Test for each outlet and MUTOA. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
 - 1) Wire map.
 - 2) Length (physical vs. electrical, and length requirements).
 - 3) Insertion loss.
 - 4) Near-end crosstalk (NEXT) loss.
 - 5) Power sum near-end crosstalk (PSNEXT) loss.
 - 6) Equal-level far-end crosstalk (ELFEXT).
 - 7) Power sum equal-level far-end crosstalk (PSELFEXT).
 - 8) Return loss.
 - 9) Propagation delay.
 - 10) Delay skew.
5. Final Verification Tests: Perform verification tests for UTP systems after the complete communications cabling and workstation outlet/connectors are installed.
 - a. Voice Tests: These tests assume that dial tone service has been installed. Connect to the network interface device at the demarcation point. Go off-hook and listen and receive a dial tone. If a test number is available, make and receive a local, long distance, and digital subscription line telephone call.
 - b. Data Tests: These tests assume the Information Technology Staff has a network installed and is available to assist with testing. Connect to the network interface device at the demarcation point. Log onto the network to ensure proper connection to the network.

D. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

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END OF SECTION 16717



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PROJECT TITLE:
**UTAH VALLEY UNIVERSITY
 NEW PARKING AND
 FACILITIES DEPARTMENT
 BUILDING**

UTAH VALLEY UNIVERSITY
 936 SOUTH 400 WEST
 OREM, UTAH

NO.	REVISIONS	DATE	DESCRIPTION
1	8/11/10	APPENDIX	

MARK: DATE: DISCUSSION

ISSUE TYPE: CONSTRUCTION DOCUMENTS

ISSUE DATE: August 02, 2010

CAD PROJECT NO: 09247900

CAD DWG FILE: 09247900

DRAWN BY: E.J.K.M

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KEY PLAN

SHEET TITLE

GENERAL NOTES
 AND SCHEDULES

SHEET NUMBER

E-001

GENERAL NOTES

22. UNDERGROUND CONDUIT FOR SITE LIGHTING SHALL BE BURIED 24" B.T.C. AND SHALL HAVE ONE (1) #10 THIN GREEN GROUND CONDUCTOR TO GROUND ALL LUMINAIRES.
23. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE EQUIPMENT SUPPLIERS ON THE EXACT LOCATIONS OF ALL EQUIPMENT AND REQUIRED ELECTRICAL CONNECTIONS PRIOR TO RECEIVING THE PLANS FOR SPECIFICATIONS. THE CONTRACTOR SHALL MAKE THE FINAL CONNECTION TO ALL EQUIPMENT.
24. AFTER THE FACILITY IS COMPLETE AND BEGUN TO OPERATE, THE ELECTRICAL CONTRACTOR SHALL OBTAIN THE ULTIMATE DEMAND PHASE TO GROUND (PHASE TO PHASE AND EQUIPMENT GROUNDING CONDUCTOR SIZES) FROM THE OWNER. THESE DEMANDS SHALL BE OBTAINED FROM PARALLEL RIMS.

