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. 1

Date: September 15, 2010

To: Contractors

From: Wayne Smith

Reference: Camp Williams ï Building 2500 UTES Addition
Utah National Guard - Draper, Utah

Project No.10180480

Subject: **Addendum No. 1**

Pages		
	Addendum	1 page
	Revised Bid Form	2 pages
	Architects Addendum	47 pages
	Total	50 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.

1.1 SCHEDULE CHANGES ï There are no schedule changes for this project.

1.2 GENERAL ï HFS Architects ï Please see attached.
Additive alternate #1 ï Replace main water line to building.

Utah!
Where ideas connect

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

D CM

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 **Camp William BLDG 2500 UTES Addition Utah National Guard Draper, Utah - DFCM Project No.10180480** 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 ALTERNATE No. 1 Replace main water line to bldg. (see addendum 1)

_____ DOLLARS ($_____)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by March 1, 2011, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of $450.00 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 l00% 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

HFS*ARCHITECTS*
1484 South State Street
Salt Lake City, Utah 84115
801-596-0691 • Fax: 596-0693 • www.hfsa.com

Addendum No. 1

Project:	Camp Williams UTES East Remodel Design	Date:	15 September 2010
Address:	Camp Williams	Project No.:	DFCM 10207480 / HFSA 1022.01
City, State:	Riverton, Utah	Agency:	Utah National Guard

To all Bidders of Record:

This addendum forms a part of the contract documents and modifies the original specifications and drawings as noted below. Items of general information are included without reference to the plans and specifications. Revisions to the specifications are referenced by page number and paragraph heading on that page. Revisions to the drawings are reference by the drawing number. Unless otherwise stated, any changes herein offset only the specific drawings, words, or paragraphs mentioned, and the balance of the drawings and specifications remain in full force. Acknowledge receipt of this addendum in the space provided on the Bid form. Failure to do so will subject the Bidder to disqualification.

Item No.	Section or Sheet No.	Description
GENERAL ITEMS		
1 -1	Question	Specifications 13125-2, item 1.4, C: States end walls are to be expandable. Drawing SE101 show standard end walls? **Answer:** The end walls are not to be expandable.
1 -2	Question	Specifications 13125-2, item 1.4, E: States a 10'-6" eave height. The drawings show a 28'-0" rafter? **Answer:** The rafter height has changed to 32'-0", disregard the 10'-6" eave height.
1 -3	Question	Specifications 13125-2, item 1.4, G: States a roof slope of 4 on 12. The drawings shown less than 1 on 12. **Answer:** Clarification the roof slope is 1:12 to match the existing building.
1 -4	Question	Drawing AE201 drawing B3 shows the new structure and existing structure are not joined. On the same page drawing A3 shows the buildings joined. As well as, drawing AE301 drawing A1 show the buildings joined the length of the building. What is the common wall conditions. **Answer:** The buildings are joined with a 4" expansion joint. See the attached, revised roof plan sheet AE120 for the wall and roof expansion details.
1 -5	Question	On the door schedule, doors 107A, 107D, and 107G to be metal, but in details D3/AE601 and C3/AE601 it call for aluminum door. Are these hollow metal or aluminum doors? **Answer:** The door schedule is correct, the doors are to be metal.
SPECIFICATION ITEMS		
1 -6	01230	**ALTERNATES**: Add the attached section.

Item No.	Section or Sheet No.	Description
1 -7	05500	**METAL FABRICATIONS**: Clarification: The frame for the sectional overhead doors in the Service Bays 107 is to be attached to the floor by a ½" base place with two ½″ expansion anchors and at the head it is to attached to the pre-engineered building girt with clip angles.
1 -8	07542	**POLYVINYL-CHLORIDE (PVC) ROOFING**: Section 3.8 Roofing Installer's Warranty: Delete this section in it's entirety. Provide a five year Roofing Installer Warranty on the DFCM approved warranty form and a 20 year Roofing Manufacturer warranty on the DFCM approved warranty form.
1 -9	13125	**METAL BUILDING SYSTEMS**: Part 2, Section 2.1 Manufacturers: Delete all manufacturers referenced in this section. Only manufacturers with prior approval from DFCM are acceptable. See DFCM website for list of approved manufacturers.
DRAWING ITEMS		
1 -10	GI100	Change the Mechanical Engineer to: DAVID L. JENSEN & ASSOCIATES 547 WEST 500 SOUTH #140 SALT LAKE CITY, UTAH 84010 (801) 294-9299
1 -11	AS102	Replace with the attached revised sheet AS102.
1 -12	AD101	The existing VCT in Hall 100 is to be demolished.
1 -13	AE101	Clarification: The floor in Service Bay s 107 is to slope 1% from the center to the trench drains along the east and west walls.
1 -14	AE111	Clarification: The lighting layout and fixture count in Hall 100 and Breakroom 102 are to match the electrical lighting plan EL101.
1 -15	AE120	Replace with the attached revised sheet AE120.
1 -16	AE201	Replace with the attached revised sheet AE201.
1 -17	AE301	Replace with the attached revised sheet AE301.
1 -18	AE302	Replace with the attached revised sheet AE302.
1 -19	AE601	Detail C3: Change reference to aluminum door and frame to steel.
1 -20	AE601	Detail D3: Change reference to aluminum door and frame to steel.
1 -21	AE601	Detail D4: Clarification: Door head to be 2: to match the rest of the frame.
1 -22	AE701	Details A4, A5, B5, C5, D5: Clarification: All cabinet bodies, doors and drawer fronts are to be plastic laminate over 3/4" MDF with melamine inside and a 3mm self edging PVC. All shelves are to be melamine on both sides of 3/4"

Item No.	Section or Sheet No.	Description
		MCP with a 3mm self edging PVC. All countertops are to be plastic laminate with a waterfall edge on the front and a 4" back splash.
PRIOR APPROVALS		
1 -23	EverGuard	Single Ply PVC Thermoplastic Roofing
ATTACHMENTS		
1 -24	20 pages	Geotechnical Study Proposed Additions to Existing Organizational Maintenance Shop
1 -25	2 pages	Specification section 01230 Alternates.
1 -26	5 sheet s	Revised Architectural Sheets AS102, AE120, AE201, AE301, AE302.
1 -27	5 pages/10 sheets	Mechanical Addendum #1.
1 -28	2 sheets	Electrical Addendum #1.

GSH
Gordon Spilker Huber
Geotechnical Consultants, Inc.

REPORT
GEOTECHNICAL STUDY
PROPOSED ADDITIONS TO EXISTING ORGANIZATIONAL MAINTENANCE SHOP UTAH NATIONAL GUARD CAMP WILLIAMS BUILDING 2500 NORTH TO NORTHEAST OF THE INTERSECTION OF UTES EAST ROAD AND IDAHO AVENUE SOUTH OF BLUFFDALE, UTAH

Submitted To:

State of Utah
Division of Facilities Construction and Management
4110 State Office Building, Suite 4110
P.O. Box 141160
Salt Lake City, Utah 84114

Submitted By:

Gordon Spilker Huber Geotechnical Consultants, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

August 20, 2010

Job No. 0128-061-10

GSH
Gordon Spilker Huber
Geotechnical Consultants, Inc.

August 20, 2010
Job No. 0128-061-10

State of Utah
Division of Facilities Construction and Management
4110 State Office Building, Suite 4110
P.O. Box 141160
Salt Lake City, Utah 84114

Attention: Mr. Wayne Smith

Gentlemen:

Re: Report
Geotechnical Study
Proposed Additions to Existing Organizational Maintenance Shop
Utah National Guard Camp Williams Building 2500
North to Northeast of the Intersection of
Utes East Road and Idaho Avenue
South of Bluffdale, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geotechnical study performed at the sites of the proposed Organizational Maintenance Shop additions, which are located in the northeastern portion of Camp Williams which is located south of Bluffdale, Utah. The general location of the site with respect to major topographic features and existing facilities, as of 1999, is presented on Figure 1, Vicinity Map. A more detailed layout of the site showing the existing building and other facilities and the proposed additions is presented on Figure 2, Site Plan. The locations of the borings drilled in conjunction with this study are also presented on Figure 2.

During the course of this study, many of the conclusions and recommendations were presented to the project architect, Mr. Mark Pavoni of HFS Architects.

1.2 OBJECTIVES AND SCOPE

The objectives and scope of our study were planned in discussions between Mr. Wayne Smith of the State of Utah, Division of Facilities Construction and Management (DFCM); Mr. Mark D. Pavoni, AIA, of HFS Architects; and Mr. Bill Gordon of Gordon Spilker Huber

Geotechnical Consultants, Inc. (GSH). A hand sketched layout of the proposed additions was provided by Mr. Pavoni.

In general, the objectives of this study were to:

1. Accurately define and evaluate the subsurface soil and groundwater conditions in the area of the new additions.

2. Provide appropriate foundation and earthwork recommendations and geoseismic information to be utilized in the design and construction of the proposed additions.

In accomplishing these objectives, our scope has included the following:

1. A field program consisting of the drilling, logging, and sampling of three borings.

2. A laboratory testing program.

3. An office program consisting of the correlation of available data, engineering analyses, and the preparation of this summary report.

1.3 AUTHORIZATION

Authorization was initially provided verbally by Mr. Wayne Smith of the DFCM.

1.4 PROFESSIONAL STATEMENTS

Supporting data upon which our recommendations are based are presented in subsequent sections of this report. Recommendations presented herein are governed by the physical properties of the soils encountered in the exploration borings, projected groundwater conditions, and the layout and design data discussed in Section 2., Proposed Construction, of this report. If subsurface conditions other than those described in this report are encountered and/or if design and layout changes are implemented, GSH must be informed so that our recommendations can be reviewed and amended, if necessary.

Our professional services have been performed, our findings developed, and our recommendations prepared in accordance with generally accepted engineering principles and practices in this area at this time.

2. PROPOSED CONSTRUCTION

The project will consist of constructing a maintenance bay addition approximately 10 feet south of the existing Building 2500 structure and a smaller addition located at the southeast corner of, and tying into, the existing Building 2500 structure. Actual dimensions and construction are still

in the design process. Presently, the maintenance bay addition is projected to be on the order of 70 feet by 80 feet in plan dimension. The smaller addition is projected to be on the order of 20 feet by 30 feet. The additions will be one to one-extended level in height with floor slab elevations roughly the same as the existing structure. Construction will likely be similar to the existing structure and of masonry bearing walls with light steel- or wood-framing.

Shared loading between the existing structure and the southeast addition will be minor. Maximum projected column and wall loads are anticipated to be on the order of 40 to 100 kips and 2 to 5 kips per lineal foot, respectively. Projected uniform floor slab loads range from 150 to 250 pounds per square foot.

Site development will require minimal earthwork in the form of site grading. We estimate that maximum fills to achieve design grades will be on the order of one to one and one-half feet within the building addition footprints.

At this time, new pavements will not be part of the additions. However, if required, GSH can provide pavement recommendations.

3. SITE INVESTIGATIONS

3.1 FIELD PROGRAM

In order to define and evaluate the subsurface soil and groundwater conditions at the site, 3 borings were explored to depths ranging from 15.5 to 16.5 feet below existing grade. The borings were drilled using a truck-mounted drill rig equipped with hollow-stem augers. Locations of the borings are presented on Figure 2.

The field portion of our study was under the direct control and continual supervision of an experienced member of our geotechnical staff. During the course of the drilling operations, a continuous log of the subsurface conditions encountered was maintained. In addition, relatively undisturbed and small disturbed samples of the typical soils encountered were obtained for subsequent laboratory testing and examination. The soils were classified in the field based upon visual and textural examination. These classifications have been supplemented by subsequent inspection and testing in our laboratory. Detailed graphical representation of the subsurface conditions encountered is presented on Figures 3A through 3C, Log of Borings. Soils were classified in accordance with the nomenclature described on Figure 4, Unified Soil Classification System.

A 3.25-inch outside diameter, 2.42-inch inside diameter drive sampler (Dames & Moore) was utilized in the majority of the subsurface sampling at the site. Additionally, a 2.0-inch outside diameter, 1.38-inch inside diameter drive sampler (SPT) was utilized at select locations and depths. The blow counts recorded on the boring logs were those required to drive the sampler 12 inches with a 140-pound hammer dropping 30 inches.

Following completion of drilling operations, one and one-quarter-inch diameter slotted PVC pipe was installed in Boring B-1 in order to provide a means of monitoring any groundwater within the depths penetrated, 15.5 to 16.5 feet.

3.2 LABORATORY TESTING

3.2.1 General

In order to provide data necessary for our engineering analyses, a laboratory testing program was performed. The program included moisture and density, partial gradation, and chemical tests.

More "sophisticated" tests, such as consolidation tests, were not performed because of the difficulty in obtaining suitable undisturbed samples of the fine to coarse sand (granular) soils encountered. Strength and compressibility parameters utilized in our analysis for the coarse granular soils are based upon visual and textural examination, blow-count data, and our experience with similar soils in the area.

The following sections describe the tests and summarize the test data.

3.2.2 Moisture and Density Tests

To aid in classifying the soils and to help correlate other test data, moisture and density tests were performed on selected samples. The results of these tests are presented on the boring logs, Figures 3A through 3C.

3.2.3 Partial Gradation Test

To aid in classifying the granular soils, a partial gradation test was performed. Results of the test are tabulated below:

Boring No.	Depth (feet)	Percent Passing No. 200 Sieve	Soil Classification
B-3	3.5	15.2	SM

3.2.4 Chemical Tests

To determine if the site soils will react detrimentally with concrete, chemical tests were performed on a representative sample of the sand with some silt soils encountered in Boring B-2 at a depth of one and one-half feet below existing grade. The results of the chemical tests are tabulated on the following page.

Boring No.	Depth (feet)	Soil Classification	pH	Total Water Soluble Sulfate (mg/kg-dry)
B-2	1.5	SP	8.83	31.6

4. SITE CONDITIONS

4.1 SURFACE

The site is located within the Camp Williams Army National Guard Facility, south of Bluffdale, Utah. The project consists of the expansion of the Organizational Maintenance Shop (Building 2500), which is located north to northeast of the intersection of Utes East Road (north-to-south road) and Idaho Avenue (east-to-west road). The existing structure is one to one-extended level in height and constructed of masonry and light steel-framing with asphalt concrete and concrete pavement areas and open-graded gravel areas. Several small, one-level outbuildings, labeled Nos. 2540 and 2530, constructed of masonry are present to the south and west of the existing structure.

The area surrounding the existing structure is relatively flat with numerous parked army vehicles and stored equipment. The general site area slopes gently to the north and east with overall projected relief approximately two to three feet.

The site is surrounded by open undeveloped land to the north and east; Building 2600 and Idaho Avenue to the south; and an open yard area followed by Building 2200 to the west.

4.2 SUBSURFACE SOIL AND GROUNDWATER

The soil conditions encountered in each of the borings, to the depths penetrated, were relatively similar. At the boring locations, there exists a surface two-inch layer of asphalt concrete underlain by granular fill to a depth of one foot below the surface. An additional thin layer, roughly six inches thick, of silty clay fill was encountered from one foot to one and one-half feet below the surface in Boring B-1. These surficial fills are projected to be structural fill placed in conjunction with the pavements.

Below the fill, there exists a layer of fine to coarse sand with varying silt and gravel content extending to depths of 15.0 feet, 14.0 feet, and the full depth penetrated, 15.5 feet, in Borings B-1 through B-3, respectively. These sands are loose to medium dense, moist, brown, and will exhibit high strength and low compressibility characteristics under the projected design loading. Below the sand layer to the full depth penetrated, 16.5 feet, in Borings B-1 and B-2, a layer of silty clay with some fine sand was encountered. This clay layer is stiff, moist, and brown in color.

Groundwater was not encountered within the depths penetrated at the time of the field work. Static groundwater is projected to be deeper than 25 feet below the surface.

5. DISCUSSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

The results of this study indicate that the proposed additions can be supported upon conventional spread and continuous wall foundations established upon suitable natural soils or properly placed, compacted, and tested structural fill extending to suitable natural soils. The most significant geotechnical aspect that may affect construction is the one- to one and one-half-foot layer of fill encountered at the surface. This fill is primarily granular and was likely placed as structural fill to support the existing asphalt concrete pavement. This fill may remain below structures if properly prepared as outlined in this report.

In the following sections, detailed discussions pertaining to earthwork, foundations, lateral resistance and pressure, floor slabs, and the geoseismic setting of the site are provided.

5.2 EARTHWORK

5.2.1 Site Preparation

Site preparation will consist of the stripping of all deleterious materials and pavements from beneath an area extending out at least two feet beyond the perimeter of the building addition footprints.

A one- to one and one-half-foot layer of primarily granular fill exists below the asphalt concrete pavement at the boring locations. This fill is likely structural fill placed to support the existing asphalt concrete pavement. However, unless verified through in-place density tests meeting the requirements for structural fill outlined in Section 5.2.4, Fill Placement and Compaction, of this report, this fill must be removed below all new foundations.

Below floor slabs, pavements, and outside flatwork, this fill layer may remain provided that prior to placing site grading fills, floor slabs, outside flatwork, and pavements, it is proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least three times. If excessively soft or loose soils are encountered, they must be removed to a maximum depth of two feet and replaced with structural fill. If excessively soft or loose soils are encountered below footings, they must be completely removed. If required removal of soft soils below footings is greater than two feet thick, GSH must be notified to provide additional recommendations.

5.2.2 Excavations

Static groundwater was not encountered within the depths penetrated, 15.5 to 16.5 feet. Temporary construction excavations in granular (cohesionless) soils, above the water table and not exceeding four feet, should be no steeper than one-half horizontal to one vertical. For excavations up to eight feet, in granular soils and above the water table, the slopes should be no steeper than one horizontal to one vertical. Excavations deeper than eight feet are not anticipated at the site. Excavations encountering saturated cohesionless soils will be very difficult and will require very flat sideslopes and/or shoring, bracing, and dewatering.

Temporary excavations in cohesive soil, not exceeding four feet in depth and above or below the groundwater table, may be constructed with near-vertical sideslopes. Temporary excavations up to eight feet deep in fine-grained cohesive soils, above or below the water table, may be constructed with sideslopes no steeper than one-half horizontal to one vertical.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated.

We recommend that footing excavations be completed with a smooth-lip bucket to reduce disturbance of the bearing subgrade soils.

5.2.3 Structural Fill

Structural fill will be required as site grading fill, as backfill over foundations and utilities, and possibly as replacement fill beneath footings. All structural fill must be free of sod, rubbish, construction debris, frozen soil, and other deleterious materials.

Structural site grading fill is defined as fill placed over fairly large open areas to raise the overall site grade. The maximum particle size within structural site grading fill should generally not exceed four inches in diameter; although, occasional particles up to six to eight inches may be incorporated provided that they do not result in "honeycombing" or preclude the obtainment of the desired degree of compaction.

Granular soils were encountered within the boring to depths of 14.0 to 15.5 feet. These on-site soils may be re-utilized as structural site grading fill if they meet the requirements of structural fill stated herein.

In confined areas, such as around foundations, within utility trenches, and as replacement fill below footings etc., only granular soils are recommended. The maximum particle size should generally be restricted to two inches.

Imported granular structural fill should consist of a fairly well-graded mixture of sand and gravel with less than 20 percent fines.

5.2.4 Fill Placement and Compaction

All structural fill should be placed in lifts not exceeding eight inches in loose thickness. Structural fills beneath the area extending out at least 2 feet from the perimeter of the proposed structure must be compacted to at least 95 percent of the maximum dry density as determined by the AASHTO[1] T-180 (ASTM[2] D-1557) compaction criteria.

Structural fills less than 5 feet thick, which are not beneath an area extending out at least 2 feet from the perimeter of the structure, should be compacted to at least 90 percent of the above-defined criteria. Structural fills greater than 5 feet thick, which are not beneath an area extending out at least 2 feet from the perimeter of the structure, should be compacted to at least 92 percent of the above-defined criteria.

Subsequent to stripping and prior to the placement of structural site grading fill, the subgrade should be prepared as discussed in Section 5.2.1, Site Preparation, of this report. In confined areas, subgrade preparation should consist of the removal of all loose or disturbed soils.

Non-structural fill may be placed in lifts not exceeding 12 inches in loose thickness and compacted by passing construction, spreading, or hauling equipment over the surface at least twice.

5.2.5 Utility Trenches

All utility trench backfill material below structurally loaded facilities (flatwork, floor slabs, roads, etc.) should be placed at the same density requirements established for structural fill. If the surface of the backfill becomes disturbed during the course of construction, the backfill should be proofrolled and/or properly compacted prior to the construction of any exterior flatwork over a backfilled trench. Proofrolling may be performed by passing moderately loaded rubber tire-mounted construction equipment uniformly over the surface at least twice. If excessively loose or soft areas are encountered during proofrolling, they should be removed to a maximum depth of two feet below design finish grade and replaced with structural fill.

Most utility companies and City-County governments are now requiring that Type A-1a or A-1b (AASHTO Designation – basically granular soils with limited fines) soils be used as backfill over utilities. These organizations are also requiring that in public roadways the backfill over major utilities be compacted over the full depth of fill to at least 96 percent of the maximum dry density as determined by the AASHTO T-180 (ASTM D-1557) method of compaction. We recommend that as the major utilities continue onto the site that these compaction specifications are followed.

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1 American Association of State Highway and Transportation Officials
2 American Society for Testing and Materials

The natural fine sands may be considered as utility backfill. However, they may be more difficult to compact than a fairly well-graded mixture of sand and gravel. Fine-grained cohesive soils, such as clays and silts, are not recommended for use as trench backfill.

5.3 SPREAD AND CONTINUOUS WALL FOUNDATIONS

5.3.1 Design Data

The proposed additions may be supported upon conventional spread and continuous wall foundations. All foundations shall be supported on suitable natural soils or compacted and tested granular structural fills extending to suitable natural soils. For design, the following parameters are provided with respect to the projected loading discussed in Section 2., Proposed Construction of this report:

Minimum Recommended Depth of Embedment for Frost Protection	- 30 inches
Minimum Recommended Depth of Embedment for Non-frost Conditions	- 15 inches
Recommended Minimum Width for Continuous Wall Footings	- 18 inches
Minimum Recommended Width for Isolated Spread Footings	- 24 inches
Recommended Net Bearing Pressure for Real Load Conditions	- 2,500 pounds per square foot*
Bearing Pressure Increase for Seismic Loading Downward vertical loading only	- 50 percent**

* This bearing pressure is based on typical footing widths and depths. Higher bearing pressures can be utilized for more highly loaded (larger footings) if granular soils are at least four to five feet thick below the base of the footings over deeper silty clays.

** Increase in bearing pressure should not apply for inclined or overturning loading conditions with the exception of footing four feet wide or wider.

The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above the lowest adjacent final grade. Therefore, the weight of the footing and backfill to lowest adjacent final grade need not be considered. Real loads are defined as the total of all

dead plus frequently applied live loads. Total load includes all dead and live loads, including seismic and wind.

5.3.2 Installation

Under no circumstances should the footings be established upon soft, loose or disturbed soils, non-engineered fills, sod, rubbish, frozen soils, debris, or within ponded water. If the natural granular soils upon which the footings are to be established become loose or disturbed, they must be recompacted to the requirements for structural fill. Where unsuitable soils are encountered, they must be removed and replaced with granular structural fill. If granular structural fill upon which the footings are to be established become disturbed, they should be recompacted to the requirements for structural fill.

The width of replacement fill below footings should be equal to the width of the footing plus one additional foot for each foot of fill thickness placed. For example, if the width of the footing is two feet and the thickness of the structural fill beneath the footing is one foot, the width of the structural fill at the base of the footing excavation would be a total of three feet. We recommend that footing excavations be completed with a smooth-lip bucket to reduce disturbance of the bearing subgrade soils.

5.3.3 Settlements

Maximum settlements of foundations designed and installed in accordance with recommendations presented herein and supporting maximum anticipated loads as discussed in Section 2., Proposed Construction, are anticipated to be on the order of one-quarter to three-eights of an inch.

Approximately 60 percent of the quoted settlement should occur during construction.

5.4 LATERAL RESISTANCE

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. In determining frictional resistance, a coefficient of 0.45 should be utilized. Passive resistance provided by properly placed and compacted granular structural fill above the water table may be considered equivalent to a fluid with a density of 300 pounds per cubic foot. Below the water table, this granular soil should be considered equivalent to a fluid with a density of 150 pounds per cubic foot.

A combination of passive earth resistance and friction may be utilized provided that the friction component of the total is divided by 1.5.

5.5 LATERAL PRESSURES

The proposed additions are planned to be constructed slab-on-grade. However, for the purpose of potential shallow subgrade structures up to four feet below the surface, such as utility boxes, etc., the following lateral pressure discussion is provided.

The lateral pressure parameters, as presented within this section, are for backfills, which will consist of drained granular soil, placed and compacted in accordance with the recommendations presented herein. The lateral pressures imposed upon subgrade facilities will, therefore, be basically dependent upon the relative rigidity and movement of the backfilled structure. For active walls, such as retaining walls which can move outward (away from the backfill), granular backfill may be considered equivalent to a fluid with a density of 35 pounds per cubic foot in computing lateral pressures. For more rigid walls, granular backfill may be considered equivalent to a fluid with a density of 45 pounds per cubic foot. The above values assume that the surface of the soils slope behind the wall is horizontal and that the granular fill within three feet of the wall will be compacted with hand-operated compacting equipment.

For seismic loading and below-grade walls up to 4 feet tall, uniform pressures of 25 and 50 pounds per square foot should be added for active and more rigid case walls, respectively.

5.6 FLOOR SLABS

To facilitate construction, we recommend that all at-grade slabs be immediately underlain by a minimum of four inches of aggregate base course. The aggregate base course may be placed directly upon properly prepared suitable natural soils, existing properly prepared structural fill soils, and/or additional granular structural fill extending to properly prepared natural/existing fill soils.

It is recommended that the more heavily loaded floor slabs and concrete aprons for the proposed maintenance bay addition be no less than six inches thick. Additionally, it is recommended that these slabs be immediately underlain by a minimum of six inches of aggregate base course.

Projected settlements of floor slabs prepared as described above and under the projected loading in Section 2., Proposed Construction, will be minor (less than one-quarter of an inch).

5.7 CEMENT TYPES

Laboratory tests indicate that the site soils contain negligible amounts of water soluble sulfates. Therefore, all concrete which will be in contact with the site soils may be prepared using Type I or IA cement.

5.8 GEOSEISMIC SETTING

5.8.1 General

Most of the Utah municipalities adopted the International Building Code (IBC) 2009 on July 1, 2010. The IBC 2009 code determines the seismic hazard for a site based upon 2002 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points).

The structure must be designed in accordance with the procedure presented in Section 1613, Earthquake Loads, of the IBC 2009 edition.

5.8.2 Faulting

Based on our review of available literature, no active faults pass through or immediately adjacent to the site.

5.8.3 Soil Class

For dynamic structural analysis, the Site Class D - Stiff Soil Profile as defined in Table 1613.5.2, Site Class Definitions, of the IBC 2006 can be utilized.

5.8.4 Ground Motions

The IBC 2009 code is based on 2002 USGS mapping, which provides values of short and long period accelerations for the Site Class B-C boundary for the Maximum Considered Earthquake (MCE). This Site Class B-C boundary represents a hypothetical bedrock surface and must be corrected for local soil conditions. The following table summarizes the peak ground and short and long period accelerations for a MCE event and incorporates a soil amplification factor for a Site Class D soil profile in the second column. Based on the site latitude and longitude (40.4382 degrees north and 111.9216 degrees west, respectively), the values for this site are tabulated below:

Spectral Acceleration Value, T Seconds	Site Class B-C Boundary [mapped values] (% g)	Site Class D [adjusted for site class effects] (% g)
Peak Ground Acceleration	45.7	47.6
0.2 Seconds, (Short Period Acceleration)	$S_S = 114.1$	$S_{MS} = 119.1$
1.0 Seconds (Long Period Acceleration)	$S_1 = 46.8$	$S_{M1} = 71.7$

The IBC 2009 code design accelerations (S_{DS} and S_{D1}) are based on multiplying the above accelerations (adjusted for site class effects) for the MCE event by two-thirds (⅔).

5.8.5 Liquefaction

The site is located in an area that has been identified by the Utah Earthquake Preparedness Information Center Utah Division of Comprehensive Emergency Management for Utah County as having "very low" liquefaction potential. Liquefaction is defined as the condition when saturated, loose, granular soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will not liquefy during a major seismic event.

Groundwater was not encountered within the depths penetrated, 15.5 to 16.5 feet and is projected be deeper than 25.0 feet below the surface. Based on the conditions encountered within the borings during this study, the potential for liquefaction is projected to be low.

We appreciate the opportunity of providing this service for you. If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

GSH Geotechnical Consultants, Inc.