GENERAL NOTES

1. THE ELECTRICAL SYSTEMS DEFINED BY THESE PLANS AND SPECIFICATIONS ARE TO BE INSTALLED IN ACCORDANCE WITH THE 2008 NATIONAL ELECTRICAL CODE (NEC) AND THE 2008 NATIONAL ELECTRICAL SAFETY CODE (NFPA 70E). ALL THE RELEVANT DOCUMENTS AND BECOME PART OF THIS CONTRACT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND APPROVALS FROM THE LOCAL AND STATE AUTHORITIES. THE CONTRACTOR SHALL MAKE THE FINAL CONNECTION TO ALL EQUIPMENT.
2. THE ARCHITECTURAL AND MECHANICAL PLANS ARE CONSIDERED A PART OF THE ELECTRICAL PLANS. THE ELECTRICAL CONTRACTOR SHALL REFER TO AND COORDINATE WITH THEM. NO EXTRA COST SHALL BE ALLOWED FOR FAILURE TO COORDINATE THE ELECTRICAL SYSTEM WITH THE ARCHITECTURAL AND MECHANICAL PLANS.
3. NO ADDITIONS TO THE CONTRACTOR BID WILL BE ALLOWED FOR CHANGES MADE NECESSARY BY INTERFERENCE WITH OTHER WORK.
4. THE ELECTRICAL CONTRACTOR SHALL PROVIDE EQUIPMENT, MATERIALS AND LABOR FOR THE CONNECTIONS OF ALL EQUIPMENT SHOWN ON THE PLANS - ARCHITECTURAL, MECHANICAL, ETC.
5. THIS PROJECT IS TO BE INSTALLED IN STRICT ACCORDANCE WITH LOCAL AND STATE CODES AND THE NEC. IF AT ANY TIME DURING CONSTRUCTION IT IS DETERMINED THAT THE CODES LISTED ABOVE, IT SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
6. ELECTRICAL CONTRACTOR SHALL CONFORM THE EXACT LOCATION OF THE OWNER SERVICE TRANSFORMER, BEFORE INSTALLING THE PFD AND SERVICE CONDUIT.
7. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE SERVICE FEEDER TO THE BUILDING WITH THE OWNER. PROVIDE LABOR AND CONDUIT TO THE SERVICE FEEDER TO THE BUILDING. THE CONTRACTOR SHALL PROVIDE THE SERVICE FEEDER TO THE BUILDING FOR A COMPLETE ELECTRICAL SERVICE TO THIS FACILITY.
8. THE EC SHALL INSTALL A SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT RIM, GROUNDING CONDUCTOR. THE EC SHALL GROUND THE SERVICE FEEDER TO THE BUILDING IN ACCORDANCE WITH LOCAL AND NATIONAL CODES.
9. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND OWNER OF ANY CHANGES TO THE DIMENSIONS ARE CRITICAL FOR ALL PANELS, SWITCHGEAR, ETC. AND NO PIECE OF EQUIPMENT SHALL EXCEED THE PHYSICAL SIZE INDICATED ON THE PLANS.
10. ELECTRICAL CONTRACTOR SHALL CONFORM MINIMUM CODE (NEC) WORKING CLEARANCE BEFORE INSTALLING ANY ELECTRICAL PANELS OR CONDUITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND APPROVALS FROM THE LOCAL AND STATE AUTHORITIES. IF CLEARANCE IS NOT POSSIBLE, THE DESIGNER SHALL BE NOTIFIED IMMEDIATELY IN WRITING.
11. THE CONTRACTOR SHALL ALLOW THE JOINTMENT, BEFORE ROUGH-IN, OF ANY ELECTRICAL PANEL, SWITCHGEAR, ETC. A DISTANCE OF 10 FEET FROM THE EXTERIOR WALL AND 10 FEET FROM THE PROJECT.
12. THE ELECTRICAL CONTRACTOR SHALL SECURE ALL PLACES USING INSURING STRAPPING METHODS AND PRACTICES.
13. TO ASSURE ALL DEVICES ARE PROPERLY SET, THE CONTRACTOR SHALL PROVIDE ALL THE SERVICE BOXES WITH BRACKETED HANGERS, ETC. DESIGNED FOR THE APPLICATION. ANY DEVICE BOXES NOT SECURED WILL BE MADE SECURE AT THE CONTRACTOR'S EXPENSE.
14. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE TELEPHONE SERVICE CONDUIT WITH A NYLON RAIL SIZE, AND LOCATION OF THE TELEPHONE SERVICE CONDUIT, AND THE MAIN TELEPHONE BOARD WITH THE OWNER AND EACH TELEPHONE OUTLET WITH OWNERS PRIOR TO ROUGH-IN.
15. EC SHALL INSTALL A 3/4" CONDUIT WITH (1) #6 BARE COPPER CONDUCTOR FROM TELEPHONE PANEL TO THE MAIN ELECTRICAL GROUNDING BUS. BEFORE ANY ELECTRICAL CONDUIT, BOXES, ETC. ARE COVERED (FLOOR, CEILING, WALLS, ETC.), THEY SHALL BE APPROVED BY THE INSPECTING OFFICER INSPECTED. THE DIMENSIONS AND INSPECTION PURPOSES WILL BE AT THE COST OF THE ELECTRICAL CONTRACTOR.
17. DO NOT INSTALL CONDUIT IN BOND BEAMS.
18. LENGTHS OF FLEXIBLE CONDUIT GREATER THAN 48 INCHES SHALL NOT BE INSTALLED ON THIS PROJECT. ALL FLEXIBLE CONDUIT SHALL BE INSTALLED WITH A MINIMUM BEND RADIUS OF 10 FEET. FLEXIBLE CONDUIT SHALL NOT BE CONCEALED.
19. ALL BATTERY POWERED OR CONTINUOUS BURN EQUIPMENT SHALL BE INSTALLED IN A VENTILATED AREA. ALL LIGHTS, NIGHT LIGHTS, OR EMERGENCY LIGHTS, SHALL BE CONNECTED TO THE UN-SWITCHED LEG OF THE LIGHTING CIRCUIT FEEDING THAT AREA.
20. LUMINAIRES INSTALLED IN THE MECHANICAL ROOM SHALL BE PLACED SO THAT ALL EQUIPMENT IS ADEQUATELY ILLUMINATED AFTER THE MECHANICAL EQUIPMENT IS IN PLACE.
21. ALL LUMINAIRES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE AND NOT THE CEILING GRID OR OTHER NONSTRUCTURAL MEMBER.