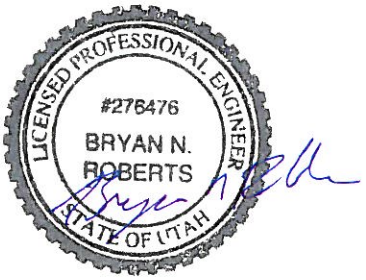
Bryan N. Roberts, P.E.
State of Utah No. 276476
Project Geotechnical Engineer

Reviewed by:

William J. Gordon, P.E.
State of Utah No. 146417
President/Senior Geotechnical Engineer

BNR/WJG:sn

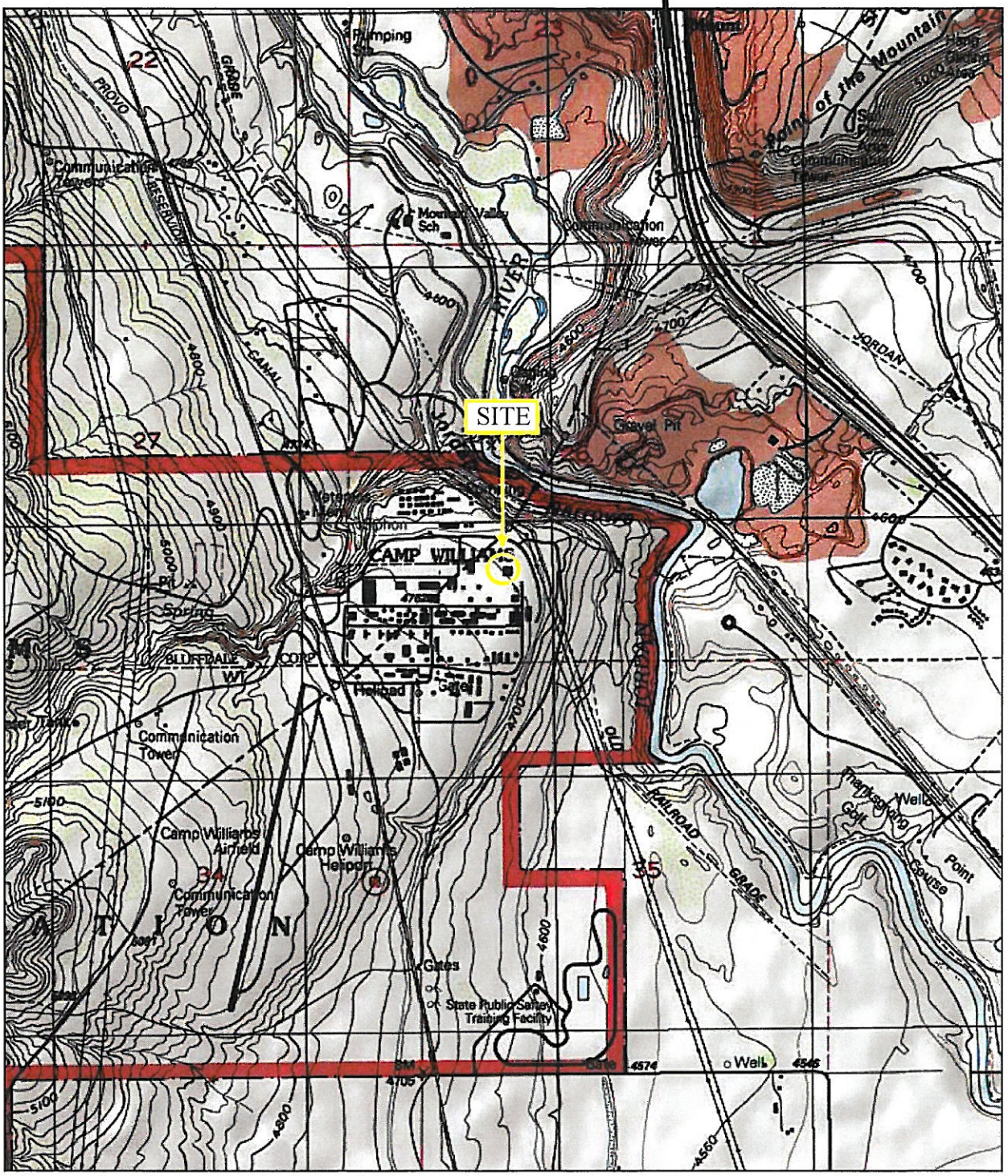
Encl. Figure 1, Vicinity Map
Figure 2, Site Plan
Figures 3A through 3C, Log of Borings
Figure 4, Unified Soil Classification System



Addressee (3 + email)
c: Mr. Mark Pavoni, AIA (1 + email)
HFS Architects
1484 South State Street
Salt Lake City, Utah 84115

STATE OF UTAH-DFCM
JOB NO. 0128-061-10

APPROXIMATELY 5 MILES
TO BLUFFDALE



SCALE IN FEET
1000 0 1000 2000

FIGURE 1
VICINITY MAP

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAP
TITLED "JORDAN NARROWS, UTAH" DATED 1999

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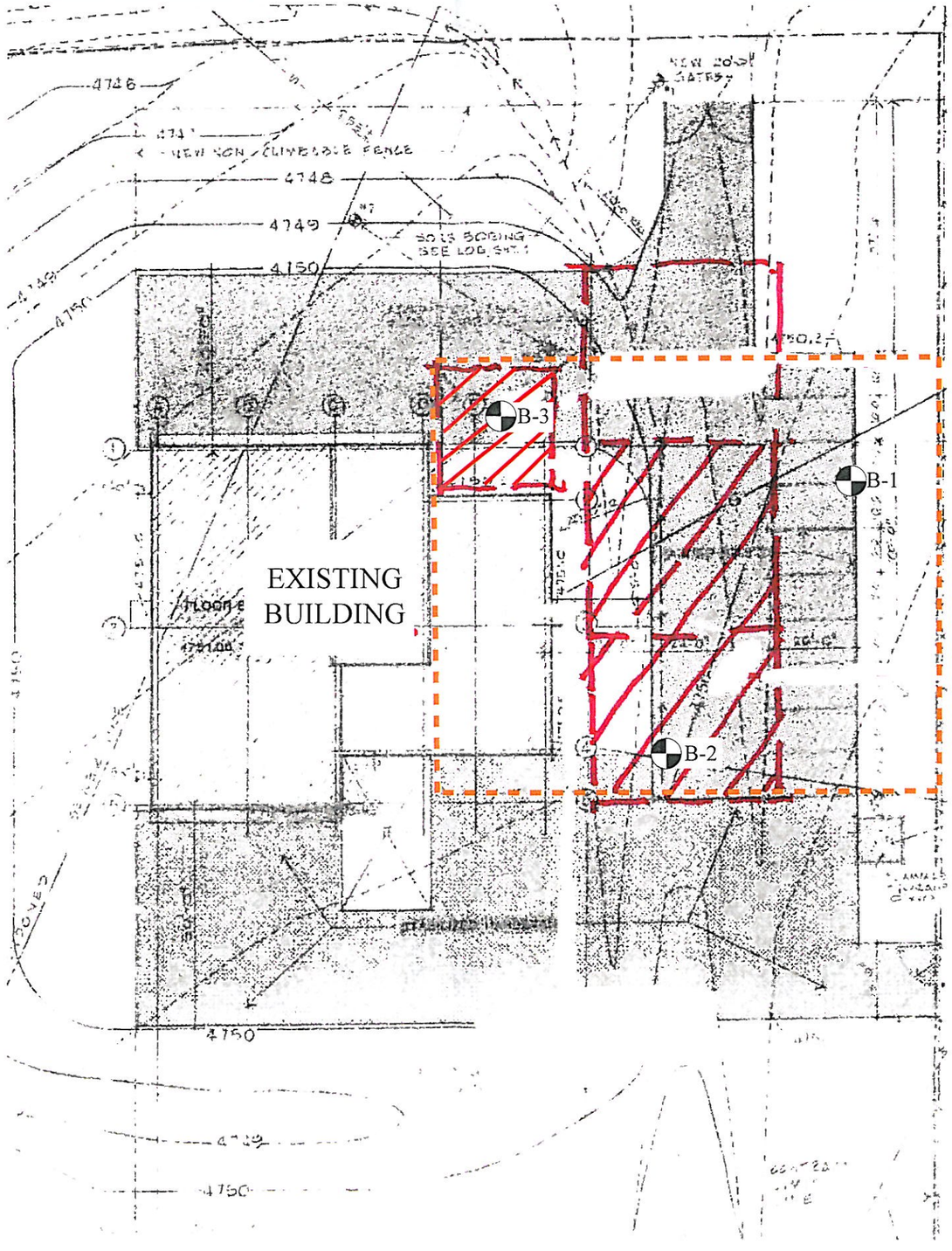
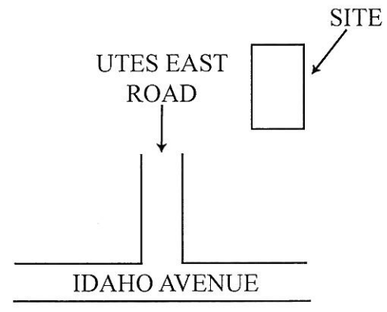
STATE OF UTAH-DFCM
JOB NO. 0128-061-10



PLANNED ADDITION



VICINITY MAP NOT TO SCALE

REFERENCE:
ADAPTED FROM DRAWING ENTITLED
"ORGANIZATIONAL MAINTANCE SHOP"
BY RICHARDSON ASSOCIATES, DATED SEPTEMBER 12, 1979

APPROXIMATE SCALE: 1"=27'

FIGURE 2
SITE PLAN

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Salt Lake City, Utah 84123

BOREHOLE B-1

Project Name: Prop. Organizational Maintance Shop Additions
Project No.: 0128-061-10
Location: Building 2500 Camp Williams, Bluffdale, Utah
Client: State of Utah-DFCM
Drilling Method: 3-3/4" ID Hollow-Stem Auger
Date Drilled: 07-26-10 GSH Field Rep.: RJG
Elevation: - - -
Water Level: No groundwater encountered (07-26-10)
Remarks:

DESCRIPTION	DEPTH FT.	BLOWS/FT	MOISTURE (%)	% PASSING 200	DRY DENSITY (PCF)	Liquid Limit (%)	Plastic Limit (%)	REMARKS
Ground Surface	0							
2" ASPHALT CONCRETE								moist
SILTY FINE SAND, FILL with some fine and coarse gravel; brown (SM/GM-FILL)								medium dense
								moist
SILTY CLAY, FILL with some fine to coarse sand; dark brown (CL-FILL)								stiff
		16						moist
FINE TO COARSE SAND with trace silt and occasional fine and coarse gravel; brown (SP)								loose
grades with fine to coarse sand and trace silt	5	9						loose/medium dense
	10	18						loose
SILTY CLAY with some fine sand; oxidation mottling; brown (CL)	15	7						moist stiff
Stopped drilling at 15.0'.								
Stopped sampling at 16.5'.								
No groundwater encountered at time of drilling.								
Installed 1-1/4" diameter slotted PVC pipe to 16.5'.	20							
	25							

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 3A

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Salt Lake City, Utah 84123

BOREHOLE B-2

Project Name: Prop. Organizational Maintance Shop Additions
Project No.: 0128-061-10
Location: Building 2500 Camp Williams, Bluffdale, Utah
Client: State of Utah-DFCM
Drilling Method: 3-3/4" ID Hollow-Stem Auger
Date Drilled: 07-26-10 GSH Field Rep.: RJG
Elevation: - - -
Water Level: No groundwater encountered (07-26-10)
Remarks:

Graphical Log	Water Level	DESCRIPTION	DEPTH FT.	BLOWS/FT	SAMPLE SYMBOL	MOISTURE (%)	% PASSING 200	DRY DENSITY (PCF)	Liquid Limit (%)	Plastic Limit (%)	REMARKS
		Ground Surface	0								
		2" ASPHALT CONCRETE									moist
		SILTY FINE SAND, FILL with occasional fine and coarse gravel; brown (SM/GM-FILL)									loose
		FINE TO COARSE SAND with trace silt and trace to some fine gravel; brown (SP)		22							moist loose
		grades with occasional fine and coarse gravel	5	19							medium dense
		grades light brown	10	11							
		SILTY CLAY with some fine sand; oxidation mottling; brown (CL)	15	12		26.2		98			moist stiff
		Stopped drilling at 15.0'. Stopped sampling at 16.5'. No groundwater encountered at time of drilling.	20 25								

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 3B

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Salt Lake City, Utah 84123

BOREHOLE B-3

Project Name: Prop. Organizational Maintance Shop Additions
Project No.: 0128-061-10
Location: Building 2500 Camp Williams, Bluffdale, Utah
Client: State of Utah-DFCM
Drilling Method: 3-3/4" ID Hollow-Stem Auger
Date Drilled: 07-26-10 GSH Field Rep.: RJG
Elevation: - - -
Water Level: No groundwater encountered (07-26-10)
Remarks:

Graphical Log	Water Level	DESCRIPTION	DEPTH FT.	BLOWS/FT	SAMPLE SYMBOL	MOISTURE (%)	% PASSING 200	DRY DENSITY (PCF)	Liquid Limit (%)	Plastic Limit (%)	REMARKS
		Ground Surface	0								
		2" ASPHALT CONCRETE									
		SILTY FINE SAND, FILL with occasional fine and coarse gravel; light brown (SM/GM-FILL)									moist loose
		SILTY FINE TO COARSE SAND with occasional fine and coarse gravel; brown (SM)									moist loose
				6		6.9	15.2				
			5								
		FINE TO COARSE SAND with trace silt and occasional fine and coarse gravel; brown (SP)		11							medium dense
		grades trace to some fine gravel		11							loose
			10								
				32		20.1		93			medium dense
			15								
		Stopped drilling at 14.0'.									
		Stopped sampling at 15.5'.									
		No groundwater encountered at time of drilling.									
			20								
			25								

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 3C

UNIFIED SOIL CLASSIFICATION SYSTEM

FIELD IDENTIFICATION PROCEDURES				GRAPH SYMBOL	LETTER SYMBOL [a]	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — More than half of material is larger than No. 200 sieve size. [b] (The No. 200 sieve size is about the smallest particle visible to the naked eye)	GRAVELS — More than half of coarse fraction is larger than No. 4 sieve size. (For visual classifications, the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.		GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			Predominantly one size or a range of sizes with some intermediate sizes missing.		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).		GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
			Plastic fines (for identification procedures see CL below).		GC	Clayey gravels, poorly graded gravel-sand-clay mixtures.
	SANDS — More than half of coarse fraction is smaller than No. 4 sieve size. (For visual classifications the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.		SW	Well graded sands, gravelly sands, little or no fines.
			Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	Poorly graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).		SM	Silty sands, poorly graded sand-silt mixtures.
			Plastic fines (for identification procedures see CL below).		SC	Clayey sands, poorly graded sand-clay mixtures.
	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE					
		DRY STRENGTH: (CRUSHING CHARACTERISTICS)	DILATANCY (REACTION TO SHAKING)	TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)		
FINE GRAINED SOILS — More than half of material is smaller than No. 200 sieve size. (The No. 200 sieve size is about the smallest particle visible to the naked eye)	SILTS AND CLAYS — Liquid limit less than 50	None to slight	Quick to slow	None	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sand with slight plasticity.
		Medium to high	None to very slow	Medium	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		Slight to medium	Slow	Slight	OL	Organic silts and organic silt-clays of low plasticity.
	SILTS AND CLAYS — Liquid limit greater than 50	Slight to medium	Slow to none	Slight to medium	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		High to very high	None	High	CH	Inorganic clays of high plasticity, fat clays.
		Medium to high	None to very slow	Slight to medium	OH	Organic clays of medium to high plasticity.
HIGHLY ORGANIC SOILS		Readily identified by color, odor, spongy feel and frequently by fibrous texture.			Pt	Peat and other highly organic soils.

[b] Boundary classifications: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.
[a] All sieve sizes on this chart are U.S. standard.

GSH

GENERAL NOTES

1. In general, Unified Soil Classification Designations presented on the logs were evaluated by visual methods only. There rore, actual designations (based on laboratory testing) may differ.
2. Lines seperating strata on the logs represent approximate boundaries only Actual transitions may be gradual.
3. Logs represent general soil conditions observed at teh point of exploration onthe date indicated.
4. No warranty is provided as to the continuity of soil conditions between individual sample locations.

LOG KEY SYMBOLS

- Bulk / Bag Sample
- Standard Penetration Split Spoon Sampler
- Rock Core
- Water Level
- Thin Wall
- No Recovery
- 3-3/4" ID D&M Sampler
- 3" ID D&M Sampler
- California Sampler

FINE - GRAINED SOIL

CONSISTENCY	SPT (blows/ft)	TORVANE UNDRAINED SHEAR STRENGTH (tsf)	POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)	FIELD TEST
Very Soft	<2	<0.125	<0.25	Easily penetrated several inches by Thumb. Squeezes through fingers.
Soft	2 - 4	0.125 - 0.25	0.25 - 0.5	Easily penetrated 1 " by Thumb . Molded by light finger pressure.
Medium Stiff	4 - 8	0.25 - 0.5	0.5 - 1.0	Penetrated over 1/2 " by Thumb with moerate effort. Molded by strong finger pressure.
Stiff	8 - 15	0.5 - 1.0	1.0 - 2.0	Indented about 1/2 " by Thumb but penetrated only with great effort
Very Stiff	15 - 30	1.0 - 2.0	2.0 - 4.0	Readily indented by Thumbnail
Hard	>30	>2.0	>4.0	Indented with difficulty by Thumbnail

COARSE -GRAINDE SOIL

APPERENT DENSITY	SPT (blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
Very Loose	<4	0 - 15	Easily penetrated with 1/2 " reinforcing rod pushed by hand
Loose	4 - 10	15 - 35	Difficult to penetrated with 1/2 " reinforcing rod pushed by hand
Medium Dense	10 - 30	35 - 65	Easily penetrated a foot with 1/2 " reinforcing rod driven with 5-lb hammer
Dense	30 - 50	65 - 85	Difficult to penetrated a foot with 1/2 " reinforcing rod driven with 5-lb hammer
Very Dense	>50	85 - 100	Penetrated only a few inches with 1/2 " reinforcing rod driven with 5-lb hammer

STRATIFICATION

DESCRIPTION	THICKNESS
SEAM	1/16 - 1/2 "
LAYER	1/2 - 12 "

DESCRIPTION	THICKNESS
Occasional	One or less per foot of thickness
Frequent	More than on per foot of thichness

CEMENTATION

DESCRIPTION	DESCRIPTION
Weakely	Crumbles or breaks with handling of slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumbles or breaks with finger pressure

MODIFIERS

DESCRIPTION	%
Trace	<5
Some	5 - 12
With	>12

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible water, usually soil below Water Table

FIGURE 4

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Geotechnical Consultants, Inc.

SECTION 01230 - 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 for alternates.

1.3 DEFINITIONS

A. Alternate: 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 Owner decides to accept a corresponding change either in 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 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 integrate work of the alternate into 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 indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if 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 the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

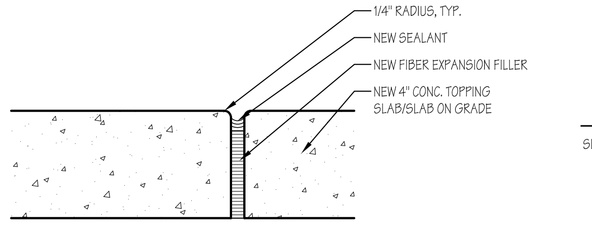
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

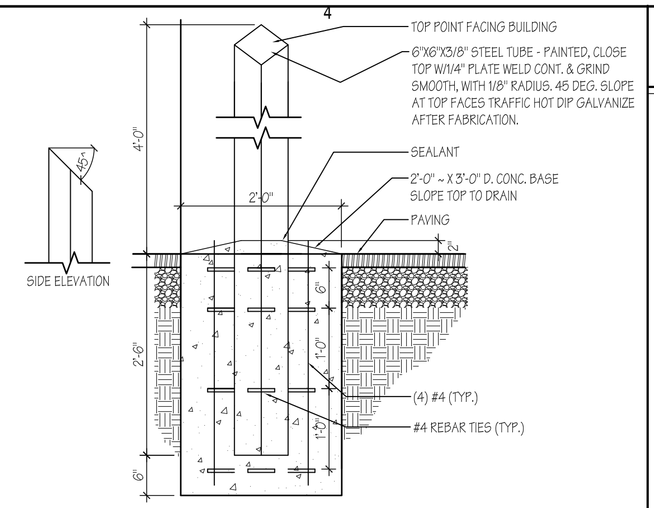
3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Replace 2" Diameter Domestic Water Line, from the PRV station in the water heater room to the main line on the south side of the building (approximately 25 feet inside the building and 115 feet outside the building). The section of pipe inside the building is located above the ceiling until it reaches the outside wall at which point it drops below grade. Remove and replace the ceiling as needed to access the pipe and match the ceiling finish to existing.

END OF SECTION 01230



D3 CONCRETE JOINT DETAIL
N.T.S.



D4 BOLLARD DETAIL
3/4"=1'-0"

GENERAL NOTES

1. ALL DIMENSIONS & EXISTING CONDITIONS IN AREAS OF WORK ARE TO BE FIELD VERIFIED PRIOR TO COMMENCING WORK - ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT OR ENGINEER OF RECORD PRIOR TO COMMENCING WORK.

2. PROTECT ALL AREAS & SURFACES ADJACENT TO DEMOLITION & CONSTRUCTION. PATCH & REPAIR ANY DAMAGE RESULTING FROM THE DEMOLTION OF EXISTING ITEMS OR THE CONSTRUCTION OF NEW ITEMS.

3. NOTED AREAS INDICATED THE GENERAL EXTENT OF DEMOLITON. THE CONTRACTOR'S CHOICE OF MEANS & METHODS OF CONSTRUCTION MAY REQUIRE MORE OR LESS DEMOLITION. THE MEANS & METHODS OF DEMOLITION & CONSTRUCTION MUST BE ACCOUNTED FOR IN THE CONTRACTORS BID. ANY DEMOLITION & REPAIR TO ADJACENT SURFACES BEYOND THE AREAS INDICATED IN THE CONTRACT DOCUMENTS WILL NOT BE COMPENSATED FOR AFTER THE BID OPENING.

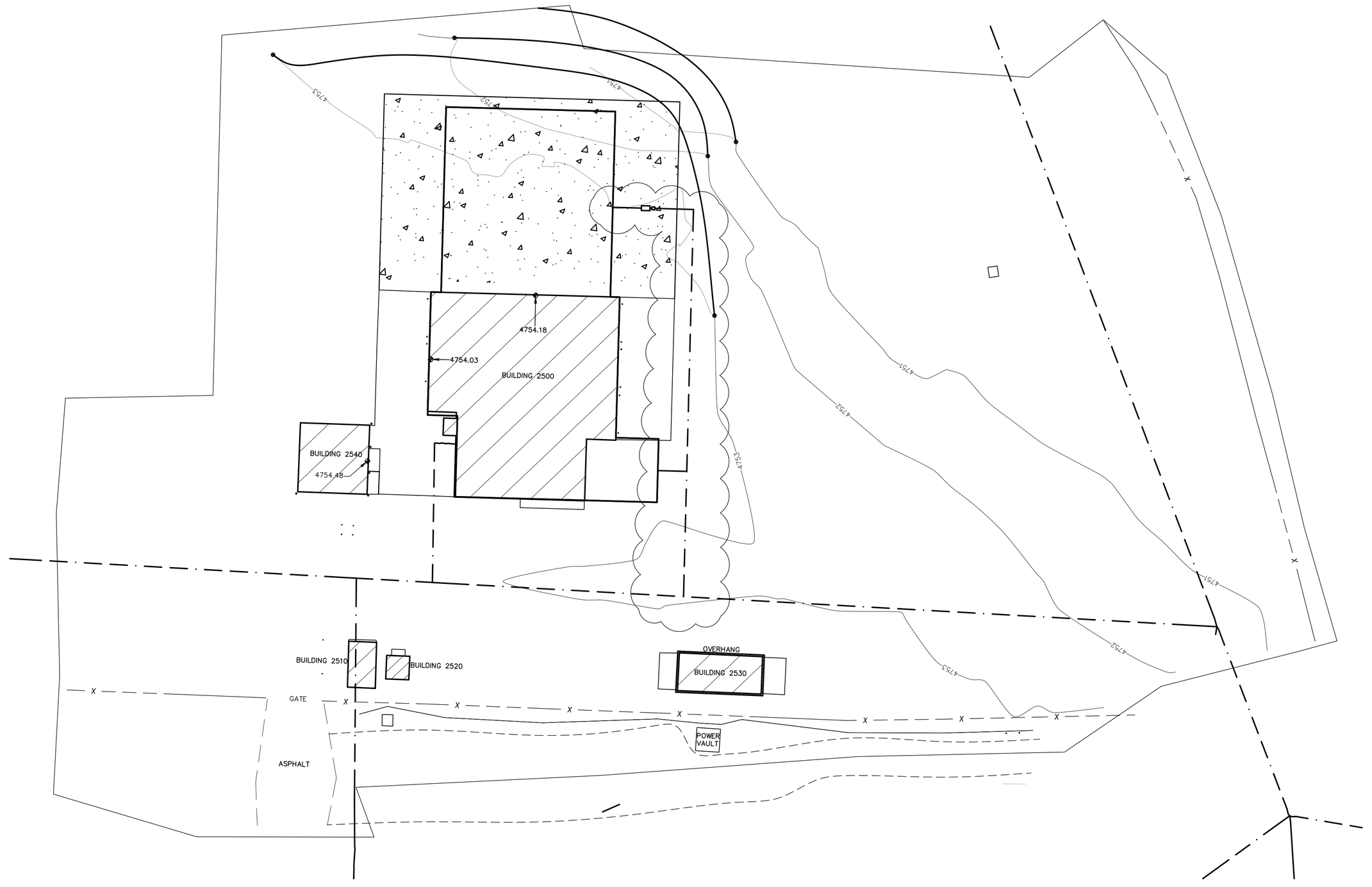
4. 72-HOUR NOTICE IS REQUIRED FOR ANY UTILITY SHUT DOWN.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EXISTING SITE IMPROVEMENTS WHICH ARE TO REMAIN FREE FROM DAMAGE DURING CONSTRUCTION BOTH INSIDE AND OUTSIDE THE CONTRACT LIMIT LINE.

6. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL UTILITIES & SITE IMPROVEMENTS WHICH ARE AFFECTED BY OR WHICH TIE IN WITH NEW CONSTRUCTION.

7. PROVIDE TEMPORARY 6'-0" HIGH CHAIN LINK FENCE @ PROJECT LIMIT LINE, COMPLETE W/GATES AS REQUIRED, UNLESS NOTED OTHERWISE.

8. EXISTING ROADS, PARKING, SERVICE DRIVES, & SIDEWALKS SHALL REMAIN ACCESSIBLE & KEPT CLEAR OF CONSTRUCTION EQUIPMENT, MATERIALS, DIRT AND DEBRIS.



A2 NEW SITE PLAN
1" = 30'-0"
0 15' 30' 60'
N

HFSArchitects
ARCHITECTURE
INTERIORS
PLANNING
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Salt Lake City, Utah 84115
801-596-0691/F: 596-0693
www.hfsa.com

CONSULTANT

CAMP WILLIAMS UTES
EAST REMODEL DESIGN

UTAH NATIONAL GUARD
CAMP WILLIAMS

MARK	DATE	DESCRIPTION

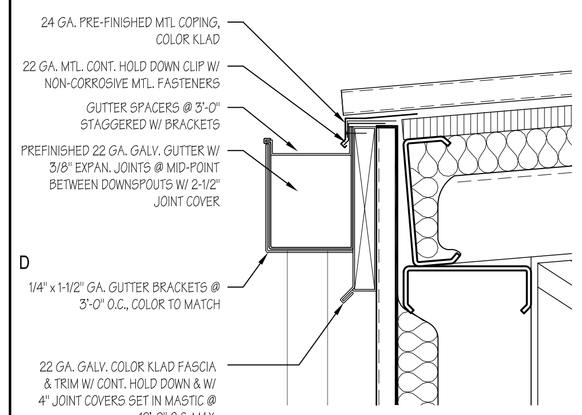
DATE:	30 AUGUST 2010
AGENCY PROJECT NO:	10207480
HFSA PROJECT NO:	1022.01
CAD DWG FILE NO:	
DRAWN BY:	RLS
CHECKED BY:	MDP
DESIGNED BY:	RLS
DWG TYPE:	ARCHITECTURAL

ARCHITECTURAL PHASE:
CONSTRUCTION DOCUMENTS BID SET

SHEET TITLE

NEW SITE PLAN
& SITE PLAN

AS102
SHEET 4 OF 16



D1 ROOF DETAIL
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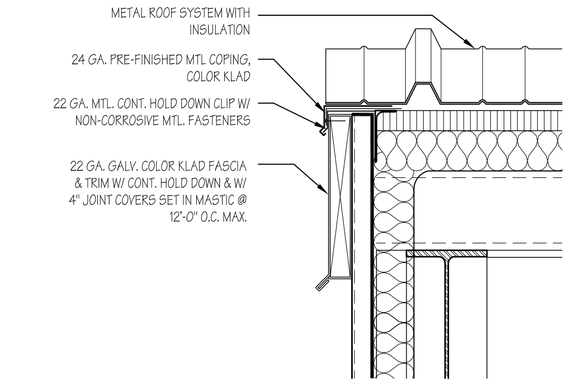

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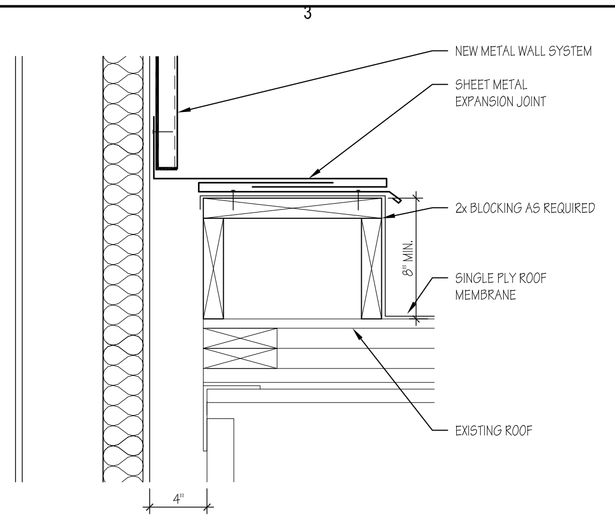

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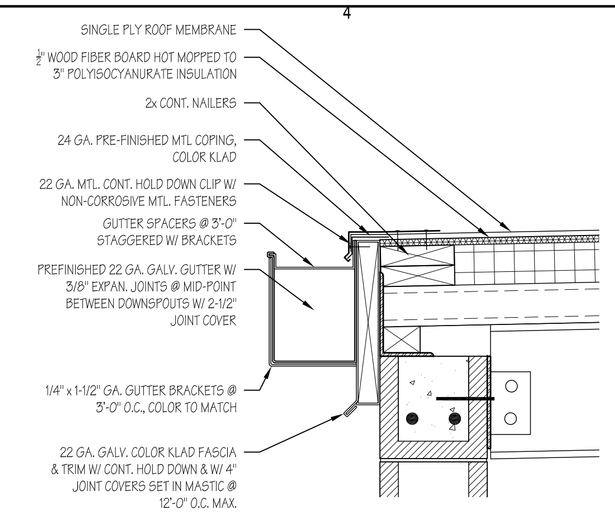

D4 ROOF DETAIL
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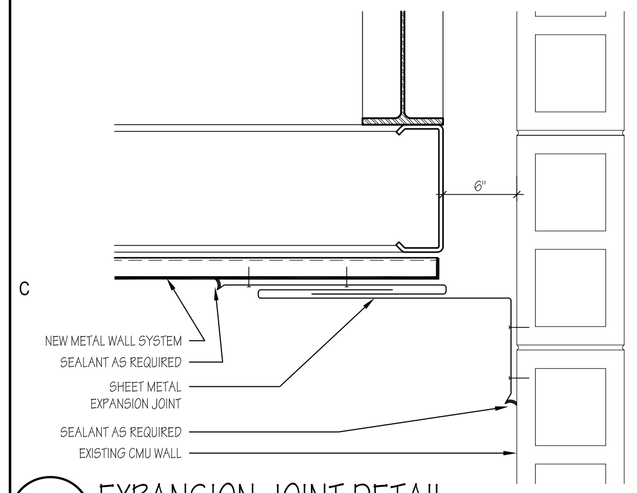
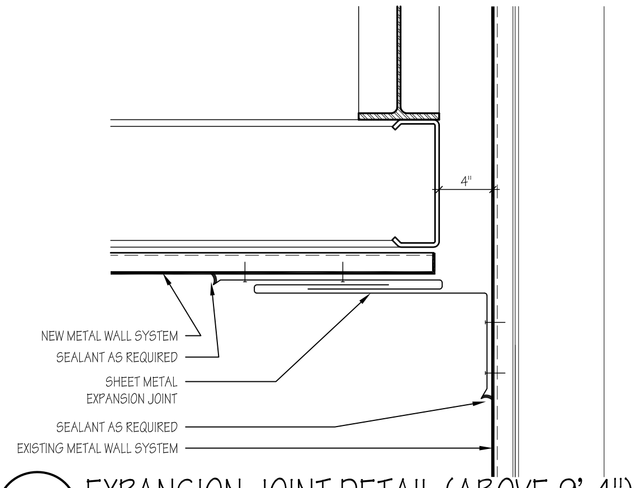
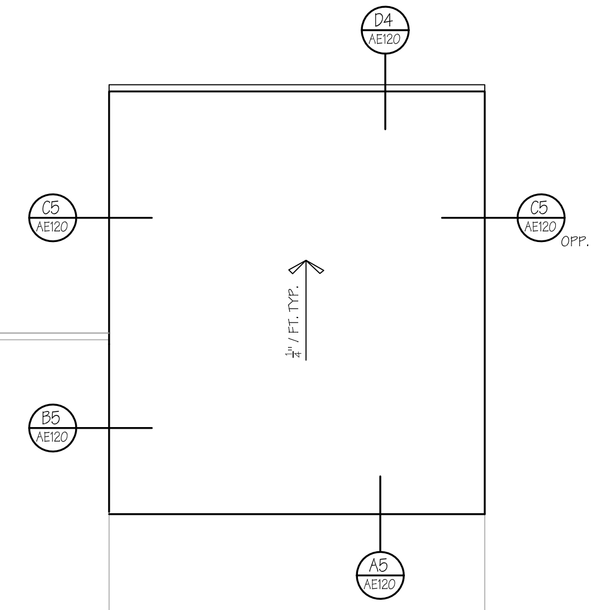
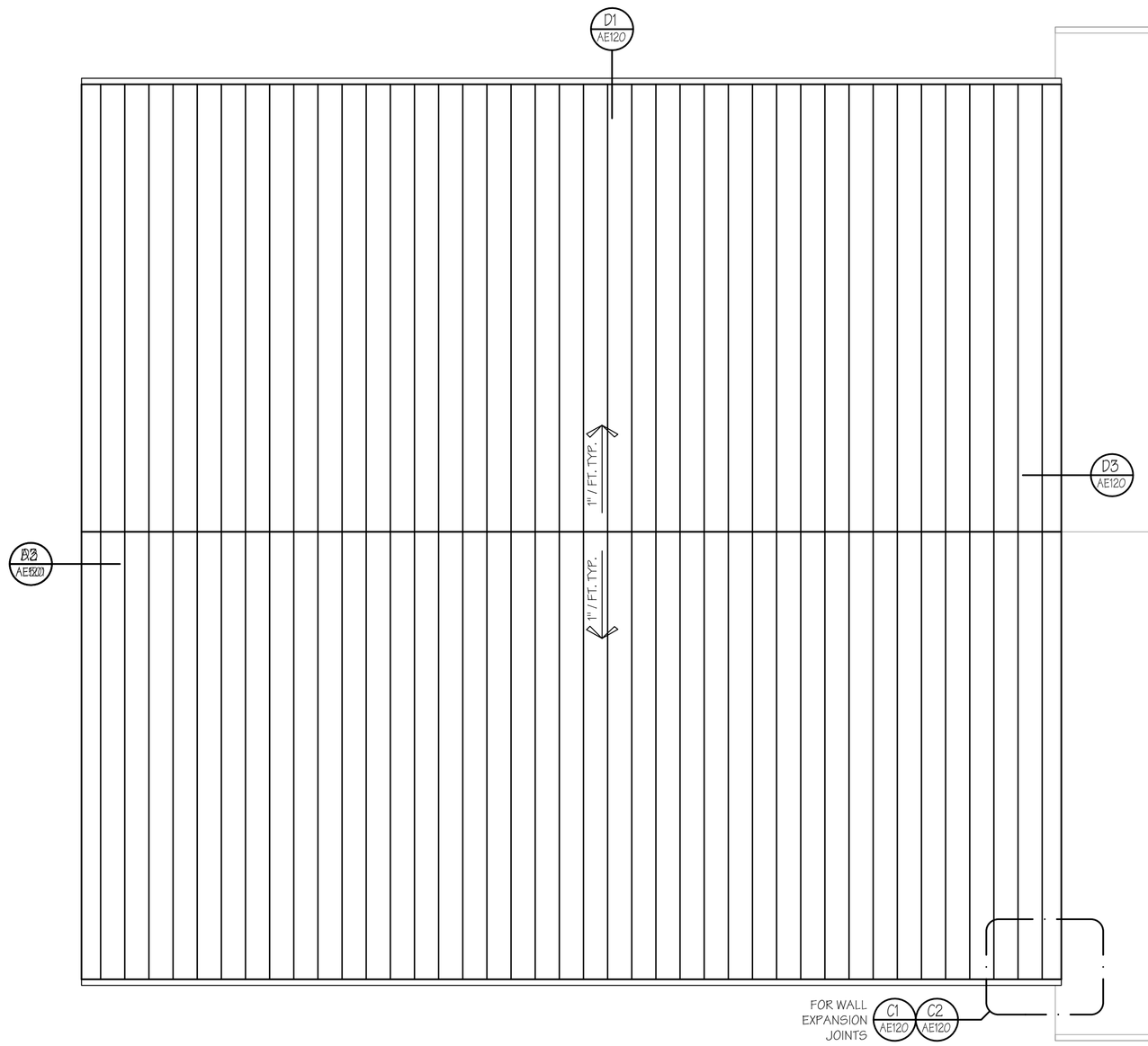


C1 EXPANSION JOINT DETAIL
1-1/2"=1'-0"

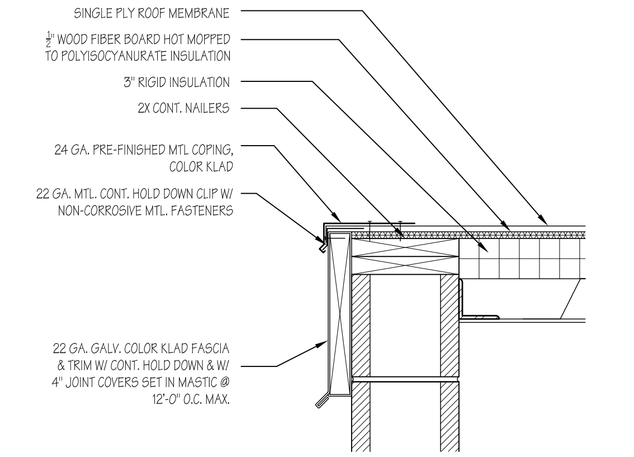


C2 EXPANSION JOINT DETAIL (ABOVE 9'-4")
1-1/2"=1'-0"

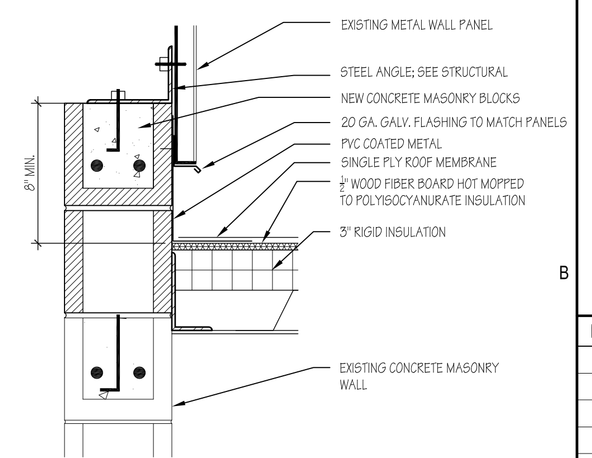




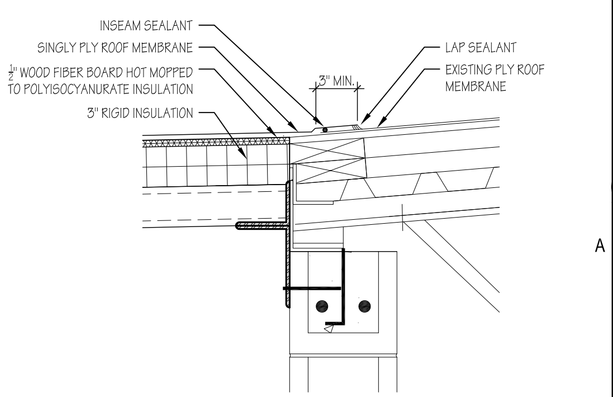
A3 NEW ROOF PLAN
1/8"=1'-0"



C5 ROOF DETAIL
1-1/2"=1'-0"



B5 ROOF DETAIL
1-1/2"=1'-0"



A5 ROOF DETAIL
1-1/2"=1'-0"

GENERAL NOTES

1. ALL DIMENSIONS & EXISTING CONDITIONS IN AREAS OF WORK ARE TO BE FIELD VERIFIED PRIOR TO COMMENCING WORK - ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT OR ENGINEER OF RECORD PRIOR TO COMMENCING WORK.

2. PROTECT ALL AREAS & SURFACES ADJACENT TO DEMOLITION & CONSTRUCTION. PATCH & REPAIR ANY DAMAGE RESULTING FROM THE DEMOLITION OF EXISTING ITEMS OR THE CONSTRUCTION OF NEW ITEMS.

3. NOTED AREAS INDICATED THE GENERAL EXTENT OF DEMOLITON. THE CONTRACTOR'S CHOICE OF MEANS & METHODS OF CONSTRUCTION MAY REQUIRE MORE OR LESS DEMOLITION. THE MEANS & METHODS OF DEMOLITION & CONSTRUCTION MUST BE ACCOUNTED FOR IN THE CONTRACTORS BID. ANY DEMOLITION & REPAIR TO ADJACENT SURFACES BEYOND THE AREAS INDICATED IN THE CONTRACT DOCUMENTS WILL NOT BE COMPENSATED FOR AFTER THE BID OPENING.

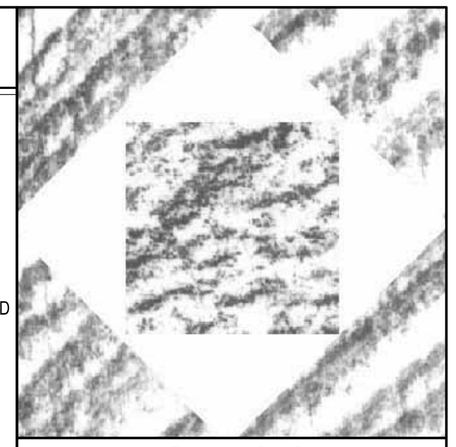
4. 72-HOUR NOTICE IS REQUIRED FOR ANY UTILITY SHUT DOWN.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EXISTING SITE IMPROVEMENTS WHICH ARE TO REMAIN FREE FROM DAMAGE DURING CONSTRUCTION BOTH INSIDE AND OUTSIDE THE CONTRACT LIMIT LINE.

6. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL UTILITIES & SITE IMPROVEMENTS WHICH ARE AFFECTED BY OR WHICH TIE IN WITH NEW CONSTRUCTION.

7. PROVIDE TEMPORARY 6'-0" HIGH CHAIN LINK FENCE @ PROJECT LIMIT LINE, COMPLETE W/GATES AS REQUIRED, UNLESS NOTED OTHERWISE.

8. EXISTING ROADS, PARKING, SERVICE DRIVES, & SIDEWALKS SHALL REMAIN ACCESSIBLE & KEPT CLEAR OF CONSTRUCTION EQUIPMENT, MATERIALS, DIRT AND DEBRIS.



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CAMP WILLIAMS UTES
EAST REMODEL DESIGN

UTAH NATIONAL GUARD
CAMP WILLIAMS

MARK	DATE	DESCRIPTION

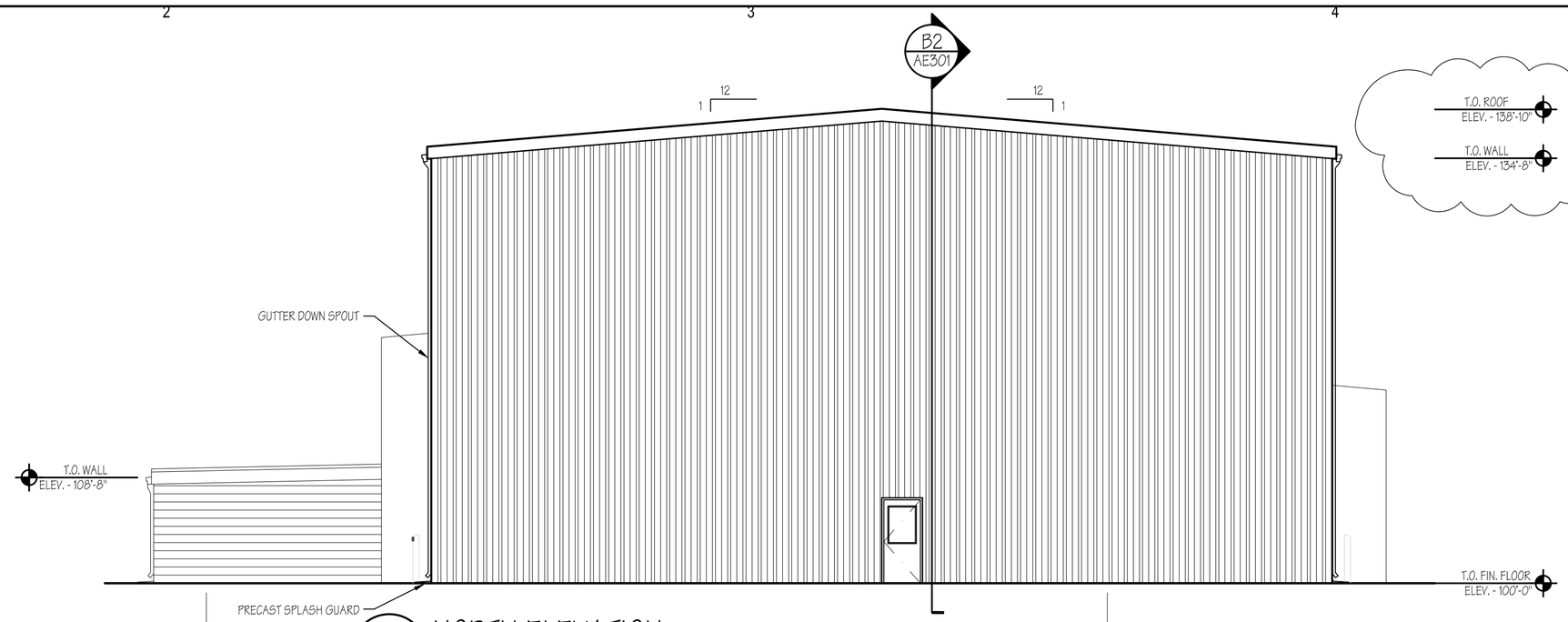
DATE:	30 AUGUST 2010
AGENCY PROJECT NO:	10207480
HFSA PROJECT NO:	1022.01
CAD DWG FILE NO:	
DRAWN BY:	RLS
CHECKED BY:	MDP
DESIGNED BY:	RLS
DWG TYPE:	ARCHITECTURAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS BID SET

SHEET TITLE

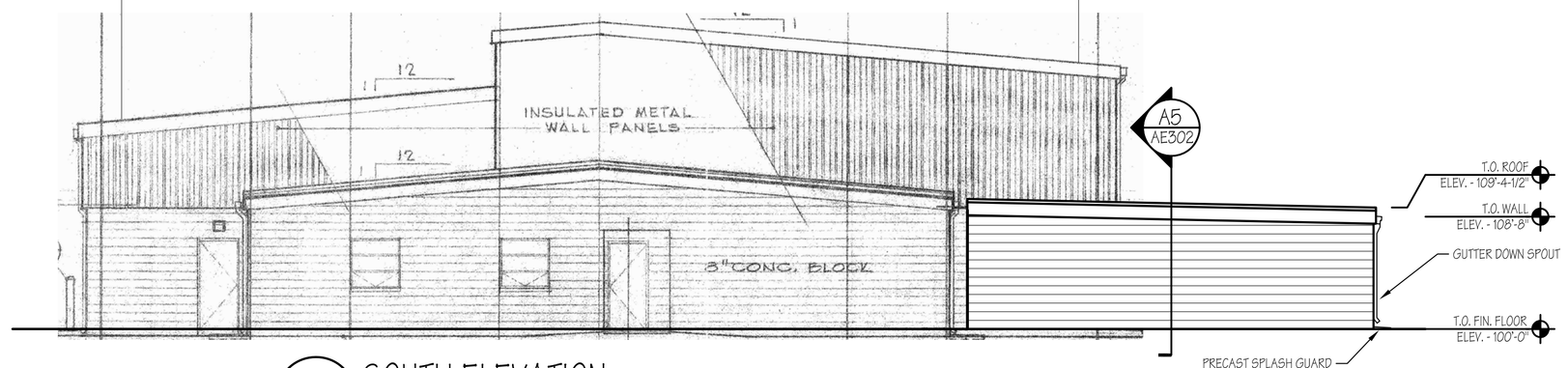
ROOF PLAN
AND DETAILS

AE120

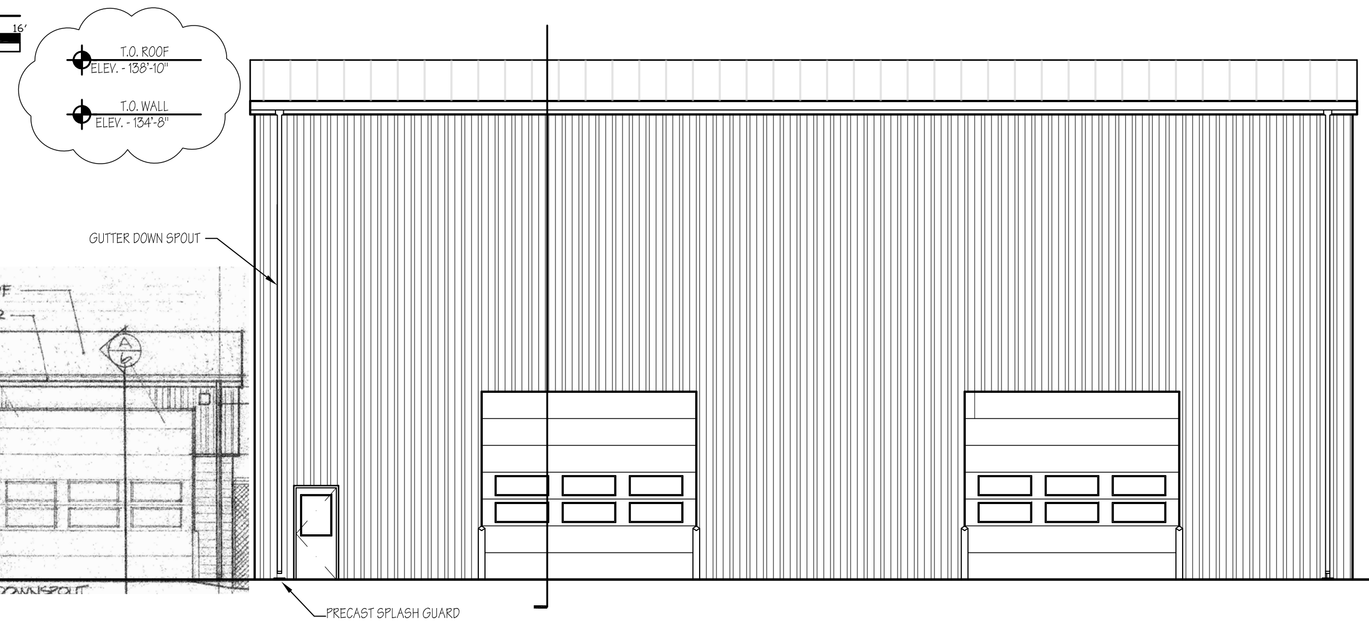
SHEET 9 OF 16



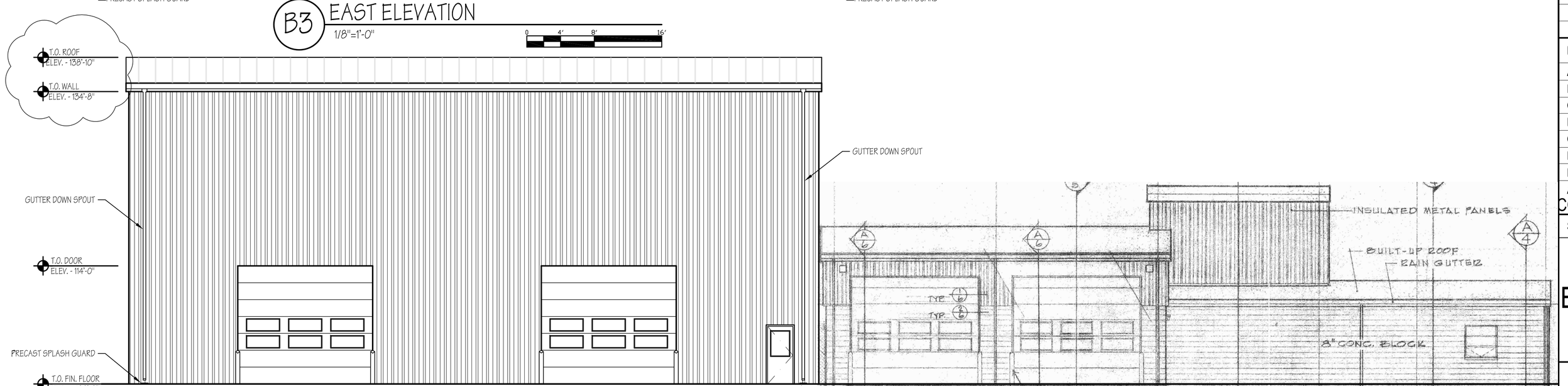
D3 NORTH ELEVATION
1/8"=1'-0"



C3 SOUTH ELEVATION
1/8"=1'-0"



B3 EAST ELEVATION
1/8"=1'-0"



A3 WEST ELEVATION
1/8"=1'-0"

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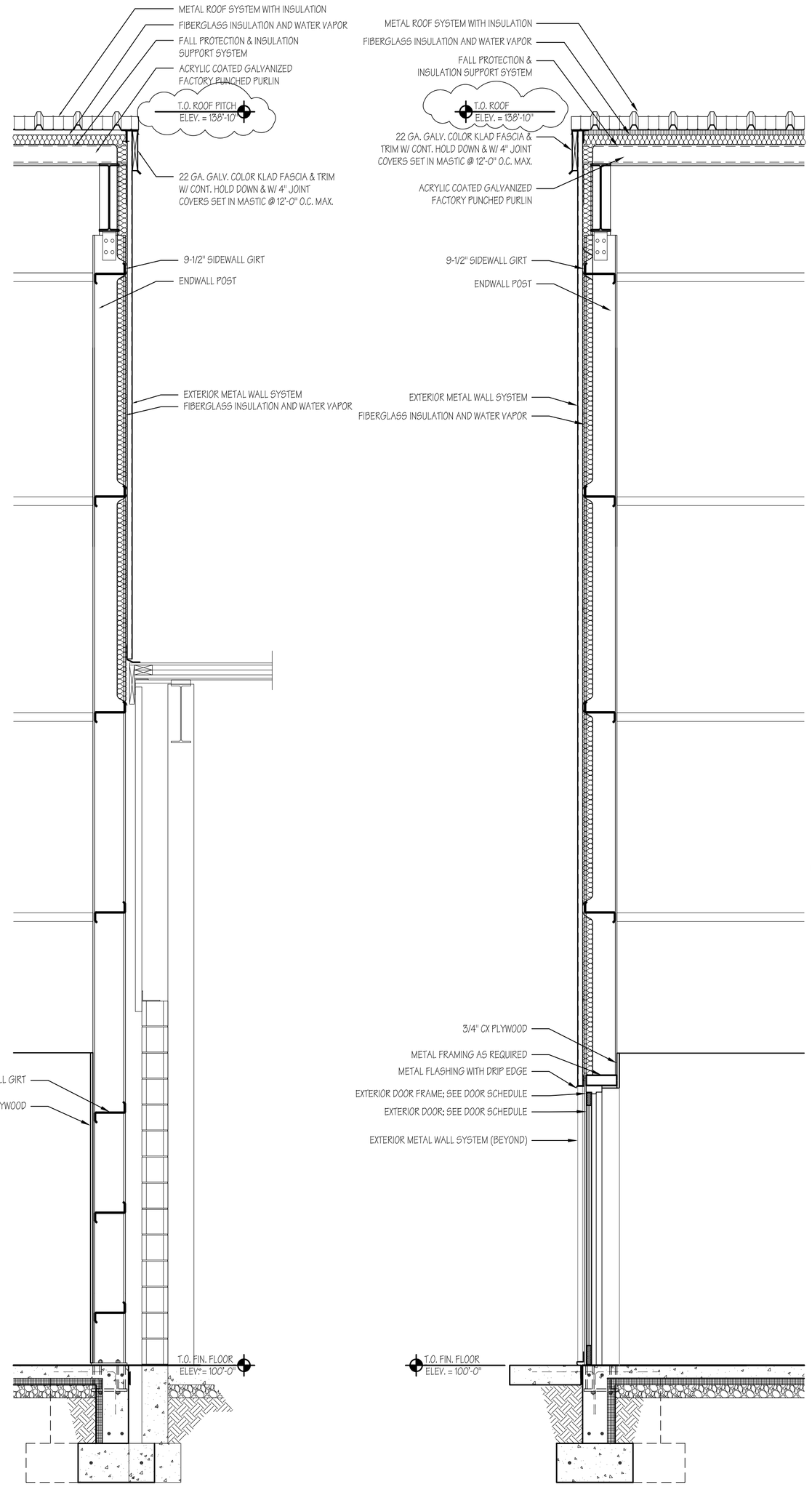
SHEET TITLE