ELECTRICAL SYMBOL SCHEDULE (CONT.)

SYMBOL	DEVICE/FEATURE DESCRIPTION	NOTES
⊗	FLUORESCENT LIGHT FIXTURE	(1) (2) (3)
⊗	FLUORESCENT EMERGENCY LIGHT FIXTURE	(1) (2) (3) (4)
⊗	EXIT LIGHT FIXTURE - WALL MOUNT	(1) (2) (4)
⊗	EXIT FIXTURE - ONE WAY WALL MOUNT	(1) (2) (4) (5)
⊗	EXIT LIGHT FIXTURE - CEILING MOUNT	(1) (2) (4)
⊗	EXIT FIXTURE - ONE WAY CEILING MOUNT	(1) (2) (4) (5)
⊗	RECESSED LIGHT FIXTURE	(1) (3)
⊗	AREA LIGHT FIXTURE - FLEX MOUNTED	(1) (2)
⊗	CEILING LIGHT FIXTURE	(1) (2) (3)
⊗	THREE WAY SWITCH	(6)
⊗	FOUR WAY SWITCH	(6)
⊗	DIMMER SWITCH	(6)
⊗	DIMMER SWITCH OCCUPANCY SENSOR	(6)
⊗	DUPLEX CONVENIENCE OUTLET, GROUNDING TYPE	(6)
⊗	DUPLEX CONVENIENCE OUTLET - GFI	(6)
⊗	DOUBLE DUPLEX OUTLET	(6)
⊗	RESEALABLE & DATA/TELEPHONE	(6) (15) (18)
⊗	DUAL TELEPHONE/DATA	(6) (17)
⊗	WEATHER-RESISTANT	(6) (19)
⊗	JUNCTION BOX	(12)
⊗	PHOTO-ELECTRIC CELL WITH RELAY	(10)
⊗	DISCONNECT SWITCH	(8) (13)
⊗	FUSED DISCONNECT SWITCH	(8) (13)
⊗	PANEL BOARD	(8) (13)
⊗	PANEL BOARD RECESSED	(8) (13)
⊗	FAP	(8) (18)
⊗	POWER RELAY (PHOT) IN MEDIA 1 ENCLOSURE	(11) (23)
⊗	HORN STROBE 75 DB	(11) (23)
⊗	STROBE 15/75 DB	(11) (23)
⊗	FIRE ALARM HORN	(11) (23)
⊗	TAMPER SWITCH	(23)
⊗	FLOW SWITCH	(23)
⊗	PHOTO-ELECTRIC SMOKE DETECTOR	(11) (23)
⊗	SMOKE DETECTOR (NON-TELEPHONE/CONVENTIONAL) SENSITIVE TO HEAT	(7)
⊗	POWER PACK WATERPROOF BY-100	(7)
⊗	CEILING DUAL TECHNOLOGY SENSING SWITCH	(7)
⊗	WALL OCCUPANCY DUAL TECHNOLOGY SENSING SWITCH	(7)
⊗	MOTOR ON ROOF	(22)
⊗	MECHANICAL EQUIPMENT	
⊗	LOW VOLTAGE WIRING	
⊗	MECHANICAL EQUIPMENT ON WALL	
⊗	CONDUIT TURNED UP	
⊗	CONDUIT HUNG FROM TO PANEL. 3 CONDUCTORS INCLUDING THE EQUIPMENT GROUND CONDUCTOR.	
⊗	CONDUIT HUNG FROM TO PANEL. NUMBER OF ARROW HEADS INDICATE NUMBER OF CONDUCTORS. SASH MARKS INDICATE NUMBER OF CONDUCTORS EX TWO CIRCUITS (SPECIAL NEUTRAL PER CIRCUIT). BOTH EX INCLUDE AN EQUIP. GROUND.	
⊗	WIRING IN DPO IN GROUND OR FLOOR	
⊗	CONDUIT TURNED DOWN	