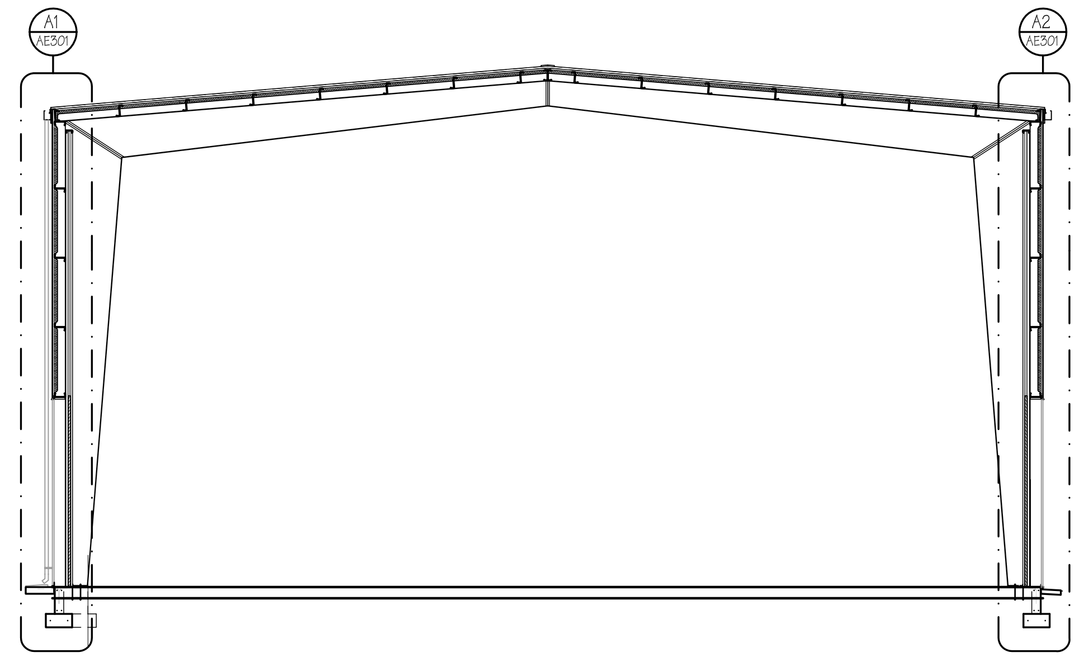
BUILDING ELEVATIONS

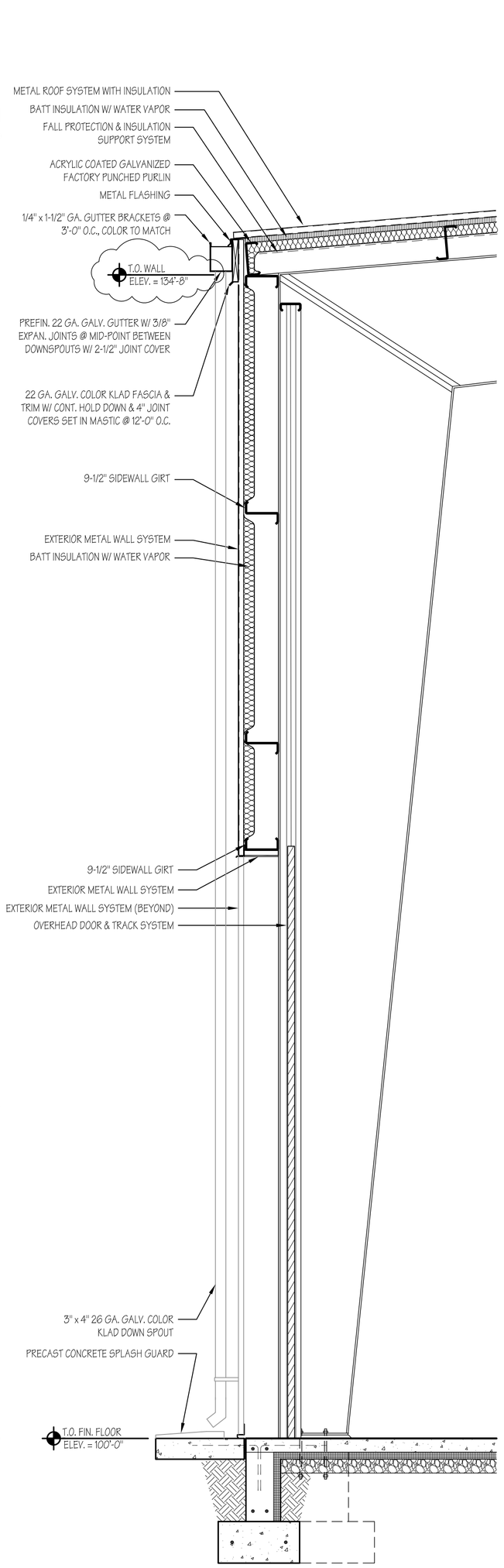
AE201

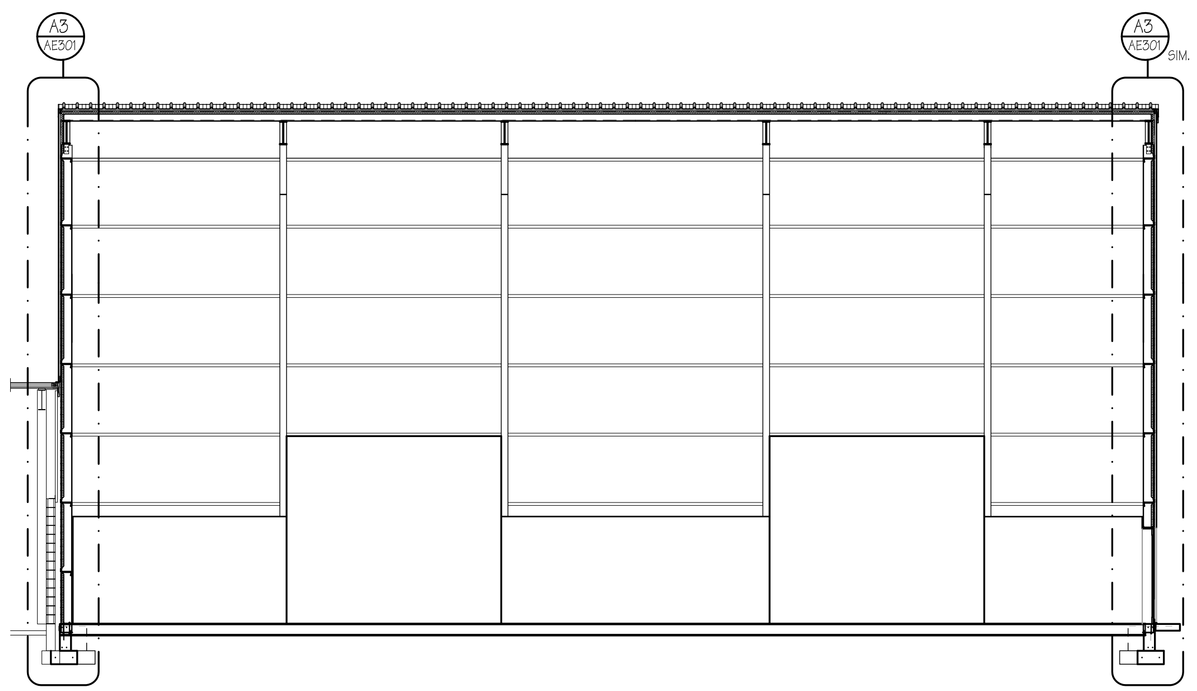
SHEET 10 OF 16



B4 BUILDING SECTION
1/8"=1'-0"







A1 WALL SECTION
1/2"=1'-0"

A2 WALL SECTION
1/2"=1'-0"

A3 WALL SECTION
1/2"=1'-0"

A4 BUILDING SECTION
1/8"=1'-0"

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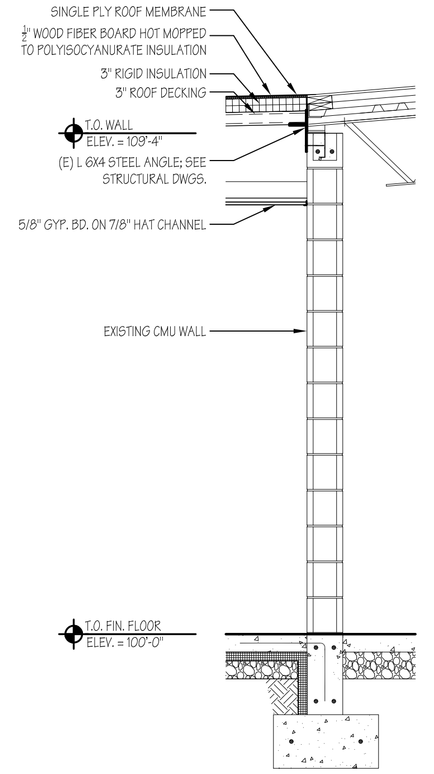
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS BID SET

SHEET TITLE

BUILDING SECTIONS & WALL SECTIONS

AE301

SHEET 11 OF 16



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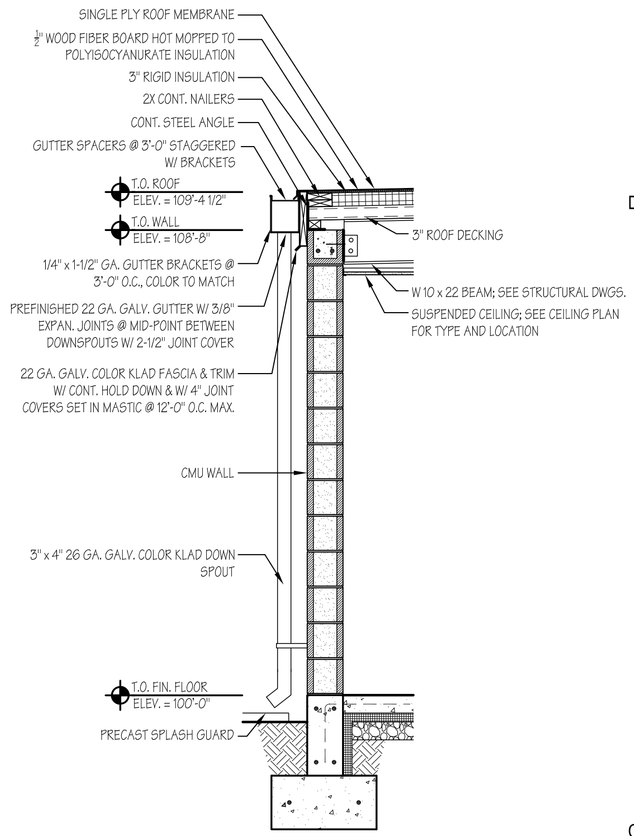
1/2"=1'-0"



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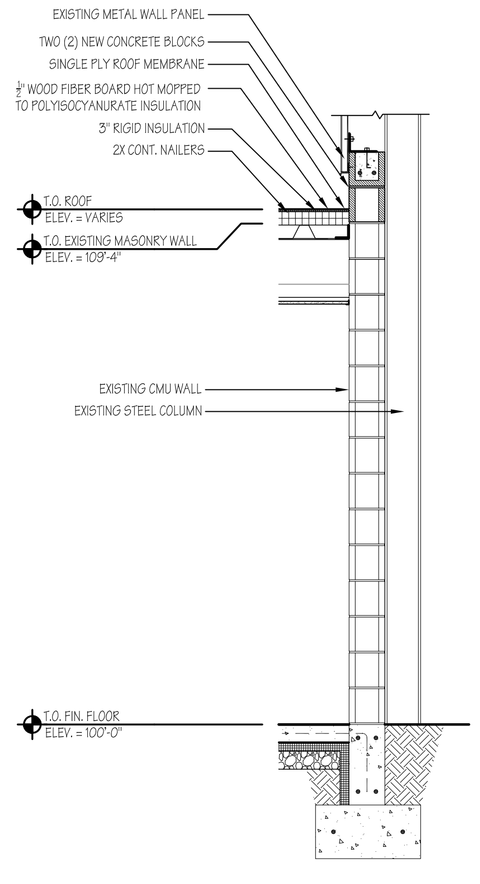
1/2"=1'-0"



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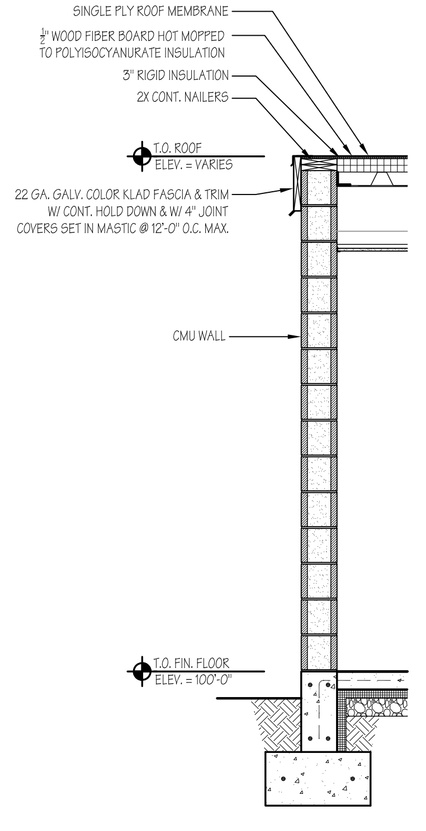
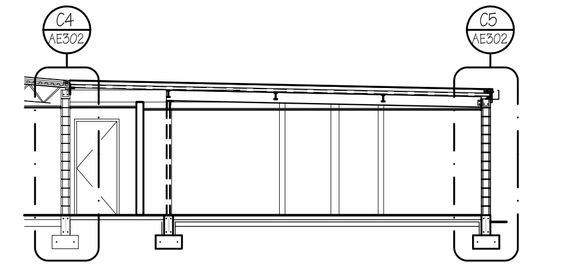
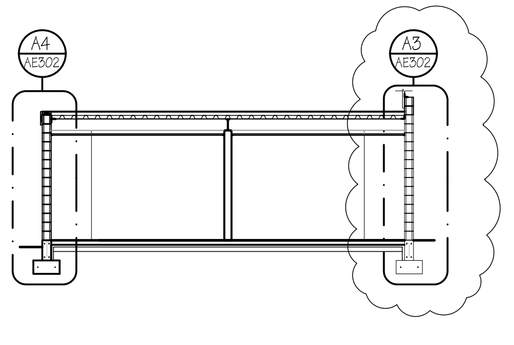
1/2"=1'-0"



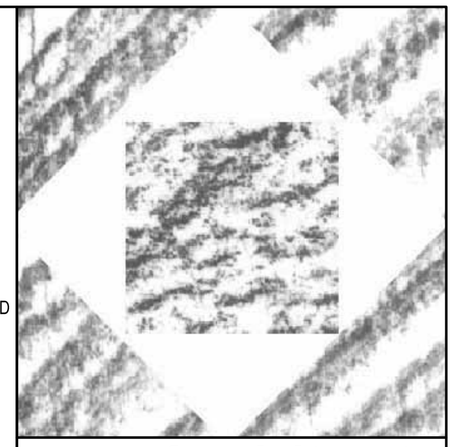
A4 WALL SECTION
1/2"=1'-0"



B5 BUILDING SECTION
1/8"=1'-0"



A5 BUILDING SECTION
1/8"=1'-0"



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CAMP WILLIAMS UTES EAST REMODEL DESIGN

UTAH NATIONAL GUARD
CAMP WILLIAMS

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CHECKED BY:	MDP
DESIGNED BY:	RLS
DWG TYPE:	ARCHITECTURAL

ARCHITECTURAL PHASE:
CONSTRUCTION DOCUMENTS BID SET

SHEET TITLE

BUILDING SECTIONS & WALL SECTIONS

AE302

SHEET 12 OF 16

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Richard D. Jensen, P.E. LEED AP
Hal L. Abercrombie, P.E.

MECHAN CAL ADDENDA NO. 1
OR HE
CAM LL AMS U ES
EAS REMODEL DES GN
U AH NA ONAL GUARD

Date: September 15, 2010

This addendum shall be included in the contract documents and shall be acknowledged, in writing, on all bid proposals for the work.

A. Specifications:
   1. Section 22 4000:
      a. Change paragraph 2.1.B.1 to reference Kohler Model K4350 (top spud).
      b. Remove paragraph 2.13.
   2. Section 23 0993:
      a. Replace entire section with attached revised section.
   3. Section 23 6520:
      a. Change paragraph 3.2 to read, “units to ship with controls needed to interface with sections 23 0900 and 23 0993”.
   4. Section 23 7200:
      a. Remove this section.
   5. Section 23 7433:
      a. Replace paragraphs 2.9 and 2.10 as follows:

      2.9 ELECTRICAL OPTIONS
         A. Control Center: Contains factory mounted and integrated VFD, 24 VAC control transformers, integral master disconnect switch, fuse blocks, and other required components to accomplish control functions.
         B. Heating Inlet Air Sensor: Automatically turns the heat on and off based on a field adjustable set point.
         C. Cooling Inlet Air Sensor: Automatically turn the evaporative cooler on and off based on a field adjustable set point.
         D. Freeze Protection: Automatically turns the evaporative cooler on and off based on a field adjustable set point.
         E. Dirty Filter Switch: Indicates when filters need servicing.
         F. Service Receptable: 120 volt outlet on the side of the unit requires a separate power source.

G. Variable Frequency Drive:
1. Provide harmonic reduction of 12% or less on current total harmonic distortion when measured at the VFC input terminals. Provide bypass switch. Provide 5-year warranty along with factory authorized startup and a harmonic analysis report furnished as part of the start up report.
2. VFD based on Mitsubishi or approved equal

2.10.1 CONTROLS
A. Supply Fan Control: Unit shall be interlocked with exhaust fans to operate VFD as follows:
1. If REF-1 and REF-2 are on, run at 4,500 CFM.
2. If VEF-1 is also on, run at 9,000 CFM.
B. Remote Control Panel: Industrial type 24 VAC remote control panel in coated steel enclosure. Wiring from remote control panel to make up air unit to be point to point.
1. Status Lights
a. Power On
b. Heat/Main Valve On
c. Exhaust Fans REF-1 and REF-2 On.
d. Exhaust fan VEF-1 On.
e. Dirty filter.
2. Switches
a. Supply Fan On/Off
b. Heat On/Off/Cool On
c. Exhaust REF-1 and REF-2
d. Exhaust Fan VEF-1
3. Temperature Controls
a. Discharge Temperature Controls: Factory mounted on remote panel.

B. Drawings:
1. Replace the following sheets with the attached revised sheets:
P201, P401, P601, M101, M201, M401, M502, M601, M602 and ME101.
2. Sheet AS100 and P401: As bid alternate #1, replace the 2-inch diameter domestic water line from the PRV station in the water heater room to the main line on the south side of the building (approximately 25 feet inside building and 115 feet outside the building). The section of pipe inside the building is located above the ceiling until it reaches the outside wall at which point it drops below grade. Remove and replace the ceiling as needed to access the pipe and match the ceiling finish to existing.

C. Prior Approvals:
1. The following manufacturers are added to the bid documents for respective equipment insofar as they meet or exceed all requirements of said bid documents.

Item	Manufacturer
Outdoor Direct Fired Makeup Air Unit	Johnson Marcraft, Absolute Air, Sterling
Gas-Fired Furnace	Day and Night
Condensing Unit	Day and Night
Evaporative Coolers	Phoenix
Radiant Tube Heaters	Ambirad, Combustion Research, Re-Verber Ray
Vehicle Exhaust Fan	Carnes, Twin City, NSGV, Penn Barry, National Garage Ventilation
Grilles, Registers, Diffusers	Air Specialties Express
HET and Manual Dampers	Air Rite, Arrow, Leader, Greenheck, Hercules, Clifco
Flexible Duct	Hart and Cooley
Vehicle Exhaust Hose	National Garage Ventilation, Ventaire, AQC
Control Dampers	Tamco, Pottorff, Greenheck
Louvers	Pottorff
Test and Balance Contractor	Independent Test and Balance
Faucet for S-1	Symmons
Toilet Seats	Comfort Seats
Trench Drain	J.R. Smith

Attachments: Specification 23 0993, Drawings: Sheet P201, P401, P601, M101, M201, M401, M502, M601, M602, ME101.

END OF MECHANICAL ADDENDUM

A. This Section includes control sequences for HVAC systems, subsystems, and equipment.

B. See Division 23 Section "Instrumentation and Control for HVAC" for control equipment and devices and for submittal requirements.

A. A space temperature sensor shall stage evaporative cooler on as follows:

Vent – Low Speed
Vent – High Speed
Cool – Low Speed (Pump)
Cool – High Speed (Pump)

B. Automatic damper in evaporator cooler duct and relief louver shall close when cooler is disabled and open when cooler is enabled. Provide end switch to prove discharge damper – open before enabling fan.

A. A space temperature sensor shall open unit heater gas valve and enable combustion fan.

A. Mount and install control panel furnished with make-up air unit. Note: this panel shall control MUA-1, REF-1, REF-2 and VEF-1.

A. A strap-on thermostat on potable hot water recirculating line/locate strap-on stat 20 lineal pipe feet from water heater. Thermostat shall cycle pump on at 120 deg F. and off at 140 deg F.

B. Recirculation pumps shall be disabled in unoccupied mode.

A. Programmable thermostat shall control unoccupied and occupied status of fan system based on adjustable seven day program and remote room sensor/push button. Fan shall run continuously in occupied mode and cycle in unoccupied mode.

B. Adjustable heating and cooling set points shall control space temperature by activating either heating or cooling equipment. Programmable thermostat provides automatic change over between heating and cooling.

C. Remote room sensor provides optional override of thermostat program by allowing three hour timed override of thermostat program at anytime by pushing ON / OFF button on remote room

sensor cover. This shall activate thermostat to occupied mode and system shall control to occupied mode and system shall control to occupied set point.

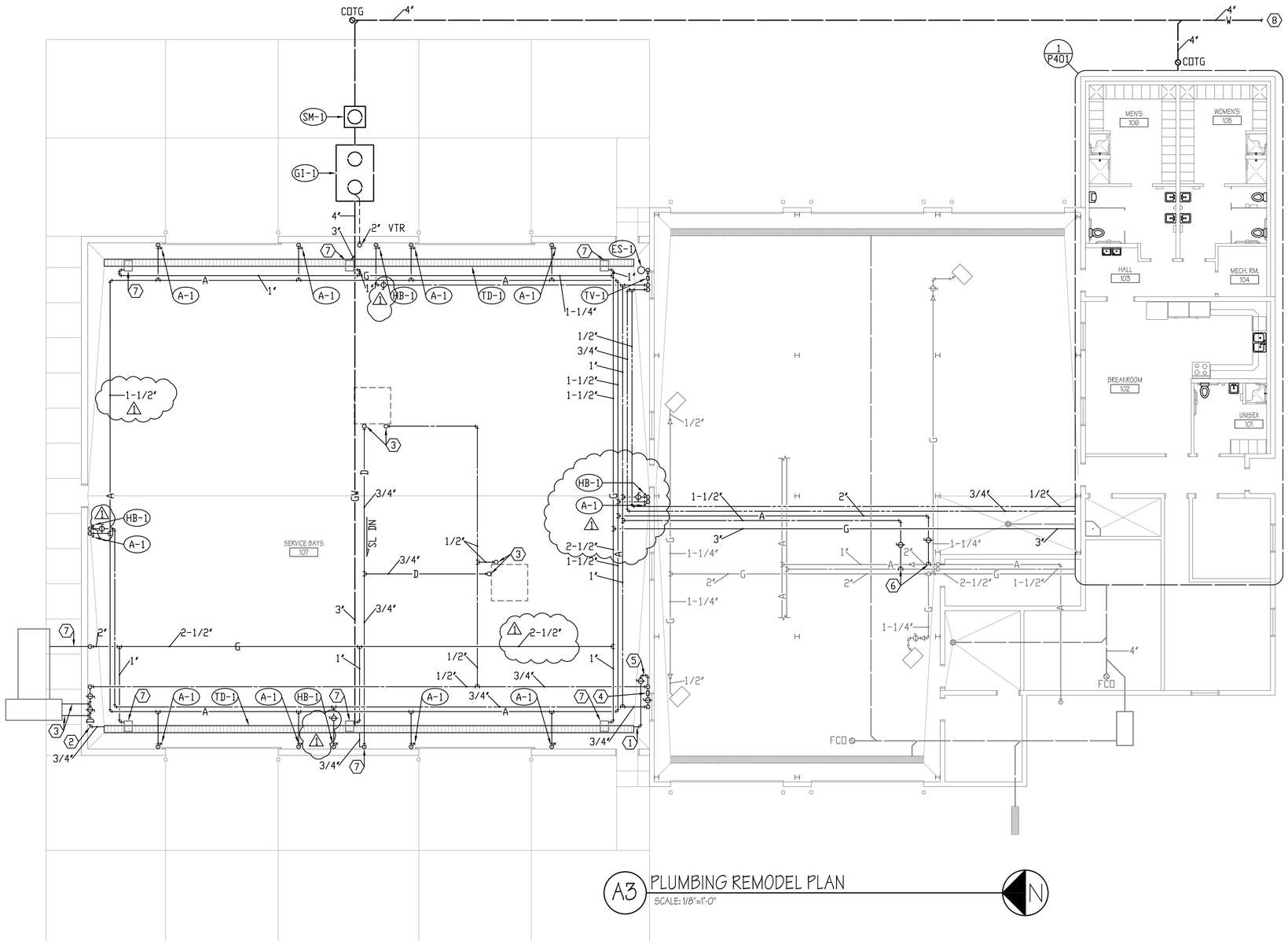
D. Minimum outside air damper, spring return type, shall open in occupied mode and remain closed in unoccupied mode in zones using outside air.

E. Exhaust fans REF-3 and REF-4 shall activate in Occupied Mode and remain inactive in Unoccupied Mode.

A. Systems with smoke detectors shall shut down fan in event of detection. See plans for detector locations.

KEYED NOTES FOR SHEET P201

1. 3/4" DRAIN FROM BACKFLOW PREVENTER, DRAIN AND EVAPORATIVE COOLER FILL STATION DRAIN.
2. EXTEND GRAVITY DRAIN FROM EVAPORATIVE COOLER SUMP PUMP SIDE DISCHARGE TO TRENCH DRAIN.
3. RISE 1/2" WATER TO EVAPORATIVE COOLER SUMP VALVE AND 3/4" DRAIN TO SUMP PUMP SIDE DISCHARGE.
4. 3/4" REDUCED PRESSURE BACKFLOW PREVENTER ON WALL MOUNTED AT 42" A. F. F.
5. EVAPORATIVE COOLER FILL STATION DRAIN.
6. CONNECT TO EXISTING PIPING.
7. CONNECT TO GAS APPLIANCE WITH ISOLATION VALVE AND FLEX PIPE WITH UNION, SEE DETAIL.
8. SEE SITE PLAN FOR CONTINUATION.



A3 PLUMBING REMODEL PLAN
SCALE: 1/8"=1'-0"

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CAMP WILLIAMS UTES
EAST REMODEL DESIGN

UTAH NATIONAL GUARD
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1	9-15-10	ADDENDUM #1

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CAD DWG FILE NO:	10089
DRAWN BY:	BDA
CHECKED BY:	HLA
DESIGNED BY:	HLA
DWG TYPE:	MECHANICAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS

SHEET TITLE

PLUMBING REMODEL PLAN

P201

SHEET 2 OF 13

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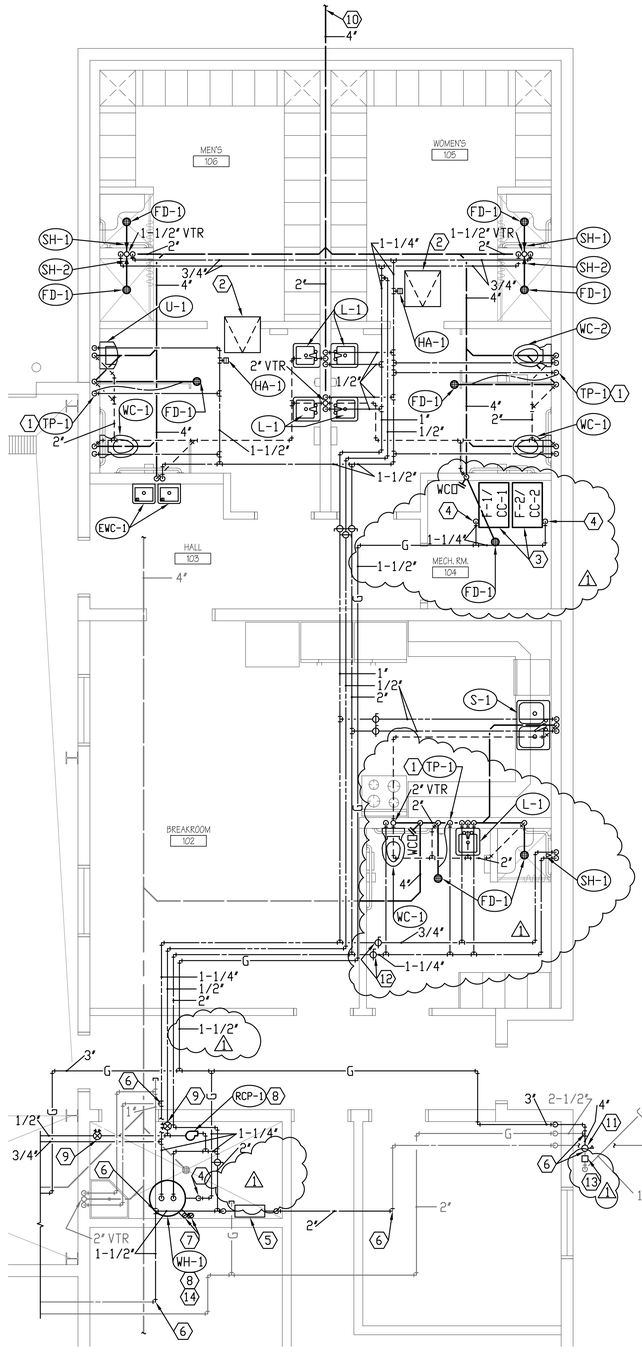

1 PLUMBING LARGE SCALE PLAN

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

KEYED NOTES FOR SHEET P401

1. PROVIDE AND INSTALL STAINLESS STEEL LOCKING WALL ACCESS DOOR TO SERVICE TRAP PRIMER.
2. PROVIDE AND INSTALL 24"X24" CEILING ACCESS DOOR FOR HAMMER ARRESTOR.
3. EXTEND DRAIN FROM FURNACE AND COOLING COIL TO FLOOR DRAIN. ⚠1
4. INSTALL ISOLATION VALVE, DIRT LEG, FLEX HOSE AND UNION AND CONNECT TO APPLIANCE. SEE DETAIL.
5. NEW 2" PRV.
6. CONNECT TO EXISTING PIPE.
7. RISE WATER HEATER GAS VENTS THROUGH ROOF.
8. SEE DETAIL FOR WATER HEATER, EXPANSION TANK AND RECIRCULATION PUMP PIPING.
9. BALANCE CIRCUIT SETTER TO 3 GPM.
10. SEE SHEET P201 FOR CONTINUATION.
11. NEW GAS REGULATOR 20 LB TO 4 OUNCE AT 1,947 MBH.
12. LOCATE ISOLATION VALVES ABOVE LAY-IN CEILING.
13. INSTALL SEISMIC VALVE ON EXISTING GAS LINE AND BRACE TO BUILDING. ⚠1
14. LOCATE WATER HEATER AS CLOSE TO JANITORS SINK AS POSSIBLE.