INSTALL CONDUIT AS DRAWN ON THE PLANS. THE ONLY EXCEPTIONS ARE THOSE AUTHORIZED IN WRITING BY THE ENGINEER. ALL CONDUITS SHALL INCLUDE AN EQUIPMENT GROUND CONDUCTOR. SEE THE NOTES/ABBREVIATIONS.

- NOTES/ABBREVIATIONS
- ATF - ABOVE FINISHED FLOOR AS SHOWN FROM FINISHED GRADE
- ABC - ABOVE FINISHED GRADE, AND OR C - CONDUIT TO BE INSTALLED IN CEILING
- EV - ELECTRO VOICE, GC - GENERAL CONTRACTOR, GND - GROUND
- MC - MECHANICAL CONTRACTOR, MCA - MINIMUM CIRCUIT AMPERES - FRONT OF SALES, RMC - RIGID METAL CONDUIT, SCA - SHEATH CIRCUIT ADDRESS, VP - VENT IN FIELD, WP - WEATHER PROOF/WEATHER PROOF
1. SEE LISTING FOR THE TYPE AND SPECIFICATIONS OF ALL EQUIPMENT.
 2. WIRE FUTURE FROM ADVISORY LABEL. NUMBER OF WIRE.
 3. PROVIDE DIM-SWITCHED CONDUCTOR TO DIMMER BALLAST
 4. ACCEPTABLE EQUALS ARE PAS, LEVITON, COVER, HIBBELT
 5. ACCEPTABLE EQUALS ARE HIBBELT, WATTS, STOPER, SENSOR SWITCH
 6. ACCEPTABLE EQUALS ARE LITTON, PAS, HIBBELT, COVER
 7. ACCEPTABLE EQUALS ARE INTERMATIC, PARKSON, EZ-CONTROL
 8. ACCEPTABLE EQUALS ARE LITTON, PAS, HIBBELT, COVER
 9. ACCEPTABLE EQUALS ARE LITTON, PAS, HIBBELT, COVER
 10. ACCEPTABLE EQUALS ARE INTERMATIC, PARKSON, EZ-CONTROL
 11. USE HEAVY DUTY FOR 480 VOLT.
 12. SIZE TO THE EQUIPMENT TERMS CONTROLLED
 13. WIRING AND BONDING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND THE NATIONAL ELECTRICAL SAFETY CODE (NFPA 70E).
 14. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 15. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 16. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 17. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 18. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 19. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 20. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 21. PROVIDE A FLOOR BOX HIBBELT 5178/859 WITH ONE WAZIRK, TWO WAZIRK AND ONE WAZIRK.
 22. SWITCH WITH LIGHTS INDICATES INDICATED OVERHEAD.
 23. PROVIDE DEVICE UL LISTED TO BE USED WITH THE EXISTING FIRE ALARM PANEL SYSTEM.
 24. PANEL SYSTEM INTERNAL AS SHOWN ON DRAWINGS OR LISTED IN SPECIFICATIONS.
 25. USE POWER PACK BY-100-E.
 26. PROVIDE RACKWAY WITH OUTLETS 12" ON CENTER, UNO.

CONDUIT/CONDUCTOR SCHEDULE

WORK	CONDUIT	CONDUCTORS	REMARKS
312	20	3/4"	12 (1) (2)
320	30	3/4"	10 (1) (2)
330	30	3/4"	10 (1) (2)
340	30	3/4"	10 (1) (2)
350	30	3/4"	10 (1) (2)
360	30	3/4"	10 (1) (2)
370	30	3/4"	10 (1) (2)
380	30	3/4"	10 (1) (2)
390	30	3/4"	10 (1) (2)
400	100	1 1/2"	4 (1) (2)
410	100	1 1/2"	4 (1) (2)
420	100	1 1/2"	4 (1) (2)
430	100	1 1/2"	4 (1) (2)
440	100	1 1/2"	4 (1) (2)
450	100	1 1/2"	4 (1) (2)
460	100	1 1/2"	4 (1) (2)
470	100	1 1/2"	4 (1) (2)
480	100	1 1/2"	4 (1) (2)
490	100	1 1/2"	4 (1) (2)
500	100	1 1/2"	4 (1) (2)

NOTE: (1) THIN/THIN-2
 (2) ALL CONDUIT SHALL CONTAIN A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC. ADDITIONAL FOR PARALLEL RIMS.
 * INDICATES ALUMINUM CONDUIT
 † INDICATES BELOW ISOLATED GROUND CONDUCTOR IN ADDITION TO THE GROUND CONDUCTOR IN NOTE ABOVE.



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PROJECT TITLE:
 UTAH VALLEY UNIVERSITY
 NEW PARKING AND
 FACILITIES DEPARTMENT
 BUILDING