⚠1

GENERAL NOTE:
1. COORDINATE PIPE ROUTING IN WATER HEATER ROOM TO MAINTAIN CLEARANCE REQUIREMENTS AT EXISTING AND NEW ELECTRICAL PANELS.

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DESIGNED BY:	HLA
DWG TYPE:	MECHANICAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS

SHEET TITLE

PLUMBING
LARGE SCALE
PLAN

P401

SHEET 3 OF 13

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	PIPE SIZE						REMARKS
		TRAP	WASTE	VENT	CW	HW	AIR	
WC-1	WATER CLOSET (ADA)	INT	4	2	1			FLOOR MTD, FLUSH VALVE
WC-2	WATER CLOSET	INT	4	2	1			FLOOR MTD, FLUSH VALVE
U-1	URINAL	INT	3	2	3/4			
L-1	LAVATORY (ADA)	1-1/4	1-1/2	1-1/2	1/2	1/2		WALL HUNG ⑤
SH-1	SHOWER (ADA)				1/2	1/2		⑥
SH-2	SHOWER				1/2	1/2		⑦
FD-1	FLOOR DRAIN	2	2	2				③
TP-1	TRAP PRIMER				1/2			
EWC-1	ELECTRIC WATER COOLER	1-1/4	1-1/2	1-1/2	1/2			BI-LEVEL (ADA)
S-1	BREAK ROOM SINK	1-1/2	1-1/2	1-1/2	1/2	1/2		
TD-1	TRENCH DRAIN		3					75 FT LONG X 6 INCHES WIDE ④
GI-1	GREASE INTERCEPTOR		4	2				
SM-1	SAMPLING MANHOLE		4					
HB-1	HOSE BIBB				1/2			②
A-1	AIR OUTLET						1/2	
WH-1	WATER HEATER				1-1/4	1-1/4		199 MBH, 100 GALLON
RCP-1	RECIRCULATION PUMP					1/2		6 GPM @ 15 FT HEAD ①
HA-1	HAMMER ARRESTOR							SIZE AS PER MANUFACTURER
ES-1	EMERGENCY SHOWER							1-1/4" TEMPERED WATER
TV-1	TEMPERING VALVE				1	3/4		CONNECT TO ES-1

① PROVIDE 24 HOUR WALL TIMER WITH OVERRIDE SWITCH. POWER REQUIREMENT IS 115 VOLT, 1/6 HP.
② PROVIDE WITH VACUUM BREAKER AND MALE HOSE THREAD.
③ PROVIDE WITH TRAP PRIMER CONNECTION WHERE SHOWN.
④ SLOPE DRAIN TO CENTER.
⑤ PROVIDE WITH TEMPERING VALVE.
⑥ PROVIDE 36"X36" FIBERGLASS ENCLOSURE WITH ADA GRAB BARS AND SEAT. SEE ARCHITECTURAL DETAILS. ALSO PROVIDE CURTAIN ROD AND CURTAIN.
⑦ PROVIDE 36"X42" FIBERGLASS ENCLOSURE. ALSO PROVIDE CURTAIN ROD AND CURTAIN.
⚠1

PLUMBING LEGEND

HOT WATER LINE	
COLD WATER LINE	
RECIRC LINE	
VENT LINE	
ABOVE GRADE WASTE LINE	
UNDER GRADE WASTE LINE	
GAS LINE	G
DRAIN LINE	D
VENT THRU ROOF	VTR
WALL CLEAN OUT	WCO
CLEAN OUT	CO
CLEAN OUT TO GRADE	COTG
FLOOR CLEAN OUT	FCO
BALL VALVE	
UNION	
GAS COCK VALVE	
PRESSURE REGULATOR	P
DROP	
RISE	
ROOF DRAIN	RD
SECONDARY ROOF DRAIN	SRD
ROOF DRAIN (BELOW GRADE)	RD

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CAMP WILLIAMS UTES
EAST REMODEL DESIGN

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SHEET TITLE

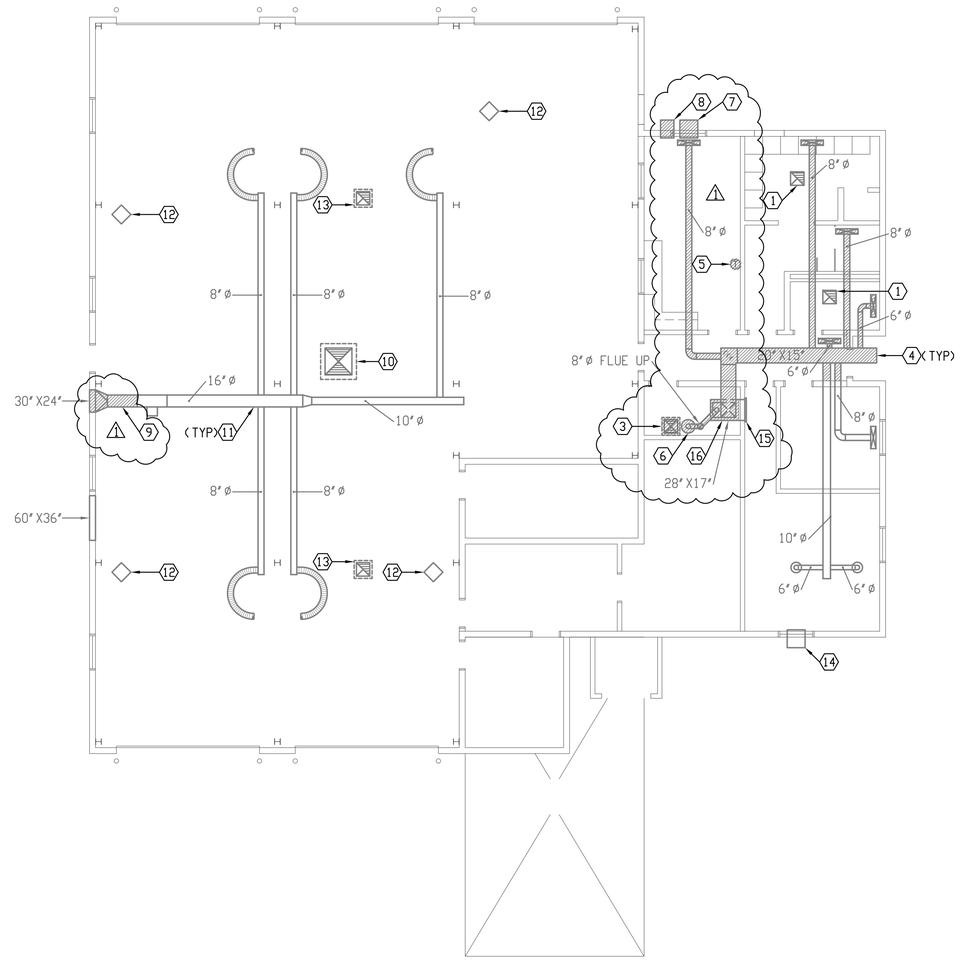
PLUMBING
SCHEDULE
AND LEGEND

P601

SHEET 5 OF 13

KEYED NOTES FOR SHEET M101

1. REMOVE CEILING EXHAUST FAN.
2. REMOVE FURNACE AND RETURN DUCT.
3. REMOVE COMBUSTION AIR AND PATCH ROOF. ⚠1
4. REMOVE HATCHED DUCT.
5. REMOVE THERMOSTAT.
6. REMOVE WATER HEATER AND FLUE THROUGH ROOF. PATCH ROOF. ⚠1
7. REMOVE WINDOW A/C UNIT.
8. REMOVE THROUGH THE WALL A/C UNIT.
9. REMOVE DISCHARGE DUCT FROM VEHICLE EXHAUST FAN. BLANK OFF LOUVER AT WALL. ⚠1
10. EVAPORATIVE COOLER TO REMAIN.
11. VEHICLE EXHAUST SYSTEM TO REMAIN.
12. UNIT HEATER TO REMAIN.
13. ROOFTOP EXHAUST TO REMAIN.
14. WINDOW A/C UNIT TO REMAIN.
15. WALL GRILLE TO REMAIN.
16. REMOVE FURNACE AND ASSORTED DUCT, FLUE, CONTROLS, ETC. ⚠1



A3 MECHANICAL DEMOLITION PLAN
SCALE: 1/8"=1'-0"

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MECHANICAL DEMOLITION PLAN

M101

SHEET 6 OF 13

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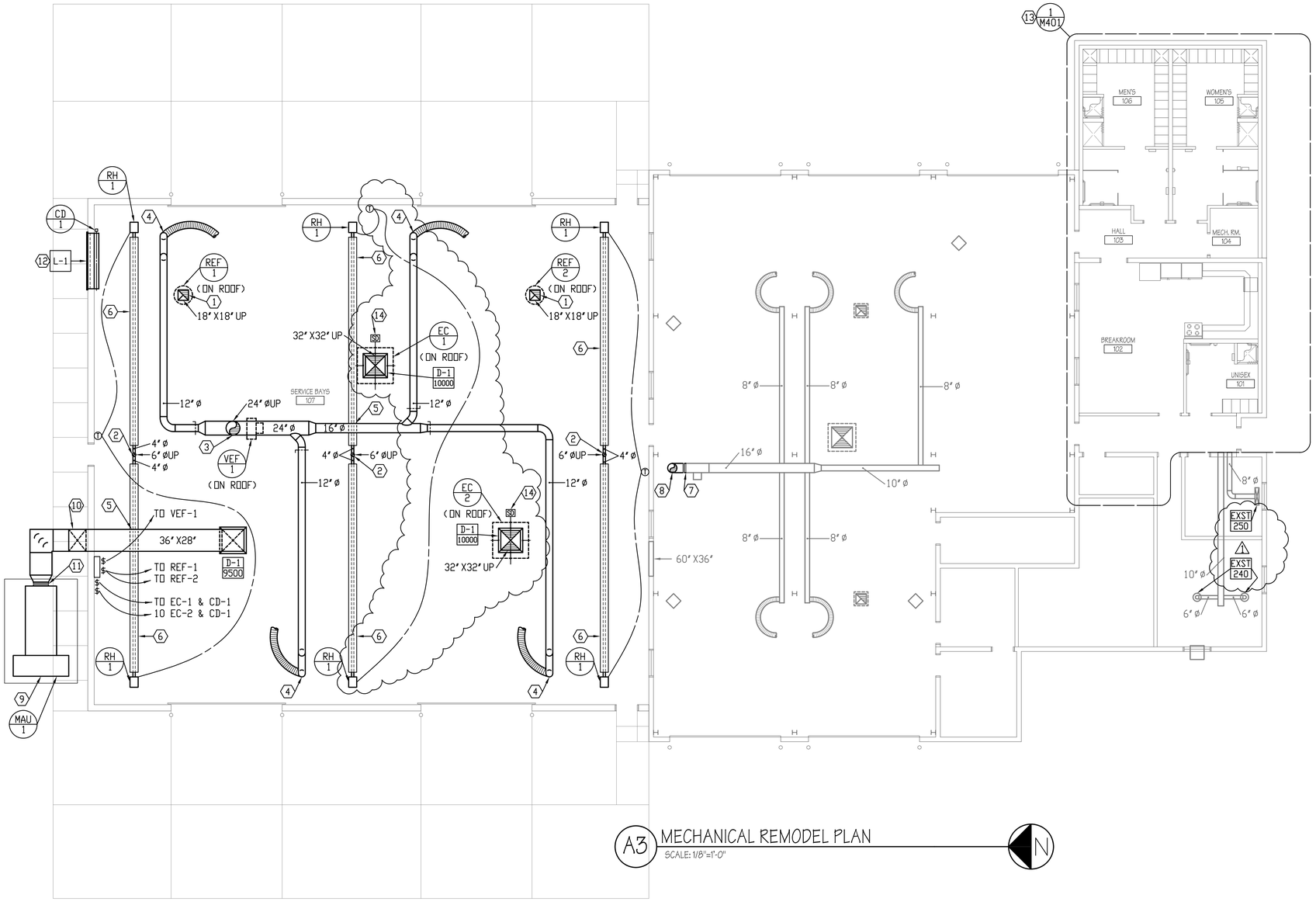

A3 MECHANICAL REMODEL PLAN

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

KEYED NOTES FOR SHEET M201

1. TERMINATE DUCT 6 INCHES BELOW UNDERSIDE OF ROOF INSULATION.
2. FLUE THROUGH ROOF.
3. DUCT THROUGH ROOF TO VEF-1.
4. DROP RIGID DUCT DOWN AND CONNECT TO VEHICLE EXHAUST HOSE (16 FT. LONG). PROVIDE HOSE WITH CABLE/PULLEY SUPPORT AND TAILPIPE ADAPTOR RATED FOR 1,250 CFM.
5. BOTTOM OF DUCT SHALL BE 28'-10" AFF (10" ABOVE BOTTOM OF RADIANT TUBE HEATER).
6. BOTTOM OF RADIANT TUBE HEATER SHALL BE 28'-0" AFF.
7. CONNECT TO EXISTING EXHAUST FAN.
8. RISE THROUGH EXISTING ROOF AND GOOSENECK DUCT ABOVE SUCH THAT OPENING IS A MINIMUM OF 24" ABOVE ROOF LINE. COVER DUCT OPENING WITH 1/2" MESH BIRD SCREEN.
9. NEW CONCRETE HOUSEKEEPING PAD A MINIMUM OF 6 INCHES LARGER THAN EQUIPMENT ON ALL SIDES. SEE ARCHITECTURAL PLANS.
10. RISE DUCT UP OUTSIDE BUILDING WALL AND TURN 90 DEGREES INTO BUILDING. BOTTOM OF DUCT INSIDE BUILDING SHELL BE 28'-10" AFF.
11. FLEXIBLE EQUIPMENT CONNECTION.
12. MOUNT BOTTOM OF LOUVER AT 8'-0" AFF.
13. SEE SHEET M401 FOR THIS AREA.
14. INSTALL SMOKE DETECTOR IN DUCT AND TIE INTO EVAP. COOLER TO SHUT DOWN IN EVENT OF DETECTION. ⚠1

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CAMP WILLIAMS UTES EAST REMODEL DESIGN

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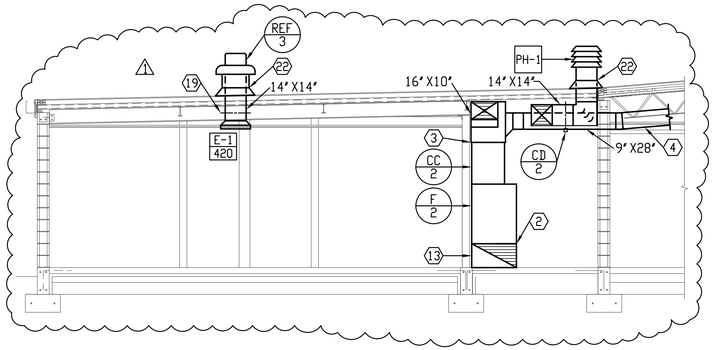
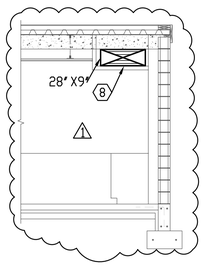
MECHANICAL REMODEL PLAN

M201

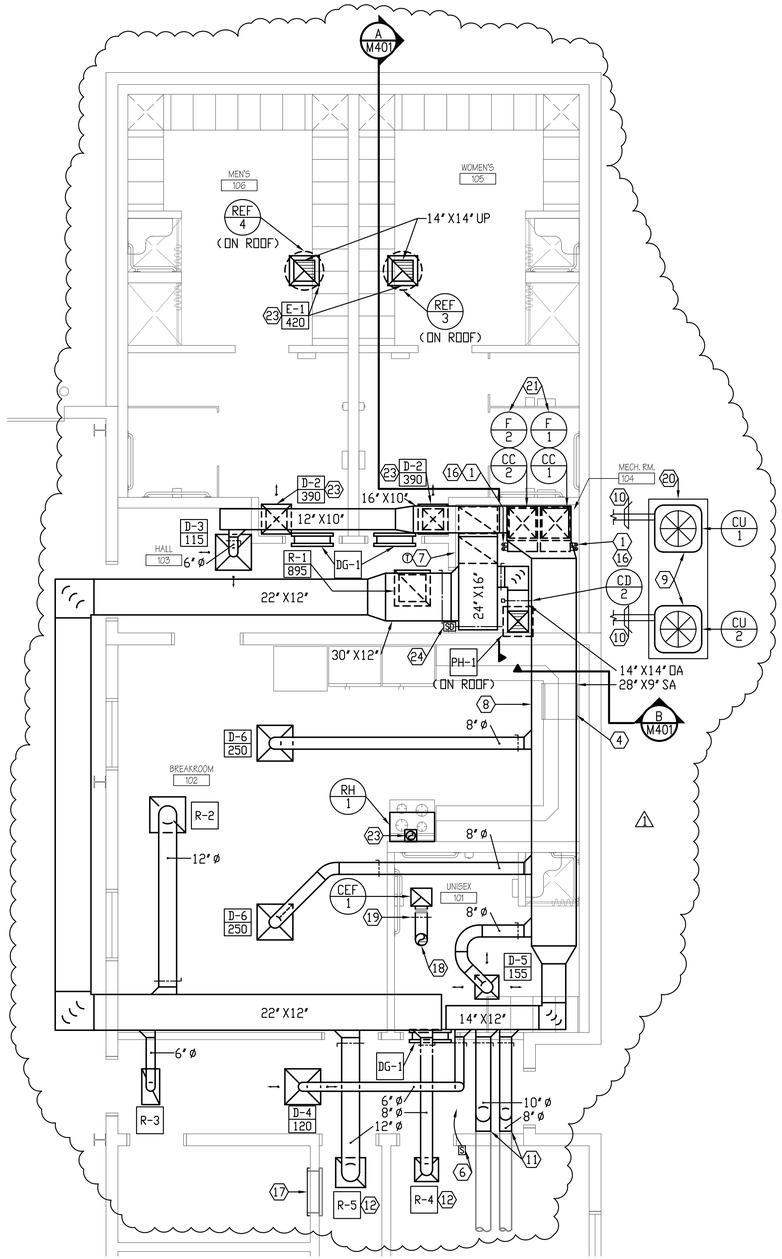
SHEET 7 OF 13



A LARGE SCALE MECHANICAL SECTION
SCALE 1/4"=1'-0"



B LARGE SCALE MECHANICAL SECTION
SCALE 1/4"=1'-0"



1 MECHANICAL LARGE SCALE PLAN
SCALE: 1/4"=1'-0"

KEYED NOTES FOR SHEET M401

1. RISE GAS VENTS THROUGH ROOF, SEE DETAIL.
2. TRANSITION TO FURNACE INLET.
3. TRANSITION DUCT TO COOLING COIL.
4. SLOPE SUPPLY DUCT UP. ⚠1
5. OMIT.
6. REMOTE TEMPERATURE SENSOR.
7. THERMOSTAT.
8. RUN DUCT IN SOFFIT.
9. MAINTAIN 36" CLEARANCE ON ALL SIDES OF CONDENSING UNIT.
10. RUN REFRIGERANT PIPING FROM COOLING COIL TO CONDENSING UNIT, SEE DETAILS.
11. CONNECT TO EXISTING DUCT.
12. INSTALL IN EXISTING CEILING, VERIFY TYPE.
13. SHEET METAL PLENUM UNDER FURNACE.
14. DROP 24"X16" DUCT DOWN AND CONNECT TO RETURN AIR PLENUM BELOW FURNACE. ⚠1
15. RISE 14"X14" OUTSIDE AIR UP THROUGH ROOF TO PH-1. ⚠1
16. RISE GAS VENTS UP THROUGH ROOF AND EXTEND 36" ABOVE OUTSIDE AIR VENT.
17. BLANK OFF EXISTING WALL GRILLE. ⚠1
18. RISE 8"ø EXHAUST DUCT THROUGH ROOF AND TERMINATE WITH ROOF CAP.
19. BACKDRAFT DAMPER.
20. NEW CONCRETE PAD TO EXTEND 4" BEYOND EQUIPMENT ON ALL SIDES, SEE ARCHITECTURAL.
21. FURNACES SHALL BE 'TWINNED' TOGETHER WITH TWINNING KIT.
22. ROOF CURB. ⚠1
23. ATTACH 6 INCH DIAMETER DUCT TO DISCHARGE ON OUTLET OF HOOD AND EXTEND UP THROUGH ROOF WITH ROOF CAP.
24. SMOKE DETECTOR IN RETURN DUCT.

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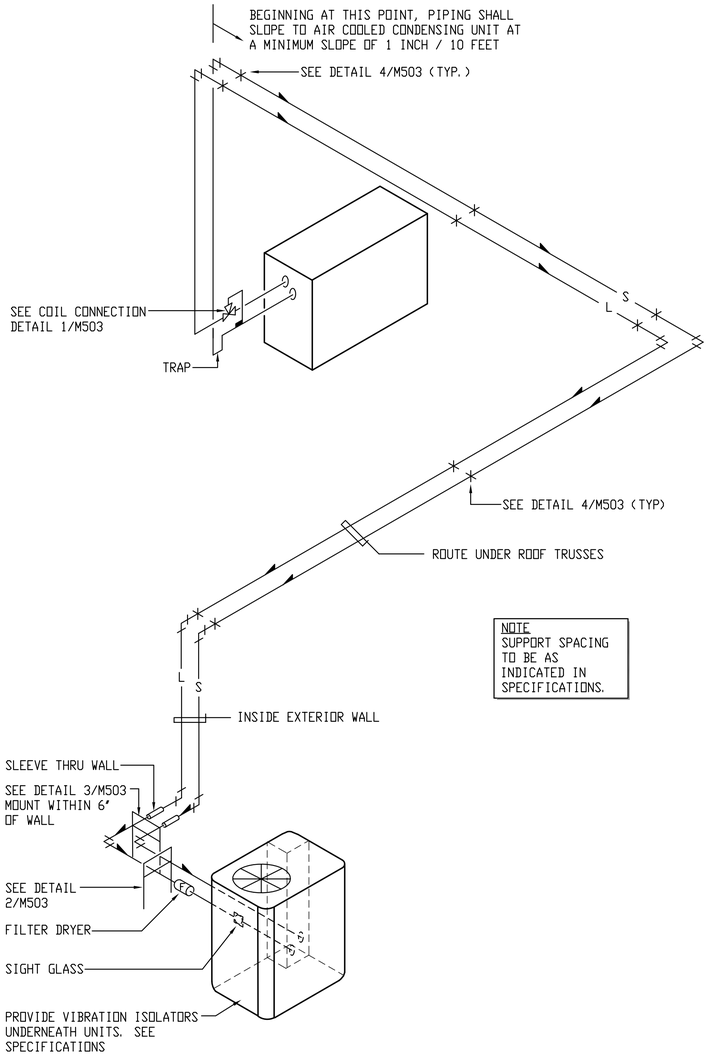
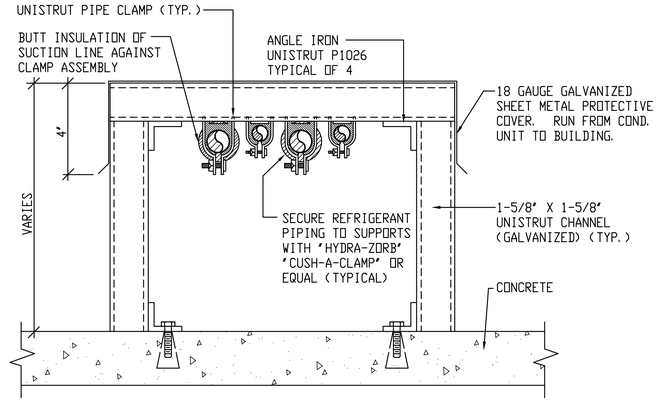
MECHANICAL
LARGE SCALE
PLAN

M401

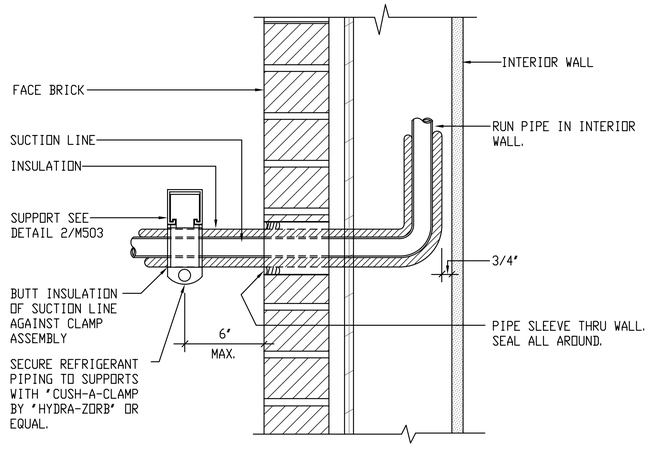
SHEET 8 OF 13



5 TYPICAL REFRIGERANT SCHEME
SCALE NONE

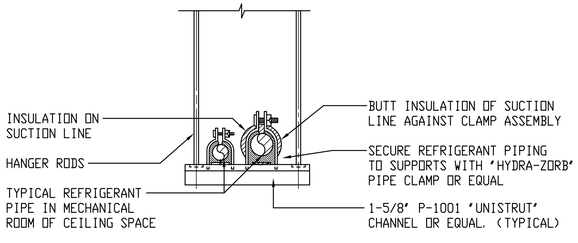


2 EXTERIOR REFRIGERANT PIPE SUPPORT DETAIL
SCALE NONE



NOTE:
LIQUID LINE SIMILAR

3 REFRIGERANT PIPE SUPPORT AT WALL
SCALE NONE



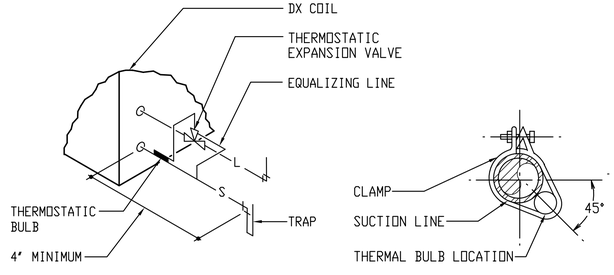
4 SUSPENDED REFRIGERANT PIPE SUPPORT AT CEILING
SCALE NONE

REFRIGERANT LINE SIZES

UNIT	LIQUID	SUCTION	REMARKS
CC 1	3/8"	3/4"	3 TON
CC 2	3/8"	3/4"	3 TON

REFRIGERANT PIPING LEGEND

SYMBOL	DESCRIPTION
	EXPANSION VALVE. SEE DETAIL 1/M502
	MOISTURE INDICATING SIGHT GLASS
	FLEXIBLE CONNECTION
F	FILTER DRIER
	PIPE SUPPORT. SEE DETAILS 3/M502 4/M502
	EXTERIOR PIPE SUPPORT. SEE DETAIL 2/M502
	TRAP. ONE PIECE FACTORY FABRICATED
	DIRECTION OF SLOPE DOWN
S	SUCTION LINE
L	LIQUID LINE



NOTES:
1. THERMOSTATIC BULB TO BE AS CLOSE TO COIL AS POSSIBLE NOT ALLOWED ON VERTICAL LINES.
2. EQUALIZING LINE SHALL BE CONNECTED IN STRAIGHT SECTION OF SUCTION LINE AFTER THERMAL BULB. (NOT ALLOWED ON VERTICAL LINES.)

1 REFRIGERANT COIL CONNECTION DETAIL
SCALE NONE

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REFRIGERANT DETAILS

M502

SHEET 10 OF 13

COOLING COIL SCHEDULE ① ②

MARK	MIN REQ'D CAP TOT. MBH	MIN REQ'D CAP SENS MBH	COND ENT EVAP DB DEG F	COND ENT EVAP WB DEG F	CFM	MAX ③ PR. DR. IN W.G.	REMARKS
CC 1	30.6	27.8	84	62	1200	0.16	
CC 2	30.6	27.8	84	62	1200	0.16	

① COMPLETE WITH FACTORY COIL BOX AND COIL.
② SEE SPECIFICATIONS FOR APPROVED MANUFACTURERS.
③ WET COIL.

AIR COOLED CONDENSING UNIT SCHEDULE ① ③ ④

MARK	MIN ② NOMINAL SIZE	COMPRESSOR RATED LOAD AMPS	FAN FULL LOAD AMPS	REMARKS
CU 1	3	14.1	1.4	⑤
CU 2	3	14.1	1.4	⑤

① REFRIGERANT R-410A.
② AT DESIGN CONDITIONS AND 105 DEGREES ENTERING AIR TEMPERATURE TO CONDENSER.
③ CONDENSING UNIT MARKS CORRESPOND WITH COOLING COIL AND FURNACE MARKS.
④ SEE SPECIFICATIONS FOR APPROVED MANUFACTURERS.
⑤ ELECTRICAL CHARACTERISTICS - COMPRESSOR: 208V/1 PHASE/60 HZ.

FURNACE SCHEDULE ② ③

MARK	INPUT BTU/HR	OUTPUT ① BTU/HR	CFM	EXT S.P. IN W.C.	MOTOR HP	MOTOR SPEED	REMARKS
F 1	100,000	94,000	1200	0.70	1/2	MED/HIGH	④ ⑤
F 2	100,000	94,000	1200	0.70	1/2	MED/HIGH	④ ⑤

① SEA LEVEL RATING.
② FURNACE MARKS CORRESPOND COOLING AND CONDENSING UNITS.
③ SEE SPECIFICATIONS FOR OTHER APPROVED MANUFACTURER.
④ ELECTRICAL CHARACTERISTICS - MOTOR: 115V/1 PHASE/60 HZ.
⑤ SET FAN MOTOR SPEED TAP TO LOWEST POSSIBLE SETTING REQUIRED TO ACHIEVE DESIGN AIR FLOW.

CONTROL DAMPER SCHEDULE

MARK	SIZE, INCHES	AIRFLOW, CFM	DUTY	REMARKS
CD 1	96" X 84"	25,000	RELIEF AIR	① ②
CD 2	14"X12"	1025	OUTSIDE AIR	② ③

① INTERLOCK TO OPEN IF EITHER EC-1 AND/OR EC-2 ARE RUNNING.
② PROVIDE TIGHT CLOSED OFF EDGE SEALS.
③ CONTROLLED BY FURNACE CONTROLS.

GENERAL NOTES:
1. THE MECHANICAL CONTRACTOR SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWINGS BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS.

EVAPORATIVE COOLER SCHEDULE ① ②

MARK	AIRFLOW, CFM	EXTERNAL STATIC, INCHES W.G.	MOTOR HP	PUMP GPM	PUMP HEAD, FT.	PUMP WATTS	ELECTRICAL REQUIREMENTS VOLTS	HZ	PHASE	AMPS	OPERATING WEIGHT	ARCTIC CIRCLE MODEL
EC 1	10,000	0.30	2	5	5	80	230	60	3	6.8	1,250 LBS	ED213
EC 2	10,000	0.30	2	5	5	80	230	60	3	6.8	1,250 LBS	ED213

① UNIT IS DOWN DISCHARGE.
② PROVIDE WITH 6 POSITION CONTROL SWITCH.
③ PROVIDE WITH ROOF CURB.

OUTDOOR DIRECT FIRED MAKE UP AIR UNIT ①

MARK	CFM	EXTERNAL STATIC IN. WC	HEATING REQUIREMENT INPUT MBH	HEATING REQUIREMENT OUTPUT MBH	HEATING REQUIREMENT EAT	POWER REQUIREMENT VOLTS	HZ	PH	HP	OPERATING WEIGHT	GREENHECK MODEL NUMBER
MAU 1	9500	0.75"	608	560	6 DEG.	208	60	3	7-1/2	2400 LBS.	DGX

① UNIT SHALL BE PROVIDED WITH
A) FRESH AIR HOOD.
B) DISCHARGE AIR TEMPERATURE CONTROL.
C) ALUMINUM MESH FILTER SECTION.
D) EVAPORATIVE PAD SECTION.
E) BLOWER SECTION.
F) HEAT EXCHANGER SECTION.
G) FRONT DISCHARGE.
H) VFD FOR 2-SPEED FAN OPERATION. HIGH SPEED = 9,500 CFM, LOW SPEED = 4,500 CFM.
I) ROOF CURB TO BE MOUNTED ON CONCRETE PAD.
J) CONTROL PANEL TO OPERATE VFD, MAU-1, REF-1, REF-2, VEF-1.
K) PROVIDE WITH HARMONIC FILTER ON VFD.
L) PROVIDE WITH SMOKE DETECTOR IN UNIT.

RADIANT HEATING UNIT SCHEDULE ①

MARK	CAPACITY BTU/HR	TUBE DIA.	ELECTRICAL REQUIREMENTS VOLTS	HZ	PHASE	CURRENT AMPS	CONTROL	ROBERTS GORDON
RH 1	80,000	4"	120	60	1	5	PROGRAMMABLE LINE VOLTAGE THERMOSTAT	VANTAGE II CTH2-80

① BOTTOM OF UNIT SHALL BE 28 FEET ABOVE FINISH FLOOR.

ROOF EXHAUST FAN SCHEDULE ① ②

MARK	CFM	EXT. STATIC	BHP	MOTOR HP ③	REMARKS	OPERATING WEIGHT	GREEHECK MODEL
REF 1	2250	0.375	0.62	3/4	BELT DRIVE	100 LBS	141 ④ ⑥
REF 2	2250	0.375	0.62	3/4	BELT DRIVE	100 LBS	141 ④ ⑥
REF 3	420	0.375	0.10	1/4	BELT DRIVE	80 LBS	081 ⑤ ⑦
REF 4	420	0.375	0.10	1/4	BELT DRIVE	80 LBS	081 ⑤ ⑦

① PROVIDE WITH BACKDRAFT DAMPER.
② PROVIDE WITH ROOF CURB.
③ POWER SHALL BE 120/60/1.
④ UPBLAST STYLE.
⑤ DOWNBLAST STYLE.
⑥ FAN SHALL BE CONTROLLED AT MAU-1 CONTROL PANEL.
⑦ FAN SHALL BE CONTROLLED FROM FURNACE CONTROLS.

CEILING EXHAUST FAN SCHEDULE ① ②

MARK	MIN SCFM	STATIC ③ PRESSURE IN W.G.	MAX. WATTS	REMARKS
CEF 1	185	0.25	75	④

① VOLTAGE IS 115/1 PHASE/60.
② CONTROL BY DIVISION 26.
③ STATIC PRESSURE GIVEN AT SEA LEVEL.
④ FAN SHALL TURN ON WITH LIGHTS.

VEHICLE EXHAUST FAN SCHEDULE ②

MARK	MIN. ① C.F.M.	STATIC PRESSURE IN W.G.	HP ①	OPERATING WEIGHT	REMARKS
VEF 1	5,000	5.0	7-1/2	1,200 LBS	

① VOLTAGE IS 230/3 PHASE/60.
② FAN SHALL BE CONTROLLED AT MAU-1 CONTROL PANEL.
③ UTILITY SET STYLE FAN.
④ PROVIDE ROOF CURB TO MOUNT FAN OUTSIDE.

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MECHANICAL SCHEDULES

M601

SHEET 11 OF 13

RANGE HOOD SCHEDULE

MARK	AIRFLOW, CFM	TYPE	ELECTRICAL REQUIREMENTS		BROAN MODEL
			VOLTS/HZ/PHASE	AMPS	
RH 1	270	CHIMNEY	120/60/1	2.86	RM5000

1. FINISH SHALL BE 430 STAINLESS STEEL #4 BRUSHED.
2. WALL MOUNT INSTALLATION.
3. DUCTED TELESCOPE FLUE UP THROUGH CEILING.
4. 6" DIA. DUCT CONNECTOR/BACKDRAFT DAMPER.
5. MULTI-SPEED SLIDE CONTROL.
6. DUAL INCANDESCENT LIGHTING.
7. 30 X 19-5/8" FOOT PRINT.
8. DISHWASHER SAFE ALUMINUM FILTER.

DIFFUSER SCHEDULE ① ②

MARK	TYPE	SERVICE	CEILING TYPE	NECK SIZE, INCHES	CFM RANGE	BLOW	PATTERN	MODEL	REMARKS
D-1	DUCT MTD	SUPPLY	NONE	48 X 48	9,500-10,000	4-WAY		TITUS TDCA	③ ④ ⑤
D-2	CEILING	SUPPLY	HARD	12 X 12	390	1-WAY		TITUS TDC	
D-3	CEILING	SUPPLY	LAY-IN	6" DIA.	115	2-WAY		TITUS TDC	
D-4	CEILING	SUPPLY	LAY-IN	6" DIA.	125	2-WAY		TITUS TDC	
D-5	CEILING	SUPPLY	HARD	8" DIA.	130-240	3-WAY		TITUS TDC	
D-6	CEILING	SUPPLY	LAY-IN	8" DIA.	130-250	4-WAY		TITUS TDC	

1. MAXIMUM NC=26 CFM UNLESS OTHERWISE NOTED.
2. FINISH SHALL BE BAKED ENAMEL WITH COLOR AS SELECTED BY ARCHITECT.
3. MAXIMUM NC=39.
4. PROVIDE WITH ADJUSTABLE VERTICAL DISCHARGE.
5. ALUMINUM CONSTRUCTION.

GRILLE AND LOUVER SCHEDULE

MARK	TYPE	SERVICE	TYPE	CFM RANGE	FACE SIZE, INCHES	NECK SIZE, INCHES	MODEL	REMARKS
R-1	CEILING	RETURN	LAY-IN	895	24 X 24	22 X 22	TITUS 355	③
R-2	CEILING	RETURN	LAY-IN	500	24 X 24	12" DIA.	TITUS 355	
R-3	CEILING	RETURN	LAY-IN	125	24 X 12	6" DIA.	TITUS 355	
R-4	CEILING	RETURN	HARD	250	12 X 12	8" DIA.	TITUS 355	⑤
R-5	CEILING	RETURN	HARD	480	16 X 16	12" DIA.	TITUS 355	
E-1	CEILING	EXHAUST	HARD	420	14 X 14	12 X 12	TITUS 355	③
DG-1	DOOR	TRANSFER	DOOR	0-350	24 X 12	22 X 10	TITUS T700	④
L-1	WALL	RELIEF	N/A	25,000	96	84	AEROLITE	
PH-1	PENTHOUSE	OUTSIDE AIR	TIER	1025	N/A	14 X 14	COOK TRE	⑥ ⑦

1. MAXIMUM NC=26 @ MAXIMUM CFM.
2. FINISH SHALL BE BAKED ENAMEL WITH COLOR AS SELECTED BY ARCHITECT.
3. PROVIDE WITH OPPOSED BLADE DAMPER IN FACE.
4. CUT DOOR AND INSTALL GRILLE.
5. VERIFY CEILING TYPE BEFORE ORDERING.
6. PRESSURE DROP NOT TO EXCEED 0.05 INCHES.
7. PROVIDE WITH ROOF CURB.

VEHICLE EXHAUST HOSE AND NOZZLE SCHEDULE

MARK	AIRFLOW, CFM	PRESSURE DROP, INCHES WC	LENGTH, FT	DIAMETER, INCHES	NOZZLE	REMARKS
VH 1	1,250	2.9	16	8	STAINLESS STEEL	① ② ③ ④ ⑤

1. PROVIDE HAND DAMPER WITH NOZZLE. NOZZLE SHALL ATTACH TO EITHER VERTICAL (LIFTING SLEEVE) OR HORIZONTAL (SPRING CLIP) EXHAUST PIPE.
2. RATING SHALL BE FOR FUMES UP TO 1,200 DEG F.
3. BASED ON NEDERMAN NFC-6.5 HOSE.
4. MAXIMUM NEGATIVE PRESSURE RATING OF 16 IN. W.G.
5. PROVIDE WITH CABLE, PULLEYS, WINCH AND LIFTING ELBOW TO SUSPEND HOSE OFF GROUND.

GENERAL NOTES:

1. THE MECHANICAL CONTRACTOR SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWINGS BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS, MOTOR NAME PLATE VOLTAGE SHALL BE NEMA STANDARD 200 VOLT FOR 208 VOLT THREE PHASE SYSTEM AND SHALL BE NEMA STANDARD 230 VOLT FOR 240 VOLT THREE PHASE OR SINGLE PHASE SYSTEM. STARTER HEATERS INSTALLED SHALL BE COORDINATED WITH THE NAME PLATE DATA.

2. S.C.F.M. LISTED IS STANDARD AIR.

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CAMP WILLIAMS UTES
EAST REMODEL DESIGN

UTAH NATIONAL GUARD
CAMP WILLIAMS

MARK	DATE	DESCRIPTION
1	9-15-10	ADDENDUM #1

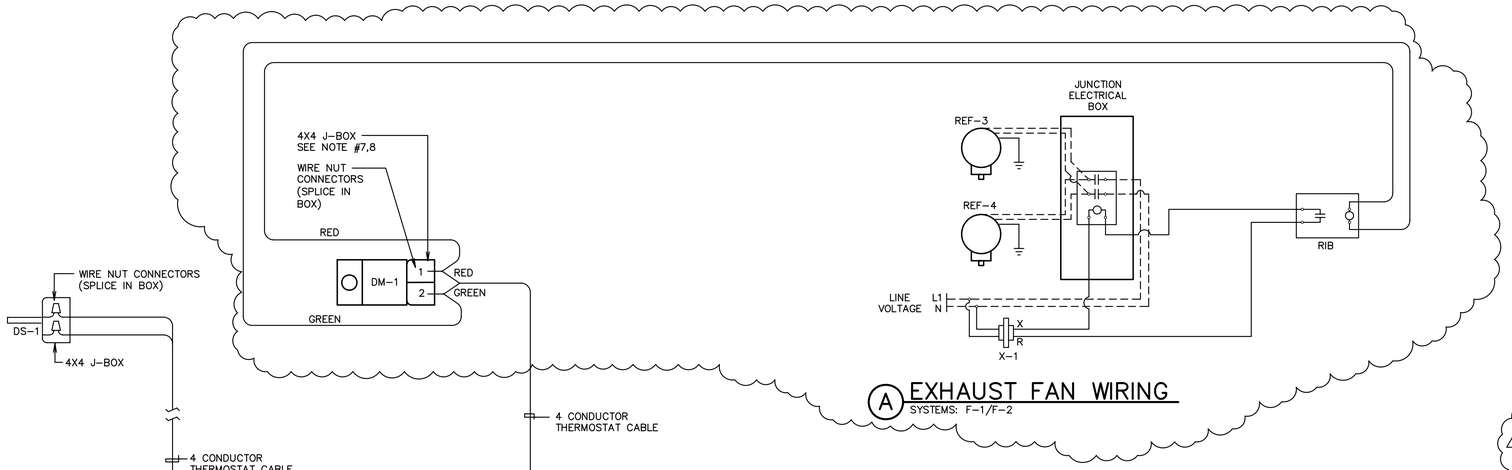
DATE:	30 AUGUST 2010
AGENCY PROJECT NO:	10207480
HFSA PROJECT NO:	1022.01
CAD DWG FILE NO:	10089
DRAWN BY:	BDA
CHECKED BY:	HLA
DESIGNED BY:	HLA
DWG TYPE:	MECHANICAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS

SHEET TITLE

MECHANICAL SCHEDULES

M602

SHEET 12 OF 13



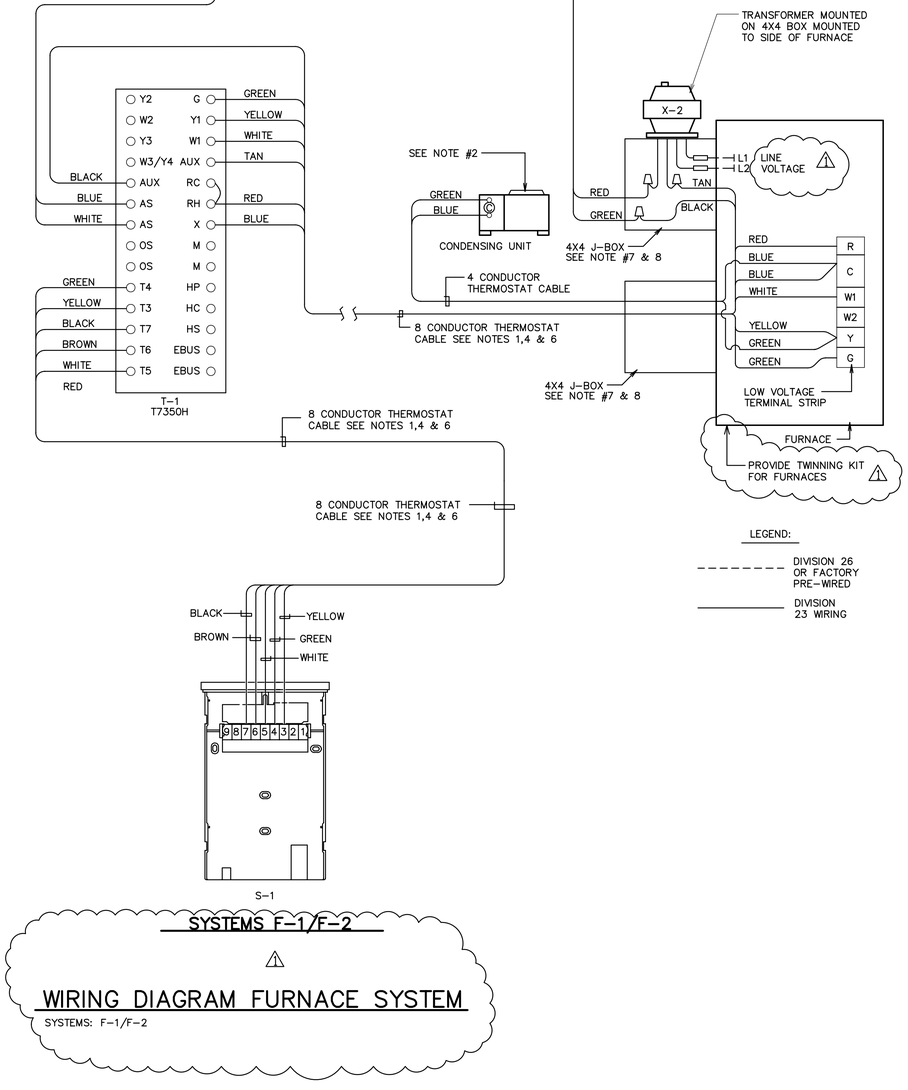
(A) EXHAUST FAN WIRING

SYSTEMS: F-1/F-2

CONTROL EQUIPMENT

MARK	DESCRIPTION	CAT. NO. (1)
T-1	THERMOSTAT	T7350H1009
S-1	REMOTE TEMPERATURE SENSOR SELECTABLE 10K OHM OR 20K OHM	T7771A1005
DS-1	DISCHARGE AIR SENSOR	C7041B2005
DM-1	DAMPER MOTOR TWO POSITION	MS8105A1008
X-2	TRANSFORMER 120V/24V 50VA	AT150F1002
X-1	TRANSFORMER 120V/24V 75VA	AT175F

(1) ALL CATALOG NUMBERS SHOWN ARE HONEYWELL UNLESS NOTED OTHERWISE.



SYMBOLS

(T) THERMOSTAT/SUBBASE OUTLET (DIV 23). PROVIDE J-BOX MOUNT TOP OF THERMOSTAT 5'-6" ABOVE FLOOR.

[S] REMOTE SENSOR OUTLET (DIV 26)

NOTES:

1. THERMOSTAT CABLE- 4, 8 OR 12 CONDUCTOR- 18 AWG SOLID COPPER WIRE INSULATED WITH HIGH DENSITY POLYETHYLENE. CONDUCTORS PARALLEL. ENCLOSED IN BROWN PVC JACKET. (NO 22 AWG CABLE ALLOWED).
2. IF CONDENSING UNITS HAVE THEIR OWN POWER SUPPLY IT MAY BE NECESSARY TO ADD ADDITIONAL RELAYS IN CONDENSING UNIT TO PROPERLY INTERFACE CONTROLS.
3. USE WIRE NUT CONNECTORS FOR SPLICING CONDUCTORS IN SPECIFIED LOCATIONS. AND TYTON TYPE CRIMP CONNECTORS FOR TERMINAL CONNECTIONS. NO TERMINAL CONNECTORS REQUIRED AT THERMOSTAT OR SENSOR.
4. DO NOT RUN ANY OTHER WIRING IN THIS CONDUIT EXCEPT THERMOSTAT CABLE.
5. VERIFY THAT FURNACE FAN SPEED CONTROL WIRING IS SET TO MATCH SCHEDULE SHEET AND THAT FAN OPERATES AT COOLING SPEED ONLY.
6. DO NOT SPLICE WIRE IN RUNS FROM SENSOR TO THERMOSTAT, THERMOSTAT TO FURNACE, AND THERMOSTAT TO DISCHARGE AIR SENSOR.
7. PROVIDE CHASE NIPPLE W/PLASTIC BUSHING WHEN ATTACHING J-BOX TO EQUIPMENT.
8. PROVIDE CABLE CLAMP SO THAT CABLES CANNOT BE PULLED OUT OF J-BOX.
9. BOXES FOR REMOTE SENSOR OUTLETS SHALL BE 2"X4" WITH LONG DIMENSION VERTICAL.
10. J-BOXES IN MECHANICAL AREAS SHALL BE 4"X4".
11. CONDUIT TO BE 1/2" UNLESS NOTED OTHERWISE.

SYSTEMS F-1/F-2

WIRING DIAGRAM FURNACE SYSTEM

SYSTEMS: F-1/F-2

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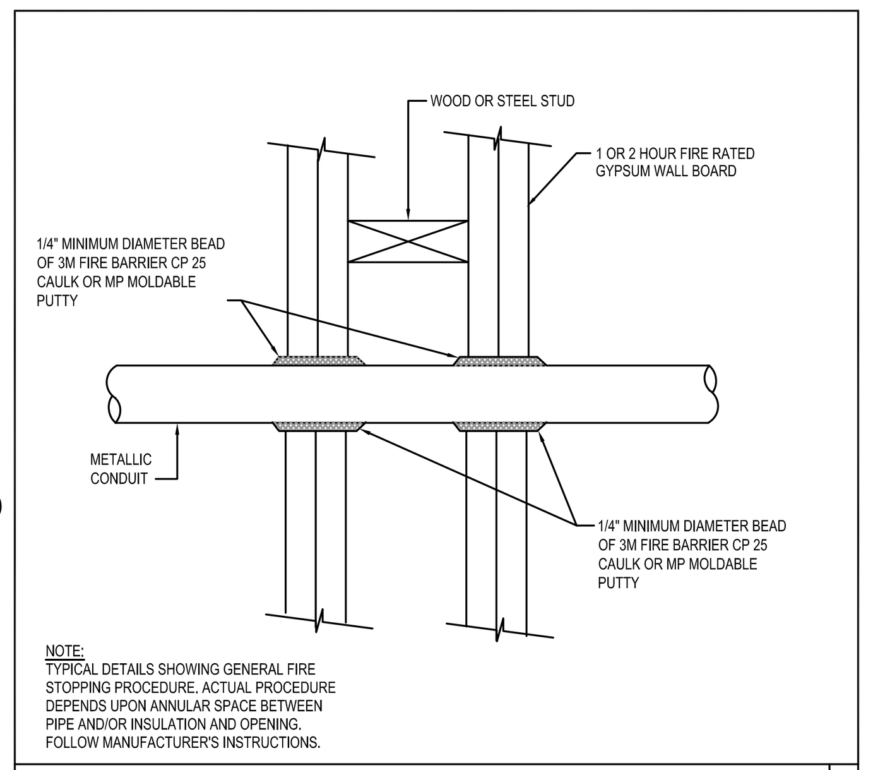
SHEET TITLE