UTAH VALLEY UNIVERSITY
 936 SOUTH 400 WEST
 OREM, UTAH

REVISIONS

NO.	DATE	DESCRIPTION
1	8.11.10	ADDENDUM

ISSUE TYPE: CONSTRUCTION DOCUMENTS

MARK	DATE	DESCRIPTION
1	August 02, 2010	ISSUE DATE

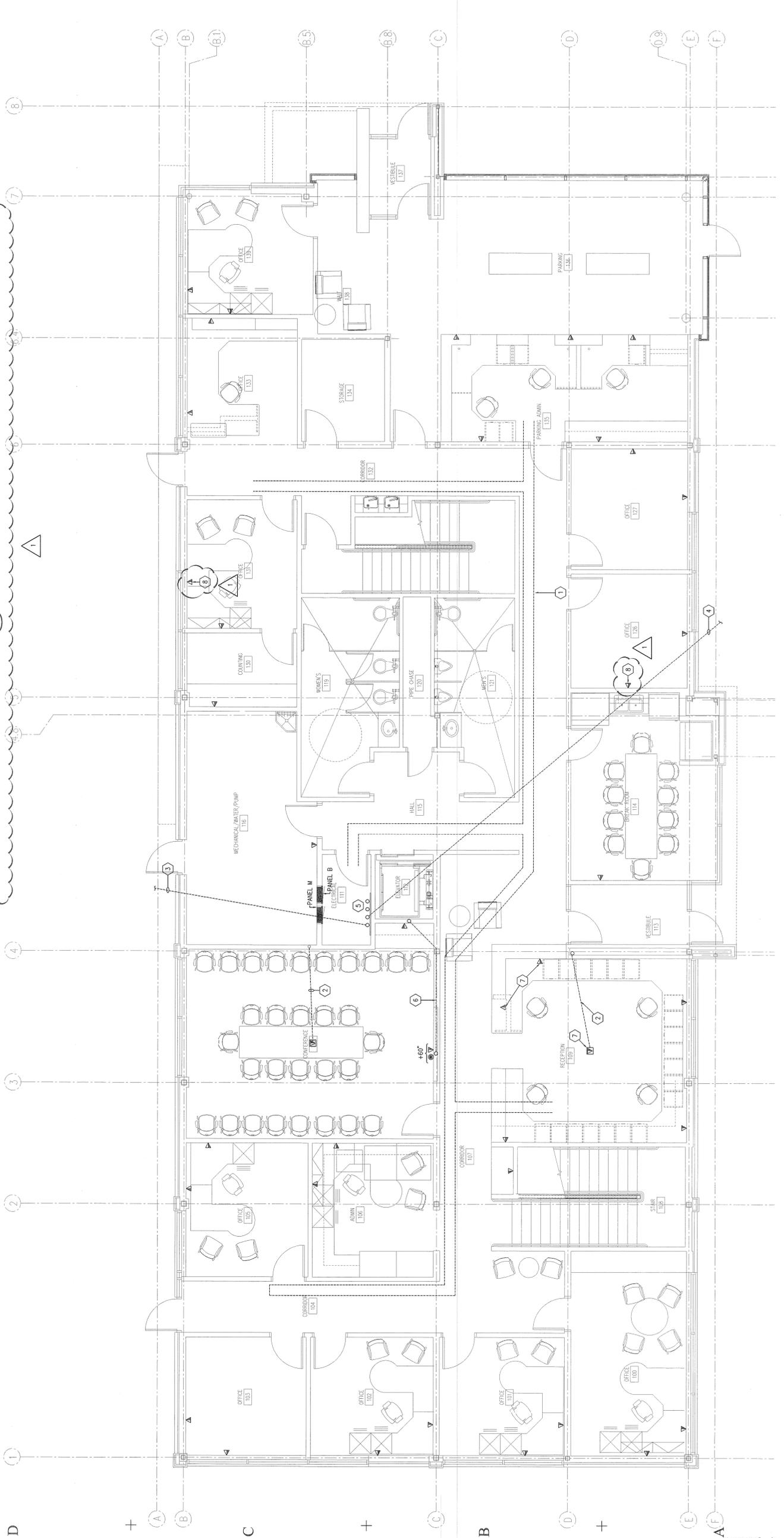
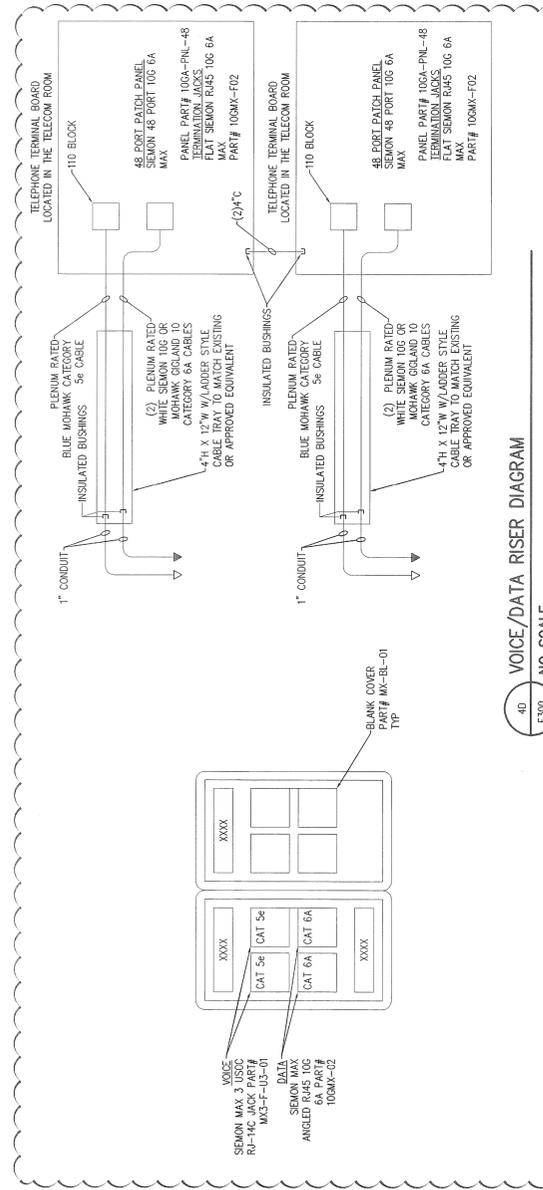
KEY PLAN