MECHANICAL
CONTROLS

ME101

SHEET 13 OF 13

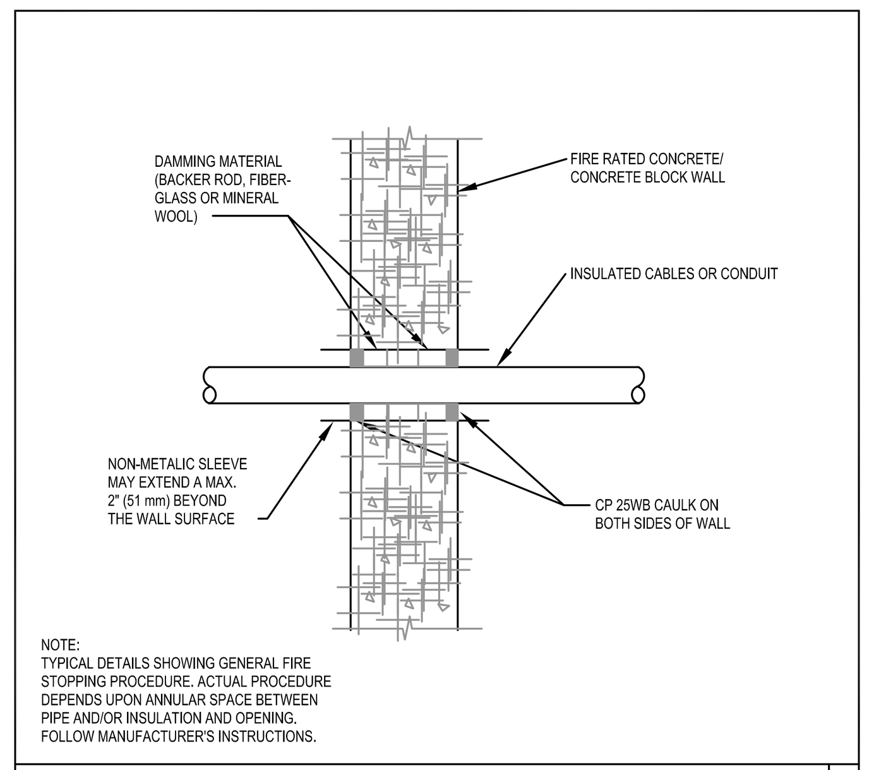
FIRESTOP FOR METAL CONDUIT THROUGH GYPSUM WALL BOARD



NOTE:
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

NOT TO SCALE

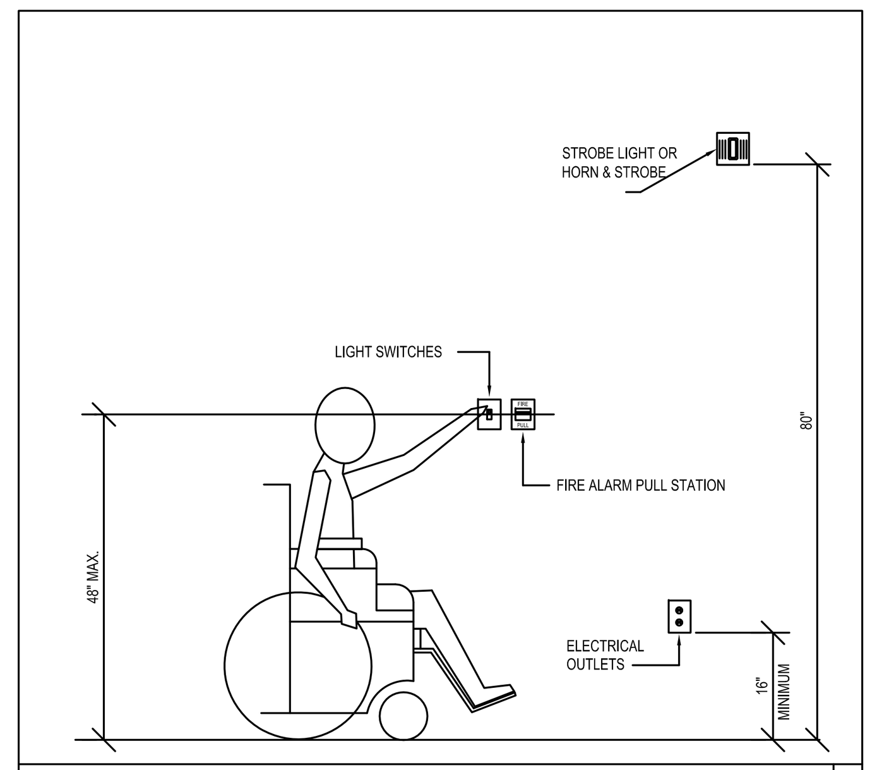
TYPICAL FIRESTOP FOR CABLES/CONDUIT THROUGH CONCRETE WALLS



NOTE:
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

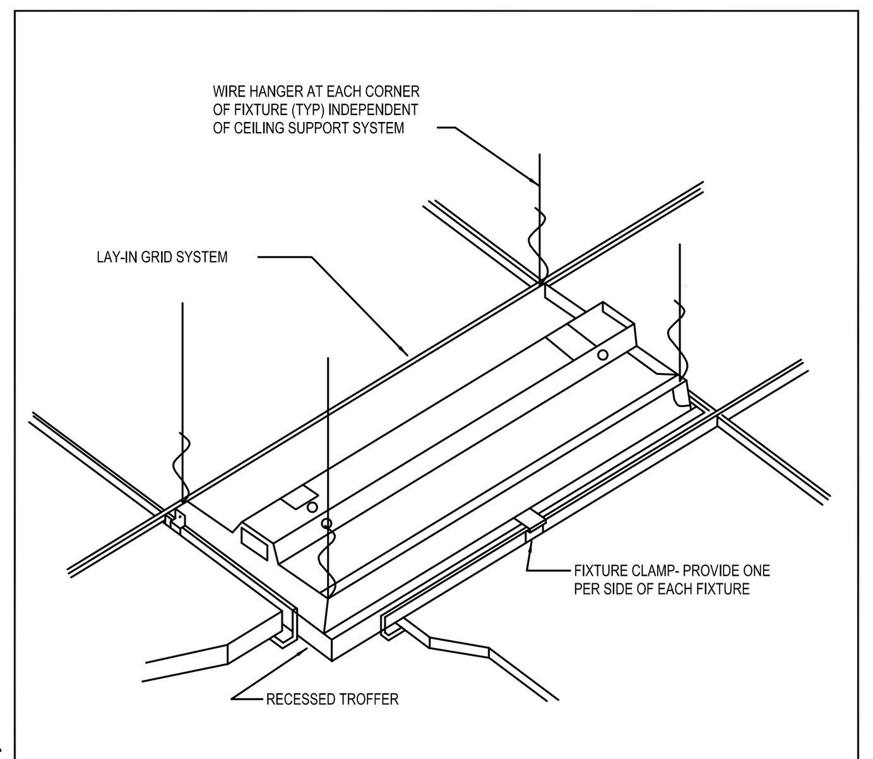
NOT TO SCALE

STANDARD HEIGHTS FOR HANDICAPPED ACCESS



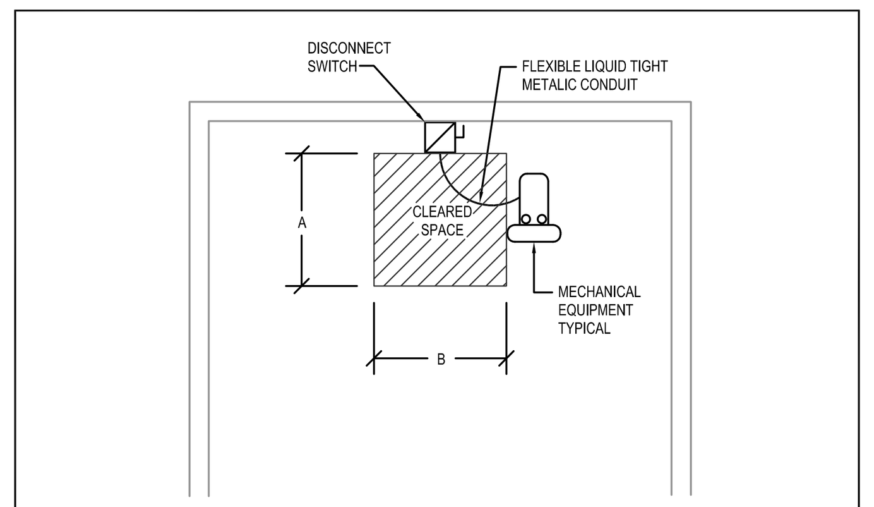
NOT TO SCALE

TYPICAL RECESSED FIXTURE MOUNTING DETAIL



NOT TO SCALE

TYPICAL DISCONNECT CLEARANCE REQUIREMENTS

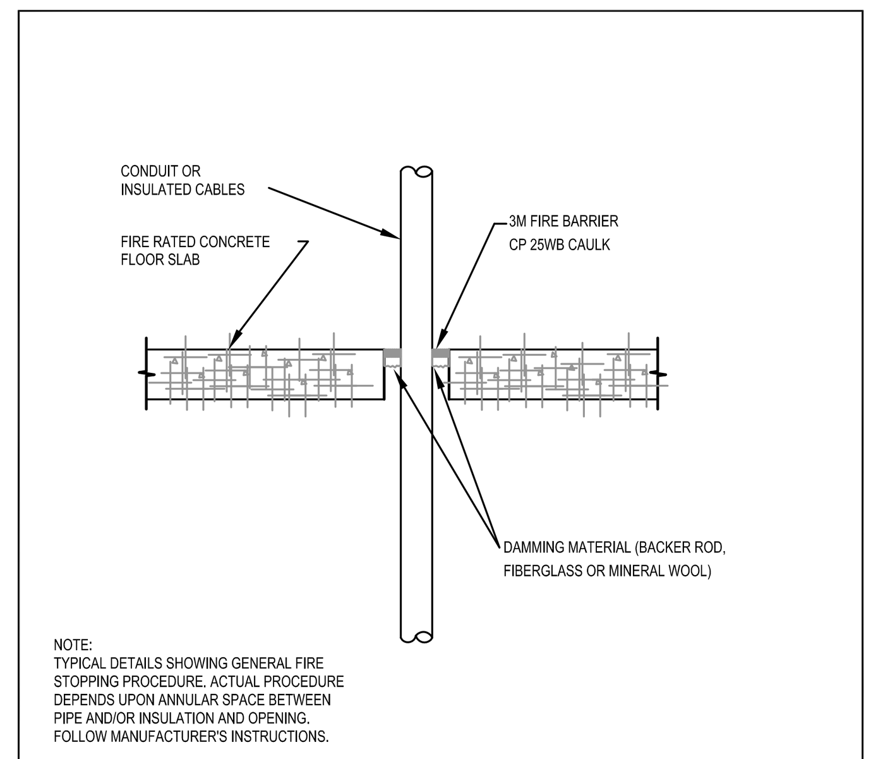


NOTE:
1. THE CONTRACTOR MUST COORDINATE EXACT LOCATION OF THE DISCONNECT WITH THE MECHANICAL CONTRACTOR TO ELIMINATE ANY OBSTACLE (PIPE,CONCRETE PAD ETC.) IN FRONT OF THE DISCONNECT. IF THERE ARE ANY OBSTACLES, PROVIDE UNISTRUT AND INSTALL THE DISCONNECT NEXT TO MECHANICAL EQUIPMENT IN ORDER TO PROVIDE THE REQUIRED CLEARANCE.
2. PROVIDE MINIMUM CLEARANCE AS FOLLOWS:

SYSTEM VOLTAGE	A	B
480	42"	30"
208	36"	30"

NOT TO SCALE

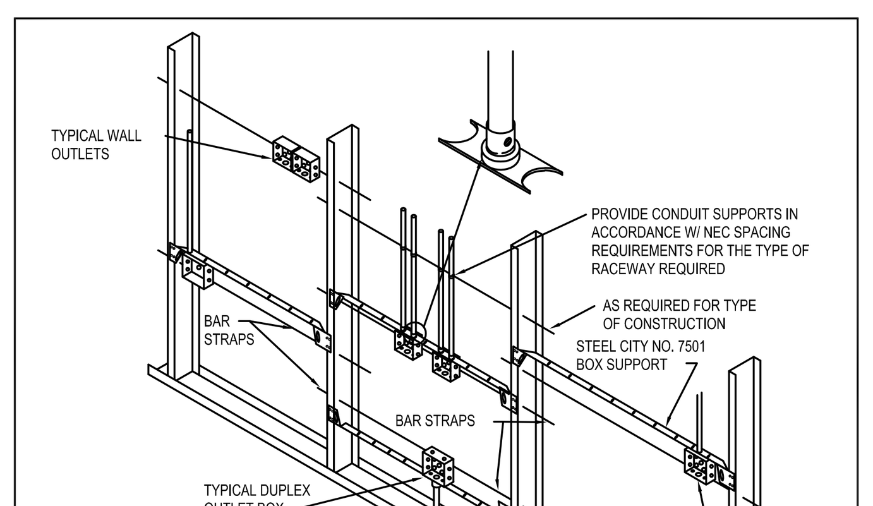
TYPICAL FIRESTOP FOR CABLES/CONDUIT THROUGH CONCRETE FLOORING



NOTE:
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

NOT TO SCALE

TYPICAL ROUGH-IN DETAIL

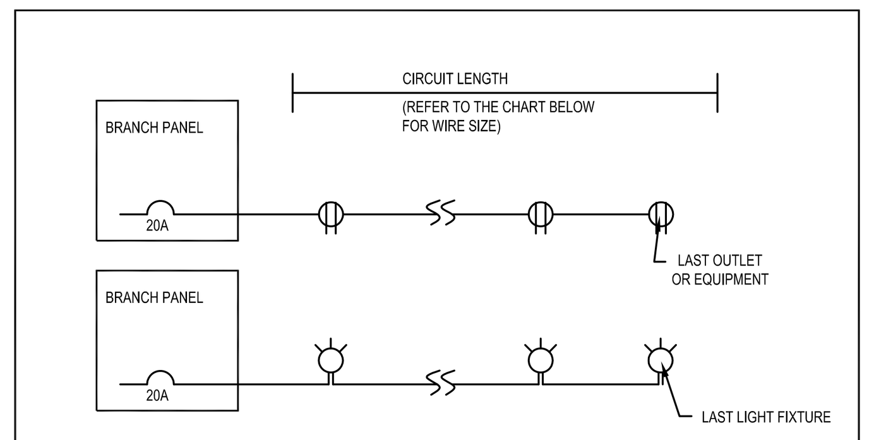


1. TYP. FOR WOOD & METAL STUD ROUGH-IN.
2. PLASTER RINGS NOT SHOWN.
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE W/ ARCH. & MECH. DWGS., AND W/ ALL APPLICABLE SHOP DWGS.

NOTES:
1. IN ACCORDANCE W/ IBC 711.3.2, OUTLETS ON OPPOSITE SIDES OF FIRE RATED WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY MIN. OF 24" HORIZONTAL DISTANCE.

NOT TO SCALE

TYPICAL BRANCH CIRCUIT LENGTH DETAIL

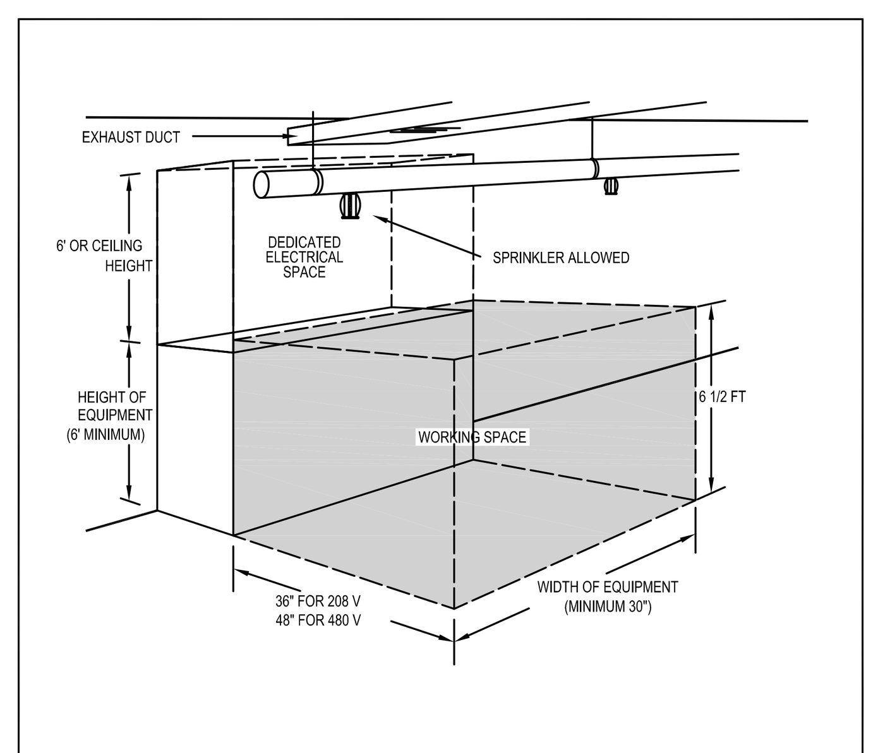


* WHERE CIRCUIT CONDUCTORS ARE TO BE INCREASED IN SIZE TO MEET THE VOLTAGE DROP REQUIREMENT, THE EQUIPMENT GROUNDING CONDUCTORS MUST BE INCREASED ACCORDINGLY (NEC 250.122)

MINIMUM CONDUCTOR SIZE (PHASE AND NEUTRAL)	MAX CIRCUIT LENGTH (120 VOLT)	MAX CIRCUIT LENGTH (277 VOLT)
#12	75 FT	180 FT
#10	125 FT	260 FT
#8	205 FT	420 FT
#6	325 FT	660 FT
#4	400 FT	900 FT

NOT TO SCALE

REQUIRED INDOOR INSTALLATION SPACES FOR ELECTRICAL EQUIPMENT



NOT TO SCALE

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMP	MANUFACTURERS	CATALOG NUMBERS
T-1	1'x4' FLUORESCENT WRAP AROUND.	2F32 T8 PREMIUM	COLM	WC4-232-EPU
			METALUX	WS-232A-UNV-ER81
			LOL	JS4A232-UNV-HI
			LSI	WNA10-232-SSOR-UE
			LITHONIA	SB 2 32 MVOLT GEB10PS
T-2	WALL MOUNTED 4' FLUORESCENT OVER THE MIRROR FIXTURE RATED FOR DAMP LOCATION WITH UP/DOWNLIGHT.	2F32 T8 PREMIUM	COLM	WAL4-1U1D32-EPU
			METALUX	BEU-232-UNV-ER81
			LOL	CWBU232-UNV-HI
			LSI	WBXB-232-SSOR-UE
			NULITE	UD 232T8 UNV PS N X DL
T-3	2'x4' RECESSED LIGHT FIXTURE. RT8 STYLE. LAY-IN GRID.	2F32 T8 PREMIUM	COLM	EPC24-232G-DL-EPU
			METALUX	2AC-232-UNV-ER81
			PINN	AD24-2T8-G1-UNV-1C-W
			LSI	ASC2-232-SSOR-UE
			LITHONIA	2RT8S 232 MVOLT
T-4	EXTERIOR WALL MOUNTED TRAPEZIODIAL WITH INTEGRATED PHOTOCELL AND EMERGENCY COLD START BALLAST. MOUNT BOTTOM OF FIXTURE 12' AFF.	CF32	DECO	D444-132-C-EB-SCBA-PC
			MC GRAW-ED	IST-32-CF-DT-2S-CF/EM-P
			VISN	SIL-2-T2-32-CF-1-DL-SCBA-PC120-CLDPK
			LSI	GBWS-FT-32CFL-F-UE-CWBB-PCIXXX
			NULITE	EIL 132CFTR UNV SCBA PC -20SB 2 32 MVOLT GEB10PSSB 2 32 MVOLT GEB10PS
T-5	8' STRIP LIGHT WITH SYMMETRICAL REFLECTOR AND 10% UPLIGHT WITH WIRE GUARD. CHAIN HUNG. MOUNT BOTTOM OF FIXTURE AT 28' AFF.	4F32 T8 PREMIUM	COLM	CSR8-232-U-4EPU-CSRWG4-CSHC
			METALUX	8TIAF-232-UNV-ER81-(2)WG/ICF-4FT / AYC CHAIN SET
			LOL	KW8A232-UNV-H4 / AWG4WCSP/AH5CSP
			LSI	F20 232 2 SSOR-U-IWG202-CHS-UE
			LITHONIA	TC 232 MVOLT GEB10RS ¼ HC36 WGCUN SSMR48 XX
T-6	4' STRIP LIGHT WITH WIRE GUARD.	2F32 T8 PREMIUM	COLM	CSR4-232-U-EPU-CSRWG4
			METALUX	SSF-232-UNV-ER81 / WG/SSF-4FT
			LOL	SW4S232HPF-UNV-HI / AWG3WCSP
			LSI	S 2 32 WG240 SSOR UE
			LITHONIA	C 232 MVOLT GEB10RS WGCUN
EX-1	GREEN LED EXIT SIGN WITH BATTERY PACK	INCLUDED	DUAL	LXUGWE
			LOL	LLNUGW
			ISOLATE	RL-EM-G-WW
			LITHONIA	LQC W X G EL N
			EXITRONIX	GVEX-U-BP-WB-WH

NOTES:
1. ALL FLUORESCENT LIGHTS SHALL HAVE ELECTRONIC PROGRAMMABLE START BALLAST, 10% TOTAL HARMONIC DISTORTION. UNIVERSAL, ADVANCE, AND HOWARD ARE APPROVED MANUFACTURERS. BALLAST TO HAVE 5 YEAR WARRANTY.
2. ALL FLUORESCENT LAMPS SHALL HAVE 4100° COLOR TEMPERATURE.
3. FIELD VERIFY ALL LIGHTING VOLTAGES PRIOR TO PLACING ANY ORDER.
4. THE WRITTEN CRITERIA OF THE FIXTURE DESCRIPTION TAKES PRECEDENCE OVER THE CATALOG NUMBER.
5. ALL METAL HALIDE LAMPS TO BE PULSE START.
6. PROVIDE ADDITIONAL REMOTE BALLAST FOR EMERGENCY LIGHT FIXTURES AS NECESSARY. REFER TO LIGHTING SHEETS.

ELECTRICAL SYMBOLS LIST

SYMBOL	DESCRIPTION
	LIGHTING SYMBOLS
	RECESSED FLUORESCENT FIXTURE
	SURFACE MOUNTED FLUORESCENT FIXTURE
	INDUSTRIAL STRIP LIGHT
	WALL MOUNTED FIXTURE
E	FIXTURE ON EMERGENCY POWER
⊗	EXIT LIGHT. ARROWS SHOW EXIT DIRECTION
T-X	LIGHTING FIX CALL OUT. NUMBER INDICATES A SUGGESTED QUANTITY- TO BE VERIFIED
X	REFERENCE NOTES CALL OUT
\$	SINGLE POLE TOGGLE SWITCH - 20 AMP
\$a,b	SINGLE POLE TOGGLE SWITCH - 20 AMP LETTERS INDICATE SWITCH ASSIGNMENT
\$3 a,b	THREE WAY TOGGLE SWITCH - 20 AMP LETTERS INDICATE SWITCH ASSIGNMENT
\$P a,b	SINGLE POLE PILOT SWITCH - 20 AMP, LETTER INDICATE SWITCH ASSIGNMENT
\$OV	OVERRIDE SWITCH - 20 AMP
T	4 HOUR SPRING WOUND TIMER SWITCH TO CONTROL THE LIGHT FIXTURE - 277 VOLT
	POWER SYMBOLS
	DUPLEX CONVENIENCE OUTLET - 20 AMP
	DUPLEX CONVENIENCE OUTLET - 20 AMP GFI.
	RECESSED CLOCK-TYPE OUTLET - 20 AMP
EWC	DUPLEX CONVENIENCE OUTLET - 20 AMP ELECTRIC WATER COOLER
	FOUR - PLEX CONVENIENCE OUTLET - 20 AMP
	SPECIAL PURPOSE SINGLE PHASE OUTLET
	SPECIAL PURPOSE THREE PHASE OUTLET
J	JUNCTION BOX - SIZE AND FUNCTION AS REQUIRED
	EACH ARROW INDICATES A HOME RUN. RUN GROUND CONDUCTOR REGARDLESS OF CONDUIT TYPE. NUMBER OF CONDUCTORS AS REQUIRED
	FUSED DISCONNECT SWITCH - SIZE AS REQUIRED
	FLUSH TELEPHONE, DATA OUTLET
	FLUSH TELEPHONE OUTLET
	FLUSH DATA OUTLET
	MOTOR LOCATION
XX-1	MECHANICAL EQUIPMENT CALL OUT
	MANUAL DISCONNECT WITH THERMAL OVERLOAD PROTECTION
	ELECTRICAL PANEL LOCATION
TTB	TELEPHONE TERMINAL BOARD
	DUAL TECH WALL MOUNTED OCCUPANCY SENSOR TO CONTROL LIGHTING IN THE ROOM
	DUAL TECH CEILING MOUNTED OCCUPANCY SENSOR TO CONTROL LIGHTING IN THE ROOM
	SPECIAL SYSTEMS SYMBOLS
	PUSH BUTTON
PO	EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER
TC	DIGITAL ASTRONOMICAL TIME CLOCK WITH BATTERY BACK-UP
TV	TV OUTLET. RUN 3/4" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
	GENERAL NOTE SYMBOLS
WP	INDICATES WEATHER PROOF EQUIPMENT
A	INDICATES DEVICE IS ABOVE COUNTER TOP-42" AFF REFER TO ARCHITECTURAL ELEVATION
	ABBREVIATIONS
D.O.	DOOR OPENER

GENERAL NOTES:

1. ALL NEW WORK MUST MEET THE CURRENT ADOPTED NATIONAL ELECTRICAL CODE.
2. NOT MORE THAN THREE (3) CIRCUITS SHALL BE INSTALLED IN A 3/4" CONDUIT.
3. RUN A NEUTRAL CONDUCTOR FOR EACH PHASE CONDUCTOR. DO NOT SHARE THE NEUTRAL CONDUCTOR IN HOMERUNS. (NEC 210.4).
4. THE MINIMUM SIZE OF THE CONDUCTORS SHALL BE A NO. 12 AWG, THHN COPPER. UNLESS INDICATED OTHERWISE N THE DRAWINGS.
5. WHERE CIRCUIT CONDUCTORS ARE TO BE INCREASED IN SIZE TO MEET THE VOLTAGE DROP REQUIREMENT, THE EQUIPMENT GROUNDING CONDUCTORS MUST BE INCREASED ACCORDINGLY (NEC 250.122)
6. ALL J-BOXES SHALL HAVE A MINIMUM DEPTH OF 2-1/8" UNLESS OTHER WISE SPECIFIED. SECURE ALL J-BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER MUD RINGS.
7. ALL EXTERIOR RECEPTACLES SHALL BE OF WEATHER-RESISTANT TYPE AS PER NEC 406.8.
8. ALL THE HOMERUNS MUST BE ACCESSIBLE. DO NOT CARRY A HOMERUN FROM ONE DEVICE TO ANOTHER WHICH IS TIED TO A SEPARATE HOMERUN INSIDE THE WALL. MARK ON ALL THE J-BOXES THE CIRCUIT NAMES AND NUMBERS.
9. ALL DISCONNECTS SHALL BE OF A HEAVY DUTY TYPE.
10. ALL DISCONNECTS, J-BOXES, AND CONDUITS EXPOSED TO THE OUTSIDE WEATHER AND MECHANICAL ROOMS SHALL BE OF A NON-CORROSIVE, WEATHER PROOF TYPE.
11. ALL NEW EXPOSED CONDUITS MUST RUN AGAINST THE WALL OR CEILING. DO NOT PENDANT MOUNT ANY CONDUIT FROM THE CEILING.
12. ALL MATERIALS USED IN INSTALLATION SHALL BE U.L. APPROVED AND NEW.
13. ALL ELECTRICAL WIRING MUST BE IN A CONDUIT (ROMEX NOT PERMITTED).
14. ALL EXTERIOR RECEPTACLES SHALL BE OF WEATHER-RESISTANT TYPE AS PER NEC 406.8.
15. NO CONDUITS SHALL RUN IN DUCT WORK.
16. CABLES OR RACEWAYS INSTALLED IN EXPOSED OR CONCEALED LOCATIONS UNDER METAL-CORRUGATED SHEET ROOF DECKING SHALL BE INSTALL AND SUPPORTED SO THAT THE NEAREST OUTSIDE SURFACE OF THE CABLE OR RACEWAY IS NOT LESS THAN 38 MM (1 1/2 IN.) FROM THE NEAREST SURFACE OF THE ROOF DECKING.
17. SWITCHBOARDS, PANELBOARDS, AND MOTOR CONTROL CENTERS SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSON'S BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT. (NEC 110-16)
18. PROVIDE LATERAL AND LONGITUDINAL BRACING FOR ALL CONDUIT RACKS, CABLE TRAYS, ETC., EXCEEDING 20 FEET IN LENGTH.
19. MINIMUM SIZE CONDUIT SHALL BE 3/4" FOR INTERIOR APPLICATION, AND 1" FOR CONDUIT BURIED BELOW GRADE IN EXTERIOR APPLICATION.
20. LABELING IS REQUIRED FOR ALL PANELBOARDS, SWITCHBOARDS, MOTOR CONTROL CENTERS, MOTOR STARTERS, TRANSFORMERS, MAJOR JUNCTION BOXES, DISCONNECT SWITCHES, BREAKERS, PUSH BUTTONS, ETC., INTERLOCKS AND RELAY PANELS.
21. USE RIGID STEEL, SET SCREW TYPE FITTINGS ONLY. DIE CAST FITTING SHALL NOT BE USED.
22. USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTABLE.
23. AT THE END OF THE JOB, PROVIDE BLANK, MATCHING COPPERPLATES FOR ALL J-BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
24. SEAL AROUND ALL CONDUIT PENETRATIONS THROUGH WALLS AND CEILINGS WITH A FIRE RATED MATERIAL. 3M IS AN APPROVED MANUFACTURER.
25. PRIOR TO SUBMITTAL FOR A BID THE ELECTRICAL CONTRACTOR SHALL INSPECT THE SITE AND INCLUDE IN THEIR BID PACKAGE ALL CHARGES RELATED TO EXISTING CONDITIONS AND DEMOLITION WORK. PROVIDE SHOP DRAWINGS AS REQUIRED BY CONSTRUCTION DOCUMENTS. ALL LABOR, MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR FROM THE DATE OF ACCEPTANCE BY THE TENANT. REPLACE OR REPAIR ALL DEFECTS DURING THE GUARANTEED PERIOD.
26. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL COLLECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
27. THE ELECTRICAL CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE MECHANICAL CONTRACTOR SO THAT NO PIPING, DUCTS, OR OTHER EQUIPMENT SHALL BE INSTALLED IN THE ENTRY, PASS THROUGH ELECTRICAL ROOM OR SPACES ABOVE OR BELOW ELECTRICAL PANELS.
28. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENT, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS.
29. THE CONTRACTOR SHALL INFORM THE ARCHITECT/ ENGINEER, IN WRITING, OF ANY DISCREPANCIES FOUND BETWEEN THE INTENDED FUNCTION OF EQUIPMENT AND EQUIPMENT SPECIFIED IN THE CONTRACT DOCUMENTS WITH A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL ADDENDUM. FAILURE TO REPORT ANY DISCREPANCY(CATALOG NUMBERS, DISCONTINUED ITEMS, ETC.) DOES NOT RELIEVE THE CONTRACTOR FROM PROVIDING EQUIPMENT WHICH SHALL CONFORM TO AND FULFILL THE INTENT OF THE CONTRACT DOCUMENTS. NOR SHALL IT BE USED AS A CONDITION TO OBTAIN ADDITIONAL FUNDS FROM THE OWNER AFTER THE CONTRACT IS AWARDED. THE CONTRACTOR SHALL REQUEST ALL CLARIFICATIONS OF CONTRACT DOCUMENT REQUIREMENTS, IN WRITING, TO THE ARCHITECT/ ENGINEER WITH A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL ADDENDUM.
30. CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE OVER SHOP DRAWINGS UNLESS SPECIFICALLY NOTED OTHERWISE.
31. DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
32. PROVIDE MANUAL THERMAL SWITCHES WITH PILOT LIGHT.
33. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR THE EXACT LOCATION OF LIGHT FIXTURES.
34. COORDINATE WITH THE OWNER AND ARCHITECT FOR THE EXACT LOCATION OF THE OUTLETS PRIOR TO ROUGH-INS.
35. LIGHT SWITCHES INSTALLED ADJACENT TO EACH OTHER, SHALL BE GANGED TOGETHER WITH A ONE PIECE COPPERPLATE.
36. PROVIDE A TYPED LABEL FOR ALL DUPLEX OUTLETS AND LIGHT SWITCHES TO INDICATE WHICH CIRCUIT THEY ARE TIED TO.
37. IF POSSIBLE, MOUNT EXIT SIGN INDICATED NEAR A WALL ON THE WALL.
38. USE WIRE MARKER BOOKS -3M OR IDEAL TO MARK CIRCUIT ON EACH SWITCH AND OUTLETS. STICK NUMBER TO THE DEVICE.
39. FEEDERS SHALL HAVE TYPE THHN/THWN INSULATION EXCEPT WHERE EXTREME HEAT OR WATER CONDITIONS EXIST REQUIRING SPECIAL INSULATION.
40. ALL NEW PANELS SHALL HAVE FULL NEUTRAL AND HALF GROUND BUS BARS. PROVIDE DOOR IN DOOR CONSTRUCTION FOR BRANCH PANELS. BUS BARS TO BE COPPER.
41. CONTRACTOR MUST PAY FOR HIS OWN ELECTRICITY DURING CONSTRUCTION. COORDINATE WITH THE LOCAL POWER COMPANY FOR SETTING UP TEMPORARY POWER.
42. THE OWNER MUST SCHEDULE INTERRUPTIONS OF SERVICE WHEN CONTRACTOR WISHES TO MAKE UTILITY CONNECTIONS. NOTIFY IN WRITING, THE OWNER'S REPRESENTATIVE 72 HOURS PRIOR TO TIME WHEN INTERRUPTION IS DESIRED. INTERRUPTION MUST BE AT THE COUNTY'S CONVENIENCE. OVERTIME, IF REQUIRED FOR THIS WORK, IS TO BE AT CONTRACTORS EXPENSE.
43. RIGID METAL CONDUIT (RMC): PROVIDED ZINC-COATED, HOT-DIPPED GALVANIZED, RIGGED METALLIC CONDUIT IN WET LOCATIONS OR AREAS SUBJECT TO DAMAGE.
44. FLEXIBLE METAL CONDUIT: PROVIDE ZINC-COATED, FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO MOTORS, TRANSFORMERS, OR OTHER EQUIPMENT SUBJECT TO MOVEMENT OR VIBRATION.
45. ALL HOMERUNS SHALL BE IN CONDUIT. MC CABLES ARE ONLY ALLOWED IN CONCEALED AREA FROM HOME RUNS TO THE DEVICES.
46. MARK BURIED CONDUIT WITH MAGNETIC YELLOW MAKER RIBBON 8" TO 12" BELOW FINISHED SURFACE.
47. ALL UNDERGROUND CONDUITS SHALL BE BURIED 24 INCHES MINIMUM UNDER THE GROUND.
48. THE FIRST 10 FEET OF ALL BURIED CONDUITS, 1 INCH AND OVER IN DIAMETER, ARE TO BE RIGID GALVANIZED STEEL WHERE THEY ARE ENTERING OR LEAVING THE BUILDING, MAN-HOLE, VAULT, ETC. ALL METALLIC UNDERGROUND CONDUITS SHALL HAVE PVC COATING.
49. ALL METALLIC CONDUITS, JOINTS, FITTINGS, ETC. IN CONTACT WITH THE GROUND SHALL BE SPIRAL WRAPPED WITH 3M SCOTCHRAP-51, 20 MIL TAPE (OR APPROVED EQUAL), 1/2" OVERLAP IS REQUIRED.
50. ELECTRICAL CONTRACTOR IS TO SUBMIT A SCALED (1/4"=1') LAYOUT OF ALL ELECTRICAL ROOMS BASED ON THE SWITCH GEAR SUBMITTALS.
51. PROVIDE ONE CAPPED SPARE 3/4"CONDUITS FROM EACH SECTION OF A FLUSH MOUNTED BRANCH PANEL BOARD INTO THE CEILING AND FLOOR.
52. PROVIDE TYPED PANEL INDEX FOR EXISTING ELECTRICAL PANELS AFFECTED BY THE SCOPE OF THIS WORK. EXISTING/UNAFFECTED CIRCUITS IN THE PANEL SHALL BE ITALICIZED AND CHANGED/ADDED CIRCUITS SHALL BE TYPED BOLD.
53. THE ELECTRICAL CONTRACTOR IS TO INCLUDE IN HIS/HER BID THE COST FOR RUNNING (LABOR AND MATERIAL) 200 FEET OF 3/4" MT CONDUIT WITH FIVE #10 WIRES. ALSO INCLUDE INSTALLATION OF 10 ELECTRICAL DEVICES.