CAD PROJECT NO:	09247790
CAD DWG FILE:	E.J.K.M
DRAWN BY:	S.S.S.J
CHKD BY:	P&A architects

SHEET TITLE
 MAIN LEVEL
 SYSTEMS PLAN

SHEET NUMBER
 E-400

- KEYED NOTES**
- 12"x4" LADDER STYLE CABLE TRAY. REFER TO SHEET E-401 FOR CABLE TRAY LAYOUT. EXACT LOCATION WITH OWNER & ARCHITECT PRIOR TO INSTALLATION.
 - 12"x4" LADDER STYLE CABLE TRAY. REFER TO SHEET E-401 FOR CABLE TRAY LAYOUT. EXACT LOCATION WITH OWNER & ARCHITECT PRIOR TO INSTALLATION.
 - 4"x4" COMMUNICATIONS TO THE KEY SHOP REFER TO THE SITE PLAN FOR MORE INFORMATION.
 - 4"x4" FOR COMMUNICATIONS TO THE STREET. REFER TO SHEET E-401 FOR MORE INFORMATION.
 - EXTEND (2) 4"x4" INTO THE ELECTRICAL ROOM ON THE SECOND FLOOR.
 - PROVIDE (1) 12"x4" CONDUIT CONCEALED IN WALL IN APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS.
 - APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS. APPROXIMATE LOCATION SHOWN FOR AV CONNECTIONS.
 - PROVIDE 1" CONDUIT FROM VOICE/DATA OUTLET IN NEAREST CABLE TRAY. CONDUIT RIM SHALL NOT BE LOWER THAN THE VOICE/DATA OUTLET. PROVIDE 1" CONDUIT FROM VOICE/DATA OUTLET IN NEAREST CABLE TRAY. CONDUIT RIM SHALL NOT BE LOWER THAN THE VOICE/DATA OUTLET.



SHEET NUMBER
 E-400



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PROJECT TITLE:
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 NEW PARKING AND
 FACILITIES DEPARTMENT
 BUILDING

UTAH VALLEY UNIVERSITY
 936 SOUTH 400 WEST
 OREM, UTAH

MARK	DATE	DESCRIPTION
Δ	8.11.10	ADDENDUM

ISSUE TYPE: CONSTRUCTION DOCUMENTS
 ISSUE DATE: August 02, 2010
 CAD PROJECT NO: 09247790
 CAD DWG FILE: E.J.K.M
 DRAWN BY: S.S.S.J
 CHECKED BY: P&A architects
 KEY PLAN

SHEET TITLE
SECOND LEVEL SYSTEMS PLAN
 SHEET NUMBER
E-401

- # KEYED NOTES
1. 15"x4" JACOBS TYPE CABLE TRAY REFER TO SPECIFICATIONS FOR JACOBS INFORMATION. COORDINATE EXACT LOCATION WITH OWNER & ARCHITECT PRIOR TO INSTALLATION.
 2. (3) 4/C CONDUITS FROM THE MAIN FLOOR TELEPHONE BOARD.
 3. PROVIDE 1" CONDUIT FROM VOICE/DATE OUTLET IN WALL UP INTO THE CEILING, THEN STUBBED INTO NEAREST CABLE TRAY. CONDUIT FROM SMALL NOT TO BE USED FOR DATA. PROVIDE 1" CONDUIT FOR MOXA/CAT 5E CABLE FOR VOICE WITH BLUE/ORANGE PAIR TERMINATED ON JACK 4 AND GREEN/BROWN PAIR ON JACK 5. AND WIRING IN THE UPPER LEFT OF FACE PLATE. (2) 4/C DATA CABLES TERMINATED TO DATA JACKS MOUNTED IN THE LOWER LEFT OF FACE PLATE. ROUTE CABLES TO THE LOWER LEFT OF FACE PLATE. DATA AND CABLE TRAY AND TERMINATE IN THE DATA/PHONE ROOM. TYPICAL UNLESS NOTED OTHERWISE. REFER TO VOICE/DATA CABLE RISER DETAIL ON SHEET E401 FOR MORE INFORMATION.