PANEL: AMPS 400 MAIN BREAKER VOLTS 120 / 208 PHASE 3 # OF WIRES 4 MOUNTING SURFACE LOCATION ___

BREAKER A	P	DESCRIPTION	TYPE	EXST /NEW	CIRCUIT VA	NO	A	B	C	NO	VA	EXST /NEW	TYPE	DESCRIPTION	BREAKER A	P
50	3	BATTERY CHARGER	N	E	3328	1	5494			2	2166	E	M	OVERHEAD CRANE	40	3
			N	E	3328	3		5494		4	2166	E	M			
			N	E	3328	5			5494	6	2166	E	M			
20	3	EXHAUST FAN EF-4	M	E	333	7	1333			8	1000	E	M	COMPRESSOR	20	3
			M	E	333	9		1333		10	1000	E	M			
			M	E	333	11			1333	12	1000	E	M			
20	3	DRILL PRESS	N	E	1000	13	2028			14	1028	N	N	PANEL B1	100	3
			N	E	1000	15		2656		16	1656	N	N			
			N	E	1000	17			1000	18	0	N	N			
20	2	HEATER EAST OIL STORAGE	N	E	1000	19	1200			20	200	N	M	CU-1A	20	2
			N	E	1000	21		1200		22	200	N	M			
20	2	HEATER EAST OIL STORAGE	N	E	1000	23			1200	24	200	N	M	CU-1B	20	2
			N	E	1000	25	1200			26	200	N	M			
20	1	RESTROOM OUTLETS	R	N	360	27		3360		28	3000	N	K	RANGE	50	2
20	1	RESTROOM OUTLETS	R	N	360	29			3360	30	[illegible]	N	K			
20	1	EWC	R	N	500	31	2180			32	1680	N	N	FURNACE F-1	20	1
20	1	HALLWAY OUTLET	R	N	180	33		18450		34	[illegible]	N	N	PANEL A	175	2
20	1	BREAKROOM OUTLETS	R	N	900	35			20380	36	19480	E	N			
20	1	BREAKROOM LTG	L	N	1500	37	23342			38	21842	N	N			
20	1	[illegible]	R	N	[illegible]	39		21638		40	20638	N	N	PANEL D	200	3
20	1	FURNACE F-2	N	N	1680	41			21970	42	20290	N	N			
							36777	54131	54737							

AIC 22KA STYLE ___ TOTAL CONNECTED LOAD 145645 VA 404 AMPS

TYPE	CONNECTED	QTY	ADJUST. FACTOR	TOTAL	NEC ART.
L/C = LIGHTING & CONTINUOUS	2500	N/A	1.25	3125 VA	210-20
LM = LARGEST MOTOR	0	N/A	1.25	0 VA	
M/N = MOTORS & NON-CONT.	135345	N/A	1	135345 VA	
R = RECEPTACLE	1800	N/A	1	1800 VA	220-44
K = KITCHEN EQUIPMENT	6000	1	1	6000 VA	220-56

TOTAL NEW CONNECTED LOAD 80414 VA 223 AMPS

PANEL: AMPS 125 MAIN LUGS ONLY VOLTS 120 / 208 PHASE 3 # OF WIRES 4 MOUNTING SURFACE LOCATION ___

BREAKER A	P	DESCRIPTION	TYPE	EXST /NEW	CIRCUIT VA	NO	A	B	C	NO	VA	EXST /NEW	TYPE	DESCRIPTION	BREAKER A	P
20	1	RCP-1	M	N	528	1	1028			2	500	N	N	F-1,2 DUCT DETECTORS	20	1
20	1	REF-3,4	LM	N	1656	3		1656		4				SPARE	20	1
20	1	SPARE				5			0	6				SPARE	20	1
20	1	SPARE				7	0			8				SPARE	20	1
20	1	SPARE				9		0		10				SPARE	20	1
20	1	SPARE				11			0	12				SPARE	20	1
	1	SPACE				13	0			14				SPACE		1
	1	SPACE				15		0		16				SPACE		1
	1	SPACE				17			0	18				SPACE		1
	1	SPACE				19	0			20				SPACE		1
	1	SPACE				21		0		22				SPACE		1
							1028	1656	0							

AIC 10KA STYLE ___ TOTAL CONNECTED LOAD 2684 VA 7 AMPS

TYPE	CONNECTED	QTY	ADJUST. FACTOR	TOTAL	NEC ART.
L/C = LIGHTING & CONTINUOUS	0	N/A	1.25	0 VA	210-20
LM = LARGEST MOTOR	1656	N/A	1.25	2070 VA	
M/N = MOTORS & NON-CONT.	1028	N/A	1	1028 VA	
R = RECEPTACLE	0	N/A	1	0 VA	220-44
K = KITCHEN EQUIPMENT	0	0	0	0 VA	220-56

TOTAL NEW CONNECTED LOAD 2684 VA 7 AMPS

PANEL: AMPS 175 MAIN BREAKER VOLTS 120 / 240 PHASE 1 # OF WIRES 4 MOUNTING SURFACE LOCATION ___

BREAKER A	P	DESCRIPTION	TYPE	EXST /NEW	CIRCUIT VA	NO	A	B	NO	VA	EXST /NEW	TYPE	DESCRIPTION	BREAKER A	P
20	1	LIGHTS SOUTH WORK BAY	L	E	1000	1	1500		2	500	E	R	PARTS ROOM OUTLETS/ELEC RM	20	1
20	1	SOUTH EAST WORK BAY WALL	L	E	1000	3		1500	4	500	E	R	BOSS OFFICE OUTLETS	20	1
20	1	SPARE				5	1500		6	1500	E	N	OUTLET WELDER 220	20	2
20	1	LIGHTS MIDDLE BAYS	L	E	1500	7		3000	8	1500	E	N			
20	1	NORTH BAY LIGHTS	L	E	1500	9	2000		10	500	E	R	OUTLET SO. EAST WORKBAY BAY	20	1
20	1	MIDDLE BAY LIGHTS	L	E	1500	11		2500	12	1000	E	R	DRYER OUTLET	20	1
20	1	LIGHTS FURNACE ROOM	L	E	1000	13	2000		14	1000	E	R	TOOL ROOM OUTLET	20	1
20	1	LIGHTS HALL/ELEC/BOSS ROOM	L	E	1600	15		2600	16	1000	E	R	OUTLET BY TOOL ROOM	20	1
					1540	17	2040		18						
20	1	LIGHTS EXST SIGNS SHOP	L	E	1050	19		1230	20						
20	2	EXHAUST FANS	M	E	375	21	750		22	375	E	M	EXHAUST FANS	20	2
			M	E	375	23		750	24	375	E	M			
20	1	UNIT HEATER/ LARGE OVERHD DR	C	E	200	25	400		26	200	E	N	HEATER SOUTHWEST BAY	20	1
20	1	LIGHTS EXST HALLWAY	L	E	1000	27		1500	28						
					500	29	1000		30						
					500	31		1000	32	500	E	R	COMPUTER ROOM OUTLETS	20	1
						33	1000		34	500	E	M	EAST OVERHEAD DOORS	20	1
						35		1000	36	500	E	M	O/H DOORS WE/DR PRESS/RF AC	20	1
						37	2500		38	2000	E	N	PANEL C	100	3
30	2	DRYER	N	E	2400	39		4400	40	2000	E	N			
			N	E	2400	41	2400		42				SPACE		
							17090	19480							

AIC 22KA STYLE ___ TOTAL CONNECTED LOAD 36570 VA 152 AMPS

TYPE	CONNECTED	QTY	ADJUST. FACTOR	TOTAL	NEC ART.
L/C = LIGHTING & CONTINUOUS	11350	N/A	1.25	14187.5 VA	210-20
LM = LARGEST MOTOR	0	N/A	1.25	0 VA	
M/N = MOTORS & NON-CONT.	15000	N/A	1	15000 VA	
R = RECEPTACLE	7680	N/A	1	7680 VA	220-44
K = KITCHEN EQUIPMENT	1000	2	1	1000 VA	220-56

TOTAL NEW CONNECTED LOAD 5720 VA 24 AMPS

*PROVIDE NEW BREAKERS IN THE EXISTING PANEL AS NECSSARY. MATCH EXISTING AIC RATING.

PANEL: AMPS 225 MAIN LUGS ONLY VOLTS 120 / 208 PHASE 3 # OF WIRES 4 MOUNTING SURFACE LOCATION ___

BREAKER A	P	DESCRIPTION	TYPE	EXST /NEW	CIRCUIT VA	NO	A	B	C	NO	VA	EXST /NEW	TYPE	DESCRIPTION	BREAKER A	P
20	1	RH-1 MIDDLE	C	N	1200	1	1700			2	500	N	M	OVERHEAD DOOR OPENER	20	1
20	1	REF-1 SOUTH	M	N	1656	3		2196		4	540	N	R	EXTERIOR OUTLETS	20	1
20	1	REF-2 NORTH	M	N	1656	5			2856	6	1200	N	C	RH-1 NORTH SIDE	20	1
20	1	RH-1 SOUTH SIDE	C	N	1200	7	3120			8	1920	N	L	SHOP LIGHTING	25	1
20	3	EC-1 EAST	M	N	902	9		2822		10	1920	N	L	SHOP LIGHTING	25	1
			M	N	902	11			1094	12	192	N	L	EXTERIOR LIGHTING	20	1
			M	N	902	13	1002			14				[illegible]	20	1
35	3	VEF-1	M	N	3039	15		3539		16	500	N	N	EC-1,2 DUCT DETECTORS	20	1
			M	N	3039	17			3039	18				SPARE		
			M	N	3039	19	3039			20				SPARE	20	1
20	3	EC-2 WEST	M	N	902	21		902		22				SPARE	20	1
			M	N	902	23			902	24				SPARE	20	1
			M	N	902	25	902			26				SPARE	30	3
20	1	ROOF OUTLETS	R	N	600	27		600		28						
20	1	SHOP OUTLETS	R	N	720	29			720	30						
20	1	SHOP OUTLETS	R	N	720	31	3759			32	3039	N	M	MAU-1	35	3
20	1	SHOP OUTLETS	R	N	720	33		3759		34	3039	N	M			
20	1	SHOP OUTLETS	R	N	720	35			3759	36	3039	N	M			
20	1	OVERHEAD DOOR OPENER	M	N	500	37	10327			38	9827	N	N	BUCKBOOST TRANSFORM 38KVA	125	3
20	1	OVERHEAD DOOR OPENER	M	N	500	39		10327		40	9827	N	N			
20	1	OVERHEAD DOOR OPENER	M	N	500	41			10327	42	9827	N	N			
							23849	24145	22697							

AIC 10KA STYLE ___ TOTAL CONNECTED LOAD 70691 VA 196 AMPS

TYPE	CONNECTED	QTY	ADJUST. FACTOR	TOTAL	NEC ART.
L/C = LIGHTING & CONTINUOUS	7632	N/A	1.25	9540 VA	210-20
LM = LARGEST MOTOR	0	N/A	1.25	0 VA	
M/N = MOTORS & NON-CONT.	59039	N/A	1	59039 VA	
R = RECEPTACLE	4020	N/A	1	4020 VA	220-44
K = KITCHEN EQUIPMENT	0	0	0	0 VA	220-56

TOTAL NEW CONNECTED LOAD 70691 VA 196 AMPS

*PROVIDE SUBFEED LUGS

PANEL: AMPS 125 MAIN BREAKER VOLTS 120 / 240 PHASE 3 # OF WIRES 4 MOUNTING SURFACE LOCATION ___

BREAKER A	P	DESCRIPTION	TYPE	EXST /NEW	CIRCUIT VA	NO	A	B	C	NO	VA	EXST /NEW	TYPE	DESCRIPTION	BREAKER A	P
100	3	WELDER	N	N	9826	1	9826			2	0	N	N	LARGE STEAM CLEANER	50	2
			N	N	9826	3		9826		4	0	N	N			
			N	N	9826	5			14368	6	4542	N	N	LARGE STEAM CLEANER	50	2
20	1	SPARE				7	4542			8	4542	N	N			
							14368	9826	14368							

AIC 10KA STYLE ___ TOTAL CONNECTED LOAD 38562 VA 93 AMPS

TYPE	CONNECTED	QTY	ADJUST. FACTOR	TOTAL	NEC ART.
L/C = LIGHTING & CONTINUOUS	0	N/A	1.25	0 VA	210-20
LM = LARGEST MOTOR	0	N/A	1.25	0 VA	
M/N = MOTORS & NON-CONT.	38562	N/A	1	38562 VA	
R = RECEPTACLE	0	N/A	1	0 VA	220-44
K = KITCHEN EQUIPMENT	0	0	0	0 VA	220-56

TOTAL NEW CONNECTED LOAD 38562 VA 93 AMPS

ONLY ONE EQUIPMENT CAN RUN AT A TIME ON THIS PANEL

EELD #341

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CAMP WILLIAMS

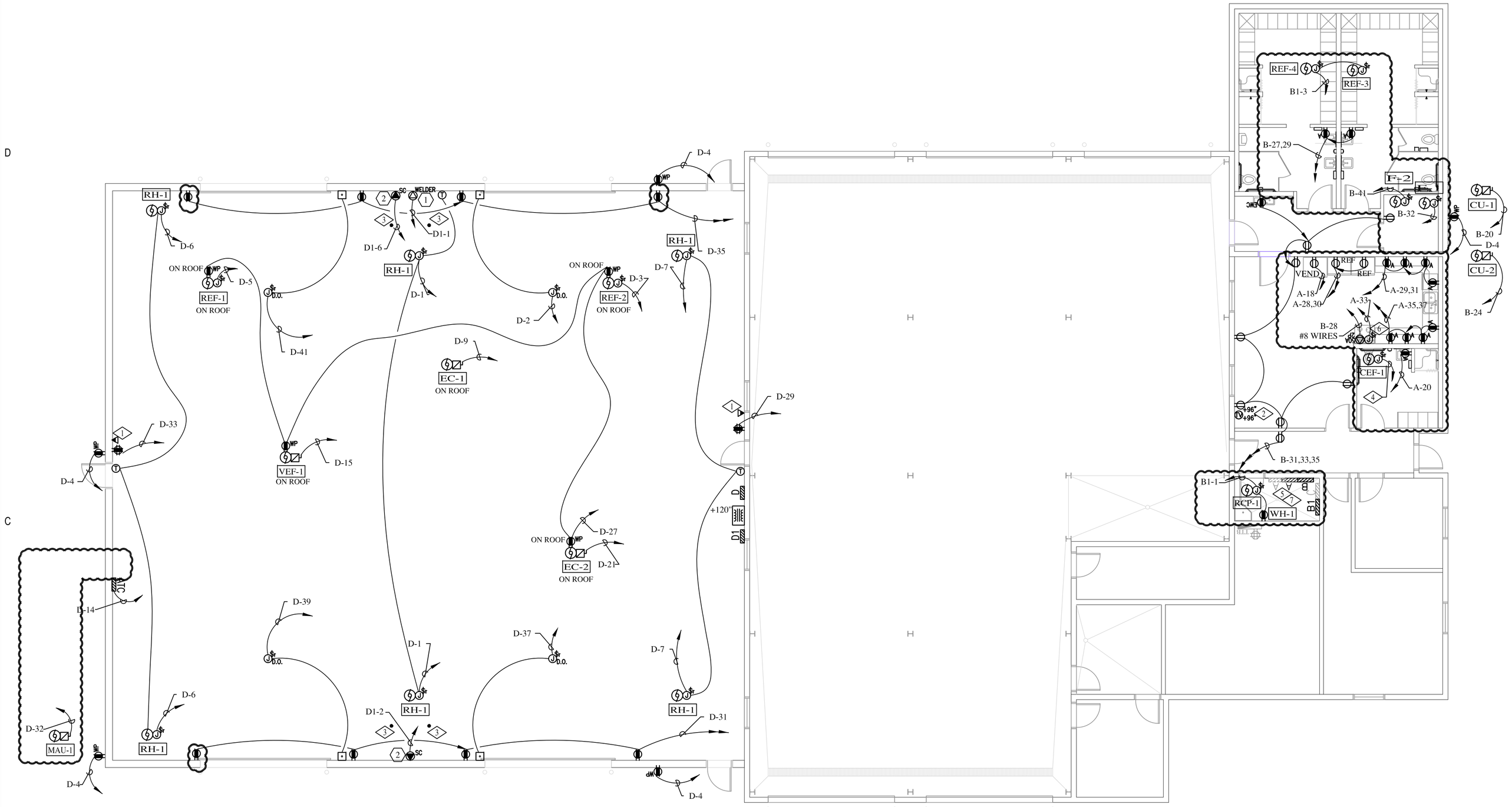
MARK	DATE	DESCRIPTION

DATE:	30 AUGUST 2010
AGENCY PROJECT NO:	10207480
HFSA PROJECT NO:	1022.01
CAD DWG FILE NO:	
DRAWN BY:	
CHECKED BY:	MDP
DESIGNED BY:	RLS
DWG TYPE:	ARCHITECTURAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS

SHEET TITLE
PANEL SCHEDULE, DETAILS, SYMBOLS LIST

EE-001

SHEET 1 OF 4



MAIN LEVEL FLOOR PLAN - POWER

SCALE 1/8"=1'-0"

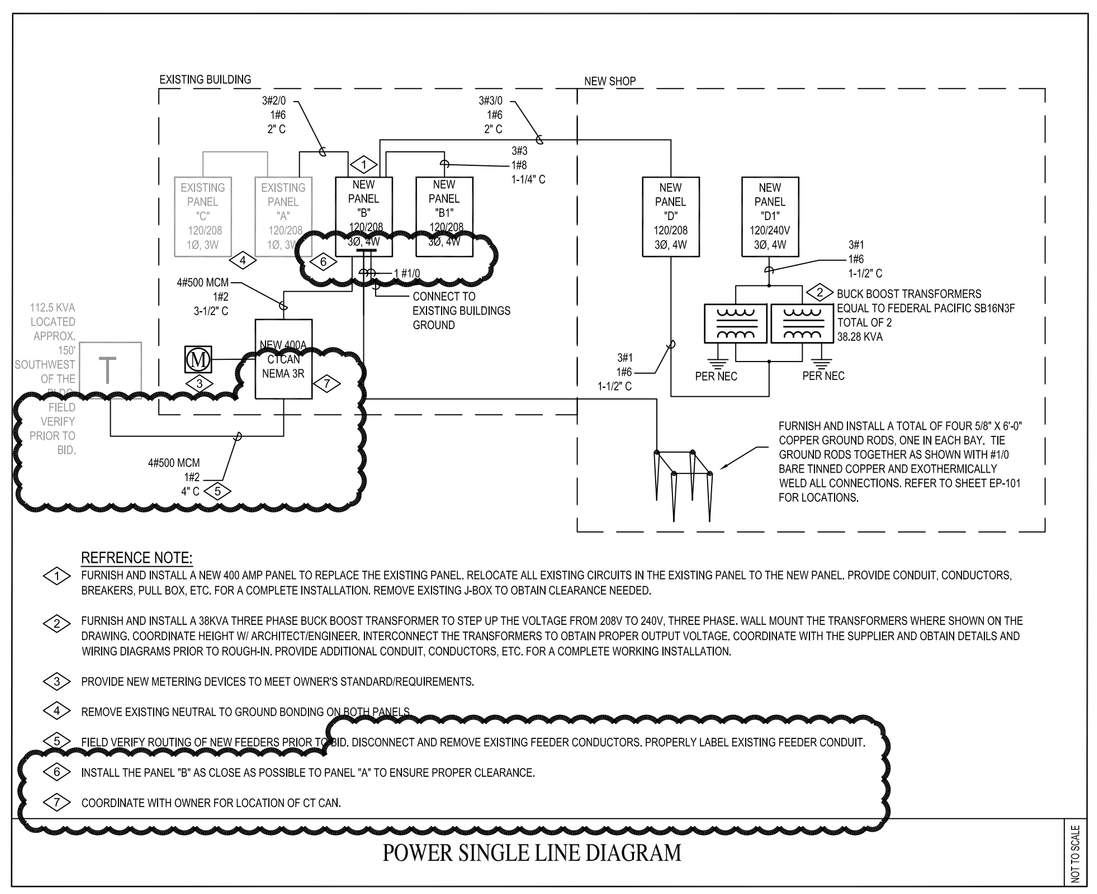
NORTH

REFERENCE NOTES: POWER

1. FURNISH AND INSTALL A 4"X4"X2-1/8" J-BOX IN THE APPROXIMATE LOCATION SHOWN FOR VOICE/DATA. RUN A 3/4" CONDUIT WITH TWO CAT6 CABLES FROM THE J-BOX TO THE TTB. MAKE FINAL CONNECTION. COORDINATE WITH THE OWNER/ARCHITECT FOR EXACT LOCATION PRIOR TO ROUGH-IN. COORDINATE THIS WORK WITH MIKE HANSEN, (801) 716-9000, PRIOR TO ROUGH-IN.
2. PROVIDE J-BOX AND RUN 3/4" CONDUIT TO NEAREST ACCESSIBLE CEILING WITH PULL STRING FOR TV. INSTALL OUTLET NEXT TO J-BOX. COORDINATE WITH ARCHITECT/ OWNER FOR EXACT LOCATION AND HEIGHT.
3. FURNISH AND INSTALL AN AIRCRAFT GROUNDING RECEPTACLE EQUAL TO STORM COPPER COMPONENTS YGT275 FLUSH IN THE CONCRETE. PROVIDE A 5/8"X6' GROUND ROD AND INSTALL PER MANUFACTURERS INSTRUCTIONS. REFER TO POWER SINGLE LINE DIAGRAM. COORDINATE THIS WORK AND EXACT LOCATION WITH OWNER.
4. TIE THE FANS TO THE LIGHTING CIRCUIT IN THE ROOM. THE FANS SHALL BE CONTROLLED BY THE MOTION SENSOR IN THE ROOM.
5. RELOCATE EXISTING PANEL "A" APPROXIMATELY 18" TO PROVIDE PROPER CLEARANCE AS PER NEC REQUIREMENTS. EXTEND THE FEEDERS AND ALL EXISTING CIRCUITS TO NEW PANEL LOCATION. PROVIDE SPLICE BOX, CONDUITS, CONDUCTORS, ETC. FOR A COMPLETE INSTALLATION.
6. COORDINATE EXACT HEIGHT OF HOOD CONNECTION WITH SUPPLIER.
7. THE ELECTRICAL CONTRACTOR IS TO LAYOUT THE NEW/EXISTING PANELS IN THE ROOM TO ENSURE PROPER CLEARANCE FOR THE PANELS. COORDINATE THIS WORK WITH THE MECHANICAL CONTRACTOR.

SPECIAL NOTE

1. INSTALL ALL OUTLETS IN THE SHOP AREA AT 24" AFF.



REFRENCE NOTE:

1. FURNISH AND INSTALL A NEW 400 AMP PANEL TO REPLACE THE EXISTING PANEL. RELOCATE ALL EXISTING CIRCUITS IN THE EXISTING PANEL TO THE NEW PANEL. PROVIDE CONDUIT, CONDUCTORS, BREAKERS, PULL BOX, ETC. FOR A COMPLETE INSTALLATION. REMOVE EXISTING J-BOX TO OBTAIN CLEARANCE NEEDED.
2. FURNISH AND INSTALL A 38KVA THREE PHASE BUCK BOOST TRANSFORMER TO STEP UP THE VOLTAGE FROM 208V TO 240V, THREE PHASE. WALL MOUNT THE TRANSFORMERS WHERE SHOWN ON THE DRAWING. COORDINATE HEIGHT W/ ARCHITECT/ENGINEER. INTERCONNECT THE TRANSFORMERS TO OBTAIN PROPER OUTPUT VOLTAGE. COORDINATE WITH THE SUPPLIER AND OBTAIN DETAILS AND WIRING DIAGRAMS PRIOR TO ROUGH-IN. PROVIDE ADDITIONAL CONDUIT, CONDUCTORS, ETC. FOR A COMPLETE WORKING INSTALLATION.
3. PROVIDE NEW METERING DEVICES TO MEET OWNER'S STANDARD/REQUIREMENTS.
4. REMOVE EXISTING NEUTRAL TO GROUND BONDING ON BOTH PANELS.
5. FIELD VERIFY ROUTING OF NEW FEEDERS PRIOR TO BID. DISCONNECT AND REMOVE EXISTING FEEDER CONDUCTORS, PROPERLY LABEL EXISTING FEEDER CONDUIT.
6. INSTALL THE PANEL "B" AS CLOSE AS POSSIBLE TO PANEL "A" TO ENSURE PROPER CLEARANCE.
7. COORDINATE WITH OWNER FOR LOCATION OF CT CAN.

POWER SINGLE LINE DIAGRAM

NOT TO SCALE

MECHANICAL EQUIPMENT SCHEDULE

	NAME OF MECHANICAL EQUIPMENT	AIR COOLED CONDENSING UNIT	FURNACE	CEILING EXHAUST FAN	VEHICLE EXHAUST FAN	ROOF UPBLAST EXHAUST FAN	ROOF UPBLAST EXHAUST FAN	RADIANT HEATING UNIT	OUTDOOR DIRECT FIRED MAKEUP AIR UNIT	WATER HEATER	RECIRCULATION PUMP	EVAPORATIVE COOLER
	EQUIPMENT NO.	CU-1,2	F-1,2	CEF-1	VEF-1	REF-1,2	REF-3,4	RH-1	MAU-1	WH-1	RCP-1	EC-1,2
	RATING/WATTS		1/2 HP	372	7.5 HP	3/4 HP	1/4 HP		7.5 HP	1/16 HP	1/6HP	
	VOLTAGE	208	120	120	208	120	120	120	208	120	120	208
	PHASE	1	1	1	3	1	1	1	3	1	1	3
MOTOR DATA	AMPS	14.1	9.8	3.1	25.3	13.8	5.8	5	25.3	1	4.4	6.8
	WIRE SIZE	2 # 12	2 # 12	2 # 12	3 # 10	2 # 12	2 # 12	2 # 12	3 # 10	2 # 12	2 # 12	3 # 12
	GROUND WIRE	1 # 12	1 # 12	1 # 12	1 # 10	1 # 12	1 # 12	1 # 12	1 # 10	1 # 12	1 # 12	1 # 12
	CONDUIT SIZE	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
	FUSE DISC. SW.	20			60				60			30
	TYPE RKI FUSES	20			35				35			10
	BREAKER	20	20	20	35	20	20	20	35	20	20	20
	NOTES	1	2,8	2	4,6	2,6	2,7	2,5	1	2	2	1,8

NOTES:

1. STARTER IS FURNISHED WITH THE UNIT. PROVIDE SITE DISCONNECT.
2. PROVIDE THERMAL OVERLOAD SWITCH.
3. PROVIDE DUPLEX OUTLETS
4. PROVIDE COMBINATION STARTER & DISCONNECT (HOA) W(2) N.O. & N.C. CONTACTS
5. RUN 2#12 WIRES IN 1/2" C TO THE THERMOSTAT FOR CONTROL.
6. RUN 1/2" C TO CONTROL PANEL FROM EQUIPMENT. COORDINATE WITH MECHANICAL CONTRACTOR.
7. TIE EQUIPMENT THROUGH RELAY PROVIDED BY DIV 23. REFER TO SHEET ME101 FOR DIV 26 RESPONSIBILITIES.
8. PROVIDE A 120V CIRCUIT TO DUCT DETECTORS FOR EQUIPMENT. TIE TO NEAREST CIRCUIT B1-2 OR D-16. COORDINATE W/ MECH CONTRACTOR.

EQUIPMENT SCHEDULE

EQUIP. NO.	EQUIPMENT NAME	EQUIPMENT DESCRIPTION	ELECTRICAL CHARACTERISTIC										COMMENTS
			VOLTS	PHASE	AMPS	KW	MINIMUM WIRE	MINIMUM GND SIZE	CONDUIT SIZE	DISC SWITCH	RKI FUSE	BREAKER SIZE	QUANTITY (VERIFY)	
1	WELDER		230	3	74.00		3 # 4	1 # 8	1"			95		NOTE 1
2	STEAM CLEANER		230	1	39.50		2 # 8	1 # 10	3/4"			50		NOTE 1

NOTES:

1. PROVIDE APPROPRIATE OUTLET TYPE

EELD #341

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NO. 334543-2202
MARSOUR ACHOUSI
STATE OF UTAH

CAMP WILLIAMS UTES EAST REMODEL DESIGN

UTAH NATIONAL GUARD
CAMP WILLIAMS

MARK	DATE	DESCRIPTION

DATE:	30 AUGUST 2010
AGENCY PROJECT NO:	10207480
HFSA PROJECT NO:	1022.01
CAD DWG FILE NO:	
DRAWN BY:	
CHECKED BY:	MDP
DESIGNED BY:	RLS
DWG TYPE:	ARCHITECTURAL
ARCHITECTURAL PHASE:	CONSTRUCTION DOCUMENTS

SHEET TITLE

MAIN LEVEL FLOOR PLAN - POWER

EP-101

SHEET 3 OF 4